

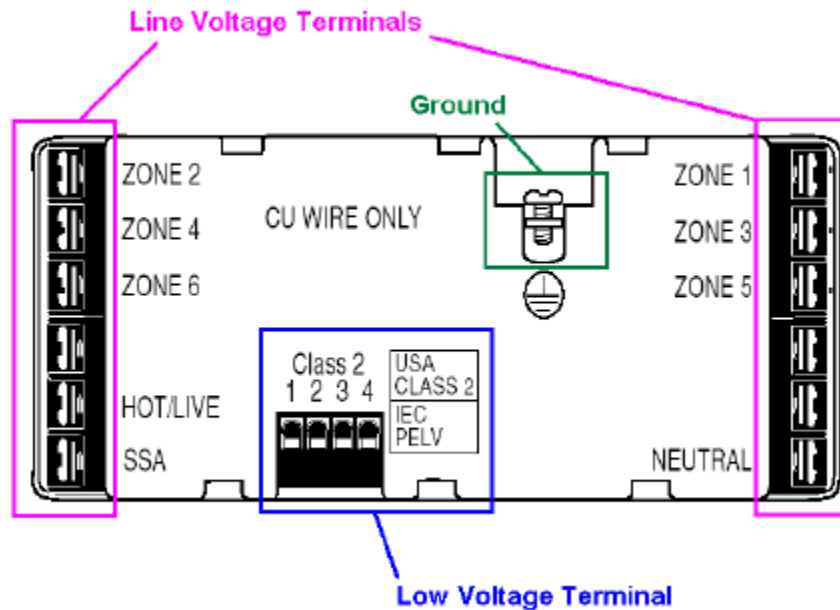
Overview

This application note explains the wiring rules in the 2002 National Electrical Code® and Canadian Electrical Code, Part 1 as they pertain to the connection of low voltage Class 2 conductors and line voltage conductors to the GRAFIK Eye 3000 control units (this includes GRX-MR and GRX-IA units). It is intended to clear up any questions which may exist with regard to these conductors occupying the same device box.

Clarifications

GRAFIK Eye 3000 Control Unit

The back of a GRAFIK Eye 3000 control unit is diagramed below*. The different terminals have been highlighted. The two- and three-zone GRAFIK Eye 3000 control units will differ in terminal arrangement, but the terminals are identical aside from the number of zones. Sections A and B below explain how the GRAFIK Eye 3000 control unit meets both the National Electrical Code® (NFPA® 70) and the Canadian Electrical Code (CSA C22.1-02).



* Model GRX-3106/3506 pictured.

A. NFPA[®] 70 – National Electrical Code[®] (NEC[®])

The wallstation control link for the *GRAFIK Eye* 3000 control units is a Class 2 power-limited circuit as described in Article 725 of the 2002 NEC[®]. Article 725.55 provides the specific rules governing Class 2 conductors and line voltage conductors within the same box. These rules state that Class 2 conductors and the line voltage conductors may occupy the same box as long as they meet the following conditions:

1. The Class 2 and line voltage conductors must both enter the box to connect to the equipment in that box.
2. All circuit conductors operate at 150 volts or less to ground and CL3, CL3R, CL3P, or a permitted substitute cable is used to install the Class 2 circuit.
3. Class 2 conductors extending beyond the cable jacket are separated by a minimum of 6 mm (0.25 in) from line voltage conductors.

The *GRAFIK Eye* 3000 control unit meets the first requirement since the Class 2 control circuit originates in the *GRAFIK Eye* 3000 control unit. For the second requirement, in the *GRAFIK Eye* 3000 conductors will not operate over 120 V and Lutron cable GRX-CBL-346S-500 is properly rated. If you are not using Lutron cable and unsure if it meets these requirements, contact your cable manufacturer for information on CL3, CL3R, and CL3P cable.

As to the third requirement, Class 3 cable consists of insulated conductors inside a jacket; at the point you connect the conductors to the *GRAFIK Eye* 3000 control unit you must strip back this jacket, exposing the insulated conductors. *GRAFIK Eye* 3000 control unit units provide for the minimum 6 mm (0.25 in.) separation of the Class 2 conductors from the line voltage conductors through the positioning of the terminal block used to make the Class 2 connections to the *GRAFIK Eye* 3000 control unit.

B. CSA C22.1-02 – Canadian Electrical Code, Part 1

The Canadian Electrical Code, 19th ed. (2002), provides the rules for wiring Class 2 circuits in Article 16-200. Article 16-212 states the specific rules for separation of Class 2 circuits from other circuits:

1. Like the NEC[®], the Class 2 and line voltage conductors must both enter the box to connect to the equipment in that box.
2. All conductors must be insulated for the maximum voltage present on any conductor in the box.

Again, the *GRAFIK Eye* 3000 control unit meets the first requirement since the Class 2 control circuit and the line voltage wires connect to the *GRAFIK Eye* 3000 control unit. For the *GRAFIK Eye* 3000 control unit, Lutron cable part number GRX-CBL-346S-500 meets the second requirement since it is rated for 300 V and the maximum voltage on any conductor in these applications will be limited to 120 V.

Additional Information

World Headquarters

Lutron Electronics Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299 U.S.A.
TOLL FREE: (800) 523-9466 (U.S.A., Canada,
and the Caribbean)
Tel: (610) 282-3800; International 1610 282-3800
Fax: (610) 282-3090; International 1610 282-3090

European Headquarters

Lutron EA LTD
Lutron House
6 Sovereign Close
Wapping
London, E1 9HW England
FREEPHONE: 0800 282107 (U.K.)
Tel: 44 (0)20-7702-0657
Fax: 44 (0)20-7480-6899

Hong Kong Office

Tel: 011 852-2104-7733
Fax: 011 852-2104-7633

Singapore Office

Tel: 011 65-6220-4666
Fax: 011 65-487-2825

Japan Office

Lutron Asuka Co., Ltd.
No. 16 Kowa Bldg. 4F
1-9-20 Akasaka,
Minato-ku, Tokyo 107-0052, Japan
TOLL FREE: (0120) 083417 (Japan)
Tel: 011 81-3-5575-8411
Fax: 011 81-3-5575-8411

Worldwide Technical and Sales Assistance

If you need technical assistance, call the toll-free **Lutron Technical Assistance Hotline**. Please provide exact model number when calling. (800) 523-9466 (U.S.A., Canada and the Caribbean)
Other countries call:
Tel: (610) 282-3800; International: 1 610 282-3800
Fax: (610) 282-3090; International: 1 610 282-1243
Our address on the Web is www.lutron.com

Lutron and GRAFIK Eye are registered trademarks of Lutron Electronics Co., Inc.
National Electrical Code, NEC, and NFPA are registered trademarks of the National Fire Protection Association, Inc. Quincy, MA.