

## Description

The GRX-TVI provides 0-10V control and ballast switching capabilities in one enclosure. The GRX-TVI gives *GRAFIK Eye* 3000 Series Control Units the ability to control any 0-10V ballasts powered by 100V-277V (**ballast must provide 0-10V sourcing of current**) and provides switching relays that can handle the in-rush current for a circuit of ballasts. The GRX-TVI gives a *GRAFIK Eye* 3000 Series Control Unit the ability to both dim and switch electronic ballasts, such as *Lutron's Eco-10™* (TVE models). The GRX-TVI can also be used to switch any of the load types listed below.

## Product Specifications

**FEATURES** ..... Provides a Class 2/PELV isolated 0-10V output signal that conforms to EN60929 and IEC60929  
Accepts a constant-gate drive fluorescent signal (100-127V, 220-240V, 50/60Hz)

**INPUT POWER RATING** ..... 100-127/220-240V, 50/60Hz

**H2/L2 TERMINAL** ..... 20mA

**INPUT RATING**

**DH2/DL2 TERMINAL** ..... 100mA

**INPUT RATING**

**0-10V OUTPUT RATING** ..... 10µA-300mA - Sinks current only (maximum 150 ballasts)

Source/Load Type	230V (CE)	100-127V/ 200-277V
Fluorescent: <i>Lutron Eco-10™</i> (TVE Series)	—	16A
Electronic Capacitive Non-Dim	10A	16A
Other Manufacturer's 0-10V Ballasts ( <i>0-10V source only</i> )	10A	16A
Incandescent	10A	16A
Low-Voltage	10A	16A
Metal Halide	10A	16A
Neon/Cold Cathode	10A	16A
Motors	1/4HP @ 100-120V 1/2HP @ 200-277V 1/2HP @ 230V CE	

**TERMINALS** Two #12-20AWG (0.5-2.5 mm<sup>2</sup>) conductors per terminal.

**MOUNTING** NEMA Type 1 enclosure, indoor use only.

**ENVIRONMENTAL** 32—104 °F (0—40 °C).

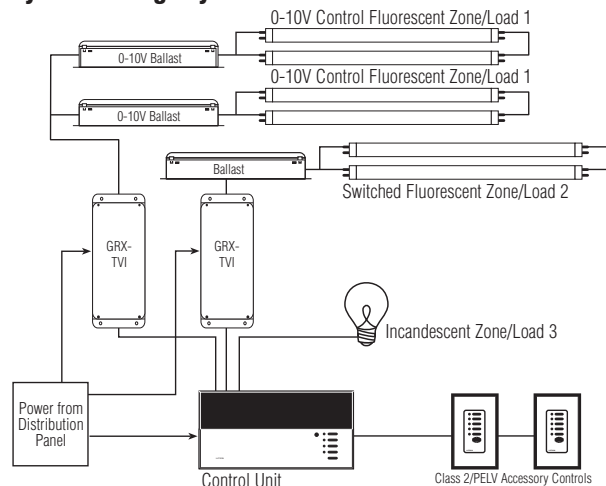
**WEIGHT** 4.25 lb. (2kg)

## Mounting

Find a suitable location for mounting.

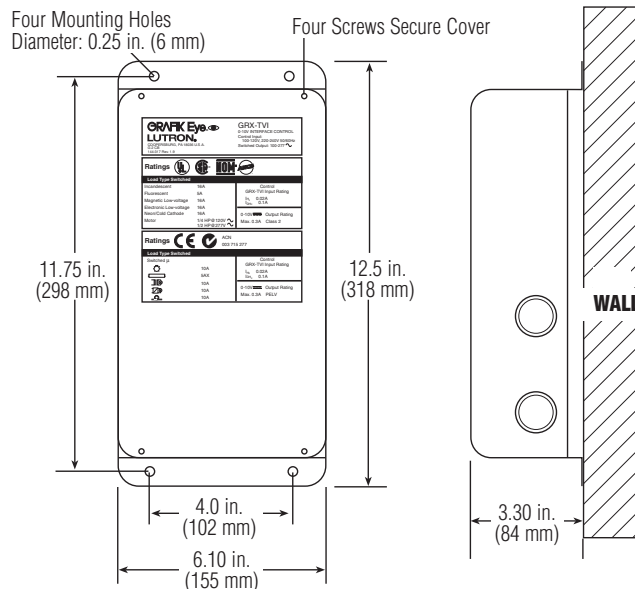
- Decide on the proper location for the GRX-TVI (NEMA Type 1 enclosure, indoor use only). See System Wiring Layout below.
- The environment where the GRX-TVI is placed must have an ambient temperature range of 32—104 °F (0—40 °C).
- Mount the enclosure vertically on a wall (screws not provided). See Mounting Diagram below.
- Mounting method must be able to support weight and forces applied during installation.
- Internal relays will click while in operation — mount where audible noise is acceptable.

## System Wiring Layout



**Note:** When using a Control Unit, a GRX-TVI is required for each 0-10V fluorescent zone. (A 3-zone Control Unit with two fluorescent zones and one incandescent zone is shown as an example.)

## Mounting Diagram



# 220-240V/CE Control Interface

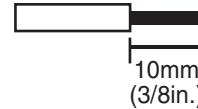
## Important Installation Information

- Install in accordance with all national and local electrical codes.
- Check for short circuited loads during new installations before wiring the GRX-TVI.



**Caution:** Multiple feeds may enter this enclosure. Locate and lock each feed circuit breaker/MCB in the OFF position before wiring the Interface.

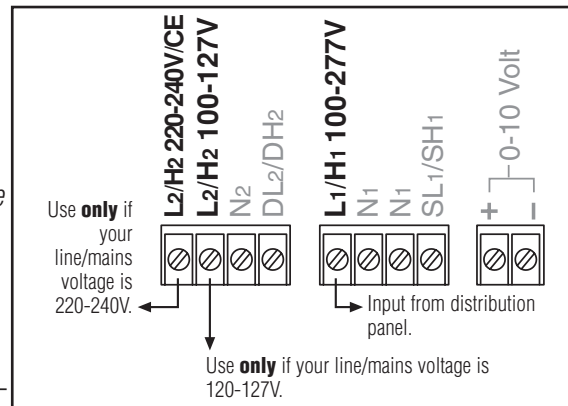
- Proper short circuit and overload protection must be provided at the distribution panel. You can use up to a 20A (16A for CE) maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-22 AWG (0.5-2.5 mm<sup>2</sup>) wires per terminal.
- Strip 3/8 in. (10 mm) of insulation from wires.
- Wiring Diagram A shows a GRX-TVI wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagram B shows a GRX-TVI wired from two separate distribution panels that may be different phases or voltages.
- Use the internal terminal block label to see where to land wires.



- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).  
L1/H1 is the Hot/Live feed to power the lighting load.  
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.  
*L2/H2 has a 100-127V connection **and** a 220-240V connection - use **only** the one corresponding to line voltage for your application.*

Note 1: Not all terminal blocks receive a connection.

Note 2: The power feed to the Control Unit and L2/H2 of the GRX-TVI must be the same phase!  
Class 2/PELV, 0-10V wiring from a ballast to the GRX-TVI-CE must be separated from the power wiring. Enter the Class 2/PELV wires through the knockout adjacent to the 0-10V terminal blocks. The Nomex<sup>®</sup> barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

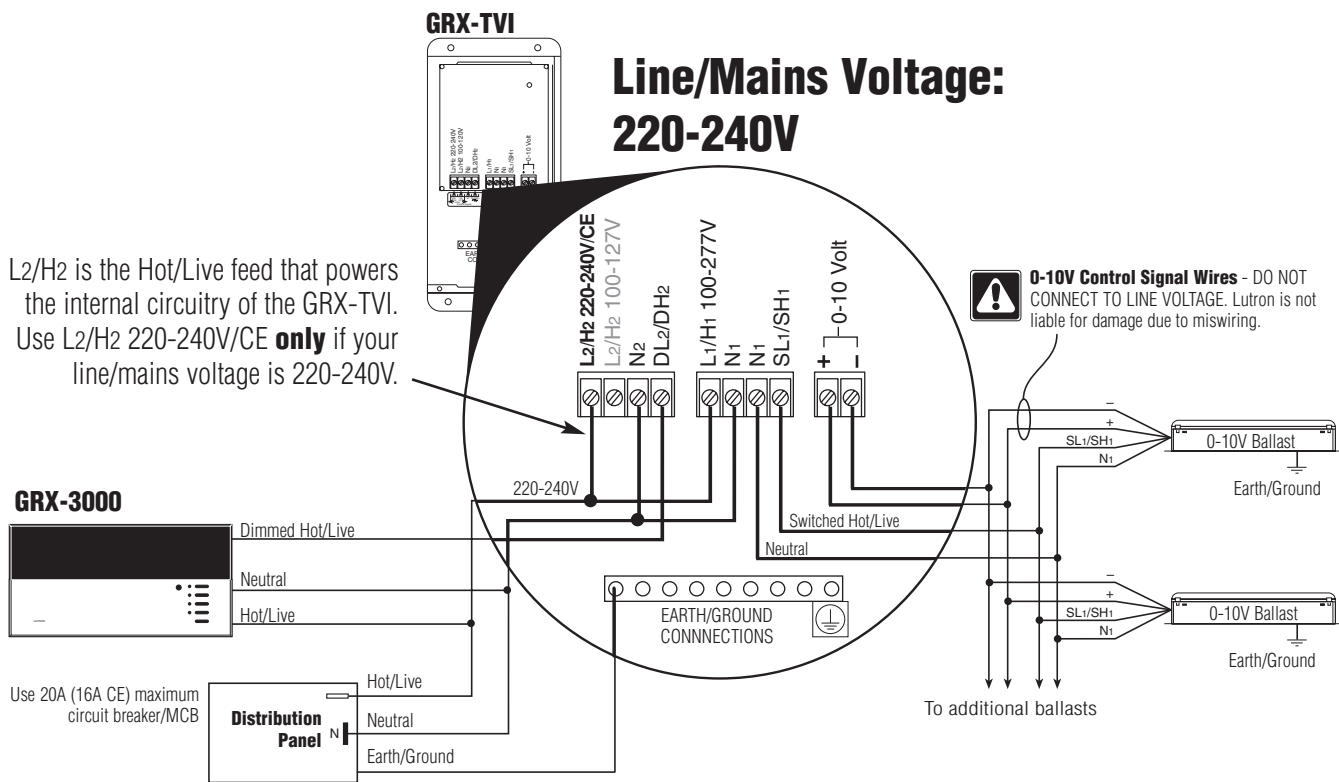


## GRX-TVI Internal Terminal Block Label Definitions

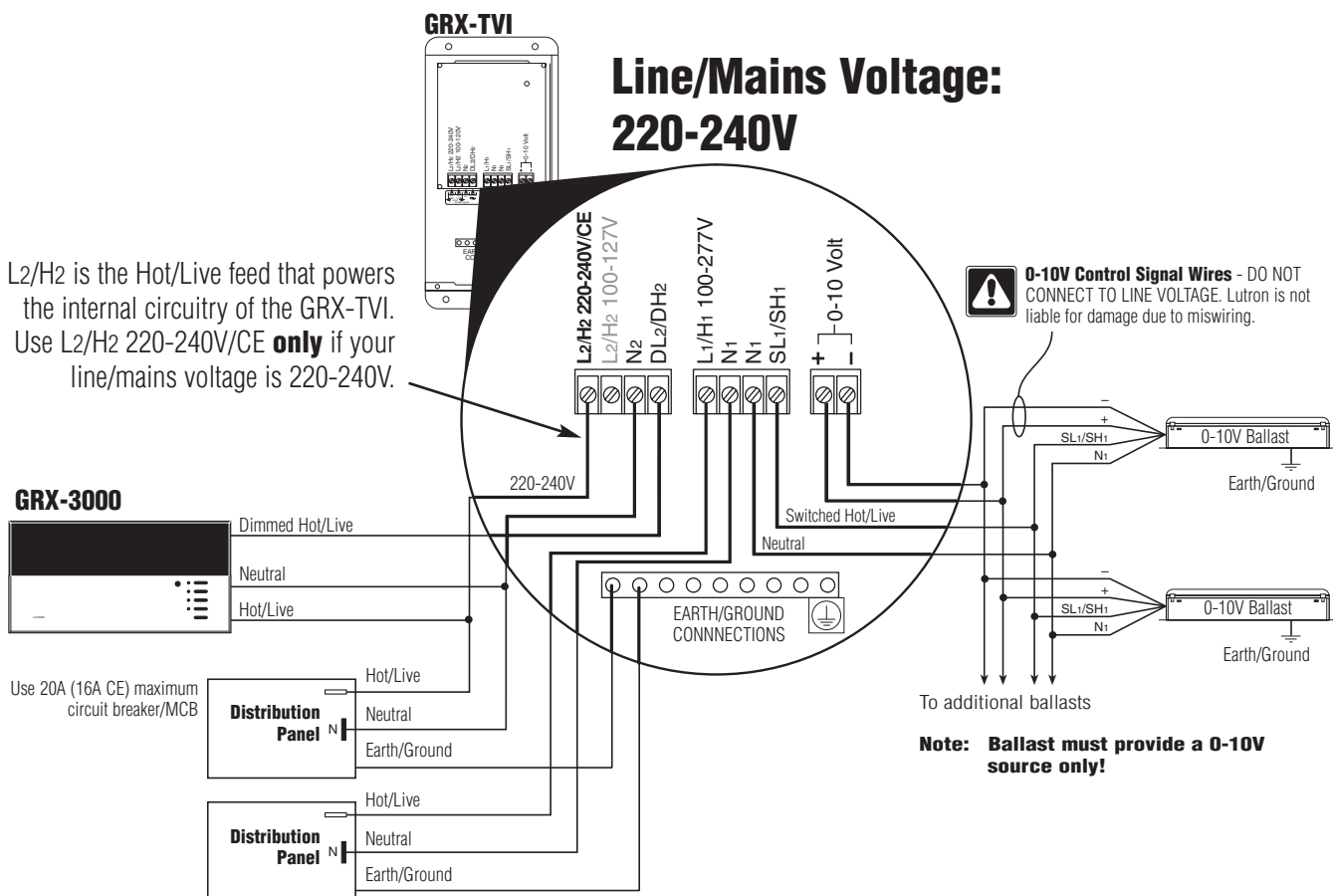
Use **only one** input according to Input Voltage:

L2/H2 240V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 100-127V)
N2	Neutral for GRX-TVI control
DL2/DH	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-TVI)
L1/H1	Power input for lighting load
N1	Neutral for lighting load (2 terminals provided and internally tied together — one for input neutral and one for load neutral)
SL1/SH1	Switched output to power lighting load
+ -	0-10V control signal wires ( <b>ballast must provide a 0-10V source only</b> )

## Wiring Diagram A: 220-240V/CE GRX-TVI — 1 Distribution Panel



## Wiring Diagram B: 220-240V/CE GRX-TVI — 2 Distribution Panels



# 100-127V Control Interface

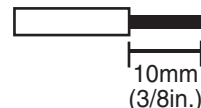
## Important Installation Information

- Install in accordance with all national and local electrical codes.
- Check for short circuited loads during new installations before wiring the GRX-TVI.



**Caution:** Multiple feeds may enter this enclosure. Locate and lock each feed circuit breaker/MCB in the OFF position before wiring the Interface.

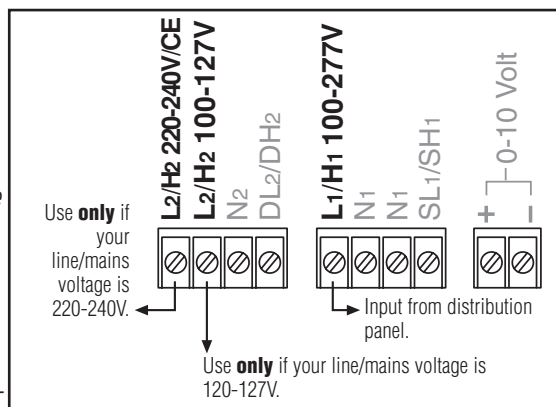
- Proper short circuit and overload protection must be provided at the distribution panel. You can use up to a 20A (16A for CE) maximum circuit breaker/MCB or equivalent (tripping curve C according to IEC 898/EN60898 is recommended) with adequate short circuit breaking capacity for your installation.
- Terminal blocks are rated for two #12-22 AWG (0.5-2.5 mm<sup>2</sup>) wires per terminal.
- Strip 3/8 in. (10 mm) of insulation from wires.
- Wiring Diagram C shows a GRX-TVI wired from one distribution panel. If the power requirement of the complete system is less than an MCB/circuit breaker rating, one feed can be jumpered inside the enclosure (as shown).
- Wiring Diagram D shows a GRX-TVI wired from two separate distribution panels that may be different phases or voltages.
- Use the internal terminal block label to see where to land wires.



- The label shows two separate Hot/Live terminals (L1/H1 & L2/H2).  
L1/H1 is the Hot/Live feed to power the lighting load.  
L2/H2 is the Hot/Live feed that powers internal circuitry of the GRX-TVI.  
L2/H2 has a 100-127V connection **and** a 220-240V connection - use **only** the one corresponding to line voltage for your application.

Note 1: Not all terminal blocks receive a connection.

Note 2: The power feed to the Control Unit and L2/H2 of the GRX-TVI must be the same phase!  
Class 2/PELV, 0-10V wiring from a ballast to the GRX-TVI-CE must be separated from the power wiring. Enter the Class 2/PELV wires through the knockout adjacent to the 0-10V terminal blocks. The *Nomex*® barrier ensures separation and is flexible to allow access to the terminals. The barrier must be in place when installation is complete.

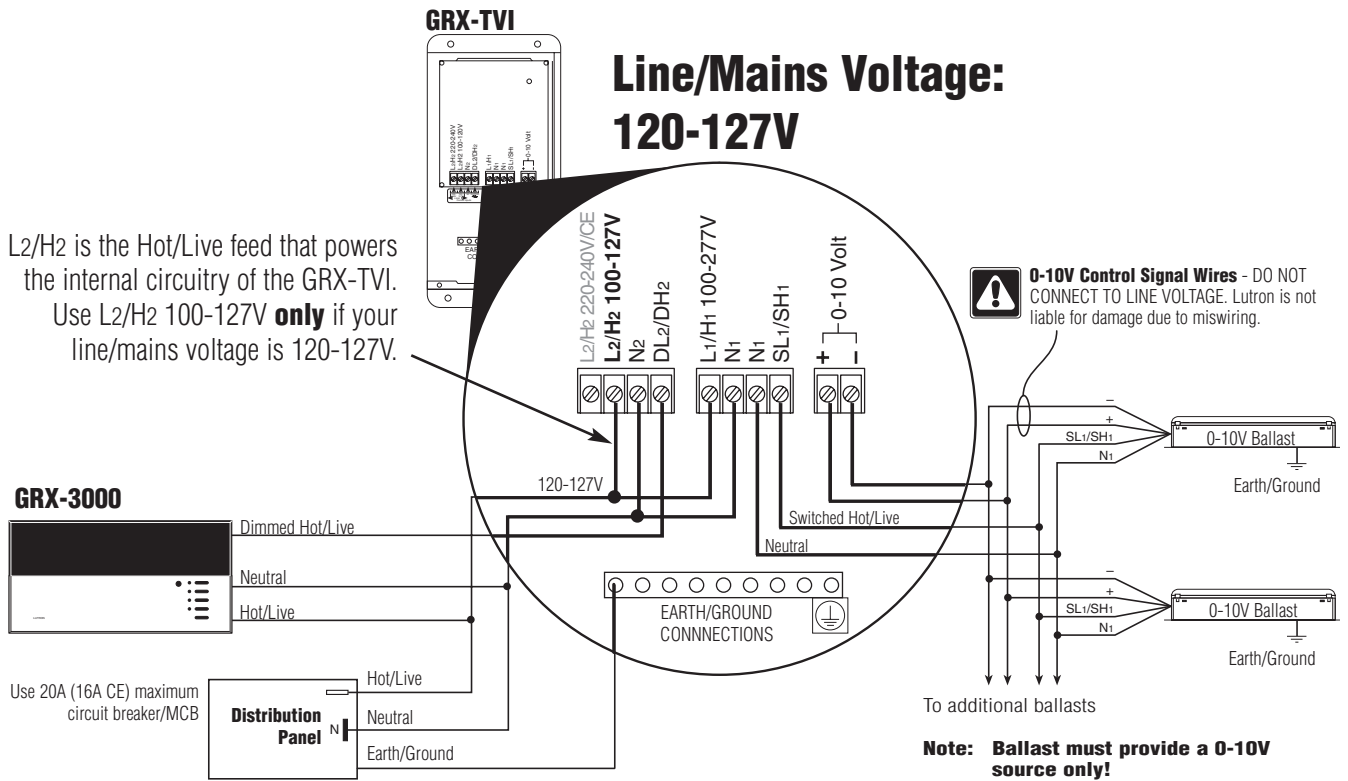


## GRX-TVI Internal Terminal Block Label Definitions

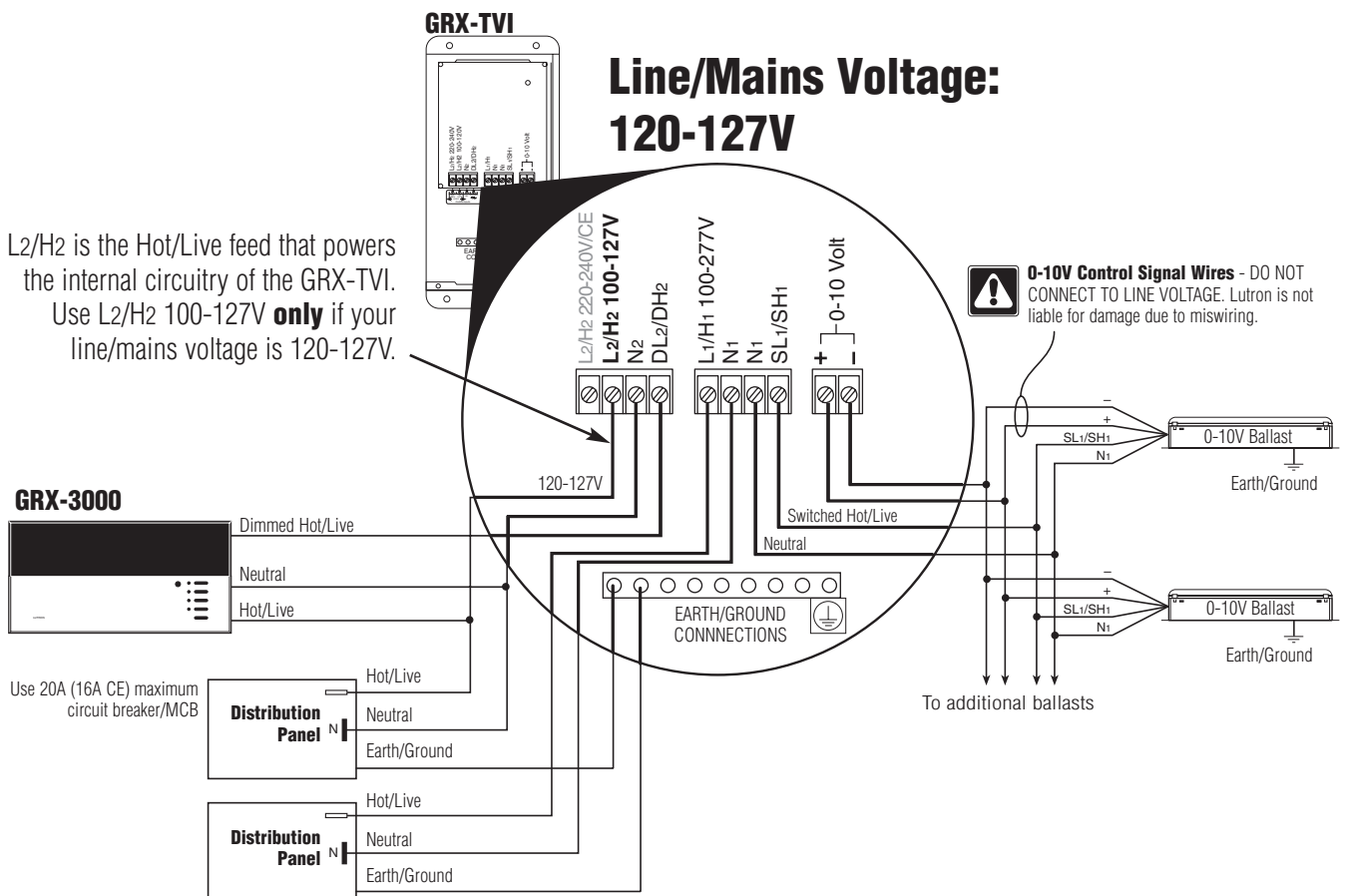
Use **only one** input according to Input Voltage:

L2/H2 240V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 220-240V)
L2/H2 127V	Power input for GRX-TVI control (line/mains voltage <b>must be</b> 100-127V)
N2	Neutral for GRX-TVI control
DL2/DH	GRAFIK Eye 3000 Series Control Unit Lighting Zone connection (Phase Control Input to GRX-TVI)
L1/H1	Power input for lighting load
N1	Neutral for lighting load (2 terminals provided and internally tied together — one for input neutral and one for load neutral)
SL1/SH1	Switched output to power lighting load
+ -	0-10V control signal wires ( <b>ballast must provide a 0-10V source only</b> )

## Wiring Diagram C: 100-127V GRX-TVI — 1 Distribution Panel



## Wiring Diagram D: 100-127V GRX-TVI — 2 Distribution Panels



## Operation

After wiring is complete, supply power to the GRX-TVI to check for proper operation.

- With the cover removed, an LED will provide visual feedback about the operation of the system.
- When power is first applied, the LED will turn on for 8 seconds to indicate start-up mode and then start to flash in one of two ways to indicate the status of the system:

### 1. Standard Operation

- The LED will flash at a rate of twice per second to signify proper communication between the Control Unit and the Interface.

### 2. Incorrect Operation - No Active Input

- The LED will repeatedly turn on for 1 second then off for 1 second to indicate that there is not an active phase control input to the GRX-TVI. Make sure that the phase control dimmer is ON and connected to the GRX-TVI at the terminal block marked DL2/DH2. Check that the corresponding zone for the DL2/DH2 terminal is ON and the light level is not set at the minimum output.
- When the LED indicates proper input of a phase control signal, then the output can be checked by looking at the load and checking operation from the Control Unit.
- For non-dimming ballasts, select non-dim load type on the GRAFIK Eye Control Unit and do not connect ballasts to 0-10V terminals.



Make sure that the Control Unit is set for **Fluorescent Load Type**. (Refer to *GRAFIK Eye 3000 Series Installer's Guide*.) If the load type is not set correctly, proper dimming will not occur.

## Troubleshooting

Symptom	Possible Cause	Solution
0-10V Ballast does not dim or control unit to the Interface.	Miswire	Verify that LED pulses twice per second. If not, check wiring from phase control unit to the Interface.
	Power is OFF	Make sure that the <i>GRAFIK Eye 3000 Series Control Unit</i> is ON.
	Miswire	Check for proper polarity of 0-10V signals at terminal blocks. Does it match what is at every ballast? A miswire at any ballast will cause all ballasts to go to the low end.
	Incorrect Control Setup	<i>GRAFIK Eye 3000 Series Control Unit</i> is not configured for fluorescent load type.
Light does not switch on	Miswire	Check that the SL1/SH1 connection goes to the ballasts.
	Miswire	Check that the DL2/DH2 connection is actually wired to a phase control input.
Light does not switch off	Miswire	Load is not connected to SH (SL) terminal.
	Miswire	Check that the DL2/DH2 connection is actually wired to a phase control input.
LED is not illuminated	No Power Input	Check that power is applied to the Interface.

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### LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid.

***This warranty is in lieu of all other express warranties, and the implied warranty of merchantability is limited to one year from purchase. This warranty does not cover the cost of installation, removal or reinstallation, or damage resulting from misuse, abuse, or improper or incorrect repair, or damage from improper wiring or installation. This warranty does not cover incidental or consequential damages. Lutron's liability on any claim for damages arising out of or in connection with the manufacture, sale, installation, delivery, or use of the unit shall never exceed the purchase price of the unit.***

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