A history of sustainability, innovation, and quality

Sustainability

At Lutron, sustainability is not a new concept. Since 1961, we have been designing industry-leading technology that saves energy and reduces greenhouse gas emissions. We're also a proud member of the U.S. Green Building Council.

Our philosophy

Lutron is a company built on a belief in taking care of the people: customers, employees, and the community. We innovate in advance of emerging market needs and continually improve our quality, our delivery, and our value.

Innovation

Lutron owns over 1,700 patents and manufactures more than 15,000 products. For over 50 years, we have met and exceeded the highest standards of quality and service. Every one of our products is quality-tested before it leaves the factory.

Global service and support

You can count on a level of support unequaled anywhere in the industry and anywhere in the world. Lutron provides 24/7 technical phone support. Lutron Field Service, made up of a global network of customer-focused field service engineers, provides world-class services that begin before your building is commissioned and continue throughout the life of your building.

www.lutron.com
World Headquarters 1.610.282.3800
Technical Support Center 1.800.523.9466 (Available 24/7)
Customer Service 1.888.LUTRON1
Lighting Control Institute: 1.610.282.6280
Field Service: 1.800.523.9466
LED Center of Excellence 1.888.346.5338 leds@lutron.com

LUTRON®

save energy with Lutron™ ®

LED Driver and Fluorescent Ballast

Selection Guide

LUTRON®

save energy with Lutron™ ®

Innovation and quality from the world leader in lighting controls

Lutron invented the world's first electronic dimming ballast more than 30 years ago, and continues to lead the industry with innovative and energy-saving LED and fluorescent dimming products. The company offers an extensive selection of ballasts, drivers, and controls, providing complete LED and fluorescent dimming solutions.

The LED Driver and Fluorescent Ballast Selection Guide helps you:

- Determine the dimming range required for your application
- Incorporate energy-saving strategies
- Choose the appropriate Lutron dimming ballast or LED driver

Find and/or configure the driver or ballast that best fits your project:

For fixtures using Lutron LED drivers: **www.lutron.com/findafixture**

For drivers: **www.lutron.com/LEDBuildAModel**

For ballasts: **www.lutron.com/BallastTool**

LED Driver and Fluorescent Ballast Selection Guide

Solutions for projects of every size

Applications

Single space

Multiple rooms to multiple buildings

Lutron offers an extensive selection of fluorescent ballasts and LED drivers, and can control a variety of sources including EcoSystem®, and 3-wire and 2-wire loads, down to 1% with a smooth fade to/from black for an incandescent-like experience.

0–10V loads can also be controlled, with the dimming performance, dependent on the non-Lutron 0–10V driver/ballast manufacturer.

All Lutron solutions offer code compliant, energy-saving options for new construction and retrofit projects.

Lutron | **Scalable light management solutions**

The extensive selection of Lutron ballasts, drivers, and controls offers a flexible, energy-saving dimming solution that fits your needs.

Drivers

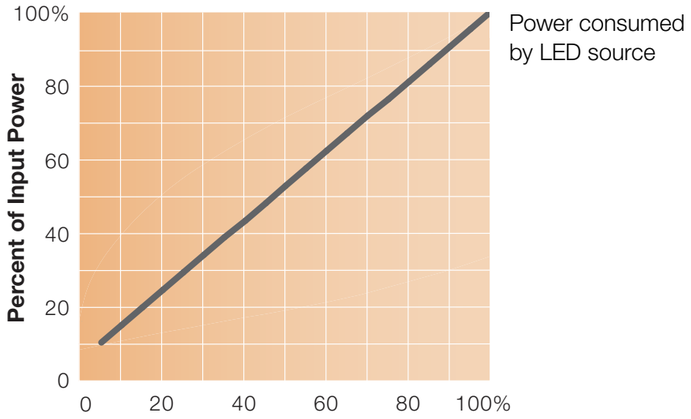
- Offers smooth, continuous dimming to 1% or 5% measured light output for virtually any LED fixture
- Works with Lutron 2-wire forward phase controls, 3-wire fluorescent controls, EcoSystem® digital controls and DALI digital controls (CE)
- Available in multiple form factors
- Supports >5,000 current and voltage levels
- Models available with a smooth incandescent like fade to/from black from 1%

Ballasts

- Available for 1%, 5%, and 10% low-end dimming levels, suitable for a variety of applications
- Compatible with several lamp types including T8 linear and U-bent, T5, T5 HO linear, T5 twin-tube, T4 compact, and select reduced-wattage lamps
- Digitally addressable dimming ballasts available, with easy set up and increased flexibility
- Factory-tuned ballast factor available for most models
- Buy American Act (BAA) models available for most models

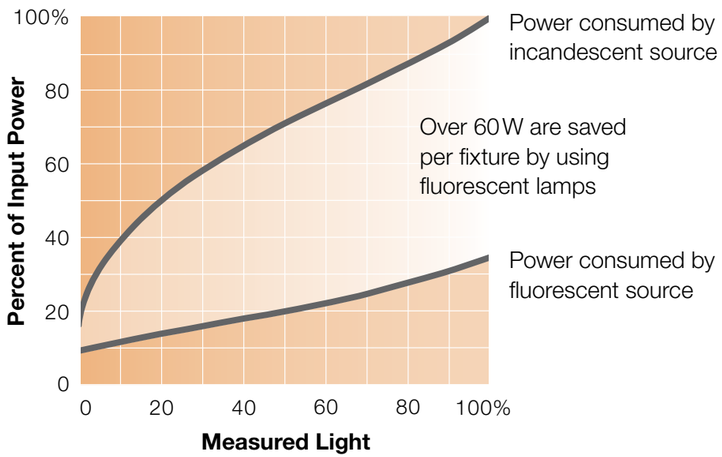
Dimming LED light saves energy

Like traditional light sources, dimming LEDs results in dramatic energy savings. Additionally, the already long life of LEDs can be further extended by dimming.



Dimming fluorescent light saves energy

Fluorescent lighting uses much less power than incandescent lighting. In a typical installation, a 32 W compact fluorescent lamp provides approximately the same light output as a 100 W incandescent lamp. As both sources are dimmed, fluorescent lamps continue to be more energy efficient.



Lutron | **Understanding Lutron drivers and ballasts**

Lutron quality

Superior components

Lutron drivers and ballasts are manufactured to the highest level of quality, using carefully selected components. Maximum lifetime is achieved by using only long-life components with significant performance history. Increased margins are incorporated into Lutron designs to help ensure that components are not operated outside of their specified limits. In many cases, Lutron works with component suppliers to design custom parts in order to improve overall driver and ballast reliability.

100% End-of-line testing

Lutron tests the performance of every driver and ballast prior to shipment. This important step eliminates units that do not meet specifications.

Extending lifetime

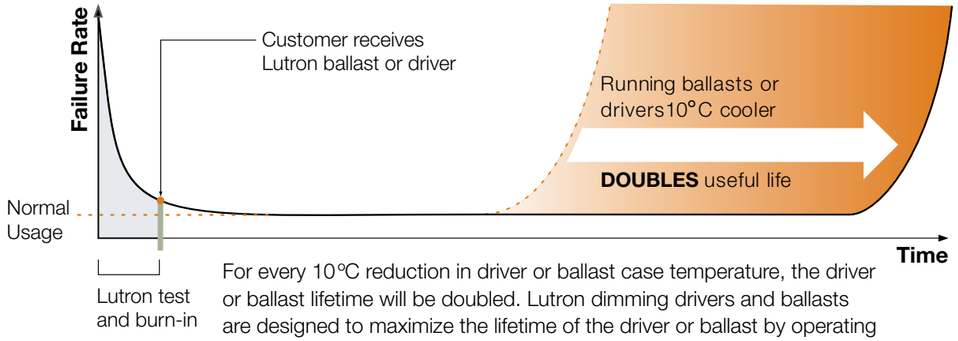
All electronic drivers and ballasts use components with a finite lifetime. A major factor for driver and ballast lifetime is operating temperature. For every 10°C reduction in case temperature, the lifetime of the driver or ballast will be doubled. Lutron dimming drivers and ballasts are designed to operate at a lower temperature, to maximize the lifetime of the driver or ballast. The operating temperature is influenced by the design of the driver or ballast, and by the characteristics of the fixture in which it is installed.

Thermal foldback

Lutron-patented “Thermal Foldback Technology” is included in most Lutron driver and ballast models. This feature actively monitors the driver or ballast temperature and adjusts the output power to ensure that the driver or ballast will meet its expected lifetime in thermally aggressive applications.

When necessary, power delivery to the output is automatically reduced, or “folded back,” to regulate the driver or ballast temperature, with minimal impact on light output. Thermal foldback is designed to activate only if the driver or ballast is operated in an environment that exceeds its temperature. This technology prevents premature driver or ballast failure due to overheating. In a properly designed application, thermal foldback will not activate.

Lutron product reliability curve



For every 10°C reduction in driver or ballast case temperature, the driver or ballast lifetime will be doubled. Lutron dimming drivers and ballasts are designed to maximize the lifetime of the driver or ballast by operating components at least 20°C lower than the rated maximum temperature.

Lutron | **Understanding Lutron drivers and ballasts**

Measured light vs. perceived light

The human eye responds to low light levels by enlarging the pupil, allowing more light to enter the eye. This response results in a difference between measured and perceived light levels.

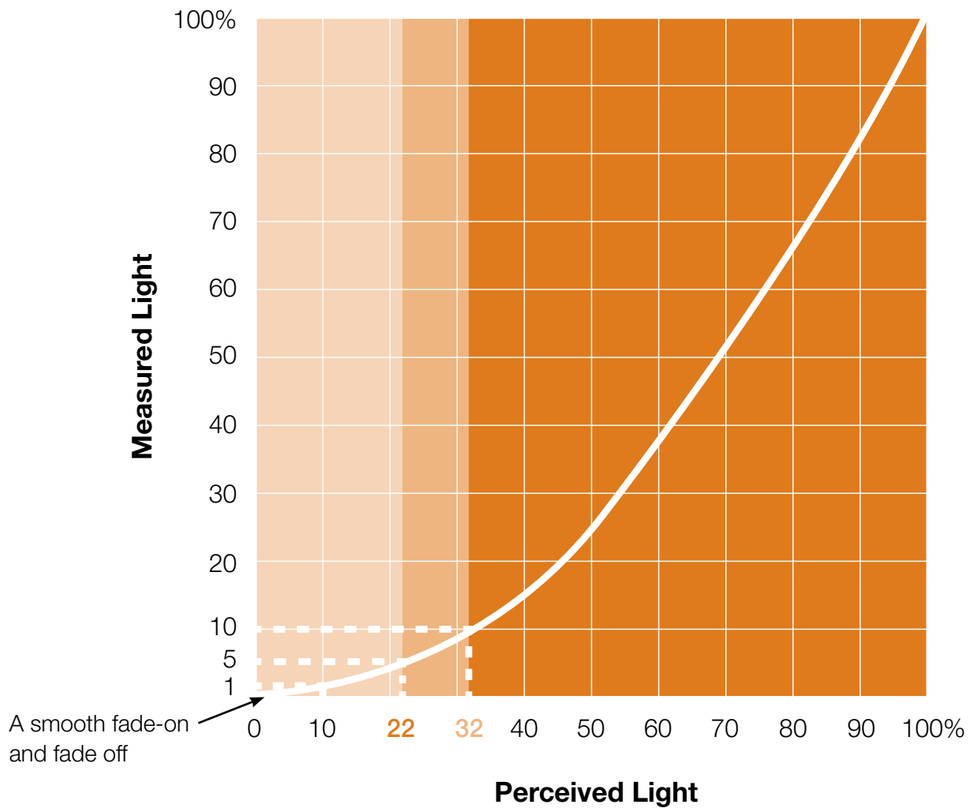
A lamp that is dimmed to 10% of its maximum measured light output is perceived as being dimmed to only 32%. Likewise, a lamp dimmed to 1% is perceived to be at 10%.

Design example

At full brightness, the measured light in a space is 60 foot-candles.
At the lowest dimmed level, 10% perceived light is desired.

1% measured light is perceived as 10% (desired result)	**5% measured light is perceived as 22% (2x brighter than desired)**	**10% measured light is perceived as 32% (3x brighter than desired)**

Fig. 1: Comparison of measured and perceived light levels*



* Rea MS. 2000. The IESNA Lighting Handbook: Ninth Edition.
The Illuminating Engineering Society of North America. New York.

Selecting a Lutron driver or ballast

Lutron offers several driver and ballast families that have various dimming levels and control options to suit any application.

LED Drivers

Low-end dimming level	Control options	Driver family	Compatible LED types
1% with fade-off/fade-on	EcoSystem® digital link	EcoSystem H-Series LED driver 	Linear LED loads, up to 75W
1%	EcoSystem digital link, 3-wire and 2-wire forward phase	Hi-lume® A-Series LED driver 	Many LED loads, up to 53W
	EcoSystem digital link*	EcoSystem LED driver (CE, 220/240V) 	Many LED loads, up to 25W
	2-wire forward phase	Hi-lume A-Series LED driver (PSE, 100/200V) 	Many common LED loads, up to 32W
5%	EcoSystem digital link	EcoSystem 5-Series LED driver 	Many common LED loads, up to 75W
	EcoSystem digital link	EcoSystem 5-Series LED driver (CE, 220/240V) 	Many common LED loads, up to 50W
	EcoSystem digital link	EcoSystem 5-Series LED driver (PSE, 100/200V) 	Many common LED loads, up to 35W

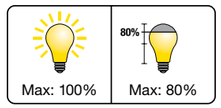
Fluorescent Ballasts

Low-end dimming level	Control options	Ballast family	Available lamp types
1%	EcoSystem® and DALI* digital link	EcoSystem H-Series 	T8 linear and U-bent, T5 linear, T5 HO linear
	EcoSystem digital link and 3-wire	Hi-lume® 3D 	T8 linear and U-bent, T5 linear, T5 HO linear
5%	EcoSystem digital link and 3-wire	EcoSystem compact 	T4 compact
		Hi-lume 3D 	T5 twin-tube
10%	EcoSystem digital link* and 3-wire (sensors wired directly to ballast)	EcoSystem 	T8 linear and U-bent, T8 reduced wattage, T5 linear, T5 HO linear, T5 twin-tube, T5 twin-tube reduced wattage
		EcoSystem H10-Series 	T8 reduced wattage**, T5 reduced wattage**, T5 HO reduced wattage**

* DALI compliance available with EcoSystem H-Series CE ballast models only.

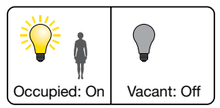
** H10-Series is a 10% low-end dimming solution for selected reduced wattage lamps; Lutron does not suggest mixing of different percentage ballasts in the same fixture/areas, as the difference in low end can cause an unsatisfactory look to the lighting in the space.

Energy-saving control strategies using dimming drivers and ballasts:



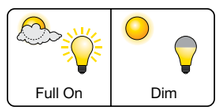
High-end trim sets the maximum light level based on customer requirements in each space.

Typical lighting energy savings:
10–30%[1]



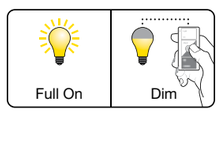
Occupancy/vacancy sensing turns lights on when occupants are in a space and off when they vacate the space.

Typical lighting energy savings:
20–60%[2]



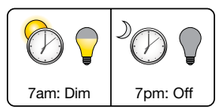
Daylight harvesting dims electric lights when daylight is available to light the space. (See Lutron automated shades.)

Typical lighting energy savings:
25–60%[3]



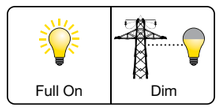
Personal dimming control gives occupants the ability to set the light level.

Typical lighting energy savings:
10–20%[4]



Scheduling provides pre-programmed changes in light levels based on time of day.

Typical lighting energy savings:
10–20%[5]



Demand response automatically reduces lighting loads during peak electricity usage times.

Typical peak period savings:
30–50%[6]

1 Williams A, et al. 2012. Lighting Controls in Commercial Buildings. Leukos. 8(3) pg 161–180.

2 VonNieda B, Maniccia D, & Tweed A. 2000. An analysis of the energy and cost savings potential of occupancy sensors for commercial lighting systems. Proceedings of the Illuminating Engineering Society. Paper #43.

3 Reinhart CF. 2002. Effects of interior design on the daylight availability in open plan offices. Study of the American Commission for an Energy Efficient Environment (ACE) Conference Proceedings. To achieve maximum lighting savings, automated shades are utilized.

4 Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg 7–29.

5 Energy savings estimated based on 50% reduction of after-hours lighting energy waste. Source: VonNieda B, Maniccia D, & Tweed A. 2000. An analysis of the energy and cost savings potential of occupancy sensors for commercial lighting systems. Proceedings of the Illuminating Engineering Society. Paper #43.

6 Newsham GR & Birt B. 2010. Demand-responsive lighting: a field study. Leukos. 6(3) pg 203–225.

Lutron | **Energy-saving strategies**

Additional energy-saving strategies

Dimming fluorescent lamps and LEDs saves energy, but that is only the beginning of the energy-saving features Lutron drivers and ballasts offer. Utilize one or more of the following to maximize energy efficiency:

1 Code compliance with occupancy/vacancy sensors

Lights on in unoccupied spaces account for a majority of a building's total energy usage. Lutron controls utilize wireless or wired occupancy/vacancy sensors with a QS sensor module.

2 Optimize ballast/driver efficiency

Low standby power: EcoSystem ballasts and drivers offer extremely low standby power—less than 1 W of power is used when the light source is off. Some ballasts are available under 0.5 W

Luminous efficacy: With more lamps per ballast, the required startup power is diffused over multiple lamps, conserving energy. The luminous efficacy of a 3-lamp 32 W ballast system is an impressive 100 lumens/watt.

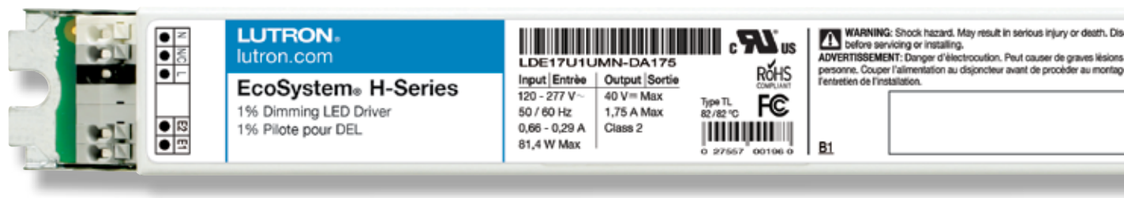
3 Know your space

The greatest energy savings can be achieved by deciding on the perfect number of lumens required for a space, avoiding over-lighting and wasted energy.

Custom ballast factor: Ballast factor is the percentage of light output for a given lamp-ballast combination. By reducing the ballast factor, it is possible to achieve greater energy savings, meet lumen/foot^2 specifications and even qualify for the highest levels of LEED. Custom ballast factors are available for: EcoSystem H-Series, Hi-lume® 3D, EcoSystem, and EcoSystem compact.

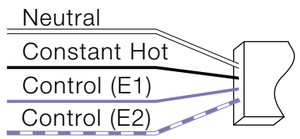
Custom ballast factor

- **No detrimental effect on lamp life or UL Listing**
- **The ballast's printed rating and model number changes to reflect reduced energy consumption, producing lower wattage per square foot values and allowing for more ballasts on a given circuit**
- **Reduces ballast/lamp temperature**



Lutron driver and ballast control options

In addition to offering drivers and ballasts with different low-end dimming levels, Lutron offers a variety of control options: digital link, 2-wire and 3-wire.



EcoSystem® digital link
The EcoSystem digital link is a wired communication technology that addresses individual drivers or ballasts to allow addressing, connection of multiple control devices, and control of drivers or ballasts individually or in groups.

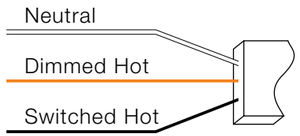
Control type	Features	Ideal applications
EcoSystem digital link	• Polarity insensitive • May be wired in any topology • May be run in same conduit with 120–277V with line-voltage wiring (Class 1) or separately from the line-voltage wiring (Class 2) • Allows for rezoning without rewiring • Data links are miswire protected	• Projects requiring digital control for individual fixture addressability • Upgrade from analog 0–10V control • Multi-zone applications • Small, retrofit applications using Lutron Energi TriPak® solution

Available for:

- EcoSystem H-Series LED drivers
- Hi-lume® A-Series LED drivers
- EcoSystem LED drivers (CE)*
- EcoSystem 5-Series LED drivers
- EcoSystem H-Series ballasts
- Hi-lume 3D ballasts
- EcoSystem ballasts
- EcoSystem compact ballasts

Note: 0–10V DC controls are available from Lutron for control only of non-Lutron 0–10V DC ballasts and drivers. The dimming performance is dependent on the driver/ballast manufacturer.

* Offers DALI compatibility

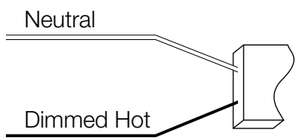


3-wire
3-wire control is a line-voltage phase control dimming method that communicates the dimming signal through a wire called Dimmed Hot.

Control type	Features	Ideal applications
3-wire	• All three wires are rated Class 1 and run within the same conduit • Stable over long wire runs allowing for maximum circuit loading • 3-Wire A-Series LED drivers can easily retrofit to existing 3-wire control systems • Dimmed Hot control wire allows for more precise performance and less electrical noise • Easy to wire	• Fluorescent dimming applications requiring precise control

Available for:

- Hi-lume® 3D ballasts
- EcoSystem® ballasts
- EcoSystem compact ballasts
- Hi-lume ballasts
- Hi-lume A-Series LED drivers



2-wire forward phase
Forward phase control is a line-voltage phase control dimming method that operates on two wires: Dimmed Hot and Neutral.

Control type	Features	Ideal applications
Forward phase	• Most commonly used for historic incandescent and magnetic low-voltage light sources • Easy to wire	• Retrofit projects • Residential and commercial system applications • Applications that have a neutral wire at the control or where a Lutron C•L® dimmer is utilized

Available for:

- Hi-lume A-Series LED drivers (LTE/120V)

System compatibility is based on the available control type for each driver and ballast family

Control type	Product family	Compatible systems
EcoSystem® digital link	• EcoSystem H-Series ballasts • Hi-lume® 3D • EcoSystem • EcoSystem Compact • EcoSystem H-Series LED • Hi-lume A-Series LED • EcoSystem 5-Series LED • EcoSystem LED (CE) • EcoSystem 5-Series LED (CE) • EcoSystem 5-Series LED (PSE)	• PowPak® dimming module with EcoSystem • GRAFIK Eye® QS with EcoSystem • Energi Savr Node™ with EcoSystem • Quantum® • HomeWorks® QS
3-wire	• Hi-lume 3D • EcoSystem • EcoSystem Compact • Hi-lume • Hi-lume A-Series LED	• 3-wire wallbox controls • Maestro Wireless® • GP Panel • GRAFIK Eye QS* • GRAFIK Eye 3000* • GRAFIK Eye 4000 • GRAFIK 5000™/6000®/7000™ • LCP128™ • Quantum • RadioRA® 2 • HomeWorks QS • HomeWorks*
2-wire forward phase	• Hi-lume A-Series LED (LTE/120V)	• Select wallbox controls • Maestro Wireless • GRAFIK Eye QS • GRAFIK Eye 3000 • GRAFIK Eye 4000 • GRAFIK 5000/6000/7000 • LCP128 • Quantum • RadioRA 2 • HomeWorks QS • HomeWorks

*Interface required for compatibility.

Lutron | **System compatibility**

Control systems compatible with EcoSystem® digital link ballasts and drivers

PowPak® dimming module with EcoSystem

The PowPak dimming module with EcoSystem is a load controller that allows for easy integration of digital lighting loads with wireless occupancy and daylight sensors as well as wireless controls.
www.lutron.com/powpakdimming

GRAFIK Eye® QS with EcoSystem

Fully customizable, GRAFIK Eye QS with EcoSystem adjusts lights and shades for any task or activity at the touch of a button. Using wireless technology, GRAFIK Eye QS with EcoSystem eliminates communication wiring to shades, sensors, and wireless controls.
www.lutron.com/qs

Energi Savr Node™ with EcoSystem

Energi Savr Node with EcoSystem allows for easy integration of occupancy sensors, daylight sensors, and EcoSystem-compatible digital drivers and ballasts. It communicates with wireless devices through the QS sensor module to minimize wiring for easy installation.
www.lutron.com/esn

Quantum® Total Light Management™

Quantum manages both electric light and daylight to not only save energy and simplify operations, but also to improve the comfort and productivity of the people in a building. It also monitors and reports on all the lighting usage in a building for optimal energy performance and productivity while minimizing maintenance and operating costs.
www.lutron.com/quantum

HomeWorks® QS

HomeWorks QS is designed for residential applications, integrating control of all light. The system also integrates with third-party equipment to provide control of HVAC and A/V systems.
www.lutron.com/homeworksqs

All Lutron LED drivers and fluorescent dimming ballasts are 100% performance-tested at the factory and come with a 5-year limited warranty with Lutron field service commissioning (3-year standard warranty) from date of purchase. Lutron Quality Systems are registered to ISO 9001.2008. Dimming fluorescent lighting instead of repeated switching helps maintain lamp life and also saves energy.

LED and fluorescent lighting is used widely in educational, institutional and commercial buildings. This lighting meets energy-conscious design criteria such as ASHRAE/IESNA 90.1 standards and LEED® guidelines. LED and fluorescent lighting is also increasingly found in residential spaces, especially in recessed downlights and coves.

The drivers and ballasts addressed in this guide are specific to each country's voltage requirements. Please confirm that the products you have selected match the required voltages by country shown on pg. 107.

Drivers and Ballasts | **Quick reference guide**

LED drivers

NEW! EcoSystem® H-Series digital LED drivers
EcoSystem digital control
pg. 30

Hi-lume® A-Series digital LED drivers
EcoSystem® digital control
2-wire forward phase control
pg. 30

EcoSystem digital LED drivers
EcoSystem digital control
pg. 32
CE MODELS ONLY

EcoSystem 5-Series digital LED drivers
EcoSystem digital control
pg. 34

EcoSystem 5-Series digital LED drivers
EcoSystem digital control
pg. 36
CE MODELS ONLY

Hi-lume A-Series digital LED drivers
2-wire forward phase control
pg. 38
PSE MODELS ONLY

EcoSystem 5-Series digital LED drivers
EcoSystem digital control
pg. 40
PSE MODELS ONLY

Fluorescent ballasts

EcoSystem H-Series digital ballasts
EcoSystem and DALI digital control
pg. 42
CE, INMETRO, CCC and S-MARK MODELS AVAILABLE

Hi-lume 3D digital ballasts
EcoSystem digital control
3-wire control
pg. 44

EcoSystem digital ballasts
EcoSystem digital control
3-wire control
pg. 46

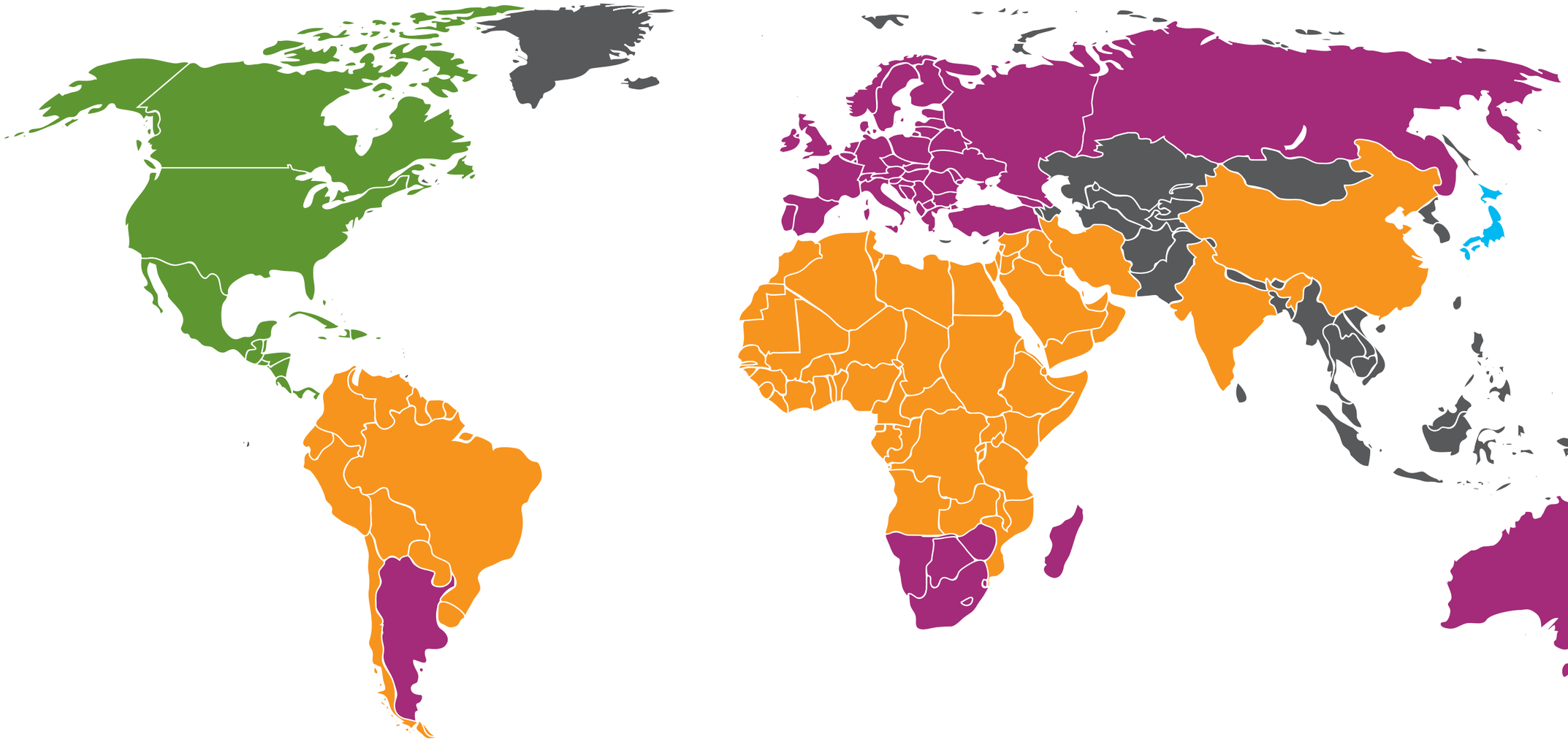
EcoSystem compact digital ballasts for compact fluorescent lamps (CFLs)
EcoSystem digital control
3-wire control
pg. 48

For additional information on LEDs, please visit **www.lutron.com/LED.**

For additional information on ballasts, please visit **www.lutron.com/ballast.**

Drivers and Ballasts | **Quick reference guide**

Lutron fluorescent dimming ballast and LED driver global offering



CE
- EcoSystem®
- EcoSystem 5-Series
- EcoSystem H-Series

UL/CSA
- Hi-lume® A-Series
- EcoSystem 5-Series
- EcoSystem H-Series
- EcoSystem H-Series
- EcoSystem
- Hi-lume 3D

UL/CSA or CE
- Hi-lume A-Series
- EcoSystem
- EcoSystem 5-Series
- EcoSystem H-Series*

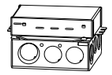
PSE
- Hi-lume A-Series
- EcoSystem 5-Series

Key
- LED driver
- Fluorescent ballast

*Ballast certifications vary by region. Additional ballast certifications may be required.

Drivers and Ballasts | **Quick reference guide**

LED drivers

Family	Compatible Lamp Types and Wattages	Input Voltage	Control Options	Available Case Types (pg. 24)	Low-end dimming level
LED drivers					
EcoSystem® H-Series LED drivers pg. 30 **UL models** 	• LED light engines, up to 75 W	• UNV: 120–277 V @ 50/60 Hz	• EcoSystem digital link	 K-case  M-case	1%, fade to/from black
Hi-lume® A-Series LED drivers pg. 30 **UL and CSA models** 	• LED light engines, up to 53 W	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz • 120 V @ 50/60 Hz	• EcoSystem® digital link • 3-wire control • 2-wire forward phase control (neutral required)	 K-case  KL-case  M-case	1%
EcoSystem LED drivers pg. 32 **CE model** 	• LED light engines, up to 25 W	• 220–240 V CE @ 50/60 Hz	• EcoSystem digital link	 P-case	1%
EcoSystem 5-Series LED drivers pg. 34 **UL and CSA models** 	• LED light engines, up to 75 W	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz	• EcoSystem digital link	 K-case  M-case	5%
EcoSystem 5-Series LED drivers pg. 36 **CE model** 	• LED light engines, up to 50 W	• 220–240 V CE @ 50/60 Hz	• EcoSystem digital link	 R-case  M-case	5%
Hi-lume A-Series LED drivers pg. 38 **PSE model** 	• LED light engines, up to 32 W	• 100 V PSE @ 50/60 Hz	• 2-wire forward phase control (neutral required)	 K-case	1%
EcoSystem 5-Series LED drivers pg. 40 **PSE model** 	• LED light engines, up to 35 W	• 100/200 V PSE @ 50/60 Hz	• EcoSystem digital link	 T-case	5%

Drivers and Ballasts | **Quick reference guide**

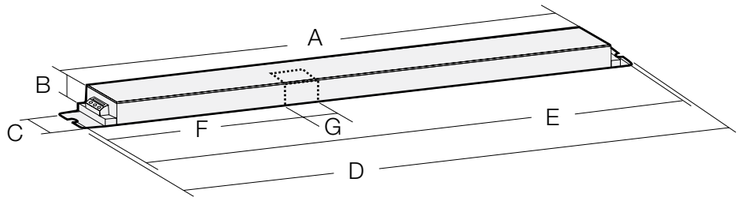
Fluorescent ballasts

Family	Compatible Lamp Types and Wattages	Input Voltage	Control Options	Available Case Types (pg. 24)	Low-end dimming level
Fluorescent ballasts					
EcoSystem® H-Series ballasts pg. 42 **UL, NOM, and CSA models** 	• T8 linear and U-bent: 17W, 25W, 32W • T5 HO linear: 24W, 39W, 54W • T5 linear: 14W, 21W, 28W **H10-Series models:** • T8 linear reduced wattage: 28W • T5 HO linear reduced wattage: 49W/50W/51W • T5 linear reduced wattage: 13W, 25W/26W	• UNV: 120V, 127V, 220/240V, 277V @ 50/60Hz • 347V CSA @ 50/60Hz	• EcoSystem digital link	 M-case  C-case  G-case	1% or lower for T8 1% for T5 and T5 HO 10% for T8, T5, and T5 HO reduced wattage*
EcoSystem H-Series ballasts pg. 42 **CE, INMETRO, CCC, and S-mark models** 	• T8 linear: 32W • T5 HO linear: 24W, 39W, 54W • T5 linear: 14W, 21W, 28W **H10-Series models (INMETRO only):** • T5 HO linear reduced wattage: 49W/50W/51W • T5 linear reduced wattage: 13W, 25W/26W NOTE: For model availability, please refer to page 42.	• 220–240V CE @ 50/60Hz • 127–220V INMETRO @ 50/60Hz • 220–240V CCC @ 50/60Hz • 220–240V S-mark @ 50/60Hz	• EcoSystem digital link • DALI digital link (CE models only)	 M-case	1% 10% for T8, T5, and T5 HO reduced wattage*
Hi-lume® 3D ballasts pg. 44 **UL, NOM, and CSA models** 	• T8 linear and U-bent: 17W, 25W, 32W, 40W • T5 HO linear: 24W, 39W, 54W • T5 linear: 14W, 21W, 28W • T5 twin-tube: 36W, 40W, 50W	• UNV: 120V, 220/240V, 277V @ 50/60Hz	• EcoSystem digital link • 3-wire control	 C-case  G-case	1% or lower for T8 1% for T5 and T5 HO 5% for T5 twin-tube
EcoSystem ballasts pg. 46 **UL, NOM, and CSA models** 	• T8 linear and U-bent: 17W, 25W 32W • T8 linear reduced wattage: 28W • T5 HO linear: 24W, 39W, 54W • T5 linear: 14W, 21W, 28W, 35W • T5 twin-tube: 36W, 39W, 40W, 50W, 55W • T5 twin-tube reduced wattage: 25W	• UNV: 120V, 220/240V, 277V @ 50/60Hz	• EcoSystem digital link • 3-wire control • Integral sensor connections for low-voltage wallbox controls, occupancy and daylight sensors	 J-case  G-case	10%
EcoSystem compact ballasts pg. 48 **UL and CSA models** 	• T4 4-pin quad-tube CFL: 18W, 26W • T4 4-pin triple-tube CFL: 26W, 32W, 42W	• UNV: 120V, 220/240V, 277V @ 50/60Hz	• EcoSystem digital link • 3-wire control	 K-case	5%

* H10-Series is a 10% low-end dimming solution for selected reduced wattage lamps; Lutron does not suggest mixing of different percentage ballasts in the same fixture/areas, as the difference in low end can cause an unsatisfactory look to the lighting in the space.

Case dimensions

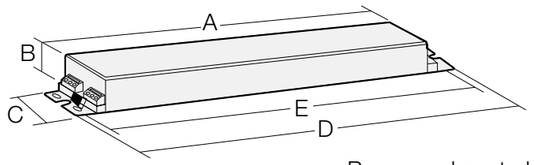
C- or J-case



Note: Dotted area for sensor attachment applies to EcoSystem® J-case only.

A 16.12 in (409 mm)
B 1.00 in (25 mm)
C 1.18 in (30 mm)
D 18.00 in (457 mm)
E 17.70 in (450 mm) (mounting centers)
F 6.82 in (173 mm) (J only)
G 0.394 in (10 mm) (J only)

G-case



A 7.13 in (181 mm)
B 1.00 in (25 mm)
C 2.38 in (60 mm)
D 9.50 in (241 mm)
E 8.91 in (226 mm) (slot mounting centers)

Lamp wires are 36 in (0.90 m) for leaded models

Power and control wires are 18 in (0.45 m) for leaded models

If using 4-hole mount, mounting centers are 8.91 in (226 mm) x 1.70 in (43 mm).

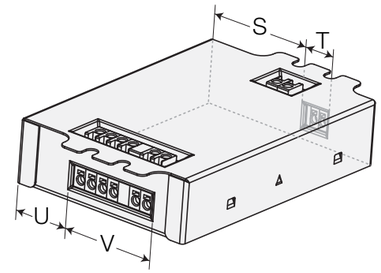
For information on discontinued ballast case dimensions see pg 105)

Drivers and Ballasts | **Quick reference guide**

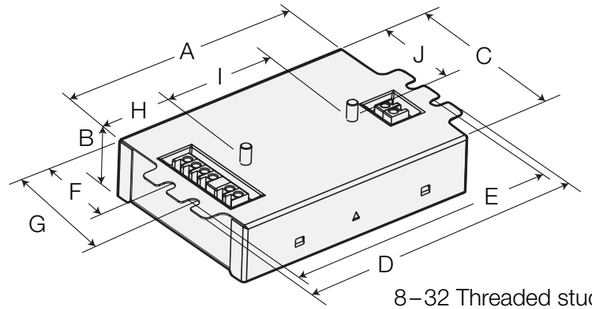
Case dimensions

K-case (LED Driver)

Non-studded:



Studded:



8–32 Threaded stud
0.29 in (7.37 mm) long

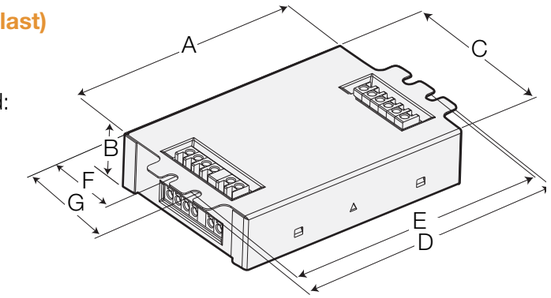
A 4.20 in (107 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 4.90 in (124 mm)
E 4.60 in (117 mm) (mounting centers)
F 1.42 in (36 mm)
G 1.99 in (51 mm)

For studded models only:
H 1.09 in (28 mm)
I 2.00 in (51 mm)
J 1.60 in (41 mm)

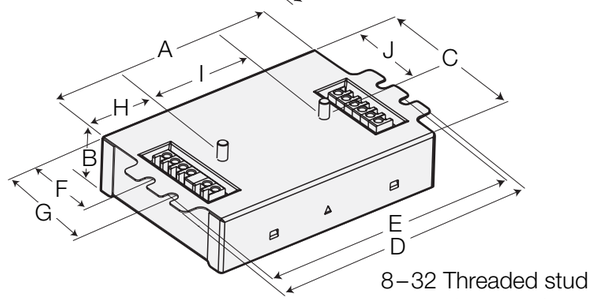
For non-studded models only:
S 1.38 in (35 mm)
T 0.64 in (16 mm)
U 0.88 in (22 mm)
V 1.53 in (39 mm)

K-case (Ballast)

Non-studded:



Studded:



8–32 Threaded stud
0.29 in (7.37 mm) long

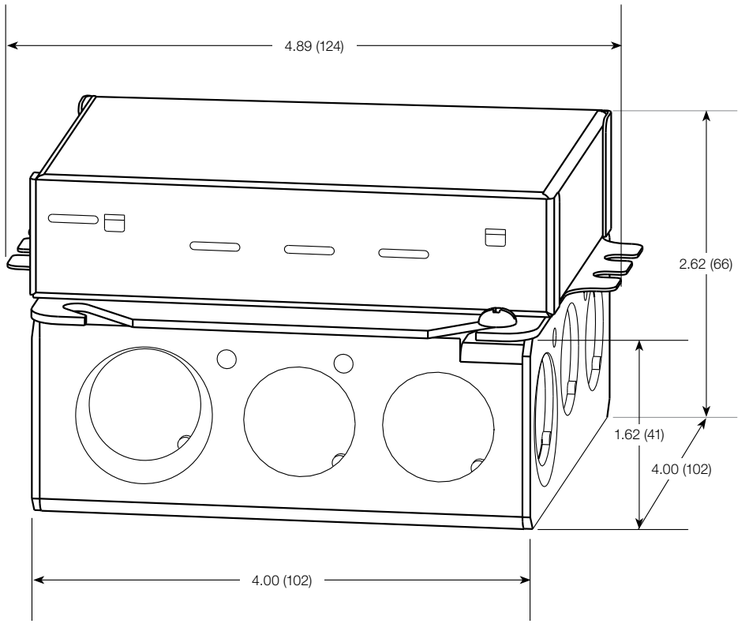
A 4.20 in (107 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 4.90 in (124 mm)
E 4.60 in (117 mm) (mounting centers)
F 1.42 in (36 mm)
G 1.99 in (51 mm)

For studded models only:
H 1.09 in (28 mm)
I 2.00 in (51 mm)
J 1.60 in (41 mm)

For information on discontinued ballast case dimensions see pg 105)

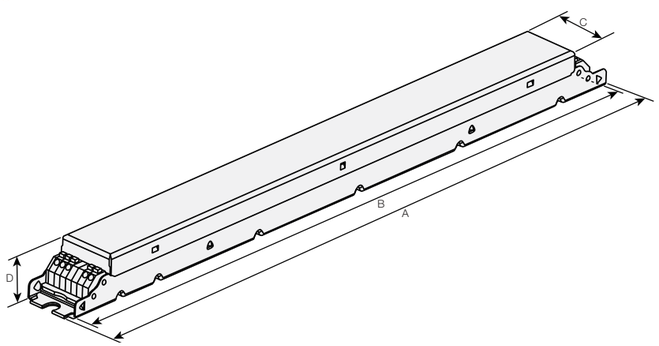
Case dimensions

KL-case



A 4.89 in (124 mm)
B 4.00 in (102 mm)
C 2.62 in (66 mm)
D 4.00 in (102 mm)
E 1.62 in (41 mm)

M-case



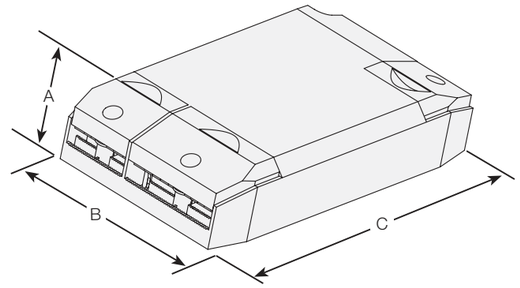
A 14.13 in (359 mm)
B 13.78 in (350 mm) (mounting centers)
C 1.18 in (30 mm)
D 0.98 in (25 mm)

For information on discontinued ballast case dimensions see pg 105)

Drivers and Ballasts | **Quick reference guide**

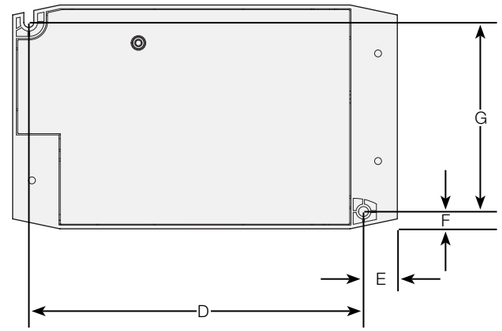
Case dimensions

P-case



A 1.25 in (32 mm)
B 3.54 in (90 mm)
C 6.09 in (155 mm)
D 5.30 in (135mm)
E 0.54 in (14 mm)
F 0.27 in (7 mm)
G 2.99 in (76 mm)

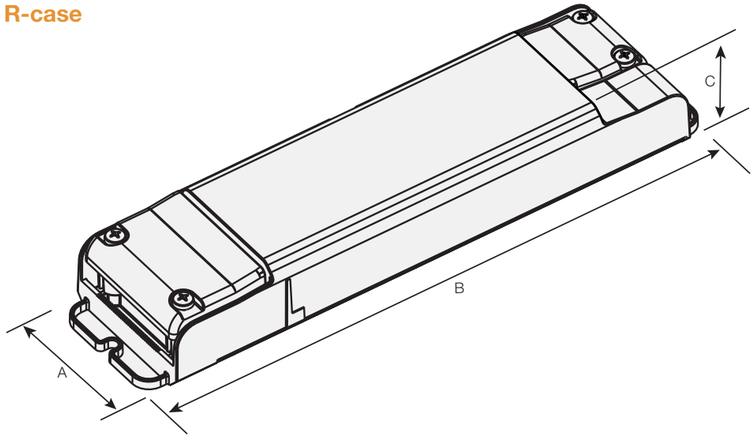
Mounting centers



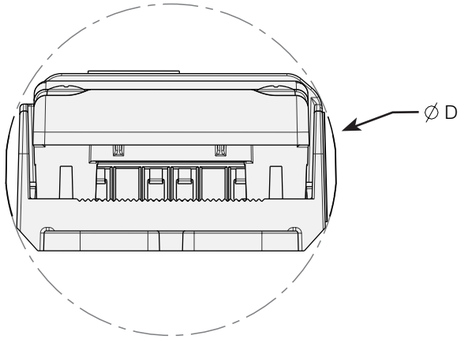
For information on discontinued ballast case dimensions see pg 105)

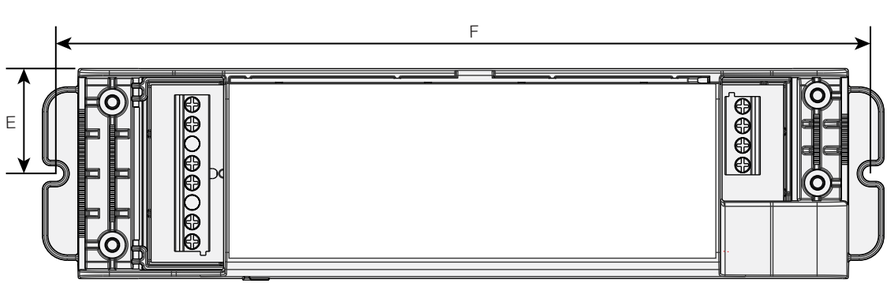
Case dimensions

R-case



A 2.11 in (54 mm)
B 8.46 in (215 mm)
C 1.21 in (31 mm)
D 2.36 in (60 mm)
E 1.06 in (27 mm)
F 8.19 in (208 mm)



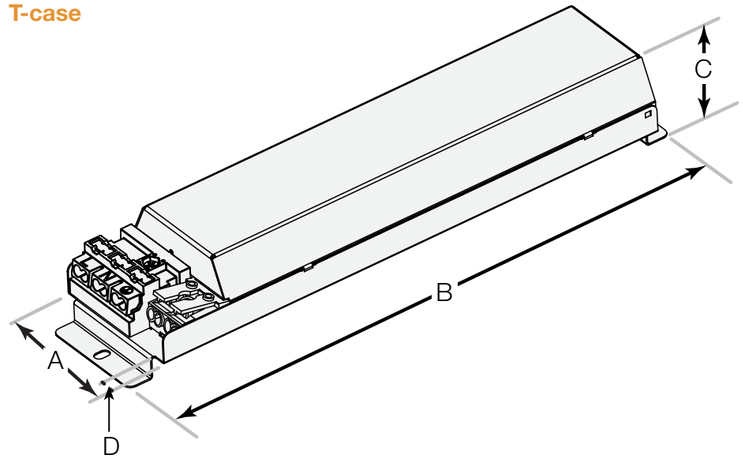


For information on discontinued ballast case dimensions see pg 105)

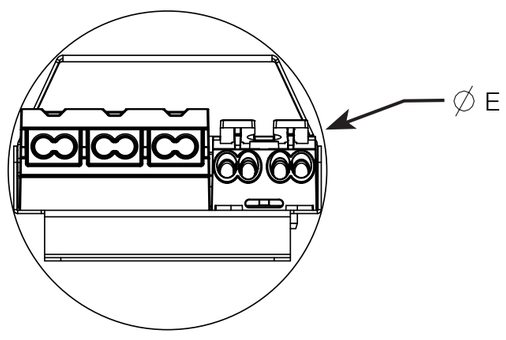
Drivers and Ballasts | **Quick reference guide**

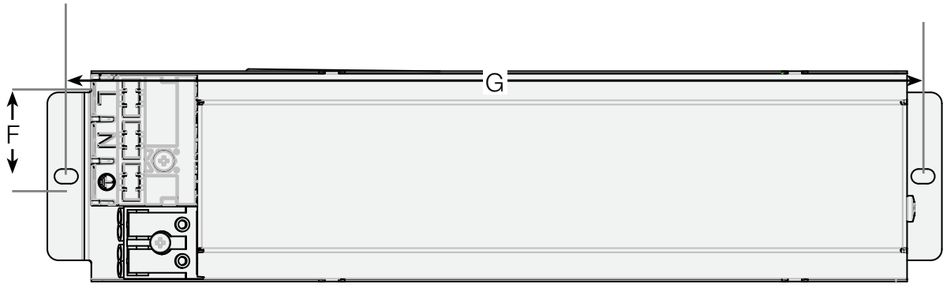
Case dimensions

T-case



A 2.28 in (58 mm)
B 9.66 in (245 mm)
C 1.52 in (39 mm)
D 0.35 in (9 mm)
E 2.36 in (60 mm)
F 1.14 in (29 mm)
G 9.25 in (235 mm)





For information on discontinued ballast case dimensions see pg 105)

Highest performance dimming to 1%, with fade to/from black

UL and cUL Models

Shown: EcoSystem H-Series LED driver, K-case and M-case

Model number is determined by load and control type. See pg. 57 for additional information.

EcoSystem H-Series LED drivers provide a high-performance solution for any space, in any application. They provide smooth, continuous dimming down to 1% of output current, and fade smoothly between 0% and 1% when turned on and off.

Operating Voltage

- Universal input (120–277 V @ 50/60 Hz)

Control options

- EcoSystem digital link

Lamp types and wattages

- Most LED modules, up to 75 W

Available case types

- K-case (compact)
- M-case (linear)

LED operating specifications

Constant Current

- 0.22 A–1.40 A (in 10 mA steps) from 8–40 W (K-case)
- 500 mA–2.1 A (in 10 mA steps) from 15–75 W (M-case)
- Constant current reduction (CCR) dimming

Key standards

- UL 8750 Recognized
- FCC Part 15 compliant for commercial applications at 120 V and 277 V
- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV

Class 2 output

- K-case type meets LED driver requirements for Energy Star version 1.2 in designated operating regions
- M-case type meets Power Factor and THD requirements of DLC (version 9/27/13) above 50% of maximum rated output power
- Type TL rated

*For a complete list of compatible controls, visit **www.lutron.com/EcoSystemHSeriesLED.**

Drivers and Ballasts | **EcoSystem® H-Series LED drivers**

Features

- Fades smoothly between 0% and 1% when turned on and off
- Continuous, flicker-free dimming from 100% to 1%[1]
- Guaranteed dimming performance when used with Lutron controls
- Compatible with Energi Savr Node™ units with EcoSystem, GRAFIK Eye® QS with EcoSystem, PowPak® dimming module with EcoSystem, and Quantum® systems, allowing for integration into a planned or existing EcoSystem lighting control solution
- Protected from miswires of input power to EcoSystem® control inputs up to 277 V~
- Rated lifetime of 50,000 hours at 75°C calibration point (tc)
- UL Type TL Rated
- FCC Part 15 compliant for commercial applications at 120–277 V~
- 100% performance tested at factory
- RoHS compliant.
- Non-volatile memory restores all settings after power failure. Instant light output at any level when turned on, without flashing to full on.
- Meets NEMA 410 in-rush current limits

Specifications

- 100% end-of-line performance-tested
- Typical standby power consumption: 0.2 W at 120 V~ and 0.3 W at 277 V~
- Power Factor (PF): > 0.9 at maximum power
- Dimming Method:
  - — Constant-current reduction dimming provides video-conference friendly dimming
  - — PWM dimming below 5% (240 Hz) for maximum compatibility with light engines at low light levels

[1] Light output at 1% depends on the efficacy of the light engine used with the driver.

Environment

- Sound rating: Class A (inaudible in a 24 dB ambient environment)
- Maximum case temperature is 167°F (75°C)

Mounting

- K-case typically mounts via studs or tabs in an LED fixture or junction box (“no studs” case option available)
- M-case driver typically mounts in a linear or troffer fixture type (downlight, cove light, sconce, undercabinet, etc.)

Wiring

- EcoSystem digital link: Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus ground in some models; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal; E1/E2 wires may also be run Class 2
- The 16 AWG control wire must not exceed 900 ft (274 m) and the 18 AWG control wire must not exceed 550 ft (167 m)
- Maximum driver-to-LED light engine wire length up to 100 ft (30 m); see specification submittal for model and wiring limitations
- For control wiring diagrams, see pg. 91, and for load wiring diagrams, see pg. 12
- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K-case)

Highest performance dimming to 1%

UL and cUL MODELS

EcoSystem® digital link, 3-wire or 2-wire forward phase controlled

Shown: Hi-lume A-Series LED driver, K-case

Model number is determined by load and control type. See pg. 53 for additional information.

Hi-lume A-Series is a high-performance LED driver that provides smooth, continuous 1% dimming for virtually any LED fixture, whether it requires constant current or constant voltage. It is the world's most versatile LED driver family offered today due to the wide variety of compatible LED arrays, multiple form factors, and numerous control options.

Operating Voltage

- Universal input (120V, 220/240V and 277V @ 50/60Hz)
- 120V only for 2-wire forward phase models

Control options

- EcoSystem digital link (L3D family)
- 3-wire control (L3D family)
- 2-wire forward phase control* (LTE/120V family/120V)

Lamp types and wattages

- Most LED modules, up to 53W

Available case types

- K-case (compact)
- M-case (linear)
- KL-case (UL Listed for US and Canada)—Junction box

For system compatibility information, see pg. 14.

LED operating specifications

Constant Current

- 200mA–2.1A (in 10mA steps) from 5–40W
- 710mA to 1.05A (in 10mA steps) from 40–53W
- Pulse width modulation (PWM) or constant current reduction (CCR) dimming output to LED

Constant Voltage

- 10V–38V (in 0.5V steps) Class 2
- 38.5V–60V (in 0.5V steps) isolated non-Class 2
- 5W–40W
- Pulse width modulation (PWM) dimming output to LED

QwikFig™

- K-case & M-case L3D models
- K-case & M-case LTE/120V models (coming soon)

*For a complete list of compatible controls, visit **www.lutron.com/HilumeLED.**

Drivers and Ballasts | **Hi-lume® A-Series LED drivers**

Key standards

- UL and cUL Listed (5–40W) models available for remote installation outside of an appropriate fixture
- UL 8750 Recognized
- L3D models FCC Part 15 compliant for commercial applications at 120V and 277V
- LTE models FCC Part 15 compliant for residential and commercial applications at 120V
- Meets ANSI C62.41 category A surge protection standards up to and including 4kV
- Models available to meet LED Driver requirements for Energy Star 1.1

Features

- Continuous, flicker-free dimming from 100% to 1%
- Efficiency greater than 80% at 40W
- A rated lifetime of 50,000 hours at maximum case temperature
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Standard 3-wire line-voltage phase-control technology for guaranteed dimming performance with all Lutron 3-wire fluorescent dimmers
- 2-wire forward phase control technology provides compatibility with select wallbox controls
- Constant current reduction (CCR) and pulse width modulation (PWM) dimming available for constant current light engines; constant voltage light engines operate with pulse width modulation (PWM) dimming only.
- Protected from miswires of input power to EcoSystem control inputs
- Non-volatile memory restores all driver settings after power failure
- Instant light output at any level when turned on, without flashing to full on

Specifications

- 100% end-of-line performance-tested
- Power factor greater than 0.90 at 40W
- Inrush current less than 2A

Environment

- Sound rating: Class A (inaudible in a 27dB ambient environment)
- Maximum case temperature is 65°C (149°F)

Mounting

- K-case driver typically mounts via studs or tabs in an LED fixture or junction box ("no studs" case option available)
- M-case driver typically mounts in a linear or troffer fixture type (downlight, cove light, sconce, under-cabinet, etc.)
- UL and cUL Listed models are available with the KL-case enclosure

Wiring

- **EcoSystem digital link:** Require four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18AWG (0.75mm² to 1.50mm²) solid copper Class 1 wire per terminal, E1/E2 wires may also be run Class 2

  3-wire: Requires three wires (Dimmed Hot, Switched Hot, and Neutral) plus Ground; one 16–18AWG (0.75mm² to 1.50mm²) solid copper Class 1 wire per terminal

  2-wire forward phase: Requires two wires plus Ground (Dimmed Hot and Neutral); one 16–18AWG (0.75mm² to 1.50mm²) solid copper Class 1 wire per terminal
- The 16AWG control wire must not exceed 900ft (274m) and the 18AWG control wire must not exceed 550ft (167m)
- Maximum driver-to-LED light engine wire length up to 100ft (30m). See specification submittal for model and wiring limitations
- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K-case)
- UL and cUL Listed driver is grounded by wire connection on the KL-case or by ground lug terminal in the junction box; all wire connections must be made in the junction box to maintain listing
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Highest performance dimming to 1%

EcoSystem and DALI digital link controlled

CE MODELS ONLY

Shown above: EcoSystem LED driver, P-case

Model number is determined by load. See pg. 56 for additional information.

Providing smooth and continuous 1% dimming, the high-performance EcoSystem LED driver works with virtually any LED fixture. It communicates via the EcoSystem digital link, a revolutionary technology that allows the driver to react to its environment. It also allows for individual control of the drivers, which eliminates the need to rewire, and provides a scalable solution for almost any application. The EcoSystem LED driver is available for fixtures requiring either constant current or constant voltage.

Operating voltage

- 220–240 V CE @ 50/60 Hz

Control options

- EcoSystem digital link

Lamp types and wattages

- Most LED modules, up to 25 W

Available case types

- P-case

LED operating specifications

Constant Current

- 0.20 A–1.05 A (in 0.01 A increments)
- 5 W–25 W
- Pulse width modulation (PWM) or constant current reduction (CCR) dimming

Constant Voltage

- 8 V–40 V (in 0.5 V increments)
- 5 W–25 W
- Pulse width modulation (PWM) dimming

For system compatibility information, see pg. 14.

Drivers and Ballasts | **EcoSystem® LED drivers (CE)**

Key standards

- CE compliant and ENEC Certified
- RoHS 2006 Compliant
- IEC Rated

Features

- Continuous, flicker-free dimming from 100% to 1%
- Efficiency of 80% at 25 W
- A rated lifetime of 50,000 hours at maximum case temperature
- Guaranteed dimming performance when used with Lutron controls
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Constant current reduction (CCR) and pulse width modulation (PWM) dimming available for constant current light engines; constant voltage light engines operate with pulse width modulation (PWM) dimming only
- Protected from miswires of input power to EcoSystem control inputs
- Non-volatile memory restores all driver settings after power failure
- Instant light output at any level when turned on, without flashing to full on

Specifications

- 100% end-of-line performance-tested
- Power factor greater than 0.95 at 25 W
- Low harmonic distortion
- Inrush current less than 2 A

Mounting

- Independent control gear; driver requires no particular mounting means

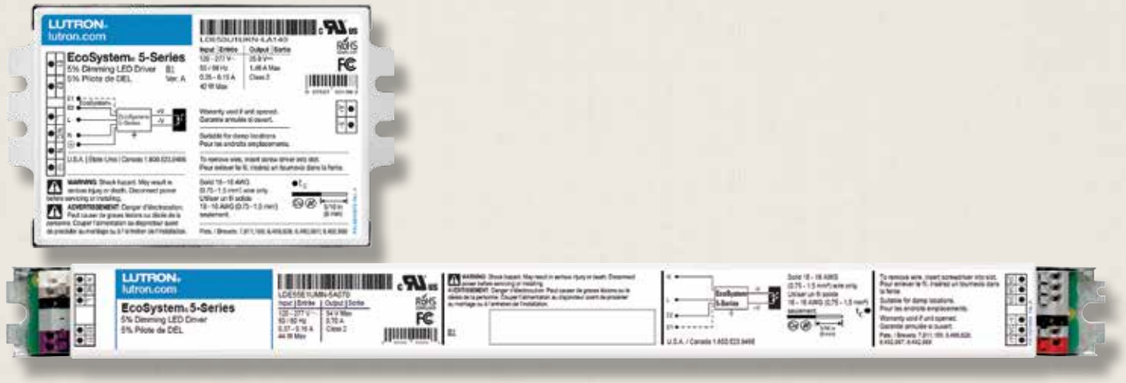
Wiring

- Requires four wires (E1, E2, Constant Hot/Live, and Neutral); one or two 0.50 mm^2 to 2.50 mm^2 2 Core Class 1 wire per terminal; E1/E2 wires may also be run Class 2
- The 1.50 mm^2 control wire must not exceed 1,017 ft (310 m), and the 0.50 mm^2 must not exceed 337 ft (103 m); maximum driver-to-LED light engine wire length is 6.56 ft (2 m) for any output type
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

High performance dimming to 5%

EcoSystem digital link controlled

UL and cUL MODELS



Shown above: EcoSystem 5-Series LED driver, K-case and M-case

Model number is determined by load. See pg. 57 for additional information.

The EcoSystem 5-Series LED driver is built on the EcoSystem platform, which guarantees dimming performance with Lutron control systems and provides an affordable solution for smooth, flicker-free dimming from 100% to 5%. The driver complements our global offering of industry leading, architectural 1% Hi-lume® A-Series LED drivers.

Operating voltage

- Universal input (120 V, 220–240 V, and 277 V @ 50/60 Hz)

Control options

- EcoSystem digital link

Lamp types and wattages

- Most common LED modules, up to 75 W

Available case types

- K-case
- M-case

LED operating specifications

Constant Current

- 350 mA – 1.4 A (in 10 mA steps) from 5-35 W
- 500 mA – 2.1 A (in 10 mA steps) from 35-75 W
- Constant current reduction (CCR) dimming

Key standards

- With UL Recognition
- FCC Part 15 compliant for commercial applications at 120 V and 277 V
- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV

Class 2 Output

- M-case type meets Power Factor and THD requirements of DLC (version 9/27/13) above 50% of maximum rated output power

Drivers and Ballasts | **EcoSystem® 5-Series LED drivers**

Features

- Continuous, flicker-free dimming from 100% to 5%
- Efficiency of greater than 85% at 35 W (K-case); Efficiency of greater than 85% at 75 W (M-case)
- Guaranteed dimming performance when used with Lutron controls
- A rated lifetime of 50,000 hours at maximum case temperature
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Constant current reduction (CCR) dimming for constant current engines
- Non-volatile memory restores all driver settings after power failure
- Protected from miswire of input power to EcoSystem control inputs
- Instant light output at any level when turned on, without flashing to full on

Specifications

- 100% end-of-line performance-tested
- Power factor greater than 0.95 at maximum output
- Typical stand-by power consumption of 0.20 W at 120 V and 0.30 W at 277 V
- Turn-on time of less than 100 ms typical from electronic off

Environment

- Sound rating: Class A (inaudible in a 27 dB ambient environment)
- Maximum case temperature is 167°F (75°C)

Mounting

- K-case typically mounts via studs or tabs in an LED fixture or junction box ("no studs" case option available)
- M-case driver typically mounts in a linear or troffer fixture type (downlight, cove light, sconce, undercabinet, etc.)

Wiring

- EcoSystem digital link: Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal; E1/E2 wires may also be run Class 2
- The 16 AWG control wire must not exceed 900 ft (274 m) and the 18 AWG control wire must not exceed 550 ft (167 m)
- Maximum driver-to-LED light engine wire length up to 100 ft (30 m); see specification submittal for model and wiring limitations
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101
- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K-case)

High performance dimming to 5%

EcoSystem and DALI digital link controlled

CE MODELS ONLY

Shown above: EcoSystem 5-Series LED driver (CE), R-case and M-case

Model number is determined by load. See pg. 58 for additional information.

The EcoSystem 5-Series LED driver is built on the EcoSystem platform, which guarantees dimming performance with Lutron control systems and provides an affordable solution for smooth, flicker-free dimming from 100% to 5%. The driver complements our global offering of industry leading, architectural 1% EcoSystem LED drivers.

Operating voltage

- 220–240 V CE @ 50/60 Hz

Control options

- EcoSystem digital control
- DALI digital control

Lamp types and wattages

- Most common LED modules, up to 50 W

Available case types

- R-case
- M-case

LED operating specifications

Constant Current

- 250 mA, 0.35 A, 0.50 A, 0.70 A, 1.05 A, 1.40 A from 5-35 W
- 070 = 0.70 A; 071 = 0.71 A; 133 = 1.33 A from 35-50 W
- Constant current reduction (CCR) dimming

Key standards

- CE Compliant and ENEC Certified
- ROHS 2006 Compliant
- IEC Rated
- DALI Compliant

Drivers and Ballasts | **EcoSystem® 5-Series LED drivers (CE)**

Features

- Continuous, flicker-free dimming from 100% to 5%
- Efficiency of greater than 85% at 35 W (K-case); Efficiency of greater than 85% at 75 W (M-case)
- A rated lifetime of 50,000 hours at maximum case temperature
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Constant current reduction (CCR) dimming available for constant current engines
- Guaranteed dimming performance when used with Lutron controls
- Protected from miswire of input power to EcoSystem control inputs
- Non-volatile memory restores all driver settings after power failure
- Instant light output at any level when turned on, without flashing to full on

Specifications

- 100% end-of-line performance-tested
- Power factor greater than 0.95 at maximum output
- Typical stand-by power consumption of 0.30 W
- Turn-on time of less than 100 ms typical from electronic off

Environment

- Operating ambient temperature range: 0°C to 50°C (32°F to 122°F)
- Provide adequate space to ensure convective cooling of LED driver

Mounting

- Independent control gear; driver requires no particular mounting means
- Driver can be independently mounted
- Will fit through 2.36 in (60 mm) ceiling cutout
- M-case driver typically mounts in a linear or troffer fixture type (downlight, cove light, sconce, undercabinet, etc.)

Wiring

- Requires four wires (E1, E2, Constant Hot/Live, and Neutral); two 0.75 mm^2 to 1.50 mm^2 (or one 1.75 mm^2 to 2.50 mm^2) solid copper Class 1 or Class 2 wire per digital link terminal, and two 0.75 mm^2 to 2.50 mm^2 solid copper Class 1 wire power terminal
- Maximum driver-to-LED light engine wire length must not exceed 49.21 ft (15 m)
- The 0.75 mm^2 control wire must not exceed 492 ft (150 m), and the 1.50 mm^2 control wire must not exceed 984 ft (300 m)
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Highest performance dimming to 1%
2-wire forward phase controlled

PSE MODELS ONLY

Shown: Hi-lume A-Series LED driver (PSE), K-case

Model number is determined by load and control type. See pg. 55 for additional information.

Hi-lume A-Series (PSE) is a high performance LED driver that provides smooth, continuous 1% dimming for constant current LED modules.

Operating Voltage
- 100 V @ 50/60 Hz

Control options
- 2-wire forward phase control*

Lamp types and wattages
- Most common LED modules, up to 32 W

Available case types
- K-case

LED operating specifications

Constant Current
- 200 mA – 1.50 A (in 10 mA steps)
- 3 W – 32 W
- Pulse width modulation (PWM) or constant current reduction (CCR) dimming

For system compatibility information, see pg. 14.

*For a complete list of compatible controls, visit **www.lutron.com/HilumeLED.**

Key standards
- PSE certified
- Meets IEEE C62.41 category A surge protection standards up to and including 4kV

Features
- Continuous, flicker-free dimming from 100% to 1%
- A rated lifetime of 50,000 hours at maximum case temperature
- Constant current reduction (CCR) and pulse width modulation (PWM) dimming available for constant current light engines
- Standard 2-wire line-voltage forward phase control technology
- Non-volatile memory restores all driver settings after power failure
- Instant light output at any level when turned on, without flashing to full on

Specifications
- 100% end-of-line performance-tested
- Power factor greater than 0.90
- Inrush current less than 2 A

Environment
- Sound rating: Class A (inaudible in 27 dB ambient environement)
- Maximum case temperature is 65°C (149°F)

Mounting
- Typically mounts via studs or tabs in an LED fixture or junction box (“no studs” case option available)

Wiring
- Requires two wires (Dimmed Hot and Neutral) plus Ground; one 16 – 18 AWG (0.75 mm² to 1.50 mm²) solid copper Class 1 wire per terminal
- Maximum driver-to-LED light engine wire length is 9.8 ft (3 m)
- Driver is grounded by a mounting screw to the grounded fixture or by terminal connection
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

High performance dimming to 5%
EcoSystem digital link controlled

PSE MODELS ONLY

Shown above: EcoSystem 5-Series LED driver (PSE), T-case

Model number is determined by load. See pg. 58 for additional information.

The EcoSystem 5-Series LED driver is built on the EcoSystem platform, which guarantees dimming performance with Lutron control systems and provides an affordable solution for smooth, flicker-free dimming from 100% to 5%. The driver complements our global offering of industry leading, architectural 1% EcoSystem LED drivers.

Operating voltage
- 100/200 V @ 50/60 Hz

Control options
- EcoSystem digital link

Lamp types and wattages
- Most common LED modules, up to 35 W

Available case types
- T-case

LED operating specifications
Constant Current
- 0.35 A, 0.50 A, 0.70 A, 1.05 A, 1.40 A
- Up to 35 W
- Constant current reduction (CCR) dimming

Key standards
- PSE certified

Drivers and Ballasts | **EcoSystem® 5-Series LED drivers (PSE)**

Features
- Continuous, flicker-free dimming from 100% to 5%
- Efficiency greater than 85% at 35 W
- Guaranteed dimming performance when used with Lutron controls
- A rated lifetime of 50,000 hours at maximum case temperature
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Constant current reduction (CCR) dimming available for constant current light engines
- Protected from miswire of input power to EcoSystem control inputs
- Non-volatile memory restores all driver settings after power failure
- Instant light output at any level when turned on, without flashing to full on

Specifications
- 100% end-of-line performance-tested
- Power factor greater than 0.95 at maximum power
- Typical stand-by power consumption of 0.50 W
- Turn-on time of less than 100 ms typical from electronic off

Environment
- Sound rating: Class A (inaudible in a 24 dB ambient environment)
- Operating ambient temperature range: 0°C to 40°C (32°F to 104°F)

Mounting
- Independent control gear; driver requires no particular mounting means
- Driver can be independently mounted
- Will fit through 2.36 in (60 mm) ceiling cutout

Wiring
- Requires four wires (E1, E2, Constant Hot/Live, and Neutral): one 0.80 mm^2 to 1.20 mm^2 solid or stranded copper Class 1 or Class 2 wire per digital link terminal, and one 1.60 mm^2 to 2.00 mm^2 solid copper Class 1 wire per power terminal
- Maximum driver-to-LED light engine wire length is 49.20 ft (15 m)
- The 1.00 mm^2 control wire must not exceed 492 ft (150 m), and the 1.75 mm^2 control wire must not exceed 1,640 ft (500 m)
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Highest performance dimming to 1% at a low cost

EcoSystem digital link controlled

Shown above: EcoSystem H-Series, M-case

Model numbers are organized by lamp type. See pg. 61 for additional information.

EcoSystem H-Series digitally addressable ballasts offer a low-cost, flexible solution for any space in an application. Providing industry-leading dimming to 1% or less, they meet the needs of the most demanding applications. The EcoSystem digital link also provides individual control, which eliminates the need to rewire, reduces design time, and provides a scalable solution for a small area to an entire building.

Operating voltage

- Universal input (120 V, 127 V, 220/240 V and 277 V @ 50/60 Hz)
- 347 V @ 60 Hz (CSA Certified only)

Lamp types and wattages

- T8 linear and U-bent: 17 W, 25 W, 32 W
- T5 HO linear: 24 W, 39 W, 54 W
- T5 linear: 14 W, 21 W, 28 W

H10-Series reduced wattage models**

- T8 linear reduced wattage: 28 W
- T5 HO linear reduced wattage: 49 W/50 W/51 W
- T5 linear reduced wattage: 13 W, 25/26 W

Control options

- EcoSystem digital link
- DALI digital link*

* DALI compliance available with CE models only.

** H10-Series is a 10% low-end dimming solution for selected reduced wattage lamps; Lutron does not suggest mixing of different percentage ballasts in the same fixture/areas, as the difference in low end can cause an unsatisfactory look to the lighting in the space.

Available case types

- G-case
- M-case
- C-case (347 V only)

Key standards

- UL Listed (evaluated to the requirements of UL 935)
- CSA Certified (evaluated to the requirements of C22.2 No. 74)
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- Select models are NOM listed
- California Energy Commission Listed
- Models are also available to meet global country-specific standards; (NOM, CE, INMETRO, CCC, and S-mark) see pg. 77 for a listing of global model numbers
- NEMA Premium and BAA compliant models available (see pg. 61 for additional information)

For system compatibility information, see pg. 14.

Drivers and Ballasts | **EcoSystem® H-Series ballasts**

Features

- Continuous, flicker-free dimming down to 0.7% or 1% of full light output for T8 lamps, 1% for T5 and T5 HO lamps, 10% for T8, T5, and T5 HO reduced watttage lamps
- The EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Protected from miswire of input power to EcoSystem control inputs
- Slim profile design
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- Lamps turn on at any dimmed level without going to full brightness

Specifications

- 100% performance-tested, including burn-in at the factory
- Total Harmonic Distortion (THD): less than 10%; select models are less than 15%
- Power factor greater than 0.95
- Ballast factor equal to 1.0 or 1.17 for T8 lamps
- Ballast factor equal to 1.0 for T5 and T5 HO lamps and CE, InMetro, CCC, and S-mark models
- Non-volatile memory restores all ballast settings after power failure
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 and 42 kHz
- Built-in inrush current-limiting circuitry (maximum of 7 A at 120 V and 3 A at 277 V)
- Factory-tuned ballast factors available to customize the ballast for different applications (available for UL and CSA models only)

Environment

- Sound rating: Class A (inaudible in a 27 dB ambient environment)
- Minimum lamp starting temperature 10°C (50°F)
- Maximum ballast case temperature 80°C (176°F)

Mounting

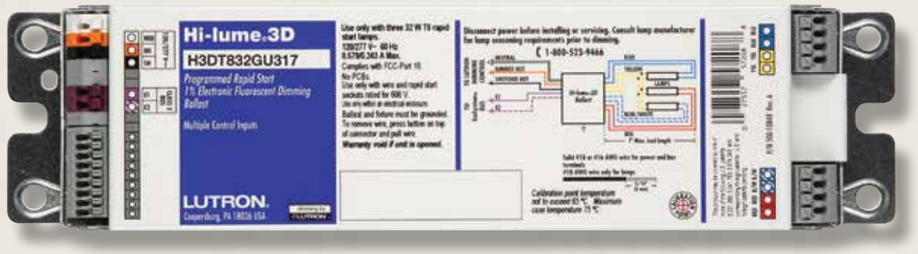
- Ballast mounts using two screws (or sheet metal feature and one screw) within a fluorescent fixture
- Ballast is grounded via a mounting screw to the fixture

Wiring

- Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal; E1/E2 wires may also be run Class 2
- Ballast grounded via case
- The 16 AWG control wire must not exceed 900 ft (274 m), and the 18 AWG must not exceed 550 ft (167 m). Maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T8, T5, and T5 HO linear lamps
- Lutron and NEMA recommend sockets complying with IEC 60400. Sockets must have a UL mark as well. Use rapid start sockets, not instant start sockets.
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Highest performance dimming to 1%*

EcoSystem® digital link or 3-wire controlled



Shown above: Hi-lume 3D, G-case

Model numbers are organized by lamp type. See pg. 63 for additional information.

Hi-lume 3D is a high-performance, energy-efficient, digitally addressable dimming ballast for demanding architectural applications. Hi-lume 3D is the world's first fluorescent dimming ballast that dims lights to 1% or less for T8 lamps. With Hi-lume 3D you get the highest performance fluorescent dimming with the same efficiency as non-dimmable ballasts.

Operating voltage

- Universal input (120 V, 220/240 V, 277 V @ 50/60 Hz)

Lamp types and wattages

- T8 linear and U-bent: 17 W, 25 W, 32 W, 40 W
- T5 HO linear: 24 W, 39 W, 54 W
- T5 linear: 14 W, 21 W, 28 W
- T5 twin tube*: 36 W, 40 W, 50 W

Control options

- EcoSystem digital link
- 3-wire control

Available case types

- C-case
- G-case

Key standards

- UL Listed (evaluated to the requirements of UL 935)
- CSA certified (evaluated to the requirements of C22.2 No. 74, specific model numbers only)
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- California Energy Commission Listed
- Select models are NOM listed (see pg. 78 for a listing of NOM model numbers)
- BAA compliant models available (see pg. 63 for additional information)

For system compatibility information, see pg. 14.

*T5 twin-tube models dim to 5%.

Drivers and Ballasts | **Hi-lume® 3D ballasts**

Features

- Broadest dimming range: continuous, flicker-free dimming down to 0.7% of full light output for T8 lamps; 1% for T5 and T5 HO lamps; and 5% for T5 twin-tube lamps
- Industry-leading ballast efficacy of up to 100 lumens per watt
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Standard 3-wire line-voltage phase-control technology for consistent dimming performance and compatibility with all Lutron 3-wire fluorescent dimmers
- Protected from miswire of input power to EcoSystem control inputs
- Slim-profile design
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- Lamps turn on at any dimmed level without going to full brightness

Specifications

- 100% performance-tested, including burn-in at the factory
- Total Harmonic Distortion (THD): less than 10%
- Power factor greater than .95
- Ballast factor equal to 1.0 or 1.17 for T8 lamps
- Ballast factor equal to 1.0 for T5 lamps
- Non-volatile memory restores all ballast settings after power failure
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 and 42 kHz
- Built-in inrush current-limiting circuitry (maximum of 7 A at 120 V and 3 A at 277 V)
- Factory-tuned ballast factors available to customize the ballast for different applications

Environment

- Sound rating: Class A
- Minimum lamp starting temperature 10°C (50°F)
- Maximum ballast case temperature 75°C (167°F)

Mounting

- Ballast mounts using two screws (or sheet metal feature and one screw) within a fluorescent fixture
- Ballast is grounded via a mounting screw to the fixture

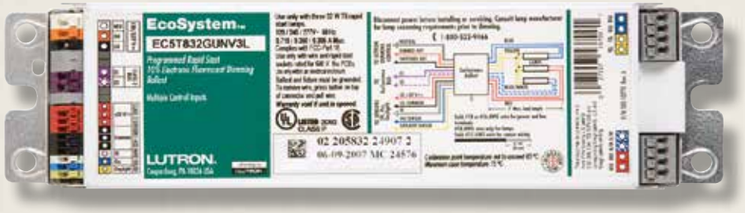
Wiring

- **EcoSystem digital link:** Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal, E1/E2 may also run Class 2

  3-wire: Hi-lume 3D ballasts require three wires (Dimmed Hot, Switched Hot, and Neutral) plus Ground; one 16–18 AWG solid copper Class 1 wire per terminal
- The 16 AWG control wire must not exceed 900 ft (274 m), and the 18 AWG must not exceed 550 ft (167 m). Maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T8, T5, and T5 HO linear lamps, and 3 ft (1 m) for T5 twin-tube lamps
- Ballast is grounded via case
- Lutron and NEMA recommend sockets complying with IEC 60400. Sockets must have a UL mark as well. Use rapid start sockets, not instant start sockets.
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Light management performance dimming to 10%

EcoSystem digital link or 3-wire controlled



Shown above: EcoSystem ballast, G-case

Model numbers are organized by lamp type. See pg. 65 for additional information.

EcoSystem digitally addressable dimming ballasts employ revolutionary technology allowing each device to listen, think, decide, remember, and react to its environment. EcoSystem fluorescent lighting control solutions are built on a simple building block architecture of fluorescent dimming ballasts, sensors, and controls, free from interfaces and power packs. EcoSystem redefines fluorescent lighting control as easy to design, easy to install, easy to maintain, and cost effective.

Operating voltage

- Universal input (120 V, 220/240 V, 277 V @ 50/60 Hz)

Lamp types and wattages

- T8 linear and U-bent: 17 W, 25 W, 32 W
- T8 linear reduced wattage: 28 W
- T5 HO linear: 24 W, 39 W, 54 W
- T5 linear: 14 W, 21 W, 28 W, 35 W
- T5 twin-tube: 36 W, 39 W, 40 W, 50 W, 55 W
- T5 twin-tube reduced wattage: 25 W

Control options

- EcoSystem digital link
- 3-wire control

Available case types

- G-case
- J-case

Key standards

- UL Listed (evaluated to the requirements of UL 935)
- CSA Certified (evaluated to the requirements of C22.2 No. 74)
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- California Energy Commission Listed
- Select models are NOM listed (see pg. 78 for a listing of NOM model numbers)
- NEMA Premium and BAA compliant models available (see pg. 65 for additional information)

For system compatibility information, see pg. 14.

For more information on Buy America Act compliant products please visit **www.lutron.com/BAA.**

Drivers and Ballasts | **EcoSystem® ballasts**

Features

- Continuous, flicker-free dimming from 100% to 10%
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Standard 3-wire line-voltage phase-control technology for consistent dimming performance and compatibility with all Lutron 3-wire fluorescent dimmers
- Sensors can connect directly to EcoSystem ballasts; all sensor and wallstation wiring is Class 2
- Protected from miswire of input power to EcoSystem control inputs
- Slim profile design
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- Lamps turn on at any dimmed level without going to full brightness

Specifications

- 100% performance-tested, including burn-in at the factory
- Total Harmonic Distortion (THD): less than 10% (select models are less than 15%)
- Power factor greater than 0.95
- Ballast factor equal to 0.85 for T8 lamps
- Ballast factor equal to 1.0 for T5 and T5 HO lamps
- Non-volatile memory restores all ballast settings after power failure
- Frequency of operation ensures that ballast does not interfere with infrared devices
- Built-in inrush current-limiting circuitry (maximum of 7 A at 120 V and 3 A at 277 V)
- Factory-tuned ballast factors available to customize the ballast for different applications

Environment

- Sound rating: Class A
- Minimum lamp starting temperature 10°C (50°F)
- Maximum ballast case temperature 75°C (167°F)

Mounting

- Ballast mounts using two screws (or sheet metal feature and one screw) within a fluorescent fixture
- Ballast is grounded via a mounting screw to the fixture

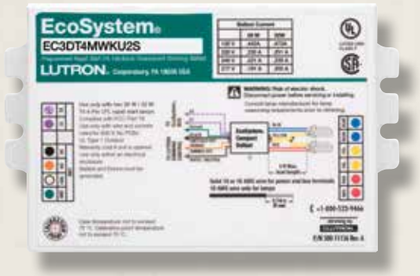
Wiring

- **EcoSystem digital link:** Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal; E1/E2 may also run Class 2

  3-wire: Requires three wires (Dimmed Hot, Switched Hot, and Neutral) plus Ground; one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) solid copper Class 1 wire per terminal
- The 16 AWG control wire must not exceed 900 ft (274 m), and the 18 AWG must not exceed 550 ft (167 m). Maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T8, T5, and T5 HO linear lamps, and 3 ft (1 m) for T5 twin-tube lamps
- Ballast is grounded via case
- Lutron and NEMA recommend sockets complying with IEC 60400. Sockets must have a UL mark as well. Use rapid start sockets, not instant start sockets.
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

High performance dimming to 5%

EcoSystem digital link or 3-wire controlled



Shown above: EcoSystem compact ballast, K-case

Model numbers are organized by lamp type. See pg. 76 for additional information.

EcoSystem compact ballasts provide high-performance dimming for any compact fluorescent (CFL) application, completing the EcoSystem solution. With a 100% to 5% dimming range for T4 CFL lamps, EcoSystem compact ballasts provide both energy savings and flexibility.

Operating voltage

- Universal input (120V, 220/240V, 277V @ 50/60Hz)

Lamp types and wattages

- T4 4-pin quad-tube CFL: 18W, 26W
- T4 4-pin triple-tube CFL: 26W, 32W, 42W

Key standards

- UL Listed (evaluated to the requirements of UL 935)
- UL Type 1 Outdoor for damp locations
- CSA Certified (evaluated to the requirements of C22.2 No. 74)
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions
- Select models are NOM listed (see pg. 78 for a listing of NOM model numbers)
- BAA compliant models available (see pg. 76 for additional information)

Control options

- EcoSystem digital link
- 3-wire control

Available case type

- K-case

Quick comparison

Feature	EcoSystem Compact	EcoSystem pg. 46
Dimming Level	5%	10%
Integral sensor connection	No	Yes
Maximum number of lamps per ballast	2	3
Maximum ballast to lamp socket lead length	3ft (1m)	7ft (2m)

For system compatibility information, see pg. 14.

Drivers and Ballasts | **EcoSystem® compact ballasts**

Features

- Continuous, flicker-free dimming from 100% to 5% for T4 CFL lamps
- EcoSystem digital link allows for rezoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Low-voltage, 2-conductor EcoSystem digital link provides individual fixture control
- Standard 3-wire line-voltage phase control technology for consistent dimming performance and compatibility with all Lutron 3-wire fluorescent dimmers
- Sensors can't connect directly to EcoSystem compact ballasts
- Protected from miswire of input power to EcoSystem control inputs
- One model can control both 26W and 32W T4 lamps
- Low standby power (<1W) when lamps are off
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- Lamps turn on at any dimmed level without going to full brightness

Specifications

- 100% performance-tested, including burn-in at the factory
- Total Harmonic Distortion (THD): less than 10%
- Power factor greater than 0.95
- Ballast factor equal to 0.95 for T4 lamps
- Non-volatile memory restores all ballast settings after power failure
- Frequency of operation ensures that ballast does not interfere with infrared devices
- Built-in inrush current-limiting circuitry (maximum of 7A at 120V and 3A at 277V)
- Factory-tuned ballast factors available to customize the ballast for different applications

Environment

- Sound rating: Class A
- Minimum lamp starting temperature 10°C (50°F)
- Maximum ballast case temperature 75°C (167°F)

Mounting

- Ballast mounts using two mounting tabs or studs within a fluorescent fixture ("no studs" case option available)
- Ballast is grounded via a mounting screw to the fixture

Wiring

- **EcoSystem digital link:** Requires four wires (E1, E2, Constant Hot/Live, and Neutral) plus Ground; one 16–18AWG (0.75mm² to 1.50mm²) solid copper Class 1 wire per terminal, E1/E2 may also run Class 2

  3-wire: Requires three wires (Dimmed Hot, Switched Hot, and Neutral) plus Ground; one 16–18AWG (0.75mm² to 1.50mm²) solid copper Class 1 wire per terminal
- The 16AWG control wire must not exceed 900ft (274m), and the 18AWG must not exceed 550ft (167m). Maximum ballast-to-lamp-socket lead length is 3ft (1m) for T4 compact lamps
- Ballast is grounded via case
- Lutron and NEMA recommend sockets complying with IEC 60400. Sockets must have a UL mark as well. Use rapid start sockets, not instant start sockets.
- For control wiring diagrams, see pg. 91, and for lamp wiring diagrams, see pg. 101

Details for building a Lutron LED driver model number

1 Choosing a control type input to the LED driver

The following control technologies refer to the signal and wiring between the control on the wall and the LED driver. The compatibility of a dimmer with a particular LED driver in the fixture begins with making sure they both use the same control method. These control technologies are used in standalone applications and control systems as well as in wired and wireless lighting controls.

Control selection is typically driven by the requirements of the project.

Control type	Features	Ideal applications
2-wire forward phase control (Dimmed Hot & Neutral) + Ground	• Typically used for incandescent and MLV light sources • General control used for LED retrofit screw-base lamps • Most common method of dimming control • 100V and 120V	• Retrofit projects • Residential and commercial system applications
EcoSystem® digital link control (2 Power-Constant Hot & Neutral plus 2 LV data - E1 & E2) + Ground	• Digitally addressable and allows LED drivers to communicate and react to environmental changes • Allows for rezoning without rewiring, and all links are miswire protected • Offers significant advantages over DALI digital systems in control zones, sensor options, and more. • 100/200V, 120V, 220–240V, and 277V	• Projects requiring digital control for individual fixture addressability • Upgrade from analog 0–10V control • Multi-zone applications • Small, retrofit applications using Lutron Energi TriPak™ solution
3-wire control (Dimmed Hot, Switched Hot & Neutral) + Ground	• Requires a third line voltage control wire, resulting in more precise performance and less electrical noise • Stable over long wire runs • Easily wired • 120V and 277V	• LED dimming applications requiring precise control • Easy to retrofit on existing 3-Wire control systems

For more information, please use the following resources:
- LED Driver Selection Tool (**www.lutron.com/LEDBuildAModel**)
- Lutron LED Control Center of Excellence (1.877.DIM.LED8 or email LEDs@lutron.com)

Drivers and Ballasts | **LED driver model numbers**

Details for building a Lutron LED driver model number

2 Choosing an LED driver output to the LED array/module/engine

Lutron LED drivers offer models for both constant current and constant voltage applications. These two types of drivers are not interchangeable.

The driver's output is determined by the design of the fixture's LED array, and must be selected by the fixture manufacturer.

	Typical applications	Details
Constant current	• Down-light trotter, linear, pendant or sconce	• One light source per driver (much like a fluorescent lamp with its associated ballast) • For a pre-made LED array designed to operate at or below a set current level
Constant voltage	• Cove, under-cabinet light, or an area with a variable number of fixtures	• For one or more LED arrays connected in parallel • Similar to electronic or magnetic low-voltage power supplies that often have 12V and 24V outputs

The Lutron Hi-lume® A-Series LED driver family and the EcoSystem® H-Series and 5-Series LED driver family can be configured for the specific needs of most LED sources (Xicato, GE, Philips, Bridgelux, Citizen, Cree, Osram and many more) and allows an LED fixture manufacturer to design for light output, power consumption, and/or efficiency.

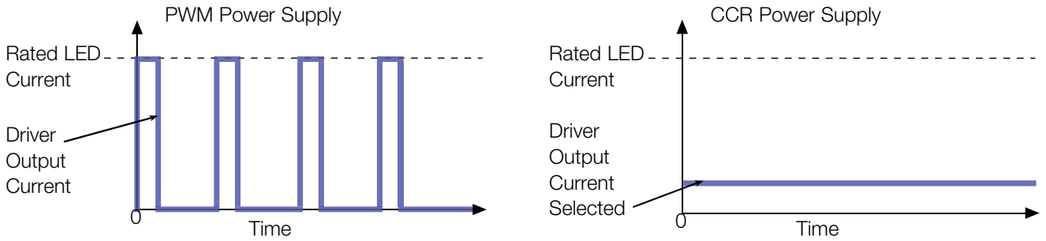
For more information, please use the following resources:
- LED Driver Selection Tool (**www.lutron.com/LEDBuildAModel**)
- Lutron LED Control Center of Excellence (1.877.DIM.LED8 or email LEDs@lutron.com)

Details for building a Lutron LED driver model number

❷ Choosing an LED dimming method

There are two mechanisms for dimming constant current LED drivers: pulse width modulation (PWM) and constant current reduction (CCR). **Constant voltage LED drivers always use PWM**. In a PWM driver, the current is switched at a high frequency between zero and the rated output current. The ratio of on time to off time determines the perceived light level.

In a CCR supply, the current flows continuously at a fixed, pre-determined amount to achieve a given light level, efficiency, or color.



Driver output	Suitable applications
Pulse width modulation (PWM)	• Fixtures that must be dimmed very low and still maintain consistent color • Color mixing applications that require precise levels for each color
Constant current reduction (CCR)	• Applications where digital video cameras are in use. • Applications that have strict EMI requirements, such as medical suites • Applications with high motion activity or rotating machinery • Most commonly used driver output

For more information, please use the following resources:
- LED Driver Selection Tool (**www.lutron.com/LEDBuildAModel**)
- Lutron LED Control Center of Excellence (1.877.DIM.LED8 or email LEDs@lutron.com)
- Dimming LEDs via PWM and CCR application note #360

Drivers and Ballasts | **LED driver model numbers**

Hi-lume® A-Series LED Drivers with UL Recognition (1% dimming)

- Dimming to 1%
- Compatible with full range of Lutron controls
- Energy saving
- QuikFig™ configurable models available

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
UL/CSA Recognized Certification						
5–40W	See below	**L3D A4U1U _ _-_ _ _ _ _**	3-wire, EcoSystem®	KS, KN, M	N	UNV = 120–277
40–53W	See pg. 5	**L3D A5U1U _ _-_ _ _ _ _**	3-wire, EcoSystem	KS, KN	N	UNV = 120–277
5–40W	See below	**LTE A4U1U _ _-_ _ _ _ _**	2-wire, Fwd Phase	KS, KN, M	N	120 only
UL Listed Certification (NEW)						
5–40W	See below	**L3D A4U1UKL-_ _ _ _ _**	3-wire, EcoSystem	KL	Y	UNV = 120–277
	See below	**LTE A4U1UKL-_ _ _ _ _**	2-wire, Fwd Phase	KL	Y	120 only

How to build a model number: Hi-lume A-Series (5–40W) LED driver with UL and cUL recognition, and UL and cUL listing (see www.lutron.com/LEDBUILDAMODEL)

L_ _ _A4U1U_ _ _ – _ _ _ _ _ _ _

Control Type:
3D = EcoSystem or 3-wire control
TE = 2-wire forward phase control (neutral required)

Case Type:
KS = Compact, Studded
KN = Compact, Non-studded
KL = Compact, UL Listed (on a Junction box)
MN = Stick, Non-studded

Current Level (for Constant Current):
020 = 0.20A; 021 = 0.21A … 210 = 2.10A
Voltage Level (for Constant Voltage):
100 = 10.0V; 105 = 10.5V … 600 = 60.0V

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming
V = Constant voltage driver with pulse width modulation (PWM) dimming

LED Load Output Range

Class 2 Constant Voltage
A = 10.0V–12.0V
B = 12.5V–20.0V
C = 20.5V–24.0V
D = 24.5V–38.0V

Isolated Non-Class 2 Constant Voltage
X = 38.5V–60.0V*

Isolated Non-Class 2 Constant Current
Y = 0.20A–0.50A 30V–60V*
Z = 0.51A–1.00A 30V–60V**

Class 2 Constant Current
E = 0.20A–0.50A 30V–54V
F = 0.51A–1.00A 30V–54V**
G = 0.20A–0.70A 8V–20V
H = 0.20A–0.70A 15V–38V
I = 0.71A–1.05A 8V–20V
J = 0.71A–1.05A 15V–38V
K = 1.06A–1.50A 8V–20V
L = 1.06A–1.50A 15V–38V**
M = 1.51A–2.10A 8V–20V**

How to build a model number: Hi-lume® A-Series 40–53 W LED Driver with UL and cUL Recognition Certification (1% dimming)

L3DA5U1UK _ - _ _ ___

Example: L3DA5U1UKS-NA105
For further assistance selecting your model number, use **www.lutron.com/LEDbuildamodel** or contact our LED Center of Excellence at 1.877.346.5338 or LEDS@lutron.com

Case Style:
S = Studded
N = Non-Studded

Current Level (for Constant Current):
071 = 0.71 A; 072 = 0.72 A … 105 = 1.05 A

Control Type:
3D = EcoSystem® or 3-wire control

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming

LED Driver Output Range

Class 2 Constant Current
N = 0.71 A–1.05 A; 35 V–54 V*

Isolated Non-Class 2 Constant Current
W = 0.71 A–1.05 A; 35 V–60 V*

*KS, KN, MN only
Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com

Drivers and Ballasts | **LED driver model numbers**

NEW EcoSystem® H-Series (up to 40 W) LED Driver with UL Recognition (1% dimming)

- Dimming to 1% with fade to/from black
- Compatible with Lutron EcoSystem® digital controls only
- Energy saving

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
7–40 W	See below	**LDE14U1UKS**	EcoSystem	K	N	UNV = 120–277
	See below	**LDE14U1UKN**	EcoSystem	K	N	UNV = 120–277

How to Build a Model Number, K-Case Type: EcoSystem® H-Series (up to 40 W) LED Driver

LDE14U1UK _ - _ A ___

Case Style:
S = Studded (K-case only)
N = Non-Studded

Current Level (for Constant Current):
020 = 0.20 A; 021 = 0.21 A … 070 = 0.70 A … 140 = 1.40 A

LED Load Output Range (see the following pages for more detail):

Class 2 Constant Current
A = 0.22 A–0.45 A, 23—50 V⎓*, 7 W–17.5 W
B = 0.33 A–0.70 A, 30—50 V⎓*, 55 W–35 W
C = 0.46 A–0.92 A, 16—39 V⎓*, 13 W–27 W
D = 0.30 A–0.75 A, 12—30 V⎓*, 8 W–16 W
E = 0.71 A–1.05 A, 31—50 V⎓*, 22 W–40 W
F = 0.71 A–1.40 A, 16—38 V⎓*, 19 W–40 W
G = 0.93 A–1.40 A, 10—26 V⎓, 14 W–28 W
H = 0.63 A–1.05 A, 10—21 V⎓, 8 W–17 W

Attention: Model numbers may appear similar to Lutron Hi-lume® A-Series drivers, but EcoSystem H-Series drivers are not a direct model-for-model replacement for Hi-lume A-Series drivers. Please note the driver's output rating and the load ratings to select the correct product for your fixture.
* Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com**

NEW EcoSystem® H-Series (up to 75W) LED Driver with UL and cUL recognition (1% dimming)

- Dimming to 1% with fade-off and fade-on
- Compatible with Lutron EcoSystem® digital controls only
- Energy saving

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
15–35W	See below	**LDE13U1UMN**	EcoSystem	M	N	UNV = 120–277
25–50W	See below	**LDE15U1UMN**	EcoSystem	M	N	UNV = 120–277
35–75W	See below	**LDE17U1UMN**	EcoSystem	M	N	UNV = 120–277

How to Build a Model Number, M-Case Type: EcoSystem® H-Series (up to 75W) LED Driver

LDE1_U1UMN-_A ___

LED Load Power Range
3 = 15W–35W
5 = 25W–50W
7 = 35W–75W

example: LDE13U1UMN-BA070
0.70A, 15W to 28W, 21.5–40V⎓** LED driver
For further assistance selecting your model number, contact our LED Center of Excellence at LEDs@lutron.com

Current Level (for Constant Current):
050 = 0.50A; … 210 = 2.10A

LED Load Output Range (see the following pages for more detail):
Class 2 Constant Current
B = 0.50A–1.25A, 20–40V⎓*, 15W–35W
C = 0.88A–1.75A, 20–40V⎓*, 25W–50W
D = 1.25A–2.10A, 20–40V⎓*, 35W–75W
T = 0.40A–0.83A, 30–50V⎓*, 15W–35W
U = 0.70A–1.33A, 30–50V⎓*, 25W–50W
V = 1.00A–1.88A, 30–50V⎓*, 40W–75W

Attention: Model numbers may appear similar to Lutron Hi-lume® A-Series drivers, but EcoSystem H-Series drivers are not a direct model-for-model replacement for Hi-lume A-Series drivers. Please note the driver's output rating and the load ratings to select the correct product for your fixture.
*Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com**
**Minimum voltage of LDE53U1UMN-BA070 limited by 15W minimum power.

Drivers and Ballasts | **LED driver model numbers**

NEW EcoSystem® 5-Series (up to 35W) LED Driver with UL and cUL recognition (5% dimming)

- Dimming to 5%
- Compatible with Lutron EcoSystem® digital controls only
- Energy saving

Wattage	Output Current	Model Number	Control Type	Case Type	Leads	Voltage
18–35W	1.400A	**LDE53U1UKN-LA140**	EcoSystem	K (N)	N	UNV = 120–277
18–35W	1.400A	**LDE53U1UKS-LA140**	EcoSystem	K (S)	N	UNV = 120–277
13–25W	1.400A	**LDE52U1UKN-KA140**	EcoSystem	K (N)	N	UNV = 120–277
13–25W	1.400A	**LDE52U1UKS-KA140**	EcoSystem	K (S)	N	UNV = 120–277
20–35W	1.050A	**LDE53U1UKN-JA105**	EcoSystem	K (N)	N	UNV = 120–277
20–35W	1.050A	**LDE53U1UKS-JA105**	EcoSystem	K (S)	N	UNV = 120–277
12–25W	1.050A	**LDE52U1UKN-MA105**	EcoSystem	K (N)	N	UNV = 120–277
12–25W	1.050A	**LDE52U1UKS-MA105**	EcoSystem	K (S)	N	UNV = 120–277
11–22.1W	0.93A	**LDE52U1UKN-MA093**	EcoSystem	K(N)	N	UNV = 120–277
11–22.1W	0.93A	**LDE52U1UKS-MA093**	EcoSystem	K(S)	N	UNV = 120–277
10–21.2W	0.89A	**LDE52U1UKN-MA089**	EcoSystem	K(N)	N	UNV = 120–277
10–21.2W	0.89A	**LDE52U1UKS-MA089**	EcoSystem	K(S)	N	UNV = 120–277
10–20.2W	0.85A	**LDE52U1UKN-MA085**	EcoSystem	K(N)	N	UNV = 120–277
10–20.2W	0.85A	**LDE52U1UKS-MA085**	EcoSystem	K(S)	N	UNV = 120–277
20–35W	0.700A	**LDE53U1UKN-RA070**	EcoSystem	K (N)	N	UNV = 120–277
20–35W	0.700A	**LDE53U1UKS-RA070**	EcoSystem	K (S)	N	UNV = 120–277
12–25W	0.700A	**LDE52U1UKN-FA070**	EcoSystem	K (N)	N	UNV = 120–277
12–25W	0.700A	**LDE52U1UKS-FA070**	EcoSystem	K (S)	N	UNV = 120–277
7–15W	0.700A	**LDE51U1UKN-QA070**	EcoSystem	K (N)	N	UNV = 120–277
7–15W	0.700A	**LDE51U1UKS-QA070**	EcoSystem	K (S)	N	UNV = 120–277
11–23.6W	0.66A	**LDE52U1UKN-FA066**	EcoSystem	K(N)	N	UNV = 120–277
11–23.6W	0.66A	**LDE52U1UKS-FA066**	EcoSystem	K(S)	N	UNV = 120–277
11–22.5W	0.63A	**LDE52U1UKN-FA063**	EcoSystem	K(N)	N	UNV = 120–277
11–22.5W	0.63A	**LDE52U1UKS-FA063**	EcoSystem	K(S)	N	UNV = 120–277
10–21.4W	0.60A	**LDE52U1UKN-FA060**	EcoSystem	K(N)	N	UNV = 120–277
10–21.4W	0.60A	**LDE52U1UKS-FA060**	EcoSystem	K(S)	N	UNV = 120–277
12–25W	0.500A	**LDE52U1UKN-PA050**	EcoSystem	K (N)	N	UNV = 120–277
12–25W	0.500A	**LDE52U1UKS-PA050**	EcoSystem	K (S)	N	UNV = 120–277
8–15W	0.500A	**LDE51U1UKN-NA050**	EcoSystem	K (N)	N	UNV = 120–277
8–15W	0.500A	**LDE51U1UKS-NA050**	EcoSystem	K (S)	N	UNV = 120–277
7–13.8W	0.46A	**LDE51U1UKN-NA046**	EcoSystem	K(N)	N	UNV = 120–277
7–13.8W	0.46A	**LDE51U1UKS-NA046**	EcoSystem	K(S)	N	UNV = 120–277
7–13.2W	0.44A	**LDE51U1UKN-NA044**	EcoSystem	K(N)	N	UNV = 120–277
7–13.2W	0.44A	**LDE51U1UKS-NA044**	EcoSystem	K(S)	N	UNV = 120–277
7–12.6W	0.42A	**LDE51U1UKN-NA042**	EcoSystem	K(N)	N	UNV = 120–277
7–12.6W	0.42A	**LDE51U1UKS-NA042**	EcoSystem	K(S)	N	UNV = 120–277
8–18W	0.350A	**LDE51U1UKN-GA035**	EcoSystem	K (N)	N	UNV = 120–277
8–18W	0.350A	**LDE51U1UKS-GA035**	EcoSystem	K (S)	N	UNV = 120–277

NEW EcoSystem® 5-Series (up to 75W) LED Driver with UL and cUL recognition (5% dimming)

- Dimming to 5%
- Compatible with Lutron EcoSystem® digital controls only
- Energy saving

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
15–35W	See below	**LDE53U1UMN-BA_ _ _**	EcoSystem	M	N	UNV = 120–277
25–50W	See below	**LDE55U1UMN-CA_ _ _**	EcoSystem	M	N	UNV = 120–277
35–75W	See below	**LDE57U1UMN-DA_ _ _**	EcoSystem	M	N	UNV = 120–277

How to build a model number: EcoSystem 5-Series (up to 75W) LED driver with UL recognition

LDE5__U1UMN– __A__ __ __

LED Load Power Range
3 = 15W–35W
5 = 25W–50W
7 = 35W–75W

Current Level (for Constant Current):
050 = 0.50A; … 210 = 2.10A

LED Load Output Range

Class 2 Constant Current

B = 0.50A–1.25A, 20–40V⎓*, 15W to 35W
C = 0.88A–1.75A, 20–40V*⎓*, 25W to 50W
D = 1.25A–2.10A, 20–40V⎓*, 35W to 35W
T = 0.40A–0.83A, 30–50V⎓*, 15W to 35W
U = 0.70A–1.33A, 30–50V⎓*, 25W to 50W
V = 1.00A–1.88A, 30–50V⎓*, 40W to 75W

*Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com**

Drivers and Ballasts | **LED driver model numbers**

Hi-lume® A-Series LED Drivers (1% dimming) with CE/ENEC Certification

- Dimming to 1%
- Compatible with Lutron EcoSystem® and DALI digital controls
- Energy saving

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
5–25W	See below	**LDEA2E1CPA-_ _ _ _ _**	EcoSystem/DALI	P	N	220–240

HOW TO BUILD A MODEL NUMBER: ECOSYSTEM® 5-25W LED DRIVER WITH CE CERTIFICATION (1% DIMMING)

L DE A2E1C PA – __ __ __ __ __

Control Type:
DE = Digital Only EcoSystem LED Driver

Current Level (for Constant Current):
020 = 0.20A; 021 = 0.21A … 100 = 1.05A

Voltage Level (for Constant Voltage):
100 = 10.0V; 105 = 10.5V … 400 = 40.0V

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming
V = Constant voltage driver with pulse width modulation (PWM) dimming

LED Load Output Range

Constant Voltage
A = 8.0V–12.0V*
B = 12.5V–20.0V*
C = 20.5V–24.0V*
D = 24.5V–40.0V
1.05A and 25W Maximum

Constant Current
G = 0.20A–0.70A 8V–20V
H = 0.20A–0.70A 15V–40V
I = 0.71A–1.05A 8V–20V
J = 0.71A–1.05A 15V–40V *
40V and 25W Maximum

*Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com**

EcoSystem® 5-Series (up to 35W) LED driver with CE/CNEC certification (5% dimming)

- Dimming to 5%
- Compatible with Lutron EcoSystem® and DALI digital controls
- Energy saving

Wattage	Output Current	Model Number	Control Type	Case Type	Leads	Voltage
20–35W	0.700A	**LDE53E1CRN-RA070**	EcoSystem/DALI	R	N	220–240
20–35W	1.050A	**LDE53E1CRN-JA105**	EcoSystem/DALI	R	N	220–240
18–35W	1.400A	**LDE53E1CRN-LA140**	EcoSystem/DALI	R	N	220–240
12–25W	0.500A	**LDE52E1CRN-PA050**	EcoSystem/DALI	R	N	220–240
12–25W	0.700A	**LDE52E1CRN-FA070**	EcoSystem/DALI	R	N	220–240
12–25W	1.050A	**LDE52E1CRN-MA105**	EcoSystem/DALI	R	N	220–240
13–25W	1.400A	**LDE52E1CRN-KA140**	EcoSystem/DALI	R	N	220–240
8–18W	0.350A	**LDE51E1CRN-GA035**	EcoSystem/DALI	R	N	220–240
8–15W	0.500A	**LDE51E1CRN-NA050**	EcoSystem/DALI	R	N	220–240
8–13W	0.250A	**LDE51E1CRN-GA025**	EcoSystem/DALI	R	N	220–240
7–15W	0.700A	**LDE51E1CRN-QA070**	EcoSystem/DALI	R	N	220–240
7–15W	1.050A	**LDE51E1CRN-SA105**	EcoSystem/DALI	R	N	220–240

NEW EcoSystem® 5-Series (up to 50W) LED Driver with CE certification (5% dimming)

- Dimming to 5%
- Compatible with Lutron EcoSystem® and DALI digital controls
- Energy saving

Wattage	Output Range	Model	Control Type	Case Type	Leads	Voltage
25–50W	See below	LDE53E1CMN-UA_ _ _	EcoSystem/DALI	M	N	220–240

How to build a model number: EcoSystem 5-Series (up to 50W) LED driver with CE certification

LDE55E1CMN– UA__ __ __

LED Load Power Range
5 = 25W–50W

Current Level (for Constant Current):
070 = 0.70A; 071 = 0.71A …133 = 1.33A

LED Load Output Range
Class 2 Constant Current
U = 0.70A–1.33A, 30–50V

Hi-lume® A-Series LED Drivers (1% dimming) with PSE Certification

- Dimming to 1%
- Compatible with Lutron 2-wire forward phase controls
- Energy saving

Wattage	Output Range	Model Number	Control Type	Case Type	Leads	Voltage
5–32W	See below	**LTE A3U1U _ _-_ _ _ _ _**	2-wire,Fwd Phase	K (S)	N	100

HOW TO BUILD A MODEL NUMBER: HI-LUME® A-SERIES 5-32W LED DRIVER WITH PSE CERTIFICATION (1% DIMMING)

LTEA3D11K _ - _ _ ___

Example: LTEA3D11KN-JA100
For further assistance selecting your model number, contact Lutron Asuka at +81.3.5575.8411 (phone), 0120.083.417 (freephone) or asuka@lutron.com

Case Style:
S = Studded
N = Non-Studded

Current Level (for Constant Current):
020 = 0.20A; 021 = 0.21A … 100 = 1.00A … 150 = 1.50A

Driver Output:
C = Constant current driver with pulse width modulation (PWM) dimming
A = Constant current driver with constant current reduction (CCR) dimming

LED Driver Output Range
Constant Current
G = 0.20A–0.70A 8V–20V
H = 0.20A–0.70A 15V–38V
J = 0.71A–1.05A 15V–38V*
L = 1.06A–1.50A 15V–38V*

*Output voltage range changes with output current and power limits. Check driver specifications carefully. Purchaser is responsible for electrical compatibility between driver and LED load. Find the driver specification submittal at **www.lutron.com**

NEW EcoSystem 5-Series (up to 35W) LED driver with PSE certification (5% dimming)						
• Dimming to 5% • Compatible with Lutron EcoSystem® digital controls only • Energy saving						
Wattage	Output Current	Model Number	Control Type	Case Type	Leads	Voltage
20–35W	0.700A	**LDE53D1JTN-RA070**	EcoSystem	T	N	100/200
20–35W	1.050A	**LDE53D1JTN-JA105**	EcoSystem	T	N	100/200
18–35W	1.400A	**LDE53D1JTN-LA140**	EcoSystem	T	N	100/200
12–25W	0.500A	**LDE52D1JTN-PA050**	EcoSystem	T	N	100/200
12–25W	0.700A	**LDE52D1JTN-FA070**	EcoSystem	T	N	100/200
12–25W	1.050A	**LDE52D1JTN-MA105**	EcoSystem	T	N	100/200
13–25W	1.400A	**LDE52D1JTN-KA140**	EcoSystem	T	N	100/200
8–18W	0.350A	**LDE51D1JTN-GA035**	EcoSystem	T	N	100/200
8–15W	0.500A	**LDE51D1JTN-NA050**	EcoSystem	T	N	100/200
7–15W	0.700A	**LDE51D1JTN-QA070**	EcoSystem	T	N	100/200
7–15W	1.050A	**LDE51D1JTN-SA105**	EcoSystem	T	N	100/200

The L3D-CFG is designed to aid LED fixture manufacturers in the design of their fixtures by giving them the capability of manipulating the output parameters of an LED driver. It enables tuning a programmable Hi-lume® A-Series LED driver for lumens per watt, total lumen output, input power, and output type. The included software allows generating, testing, and verifying the exact model number for an application without waiting for samples.

OEM Configuration Kits/Interface		
Family	Interface Model	Description
Hi-lume A-Series LED Driver OEM Kits	L3D-CFG-KS	Kit includes all hardware and software required to configure 5 studded K-case drivers
	L3D-CFG-KN	Kit includes all hardware and software required to configure 5 non-studded K-case drivers
	L3D-CFG-MN	Kit includes all hardware and software required to configure 5 M-case drivers
Replacement Components		
Replacement Components for Hi-lume A-Series LED Driver OEM Configuration Kits	L3D-CFG	Hi-lume A-Series LED driver PC interface
	L3DA4U1UKS-2AOEM	OEM kit driver replacement only
	L3DA4U1UKS-2BOEM	OEM kit driver replacement only
	L3DA4U1UKS-2COEM	OEM kit driver replacement only
	L3DA4U1UKS-1AOEM	OEM kit driver replacement only
	L3DA4U1UKS-3AOEM	OEM kit driver replacement only
	L3DA4U1UKN-2AOEM	OEM kit driver replacement only
	L3DA4U1UKN-2BOEM	OEM kit driver replacement only
	L3DA4U1UKN-2COEM	OEM kit driver replacement only
	L3DA4U1UKN-1AOEM	OEM kit driver replacement only
	L3DA4U1UKN-3AOEM	OEM kit driver replacement only
	L3DA4U1UMN-2AOEM	OEM kit driver replacement only
	L3DA4U1UMN-2BOEM	OEM kit driver replacement only
	L3DA4U1UMN-2COEM	OEM kit driver replacement only
	L3DA4U1UMN-1AOEM	OEM kit driver replacement only
	L3DA4U1UMN-3AOEM	OEM kit driver replacement only

Terms and Conditions

1. The Lutron LED Driver QwikFig system is offered to a fixture manufacturer (OEM) to enable the OEM to program Lutron LED drivers in the OEM's manufacturing facilities (OEM Factory).

2. The OEM shall provide Lutron with the name and email address of a primary (Primary OEM Contact) and secondary contact for all matters relating to the QwikFig Program, and provide timely updates to Lutron should these QwikFig contact(s) change by emailing oemorders@lutron.com.

3. The OEM shall program each Lutron configurable LED driver using the QwikFig software and hardware included in the QwikFig configuration system in accordance with the QwikFig User Guide provided by Lutron.

4. After a Lutron configurable LED driver is programmed using the QwikFig configuration system, the QwikFig software will print a label with information specific to the OEM. The OEM must apply the label to the Lutron configured LED driver. The OEM shall not modify the label from the format specified by Lutron and shall use a printer and label stock that is approved by Lutron. Blank labels are to be purchased from the supplier of your choice; Lutron will provide the approved label manufacturer part numbers. Without the LED driver configuration data (as printed on the label) Lutron will have limited ability to assist LED driver end-users. As such, if the OEM does not apply the label to the configured LED driver, the OEM will be solely responsible for managing all LED driver warranty claims with respect to that driver with the customer. The OEM would then be able to present a warranty claim to Lutron for those drivers; Lutron's existing processes for the presentation of a warranty claim to Lutron remain in effect.

5. Routine maintenance on the QwikFig equipment is required to keep the system running smoothly. Lutron shall provide a maintenance manual (and any updates) for the QwikFig configuration system to the primary point of contact via email. The OEM shall perform all maintenance in accordance with the maintenance manual. Lutron reserves the right to deny warranty claims on QwikFig enabled LED drivers programmed on equipment that is not maintained as described in the maintenance manual.

6. QwikFig software must be routinely updated to the current QwikFig software release version. Lutron shall post updates on myLutron.com and shall email the primary point of contact when an update to the QwikFig software and database is available. The Primary OEM contact will be setup with an account at myLutron.com. The OEM shall promptly update the QwikFig Software upon receipt of such notification from Lutron. Lutron reserves the right to deny warranty claims on QwikFig enabled LED drivers programmed on equipment that does not have the most current release version of the QwikFig software installed.

7. The QwikFig software shall maintain a record of the serial number and configuration for each Lutron LED configurable driver programmed using the QwikFig configuration system.

   The primary OEM Contact must email the files exported by the QwikFig Software quarterly for warranty recording purposes to Lutron's QwikFig Program Administrator (oemorders@lutron.com). In the event that the OEM do not forward the required QwikFig software files, Lutron reserves the right to deny warranty claims on those QwikFig enabled LED drivers.

8. The OEM is responsible for obtaining all certifications and approvals needed to sell the final product (UL®, etc.).

9. Lutron strongly recommends that the OEM end-of-line test each lighting fixture containing a Lutron LED driver in their manufacturing facility. At a minimum the test must include high-end, low-end, and off levels.

10. ALL PRODUCTS RETURNED TO LUTRON FOR WARRANTY CLAIM EVALUATION MUST INCLUDE THE RGA NUMBER ON THE OUTSIDE OF THE PACKAGE AND ON THE ENCLOSED PACKING LIST. Failure to include the RGA number as indicated may result in the warranty claim being denied by Lutron, no credit being issued, and/ or the package being returned at your expense. Any Lutron product replaced under warranty will be shipped to the same destination address as the original Lutron product being replaced under warranty was initially shipped.

11. Lutron reserves the right to invoice the OEM a commercially reasonable fee to investigate or assist in the resolution of an issue caused by the Lutron manufactured LED driver being configured improperly by the OEM.

12. The OEM agrees to hold Lutron harmless from any third party claims of personal injury or property damage caused by: a) the OEM's products, b) the OEM's improper configuration of the Lutron LED driver, and/or c) the OEM's failure to adhere to the above terms. The OEM shall have no obligation to hold Lutron harmless to the extent the Lutron manufactured LED driver is the cause of the loss.

Drivers and Ballasts | **QwikFig™ Manufacturing Configuration Kits**

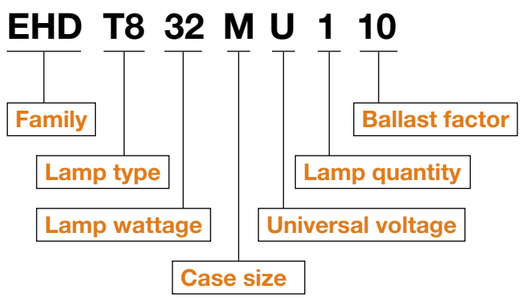
QwikFig OEM Configuration System	
Model Number	Description
QWIKFIG-KIT-A (A-Series)	1 A-Series LED driver programming nest and printer
QWIKFIG-NEST-A (A-Series)	Replacement A-Series LED driver nest
QWIKFIG-PRN	Replacement printer

QwikFig OEM Configuration bulks in case quantity (24 drivers/case)	
Hi-lume A-Series Model Number	QwikFig enabled LED Driver Model Numbers
L3DA4U1UKN-E_ _ _ _	L3DA4U1UKN-3ABLK
L3DA4U1UKN-F_ _ _ _	
L3DA4U1UKN-G_ _ _ _	L3DA4U1UKN-2GBLK
L3DA4U1UKN-H_ _ _ _	L3DA4U1UKN-2HBLK
L3DA4U1UKN-I_ _ _ _	L3DA4U1UKN-2RBLK
L3DA4U1UKN-K_ _ _ _	
L3DA4U1UKN-J_ _ _ _	L3DA4U1UKN-2SBLK
L3DA4U1UKN-L_ _ _ _	
L3DA4U1UKN-M_ _ _	L3DA4U1UKN-2ABLK
L3DA5U1UKN-N_ _ _ _	L3DA5U1UKN-3BBLK
L3DA5U1UKN-W_ _ _ _	L3DA5U1UKN-1BBLK
L3DA4U1UKN-Y_ _ _ _	L3DA4U1UKN-1ABLK
L3DA4U1UKN-Z_ _ _ _	
L3DA4U1UKS-E_ _ _ _	L3DA4U1UKS-3ABLK
L3DA4U1UKS-F_ _ _ _	
L3DA4U1UKS-G_ _ _ _	L3DA4U1UKS-2GBLK
L3DA4U1UKS-H_ _ _ _	L3DA4U1UKS-2HBLK
L3DA4U1UKS-I_ _ _ _	L3DA4U1UKS-2RBLK
L3DA4U1UKS-K_ _ _ _	
L3DA4U1UKS-J_ _ _ _	L3DA4U1UKS-2SBLK
L3DA4U1UKS-L_ _ _ _	
L3DA4U1UKS-M_ _ _ _	L3DA4U1UKS-2ABLK
L3DA5U1UKS-N_ _ _ _	L3DA5U1UKS-3BBLK
L3DA5U1UKS-W_ _ _ _	L3DA5U1UKS-1BBLK
L3DA4U1UKS-Y_ _ _ _	L3DA4U1UKS-1ABLK
L3DA4U1UKS-Z_ _ _ _	
L3DA4U1UMN-E_ _ _ _	L3DA4U1UMN-3ABLK
L3DA4U1UMN-F_ _ _ _	
L3DA4U1UMN-G_ _ _ _	L3DA4U1UMN-2CBLK
L3DA4U1UMN-I_ _ _ _	
L3DA4U1UMN-K_ _ _ _	
L3DA4U1UMN-H_ _ _ _	L3DA4U1UMN-2BBLK
L3DA4U1UMN-J_ _ _ _	
L3DA4U1UMN-L_ _ _ _	
L3DA4U1UMN-M_ _ _ _	L3DA4U1UMN-2ABLK
L3DA4U1UMN-Y_ _ _ _	L3DA4U1UMN-1ABLK
L3DA4U1UMN-Z_ _ _ _	

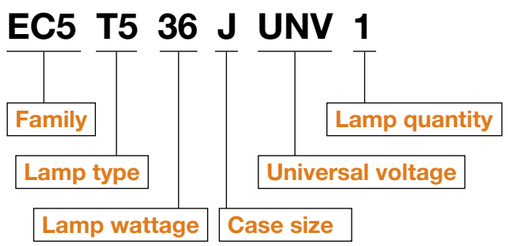
Understanding ballast model numbers

Lutron ballast model numbers are designed to illustrate basic information about the ballast. For example:

EcoSystem® H-Series ballasts



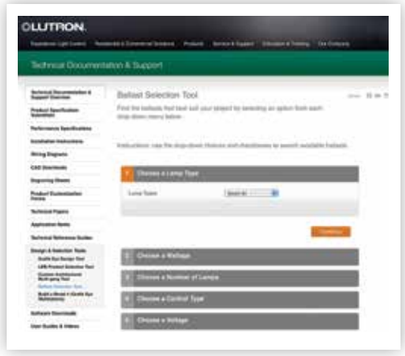
EcoSystem ballasts



Generate part numbers, confirm ballast performance specifications (input power, system lumens, ballast factor) and select the proper ballast by utilizing the Ballast Selection Tool.

This tool also enables users to choose a Custom Ballast Factor (percentage of light output for a given lamp-ballast combination). Reduced ballast factors achieve greater energy savings and are available for all Lutron ballasts with EcoSystem control.

NEW



Ballast Selection Tool with Custom Ballast Factor. Find and configure the ballast that best fits your project: **www.lutron.com/BallastTool**.

T8 Linear and U-bent

EcoSystem® H-Series (1% or less dimming) universal voltage digital dimming ballasts

- Dimming to 1% or less
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
32W (48 in [122 cm])	1	EHD T832 M U 1 10[4,5]	M	277	0.12	33.2	1.00	3,000	90	3.01	0.96
				240	0.14	33.6	1.00	3,000	89	2.98	0.95
				120	0.29	34.8	1.00	3,000	86	3.01	0.92
		EHD T832 M U 1 17[4,5]	M	277	0.15	41.6	1.17	3,510	84	2.82	0.92
				240	0.17	40.8	1.17	3,510	86	2.87	0.92
				120	0.34	40.8	1.17	3,510	86	2.87	0.90
	2	EHD T832 M U 2 10[4,5]	M	277	0.24	66.5	1.00	6,000	90	1.50	0.96
				240	0.28	67.2	1.00	6,000	89	1.49	0.95
				120	0.57	68.4	1.00	6,000	88	1.46	0.94
		EHD T832 M U 2 17[4,5]	M	277	0.28	77.6	1.17	7,020	91	1.51	0.97
				240	0.32	76.8	1.17	7,020	91	1.52	0.98
				120	0.65	78.0	1.17	7,020	90	1.50	0.96
	3	EHD T832 G U 3 10[4,5]	G	277	0.37	93.5	1.00	9,000	96	1.07	1.03
				240	0.40	94.9	1.00	9,000	95	1.05	1.01
				120	0.83	95.4	1.00	9,000	94	1.05	1.01
		EHD T832 G U 3 17[4,5]	G	277	0.41	105.7	1.17	10,530	100	1.11	1.06
				240	0.47	106.5	1.17	10,530	99	1.10	1.05
				120	0.95	106.8	1.17	10,530	99	1.10	1.05
25W (36 in [91 cm])	1	EHD T825 M U 1 10[5]	M	277	0.11	30.5	1.00	1,900	62	3.28	0.82
				240	0.11	26.4	1.00	1,900	72	3.79	0.95
				120	0.26	31.2	1.00	1,900	61	3.21	0.80
	2	EHD T825 M U 2 10[5]	M	277	0.20	55.4	1.00	3,800	69	1.81	0.90
				240	0.23	55.2	1.00	3,800	69	1.81	0.91
				120	0.47	56.4	1.00	3,800	67	1.77	0.89

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] NEMA Premium models available. Add a "-NP" to the model number when ordering (ie: EHD T832 M U 1 10 -NP).
[5] BAA models available. Add a "U" to prefix of model number when ordering (ie: UEHD T832 M U 1 10).
[6] 347V ballasts are CSA certified only.

T8 Linear and U-bent

(cont.) EcoSystem® H-Series (1% or less dimming) universal voltage digital dimming ballasts

- Dimming to 1% or less
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
17W (24 in [61 cm])	1	**EHD T817 M U 1 10[5]**	M	277	0.08	22.2	1.00	1,300	90	4.51	0.77
				240	0.09	21.6	1.00	1,300	93	4.63	0.79
				120	0.18	21.6	1.00	1,300	93	4.63	0.79
	2	**EHD T817 M U 2 10[5]**	M	277	0.15	41.6	1.00	2,600	96	2.41	0.82
				240	0.18	43.2	1.00	2,600	93	2.31	0.79
				120	0.35	42.0	1.00	2,600	95	2.38	0.81
32W (48 in [122 cm])	1	**EHD T832 C 347 110[6]**	C	347	0.10	34.4	1.00	3,000	87	2.91	0.93
	2	**EHD T832 C 347 210[6]**		347	0.19	65.3	1.00	6,000	92	1.53	0.98
	1	**EHD T832 C 347 117[6]**		347	0.12	41.2	1.17	3,150	85	2.84	0.91
	2	**EHD T832 C 347 217[6]**		347	0.22	75.6	1.17	7,020	93	1.55	0.99

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] NEMA Premium models available. Add a "-NP" to the model number when ordering (ie: EHD T832 M U 1 10 -NP).
[5] BAA models available. Add a "U" to prefix of model number when ordering (ie: UEHD T832 M U 1 10).
[6] 347V ballasts are CSA certified only.

Drivers and Ballasts | **Fluorescent ballast model numbers**

Reduced Wattage T8 Linear and U-bent

EcoSystem® H10-Series (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10% for reduced wattage (energy-saving) lamps
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)[2]	System Efficacy (lm/W)[2]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
28W (48 in [122 cm])	1	**EHD T828 M U 1 RW**	M	277	0.10	28.4	1.00	2,725	96	3.52	0.99
				240	0.12	28.4	1.00	2,725	96	3.52	0.99
				120	0.24	29.0	1.00	2,725	94	3.45	0.97
	2	**EHD T828 M U 2 RW**	M	277	0.22	60.9	1.00	5,450	89	1.64	0.92
				240	0.25	60.0	1.00	5,450	91	1.67	0.93
				120	0.51	61.2	1.00	5,450	89	1.63	0.92

[1] For case type information see pgs. 24–29.
[2] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T8 Linear and U-bent (continued)

Hi-lume® 3D (1% or less dimming) universal voltage digital dimming ballasts

- Dimming to 1% or less
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem® digital controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
40W (60 in [152 cm])	1	**H3D T840 C U 1 10**	C	277	0.16	42.8	1.00	3,800	89	2.34	0.94
				240	0.18	43.0	1.00	3,800	88	2.33	0.93
				120	0.37	43.8	1.00	3,800	87	2.28	0.91
		H3D T840 C U 1 17	C	277	0.18	49.6	1.17	4,446	90	2.36	0.94
				240	0.21	49.4	1.17	4,446	90	2.37	0.95
				120	0.43	50.6	1.17	4,446	88	2.31	0.92
	2	**H3D T840 C U 2 10**	C	277	0.32	88.9	1.00	7,600	86	1.13	0.90
				240	0.37	88.4	1.00	7,600	86	1.13	0.91
				120	0.77	90.9	1.00	7,600	84	1.10	0.88
		H3D T840 C U 2 17	C	277	0.36	98.2	1.17	8,892	91	1.19	0.95
				240	0.41	97.2	1.17	8,892	92	1.20	0.96
				120	0.84	100.3	1.17	8,892	89	1.17	0.93
32W (48 in [122 cm])	1	**H3D T832 C U 1 10[4]** **H3D T832 G U 1 10[4]**	C G	277	0.12	33.2	1.00	3,000	90	3.01	0.96
				240	0.14	33.6	1.00	3,000	89	2.98	0.95
				120	0.29	34.8	1.00	3,000	86	2.87	0.92
		H3D T832 C U 1 17[4] **H3D T832 G U 1 17[4]**	C G	277	0.15	41.6	1.17	3,510	84	2.82	0.90
				240	0.17	40.8	1.17	3,510	86	2.87	0.92
				120	0.34	40.8	1.17	3,510	86	2.87	0.92
	2	**H3D T832 C U 2 10[4]** **H3D T832 G U 2 10[4]**	C G	277	0.24	66.5	1.00	6,000	90	1.50	0.96
				240	0.28	67.2	1.00	6,000	89	1.49	0.95
				120	0.57	68.4	1.00	6,000	88	1.46	0.94
		H3D T832 C U 2 17[4] **H3D T832 G U 2 17[4]**	C G	277	0.28	77.6	1.17	7,020	91	1.51	0.97
				240	0.32	76.8	1.17	7,020	91	1.52	0.98
				120	0.65	78.0	1.17	7,020	90	1.50	0.96
	3	**H3D T832 G U 3 10[4]**	G	277	0.37	102.5	1.00	9,000	88	0.98	0.94
				240	0.40	96.0	1.00	9,000	94	1.04	1.00
				120	0.83	99.6	1.00	9,000	90	1.00	0.96
		H3D T832 G U 3 17[4]	G	277	0.41	113.6	1.17	10,530	93	1.03	0.99
				240	0.47	112.8	1.17	10,530	93	1.04	1.00
				120	0.95	114.0	1.17	10,530	92	1.03	0.99

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a "U" to the prefix of model number when ordering (ie: UH3D T832 C U 1 10).

Drivers and Ballasts | **Fluorescent ballast model numbers**

T8 Linear and U-bent (continued)

(cont.) Hi-lume® 3D (1% or less dimming) universal voltage digital dimming ballasts

- Dimming to 1% or less
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem® digital controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
25W (36 in [91 cm])	1	**H3D T825 C U 1 10**	C	277	0.11	30.5	1.00	1,900	62	3.28	0.82
				240	0.11	26.4	1.00	1,900	72	3.79	0.95
				120	0.26	31.2	1.00	1,900	61	3.21	0.80
		H3D T825 C U 1 17	C	277	0.12	33.2	1.17	2,223	67	3.52	0.88
				240	0.14	33.6	1.17	2,223	66	3.48	0.87
				120	0.28	33.6	1.17	2,223	66	3.48	0.87
	2	**H3D T825 C U 2 10**	C	277	0.20	55.4	1.00	3,800	69	1.81	0.90
				240	0.23	55.2	1.00	3,800	69	1.81	0.91
				120	0.47	56.4	1.00	3,800	67	1.77	0.89
		H3D T825 C U 2 17	C	277	0.22	60.9	1.17	4,446	73	1.92	0.96
				240	0.25	60.0	1.17	4,446	74	1.95	0.98
				120	0.51	61.2	1.17	4,446	73	1.91	0.96
17W (24 in [61 cm])	1	**H3D T817 C U 1 10[4]** **H3D T817 G U 1 10[4]**	C G	277	0.08	22.2	1.00	1,300	59	4.51	0.77
				240	0.09	21.6	1.00	1,300	60	4.63	0.79
				120	0.18	21.6	1.00	1,300	60	4.63	0.79
		H3D T817 C U 1 17[4] **H3D T817 G U 1 17[4]**	C G	277	0.08	22.2	1.17	1,521	69	5.28	0.90
				240	0.10	24.0	1.17	1,521	63	4.88	0.83
				120	0.19	22.8	1.17	1,521	67	5.13	0.87
	2	**H3D T817 C U 2 10[4]** **H3D T817 G U 2 10[4]**	C G	277	0.15	41.6	1.00	2,600	63	2.41	0.82
				240	0.18	43.2	1.00	2,600	60	2.31	0.79
				120	0.35	42.0	1.00	2,600	62	2.38	0.81
		H3D T817 C U 2 17[4] **H3D T817 G U 2 17[4]**	C G	277	0.15	41.6	1.17	3,042	73	2.82	0.96
				240	0.17	40.8	1.17	3,042	75	2.87	0.98
				120	0.35	42.0	1.17	3,042	72	2.79	0.95
	3	**H3D T817 G U 3 10[4]**	G	277	0.21	58.2	1.00	3,900	67	1.72	0.88
				240	0.25	60.0	1.00	3,900	65	1.67	0.85
				120	0.48	57.6	1.00	3,900	68	1.74	0.89
		H3D T817 G U 3 17[4]	G	277	0.23	63.7	1.17	4,563	72	1.84	0.94
				240	0.27	64.8	1.17	4,563	70	1.81	0.92
				120	0.55	66.0	1.17	4,563	69	1.77	0.90

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a "U" to the prefix of model number when ordering (ie: UH3D T832 C U 1 10).

T8 Linear and U-bent (continued)

EcoSystem® (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
32W (48 in [122 cm])	1	**EC5 T832 J UNV 1**	J	277	0.11	31.6	0.85	2,550	81	2.69	0.86
				240	0.13	31.0	0.85	2,550	82	2.74	0.87
				120	0.26	31.3	0.85	2,550	81	2.72	0.87
	2	**EC5 T832 J UNV 2**[5]	J	277	0.21	57.4	0.85	5,100	89	1.48	0.95
				240	0.25	59.0	0.85	5,100	86	1.44	0.92
				120	0.49	59.1	0.85	5,100	86	1.44	0.92
		EC5 T832 G UNV 2L[4]	G	277	0.22	59.6	0.85	5,100	86	1.43	0.91
				240	0.25	57.6	0.85	5,100	89	1.48	0.94
				120	0.49	58.8	0.85	5,100	87	1.45	0.93
	3	**EC5 T832 G UNV 3L**[4,5]	G	277	0.31	86.5	0.85	7,650	88	0.98	0.94
				240	0.36	84.0	0.85	7,650	89	1.01	0.97
				120	0.72	85.9	0.85	7,650	89	0.99	0.95
		EC5 T832 G UNV 317L[4]	G	277	0.41	105.7	1.17	10,530	100	1.11	1.06
				240	0.47	106.5	1.17	10,530	99	1.10	1.05
				120	0.95	106.8	1.17	10,530	99	1.10	1.05
25W (36 in [91 cm])	1	**EC5 T825 J UNV 1**	J	277	0.10	27.6	0.85	1,828	66	3.08	0.77
				240	0.11	27.0	0.85	1,828	68	3.15	0.79
				120	0.23	26.9	0.85	1,828	68	3.16	0.79
	2	**EC5 T825 J UNV 2**	J	277	0.18	48.9	0.85	3,665	75	1.74	0.87
				240	0.20	49.0	0.85	3,665	75	1.73	0.87
				120	0.41	49.0	0.85	3,665	75	1.73	0.87
17W (24 in [61 cm])	1	**EC5 T817 J UNV 1**	J	277	0.08	20.6	0.85	1,190	58	4.13	0.70
				240	0.08	20.0	0.85	1,190	60	4.25	0.72
				120	0.17	20.1	0.85	1,190	59	4.23	0.72
	2	**EC5 T817 J UNV 2**	J	277	0.13	36.2	0.85	2,380	66	2.35	0.80
				240	0.15	37.0	0.85	2,380	64	2.30	0.78
				120	0.31	37.0	0.85	2,380	64	2.30	0.78

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] Ballast ships with leads.
[5] NEMA Premium models available. Add a "-NP" to the model number when ordering (ie: EC5 T832 J UNV 2 -NP).

Drivers and Ballasts | **Fluorescent ballast model numbers**

Reduced Wattage T8 and U-bent

EcoSystem® H10-Series (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10% for reduced wattage (energy-saving) lamps
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
28W (48 in [122 cm])	1	**EHD T828 M U 1 RW**	M	277	0.10	28.4	1.00	2,725	96	3.52	0.99
				240	0.12	28.4	1.00	2,725	96	3.52	0.99
				120	0.24	29.0	1.00	2,725	94	3.45	0.97
	2	**EHD T828 M U 2 RW**	M	277	0.22	60.9	1.00	5,450	89	1.64	0.92
				240	0.25	60.0	1.00	5,450	91	1.67	0.93
				120	0.51	61.2	1.00	5,450	89	1.63	0.92

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T5 Linear

EcoSystem® H-Series (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
28W (45.2in [115cm])	1	**EHD T528 M U 1 10[4]**	M	277	0.12	33.0	1.00	2,900	88	3.03	0.85
				240	0.13	31.2	1.00	2,900	93	3.21	0.90
				120	0.28	33.6	1.00	2,900	86	2.98	0.83
	2	**EHD T528 M U 2 10[4]**	M	277	0.22	59.8	1.00	5,800	97	1.67	0.94
				240	0.26	62.4	1.00	5,800	93	1.60	0.90
				120	0.52	62.4	1.00	5,800	93	1.60	0.90
	1	**EHD T528 M E 1 10**	M	240	0,13	31,2	1,00	2 900	93	3,21	0,90
				220	0,15	33,0	1,00	2 900	88	3,03	0,85
	2	**EHD T528 M E 2 10**	M	240	0,26	62,4	1,00	5 800	93	1,60	0,90
				220	0,29	63,8	1,00	5 800	91	1,57	0,88
	1	**EHD T528 C 347 110[5]**	C	347	0.09	30.9	1.00	2,900	94	3.23	0.91
	2	**EHD T528 C 347 210[5]**		347	0.17	58.4	1.00	5,800	99	1.71	0.96
21W (33.4in [84cm])	1	**EHD T521 M U 1 10[4]**	M	277	0.10	26.6	1.00	2,100	79	3.76	0.79
				240	0.11	26.3	1.00	2,100	80	3.81	0.80
				120	0.22	26.3	1.00	2,100	80	3.81	0.80
	2	**EHD T521 M U 2 10[4]**	M	277	0.18	48.5	1.00	4,200	87	2.06	0.87
				240	0.20	48.6	1.00	4,200	86	2.06	0.86
				120	0.41	48.7	1.00	4,200	86	2.05	0.86
	1	**EHD T521 M E 1 10**	M	240	0,11	26,4	1,00	2 100	80	3,79	0,80
				220	0,12	26,4	1,00	2 100	80	3,79	0,80
	2	**EHD T521 M E 2 10**	M	240	0,20	48,0	1,00	4 200	88	2,08	0,88
				220	0,21	46,2	1,00	4 200	91	2,16	0,91

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a “U” to the prefix of model number when ordering (ie: UH3D T832 C U 1 10).
[5] 347V ballasts are CSA certified only.

Drivers and Ballasts | **Fluorescent ballast model numbers**

T5 Linear (continued)

EcoSystem® H-Series (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
14W (21.6in [55cm])	1	**EHD T514 M U 1 10[4]**	M	277	0.07	19.4	1.00	1,350	70	5.16	0.72
				240	0.08	19.2	1.00	1,350	70	5.21	0.73
				120	0.16	19.2	1.00	1,350	70	5.21	0.73
	2	**EHD T514 M U 2 10[4]**	M	277	0.13	36.0	1.00	2,700	75	2.78	0.78
				240	0.15	36.0	1.00	2,700	75	2.78	0.78
				120	0.31	36.0	1.00	2,700	75	2.78	0.78
	1	**EHD T514 M E 1 10**	M	240	0,08	19,2	1,00	1 350	70	5,21	0,73
				220	0,09	19,8	1,00	1 350	68	5,05	0,71
	2	**EHD T514 M E 2 10**	M	240	0,15	36,0	1,00	2 700	75	2,78	0,78
				220	0,16	35,2	1,00	2 700	77	2,84	0,80

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a “U” to prefix of model number when ordering (ie: UH3D T832 C U 1 10).

Reduced Wattage T5 Linear

EcoSystem® H10-Series (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10% for reduced wattage (energy-saving) lamps
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)[2]	System Efficacy (lm/W)[2]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
13W (21.6 in [55 cm])	1	**EHD T513 M U 1 RW**	M	277	0.06	17.9	1.00	1,350	75	5.59	0.73
				240	0.07	17.4	1.00	1,350	78	5.75	0.75
				120	0.15	17.3	1.00	1,350	78	5.78	0.75
	2	**EHD T513 M U 2 RW**	M	277	0.11	29.0	1.00	2,700	93	3.45	0.86
				240	0.13	30.0	1.00	2,700	90	3.33	0.87
				120	0.25	30.2	1.00	2,700	89	3.31	0.90
25 / 26 W[3] (45.2 in [115 cm])	1	**EHD T525 M U 1 RW**	M	277	0.11	31.4	1.00	2,900	92	3.18	0.80
				240	0.13	29.8	1.00	2,900	97	3.36	0.84
				120	0.26	31.4	1.00	2,900	92	3.18	0.80
	2	**EHD T525 M U 2 RW**	M	277	0.21	56.6	1.00	5,800	102	1.77	0.88
				240	0.24	57.4	1.00	5,800	101	1.74	0.87
				120	0.49	59.0	1.00	5,800	98	1.69	0.85

[1] For case type information see pgs. 24–29.
[2] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

Drivers and Ballasts | **Fluorescent ballast model numbers**

T5 Linear (continued)

Hi-lume® 3D (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem® digital controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
28W (45.2 in [115 cm])	1	**H3D T528 C U 1 10[4]**	C	277	0.12	33.0	1.00	2,900	88	3.63	0.85
				240	0.13	31.2	1.00	2,900	93	3.21	0.90
				120	0.28	33.6	1.00	2,900	86	2.98	0.83
	2	**H3D T528 C U 2 10[4]**	C	277	0.22	59.8	1.00	5,800	97	1.67	0.94
				240	0.26	62.4	1.00	5,800	93	1.60	0.90
				120	0.52	62.4	1.00	5,800	93	1.60	0.90
21W (33.4 in [84 cm])	1	**H3D T521 C U 1 10[4]**	C	277	0.10	26.6	1.00	2,100	79	3.76	0.79
				240	0.11	26.3	1.00	2,100	80	3.81	0.80
				120	0.22	26.3	1.00	2,100	80	3.81	0.80
	2	**H3D T521 C U 2 10[4]**	C	277	0.18	48.5	1.00	4,200	87	2.06	0.87
				240	0.20	48.6	1.00	4,200	86	2.06	0.86
				120	0.41	48.7	1.00	4,200	86	2.05	0.86
14W (21.6 in [55 cm])	1	**H3D T514 C U 1 10[4]**	C	277	0.07	19.4	1.00	1,350	70	5.16	0.72
				240	0.08	19.2	1.00	1,350	70	5.21	0.73
				120	0.16	19.2	1.00	1,350	70	5.21	0.73
	2	**H3D T514 C U 2 10[4]**	C	277	0.13	36.0	1.00	2,700	75	2.78	0.78
				240	0.15	36.0	1.00	2,700	75	2.78	0.78
				120	0.30	36.0	1.00	2,700	75	2.78	0.78

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a “U” to prefix of model number when ordering (ie: UH3D T832 C U 1 10).

T5 Linear (continued)

EcoSystem® (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
35W (57.1 in [145 cm])	1	**EC5 T535 J UNV 1**	J	277	0.15	42.0	1.00	3,650	87	2.38	0.83
				240	0.18	42.3	1.00	3,650	87	2.38	0.83
				120	0.35	42.2	1.00	3,650	87	2.38	0.83
28W (45.2 in [115 cm])	1	**EC5 T528 J UNV 1**	J	277	0.12	32.6	1.00	2,900	89	3.07	0.86
				240	0.14	32.9	1.00	2,900	88	3.04	0.85
				120	0.27	32.9	1.00	2,900	88	3.04	0.85
	2	**EC5 T528 J UNV 2**	J	277	0.23	64.5	1.00	5,800	90	1.55	0.87
				240	0.27	65.0	1.00	5,800	89	1.54	0.86
				120	0.54	65.2	1.00	5,800	89	1.53	0.86
21W (33.4 in [84 cm])	1	**EC5 T521 J UNV 1**	J	277	0.09	24.9	1.00	2,100	84	4.01	0.84
				240	0.12	28.8	1.00	2,100	73	3.47	0.73
				120	0.22	26.4	1.00	2,100	80	3.79	0.80
	2	**EC5 T521 J UNV 2**	J	277	0.17	46.0	1.00	4,200	91	2.17	0.91
				240	0.20	47.2	1.00	4,200	89	2.12	0.89
				120	0.39	47.2	1.00	4,200	89	2.12	0.89
14W (21.6 in [55 cm])	1	**EC5 T514 J UNV 1**	J	277	0.07	19.0	1.00	1,350	71	5.26	0.74
				240	0.08	19.2	1.00	1,350	70	5.21	0.74
				120	0.16	19.2	1.00	1,350	70	5.21	0.74
	2	**EC5 T514 J UNV 2**	J	277	0.12	32.8	1.00	2,700	82	3.05	0.85
				240	0.14	33.3	1.00	2,700	81	3.00	0.85
				120	0.28	33.3	1.00	2,700	81	3.00	0.85

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

Drivers and Ballasts | **Fluorescent ballast model numbers**

T5 HO Linear

EcoSystem® H-Series (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron EcoSystem digital controls
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
54W (45.2 in [115 cm])	1	**EHD T554 M U 1 10[4]**	M	277	0.23	63.7	1.00	5,000	78	1.57	0.85
				240	0.26	62.4	1.00	5,000	80	1.60	0.87
				120	0.54	64.8	1.00	5,000	77	1.54	0.83
	2	**EHD T554 M U 2 10[4]**	M	277	0.42	116.3	1.00	10,000	86	0.86	0.93
				240	0.48	115.2	1.00	10,000	87	0.87	0.94
				120	0.95	114.0	1.00	10,000	88	0.88	0.95
	1	**EHD T554 M E 1 10**	M	240	0,26	62,4	1,00	5 000	80	1,60	0,87
				220	0,29	63,8	1,00	5 000	78	1,57	0,85
	2	**EHD T554 M E 2 10**	M	240	0,48	115,2	1,00	10 000	87	0,87	0,94
				220	0,51	112,2	1,00	10 000	89	0,89	0,96
	1	**EHD T554 C 347 110[5]**	C	347	0.17	58.4	1.00	5,000	86	1.71	0.92
	2	**EHD T554 C 347 210[5]**		347	0.34	116.8	1.00	10,000	86	0.86	0.92
39W (33.4 in [84 cm])	1	**EHD T539 M U 1 10[4]**	M	277	0.17	46.0	1.00	3,500	76	2.17	0.85
				240	0.19	44.9	1.00	3,500	78	2.23	0.87
				120	0.37	44.4	1.00	3,500	79	2.25	0.88
	2	**EHD T539 M U 2 10[4]**	M	277	0.29	81.4	1.00	7,000	86	1.23	0.96
				240	0.35	84.0	1.00	7,000	83	1.19	0.93
				120	0.70	84.0	1.00	7,000	83	1.19	0.93
	1	**EHD T539 M E 1 10**	M	240	0,18	43,2	1,00	3 500	81	2,31	0,90
				220	0,19	41,8	1,00	3 500	84	2,39	0,93
	2	**EHD T539 M E 2 10**	M	240	0,34	81,6	1,00	7 000	86	1.23	0,96
				220	0,39	85,8	1,00	7 000	82	1,17	0,91

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a “U” to the prefix of model number when ordering (ie: UEHD T832 M U 2 10).
[5] 347V ballasts are CSA certified only.

T5 HO Linear (continued)

EcoSystem® H-Series (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron EcoSystem digital controls
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
24W (21.6 in [55 cm])	1	**EHD T524 M U 1 10[4]**	M	277	0.10	27.7	1.00	2,000	72	3.61	0.87
				240	0.12	28.8	1.00	2,000	69	3.47	0.83
				120	0.25	30.0	1.00	2,000	67	3.33	0.80
	2	**EHD T524 M U 2 10[4]**	M	277	0.20	55.4	1.00	4,000	72	1.81	0.87
				240	0.23	55.2	1.00	4,000	72	1.81	0.87
				120	0.46	54.6	1.00	4,000	73	1.83	0.88
	1	**EHD T524 M E 1 10**	M	240	0,12	28,8	1,00	2 000	69	3,47	0,83
				220	0,13	28,6	1,00	2 000	70	3,50	0,84
	2	**EHD T524 M E 2 10**	M	240	0,22	52,8	1,00	4 000	76	1,89	0,91
				220	0,25	55,0	1,00	4 000	73	1,82	0,87

Reduced Wattage T5 HO Linear

EcoSystem® H10-Series (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10% for reduced wattage (energy-saving) lamps
- Compatible with Lutron EcoSystem digital controls only
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
49/50/51W[3] (45.2 in [115 cm])	1	**EHD T549 M U 1 RW**	M	277	0.20	56.1	1.00	5,000	89	1.78	0.87
				240	0.23	56.2	1.00	5,000	89	1.78	0.87
				120	0.49	58.3	1.00	5,000	86	1.72	0.84
	2	**EHD T549 M U 2 RW**	M	277	0.39	108.0	1.00	10,000	93	0.93	0.91
				240	0.45	108.0	1.00	10,000	93	0.93	0.91
				120	0.93	111.6	1.00	10,000	90	0.90	0.88

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a "U" to prefix of model number when ordering (ie: UH3D T832 C U 1 10).

Drivers and Ballasts | **Fluorescent ballast model numbers**

T5 HO Linear (continued)

Hi-lume® 3D (1% dimming) universal voltage digital dimming ballasts

- Dimming to 1%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
54W (45.2 in [115 cm])	1	**H3D T554 C U 1 10[4]**	C	277	0.23	63.7	1.00	5,000	78	1.57	0.85
				240	0.26	62.4	1.00	5,000	80	1.60	0.87
				120	0.54	64.8	1.00	5,000	77	1.54	0.83
	2	**H3D T554 C U 2 10[4]**	C	277	0.42	116.3	1.00	10,000	86	0.86	0.93
				240	0.48	115.2	1.00	10,000	87	0.87	0.94
				120	0.95	114.0	1.00	10,000	88	0.88	0.95
39W (33.4 in [84 cm])	1	**H3D T539 C U 1 10[4]**	C	277	0.17	46.0	1.00	3,500	76	2.17	0.85
				240	0.19	44.9	1.00	3,500	78	2.23	0.87
				120	0.37	44.4	1.00	3,500	79	2.25	0.88
	2	**H3D T539 C U 2 10[4]**	C	277	0.29	81.4	1.00	7,000	86	1.23	0.96
				240	0.35	84.0	1.00	7,000	83	1.19	0.93
				120	0.70	84.0	1.00	7,000	83	1.19	0.93
24W (21.6 in [55 cm])	1	**H3D T524 C U 1 10[4]**	C	277	0.10	27.7	1.00	2,000	72	3.61	0.87
				240	0.12	28.8	1.00	2,000	69	3.47	0.83
				120	0.25	30.0	1.00	2,000	67	3.33	0.80
	2	**H3D T524 C U 2 10[4]**	C	277	0.20	55.4	1.00	4,000	72	1.81	0.87
				240	0.23	55.2	1.00	4,000	72	1.81	0.87
				120	0.46	54.6	1.00	4,000	73	1.83	0.88

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] BAA models available. Add a "U" to prefix of model number when ordering (ie: UH3D T832 C U 1 10).

T5 HO Linear (continued)

EcoSystem® (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
54W (45.2 in [115 cm])	1	**EC5 T554 J UNV 1**	J	277	0.21	56.5	1.00	5,000	88	1.77	0.96
				240	0.24	58.0	1.00	5,000	86	1.73	0.93
				120	0.48	57.9	1.00	5,000	86	1.73	0.93
	2	**EC5 T554 J UNV 2**	J	277	0.40	110.1	1.00	10,000	91	0.91	0.98
				240	0.52	119.0	1.00	10,000	84	0.84	0.91
				120	0.99	119.3	1.00	10,000	84	0.84	0.91
39W (33.4 in [84 cm])	1	**EC5 T539 J UNV 1**	J	277	0.16	43.3	1.00	3,500	81	2.31	0.90
				240	0.18	44.0	1.00	3,500	80	2.27	0.89
				120	0.37	44.0	1.00	3,500	80	2.27	0.89
	2	**EC5 T539 J UNV 2**	J	277	0.30	83.0	1.00	7,000	84	1.20	0.94
				240	0.35	84.0	1.00	7,000	83	1.19	0.93
				120	0.70	84.3	1.00	7,000	83	1.19	0.93
24W (21.6 in [55 cm])	1	**EC5 T524 J UNV 1**	J	277	0.11	30.0	1.00	2,000	67	3.33	0.80
				240	0.13	28.8	1.00	2,000	69	3.47	0.83
				120	0.24	28.8	1.00	2,000	69	3.47	0.83
	2	**EC5 T524 J UNV 2**	J	277	0.20	54.8	1.00	4,000	73	1.82	0.89
				240	0.23	54.0	1.00	4,000	74	1.85	0.89
				120	0.45	53.9	1.00	4,000	74	1.86	0.89

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

Drivers and Ballasts | **Fluorescent ballast model numbers**

T5 Twin-Tube

Hi-lume® 3D (5% dimming) universal voltage digital dimming ballasts

- Dimming to 5%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem® digital controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
50W (22.5 in [57 cm])	1	**H3D T550 G U 1 10**	G	277	0.20	54.8	1.00	4,000	73	1.82	0.91
				240	0.23	54.6	1.00	4,000	73	1.83	0.92
				120	0.45	53.5	1.00	4,000	75	1.87	0.93
	2	**H3D T550 G U 2 10**	G	277	0.36	98.7	1.00	8,000	81	1.01	1.01
				240	0.42	99.8	1.00	8,000	80	1.00	1.00
				120	0.84	99.8	1.00	8,000	80	1.00	1.00
40W (22.5 in [57 cm])	1	**H3D T540 G U 1 10**	G	277	0.16	43.9	1.00	3,100	71	2.28	0.91
				240	0.18	42.8	1.00	3,100	72	2.34	0.93
				120	0.36	42.8	1.00	3,100	72	2.34	0.93
	2	**H3D T540 G U 2 10**	G	277	0.27	74.0	1.00	6,200	84	1.35	1.08
				240	0.32	76.0	1.00	6,200	82	1.32	1.05
				120	0.64	76.0	1.00	6,200	82	1.32	1.05
	3	**H3D T540 G U 3 10**	G	277	0.40	109.7	1.00	9,300	85	0.91	1.09
				240	0.47	111.7	1.00	9,300	83	0.90	1.07
				120	0.95	112.9	1.00	9,300	82	0.89	1.06
36W (15.5 in [39 cm])	1	**H3D T536 G U 1 10**	G	277	0.14	38.4	1.00	2,850	74	2.60	1.04
				240	0.17	40.4	1.00	2,850	71	2.48	0.99
				120	0.33	39.2	1.00	2,850	73	2.55	1.02
	2	**H3D T536 G U 2 10**	G	277	0.26	71.3	1.00	5,700	80	1.40	1.12
				240	0.31	73.7	1.00	5,700	77	1.36	1.09
				120	0.61	72.5	1.00	5,700	79	1.38	1.10

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T5 Twin-Tube (continued)

EcoSystem® (10% dimming) universal voltage digital dimming ballasts

- Dimming to 10%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
55W (20.7 in [52 cm])	1	**EC5 T555 J UNV 1**	J	277	0.20	55.4	0.90	4,320	78	1.62	0.89
				240	0.23	55.2	0.90	4,320	78	1.63	0.90
				120	0.46	55.2	0.90	4,320	78	1.63	0.90
	2	**EC5 T555 J UNV 2**	J	277	0.40	110.8	0.90	8,640	78	0.81	0.90
				240	0.46	110.4	0.90	8,640	78	0.82	0.90
				120	0.92	110.4	0.90	8,640	78	0.82	0.90
50W (22.5 in [57 cm])	1	**EC5 T550 J UNV 1**	J	277	0.20	55.4	1.00	4,000	72	1.81	0.90
				240	0.23	54.0	1.00	4,000	72	1.85	0.93
				120	0.45	54.0	1.00	4,000	74	1.85	0.93
	2	**EC5 T550 J UNV 2**	J	277	0.36	99.7	1.00	8,000	80	1.00	1.00
				240	0.42	100.8	1.00	8,000	79	0.99	0.99
				120	0.84	100.8	1.00	8,000	79	0.99	0.99
40W (22.5 in [57 cm])	1	**EC5 T540 J UNV 1**	J	277	0.16	44.3	1.00	3,100	70	2.26	0.90
				240	0.18	43.2	1.00	3,100	72	2.31	0.93
				120	0.36	43.2	1.00	3,100	72	2.31	0.93
	2	**EC5 T540 J UNV 2**	J	277	0.27	74.8	1.00	6,200	83	1.34	1.07
				240	0.32	76.8	1.00	6,200	81	1.30	1.04
				120	0.64	76.8	1.00	6,200	81	1.30	1.04
	3	**EC5 T540 G UNV 3L[4]**	G	277	0.40	111.3	1.00	9,300	84	0.90	1.08
				240	0.47	112.4	1.00	9,300	83	0.89	1.07
				120	0.95	113.2	1.00	9,300	82	0.88	1.06
36/39W (15.5 in [39 cm])	1	**EC5 T536 J UNV 1**	J	277	0.14	38.8	1.00	2,850	73	2.57	0.93
				240	0.17	39.6	1.00	2,850	72	2.53	0.91
				120	0.33	39.6	1.00	2,850	72	2.53	0.91
	2	**EC5 T536 J UNV 2**	J	277	0.26	72.0	1.00	5,700	79	1.39	1.00
				240	0.31	73.2	1.00	5,700	78	1.37	0.98
				120	0.61	73.2	1.00	5,700	78	1.37	0.98

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] Ballast ships with leads.

Drivers and Ballasts | **Fluorescent ballast model numbers**

T4 Compact

EcoSystem® (5% dimming) universal voltage digital dimming ballasts

- Dimming to 5%
- Compatible with Lutron 3-wire fluorescent controls and EcoSystem digital controls
- Energy saving

Lamp Watts	Lamps per Ballast	Model Number	Case Type[1]	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)[2]	System Lumens (lm)[3]	System Efficacy (lm/W)[3]	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
42W (Triple Tube)	1	**EC3D T442 K U 1 S[4]**	K	277	0.15	42.6	0.95	3,040	71	2.23	0.94
				240	0.18	42.7	0.95	3,040	71	2.23	0.93
				120	0.36	43.2	0.95	3,040	70	2.20	0.92
	2	**EC3D T442 K U 2 S[4]**	K	277	0.31	85.4	0.95	6,080	71	1.11	0.93
				240	0.35	85.1	0.95	6,080	72	1.12	0.94
				120	0.73	87.6	0.95	6,080	69	1.08	0.91
32W (Triple Tube)	1	**EC3D T4MW K U 1 S[4]**	K	277	0.12	33.2	0.95	2,280	69	2.86	0.91
				240	0.14	33.6	0.95	2,280	68	2.83	0.90
				120	0.29	34.8	0.95	2,280	66	2.73	0.87
	2	**EC3D T4MW K U 2 S[4]**	K	277	0.24	65.5	0.95	4,560	70	1.45	0.93
				240	0.26	63.0	0.95	4,560	72	1.51	0.96
				120	0.55	66.0	0.95	4,560	69	1.44	0.92
26W (Triple/Quad Tube)	1	**EC3D T4MW K U 1 S[4]**	K	277	0.10	27.0	0.95	1,710	63	3.52	0.92
				240	0.11	26.9	0.95	1,710	64	3.54	0.92
				120	0.22	26.4	0.95	1,710	65	3.60	0.94
	2	**EC3D T4MW K U 2 S[4]**	K	277	0.19	51.4	0.95	3,420	67	1.85	0.96
				240	0.21	50.6	0.95	3,420	68	1.88	0.98
				120	0.43	51.6	0.95	3,420	66	1.84	0.96
18W (Triple/Quad Tube)	1	**EC3D T418 K U 1 S[4]**	K	277	0.08	20.8	0.95	1,140	55	4.57	0.82
				240	0.09	21.4	0.95	1,140	53	4.44	0.80
				120	0.18	21.3	0.95	1,140	54	4.46	0.80
	2	**EC3D T418 K U 2 S[4]**	K	277	0.15	39.9	0.95	2,280	57	2.38	0.86
				240	0.17	39.4	0.95	2,280	58	2.41	0.87
				120	0.34	41.1	0.95	2,280	56	2.31	0.83

[1] For case type information see pgs. 24–29.
[2] Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool**.
[3] Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
[4] Mounting studs standard. Delete -S suffix in the model number if mounting studs are not needed.

The following ballast model numbers have certifications specific to certain countries. For details on these ballast models, visit **www.lutron.com**.

Europe (CE)

EHD T514 M E 1 10
EHD T514 M E 2 10
EHD T521 M E 1 10
EHD T521 M E 2 10
EHD T524 M E 1 10
EHD T524 M E 2 10
EHD T528 M E 1 10
EHD T528 M E 2 10
EHD T539 M E 1 10
EHD T539 M E 2 10
EHD T554 M E 1 10
EHD T554 M E 2 10

Brazil (INMETRO)

EHD T513 M E 1 RW-B
EHD T513 M E 2 RW-B
EHD T525 M E 1 RW-B
EHD T525 M E 2 RW-B
EHD T549 M E 1 RW-B
EHD T549 M E 2 RW-B
EHD T832 M E 1 10-B
EHD T832 M E 2 10-B
EHD T514 M E 1 10-B
EHD T514 M E 2 10-B
EHD T521 M E 1 10-B
EHD T521 M E 2 10-B
EHD T524 M E 1 10-B
EHD T524 M E 2 10-B
EHD T528 M E 1 10-B
EHD T528 M E 2 10-B
EHD T539 M E 1 10-B
EHD T539 M E 2 10-B
EHD T554 M E 1 10-B
EHD T554 M E 2 10-B

China (CCC)

EHD T514 M E 1 10-C
EHD T514 M E 2 10-C
EHD T528 M E 1 10-C
EHD T528 M E 2 10-C
EHD T554 M E 1 10-C
EHD T554 M E 2 10-C

Drivers and Ballasts | **Ballast models by country**

The following ballast model numbers have certifications specific to certain countries. For details on these ballast models, visit **www.lutron.com**.

Mexico (NOM)

H3D T817 G U 1 10 N
H3D T817 G U 2 10 N
H3D T825 G U 1 10 N
H3D T825 G U 2 10 N
H3D T832 G U 1 10 N
H3D T832 G U 2 10 N
H3D T832 G U 3 10 N
H3D T817 C U 1 10 N
H3D T817 C U 2 10 N
H3D T825 C U 1 10 N
H3D T825 C U 2 10 N
H3D T832 C U 1 10 N
H3D T832 C U 2 10 N
H3D T832 C U 1 17 N
H3D T832 C U 2 17 N
H3D T514 C U 1 10 N
H3D T514 C U 2 10 N
H3D T521 C U 1 10 N
H3D T521 C U 2 10 N
H3D T524 C U 1 10 N
H3D T524 C U 2 10 N
H3D T528 C U 1 10 N
H3D T528 C U 2 10 N
H3D T536 G U 1 10 N
H3D T536 G U 2 10 N
H3D T539 C U 1 10 N
H3D T539 C U 2 10 N
H3D T540 G U 1 10 N
H3D T540 G U 2 10 N
H3D T540 G U 3 10 N
H3D T550 G U 1 10 N
H3D T550 G U 2 10 N
H3D T554 C U 1 10 N
H3D T554 C U 2 10 N

EC5 T514 J UNV 1 N
EC5 T514 J UNV 2 N
EC5 T521 J UNV 1 N
EC5 T521 J UNV 2 N
EC5 T524 J UNV 1 N
EC5 T524 J UNV 2 N
EC5 T528 J UNV 1 N
EC5 T528 J UNV 2 N
EC5 T535 J UNV 1 N
EC5 T536 J UNV 1 N
EC5 T536 J UNV 2 N
EC5 T539 J UNV 1 N
EC5 T539 J UNV 2 N
EC5 T540 J UNV 1 N
EC5 T540 J UNV 2 N
EC5 T550 J UNV 1 N
EC5 T550 J UNV 2 N
EC5 T554 J UNV 1 N
EC5 T554 J UNV 2 N
EC5 T555 J UNV 1 N
EC5 T555 J UNV 2 N
EC5 T817 J UNV 1 N
EC5 T817 J UNV 2 N
EC5 T825 J UNV 1 N
EC5 T825 J UNV 2 N
EC5 T832 J UNV 1 N
EC5 T832 J UNV 2 N
EC3D T418 K U 1 N
EC3D T418 K U 1 S N
EC3D T418 K U 2 N
EC3D T418 K U 2 S N
EC3D T4MW K U 1 N
EC3D T4MW K U 1 S N
EC3D T4MW K U 2 N
EC3D T4MW K U 2 S N

EC3D T442 K U 1 N
EC3D T442 K U 1 S N
EC3D T442 K U 2 N
EC3D T442 K U 2 S N
EHD T514 M U 1 10 N
EHD T514 M U 2 10 N
EHD T521 M U 1 10 N
EHD T521 M U 2 10 N
EHD T524 M U 1 10 N
EHD T524 M U 2 10 N
EHD T528 M U 1 10 N
EHD T528 M U 2 10 N
EHD T539 M U 1 10 N
EHD T539 M U 2 10 N
EHD T554 M U 1 10 N
EHD T554 M U 2 10 N
EHD T817 M U 1 10 N
EHD T817 M U 2 10 N
EHD T825 M U 1 10 N
EHD T825 M U 2 10 N
EHD T832 M U 1 10 N
EHD T832 M U 2 10 N
EHD T832 M U 1 17 N
EHD T832 M U 2 17 N
EHD T828 M U 1 RW N
EHD T828 M U 2 RW N
EHD T525 M U 1 RW N
EHD T525 M U 2 RW N
EHD T513 M U 1 RW N
EHD T513 M U 2 RW N
EHD T549 M U 1 RW N
EHD T549 M U 2 RW N

Stairwell Retrofit Kit

The stairwell retrofit kit allows you to transform high-cost/high-maintenance fluorescent fixtures into energy efficient solutions with the addition of dimming and occupancy sensing, and by updating the fixtures with more efficient lamps. Once a fixture has been retrofitted with this kit, it will communicate wirelessly with Lutron Radio Powr Savr™ occupancy/vacancy sensors (sold separately) to control the stairwell lighting. By controlling the dimming ballast, the wireless control turns the lights in a stairwell to a high light level when it's occupied, and to a low light level when it's unoccupied.

PRODUCT	PRODUCT FAMILY	PRODUCT TYPE	SIZE	# LAMPS	LAMP TYPE	REGION	CONTROLS	SOCKETS
FXRS Fixture Retrofit Kit Solution	SW Stairwell	XX Standard	12 1 x 2 ft	1 1 lamp	14 14 W T5HE, 2 ft	U UL—North America	51 50% occupied 10% unoccupied	XX None
			13 1 x 3 ft	2 2 lamps	17 17 W T8, 2 ft		82 80% occupied 20% unoccupied	SK 2 Sockets per lamp
			14 1 x 4 ft	3 3 lamps, T8	21 21 W T5HE, 3 ft			
			18 1 x 8 ft	4 4 lamps	24 24 W T5HO, 2 ft			
					25 25 W T8, 3 ft			
					28 28 W T5HE, 4 ft			
					32 32 W T8 4 ft			
					39 39 W T5HO, 3 ft			
					54 54 W T5HO, 4 ft			
					RW 25, 28 W T8 reduced wattage, 4 ft			

Kit includes

- Integral wireless control device with RF receiver and faceplate
- Lutron 1% dimming ballast with leads
- Pre-wired Lutron dimming ballast for T8, T5HE, or T5HO lamps
- Wireless control (PowPak® stairwell controller)
- Wallplate (Claro® single gang)
- Rapid-start sockets (optional)

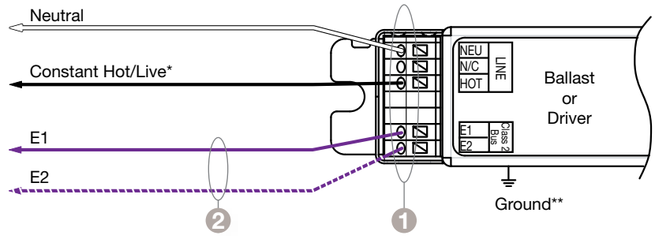
Not included (but necessary for proper installation):

- Single-gang wallbox (for mounting wireless control).
  Note: The wireless control **cannot** be mounted inside the fixture (will interfere with RF communication).
- Coupling to fit a .875 in (22 mm) knockout, used to mount the wallbox and wireless control to the exterior of the fixture.
- Jumper wire for the yellow socket connections (wired in parallel) in a 2-lamp or 3-lamp application.

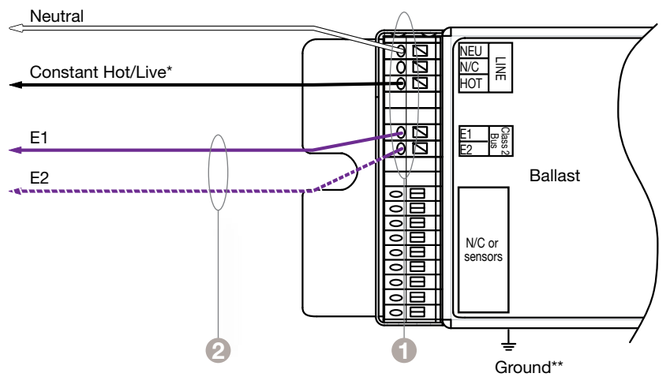
  Contact Fixtures Customer Service or e-mail fixtures@lutron.com for further information.

EcoSystem® digital link control

EcoSystem digital link control, C-case, J-case, or M-case

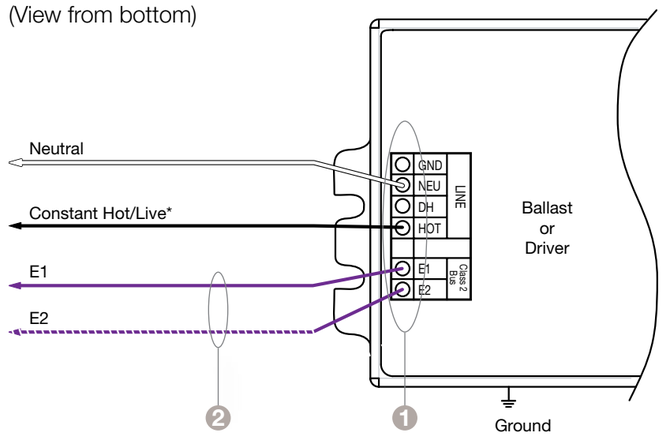


EcoSystem digital link control, G-case



EcoSystem digital link control, K-case or KL-case

(View from bottom)



Features

1. Power and digital link terminals accept only one 16–18 AWG (0.75 mm^2 to 1.50 mm^2) wire
2. See table/charts on pg. 81 for EcoSystem digital link wiring details

Terminals may be located on side and bottom.

K-case can be grounded via case or ground terminal.

L-case can be grounded via ground terminal on the enclosure or in the junction box.

* The Constant Hot/Live must not be wired to a switching device when using EcoSystem control.
** Ballast is grounded via case only.

Control wiring overview

- The EcoSystem digital link (E1 and E2) connects the digital ballasts or drivers together to form a lighting control system
- Control wires (E1 and E2) are not polarity sensitive and can be wired in any topology
- The EcoSystem digital control device does not have to be located at the end of the digital link
- The EcoSystem digital link supports up to 64 digital ballasts or drivers, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak® dimming module with EcoSystem supports up to 32 digital drivers or ballasts, 9 Pico® wireless controls, 6 wireless occupancy/vacancy sensors, and 1 wireless daylight sensor
- Control wire colors may not match driver or ballast wire colors

Technical wiring details

- EcoSystem digital link terminals accept only one 16–18 AWG (0.75 mm² to 1.50 mm²) solid copper wire per terminal (12–14 AWG wires require a wire nut to connect to terminal)
- Ballasts, drivers, and lighting fixtures must be effectively grounded
- Drivers and ballasts must be installed per national and local electrical codes
- EcoSystem link may be run with line voltage mains wiring or as a separate low-voltage wiring

EcoSystem digital link length is limited by the wire gauge used for control wires as follows:

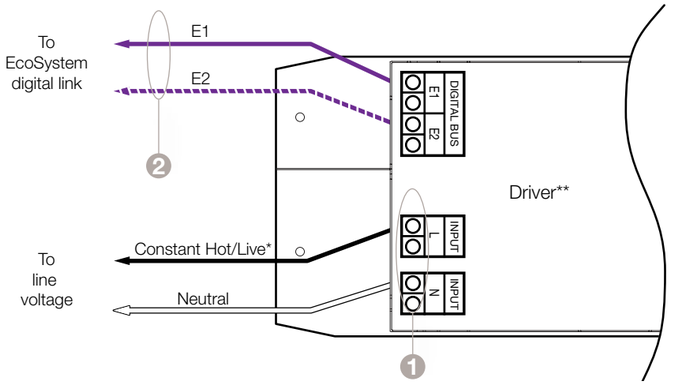
Wire gauge	Digital link length (max)
12 AWG	2200 ft (670 m)
14 AWG	1400 ft (430 m)
16 AWG	900 ft (275 m)
18 AWG	550 ft (170 m)

Wire size	Digital link length (max)
4.00 mm²	800 m
2.50 mm²	500 m
1.50 mm²	300 m
1.00 mm²	200 m
0.75 mm²	150 m
0.50 mm²	100 m

Appendix | **Control wiring diagrams**

EcoSystem® digital link control

EcoSystem digital link control, P-case



Features

1. Power terminals accept one or two 0.50 mm² to 2.50 mm² wire
2. See table below for EcoSystem digital link wiring details

Control wiring overview

- The EcoSystem digital link wiring (E1 and E2) connects the drives together to form a lighting control system
- Control wires (E1 and E2) are not polarity sensitive and can be wired in any topology
- The EcoSystem digital control device does not have to be located at the end of the digital link
- Each EcoSystem digital link supports up to 64 digital drivers or ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak® dimming module with EcoSystem supports up to 32 digital drivers or ballasts, 9 Pico® wireless controls, 6 wireless occupancy/vacancy sensors, and 1 wireless daylight sensor
- Control wire colors may not match driver wire colors

Technical wiring details

- EcoSystem digital terminals accept one or two 0.50 mm² to 2.50 mm² core wire per terminal
- Driver must be effectively grounded
- Drivers must be installed per national and local electrical codes
- EcoSystem link may be run with line voltage mains wiring or as a separate low-voltage wiring

EcoSystem digital link length is limited by the wire gauge used for control wires as follows:

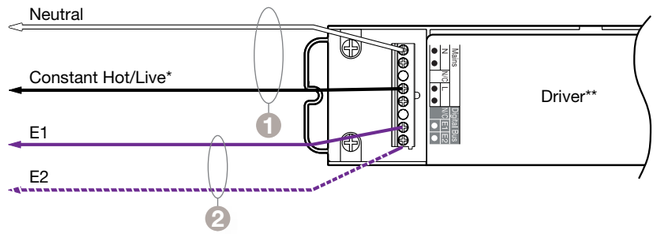
Wire gauge	Digital link length (max)
12 AWG	2200 ft (670 m)
14 AWG	1400 ft (430 m)
16 AWG	900 ft (275 m)
18 AWG	550 ft (170 m)

Wire size	Digital link length (max)
4.00 mm²	800 m
2.50 mm²	500 m
1.50 mm²	300 m
1.00 mm²	200 m
0.75 mm²	150 m
0.50 mm²	100 m

* The Constant Hot / Live must not be wired to a switching device.
**Ground termination not provided. Terminate ground in compliance with electric codes.

EcoSystem® digital link control

EcoSystem digital link control, R-case



Control wiring overview

- The EcoSystem digital link wiring (E1 and E2) connects the drives together to form a lighting control system
- Control wires (E1 and E2) are not polarity sensitive and can be wired in any topology
- The EcoSystem digital control device does not have to be located at the end of the digital link
- Each EcoSystem digital link supports up to 64 digital drivers or ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak® dimming module with EcoSystem supports up to 32 digital drivers or ballasts, 9 Pico® wireless controls, 6 wireless occupancy/vacancy sensors, and 1 wireless daylight sensor
- Control wire colors may not match driver wire colors

Technical wiring details

- EcoSystem digital link terminals accept two 0.75 mm² to 1.50 mm² (or one 1.75 mm² to 2.50 mm²) solid core wire per terminal
- Driver must be effectively grounded
- EcoSystem link may be run with line voltage mains wiring or as a separate low-voltage wiring

EcoSystem digital link length is limited by the wire gauge used for control wires as follows:

Wire gauge	Digital link length (max)
12 AWG	2200 ft (670 m)
14 AWG	1400 ft (430 m)
16 AWG	900 ft (275 m)
18 AWG	550 ft (170 m)

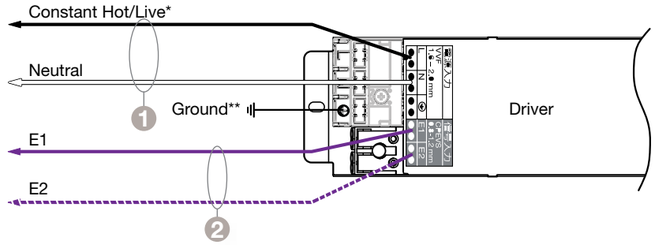
Wire size	Digital link length (max)
4.00 mm²	800 m
2.50 mm²	500 m
1.50 mm²	300 m
1.00 mm²	200 m
0.75 mm²	150 m
0.50 mm²	100 m

* The Constant Hot/Live must not be wired to a switching device.
** Ground termination not provided. Terminate ground in compliance with electric codes.

Appendix | **Control wiring diagrams**

EcoSystem® digital link control

EcoSystem digital link control, T-case



T-case can be grounded via case or ground terminal.

Control wiring overview

- The EcoSystem digital link wiring (E1 and E2) connects the drives together to form a lighting control system
- Control wires (E1 and E2) are not polarity sensitive and can be wired in any topology
- The EcoSystem digital control device does not have to be located at the end of the digital link
- Each EcoSystem digital link supports up to 64 digital drivers or ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak® dimming module with EcoSystem supports up to 32 digital drivers or ballasts, 9 Pico® wireless controls, 6 wireless occupancy/vacancy sensors, and 1 wireless daylight sensor
- Control wire colors may not match driver wire colors

Technical wiring details

- EcoSystem digital link terminals accept one 0.80 mm² to 1.20 mm² solid or stranded copper wire per terminal
- Driver must be effectively grounded
- EcoSystem link may be run with line voltage mains wiring or as a separate low-voltage wiring

EcoSystem digital link length is limited by the wire gauge used for control wires as follows:

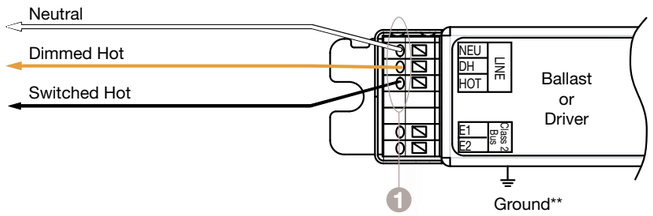
Wire gauge	Digital link length (max)
12 AWG	2200 ft (670 m)
14 AWG	1400 ft (430 m)
16 AWG	900 ft (275 m)
18 AWG	550 ft (170 m)

Wire size	Digital link length (max)
4.00 mm²	800 m
2.50 mm²	500 m
1.50 mm²	300 m
1.00 mm²	200 m
0.75 mm²	150 m
0.50 mm²	100 m

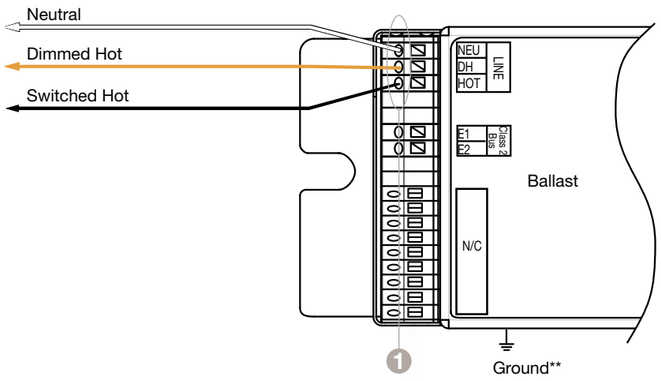
* The Constant Hot/Live must not be wired to a switching device.

3-Wire control

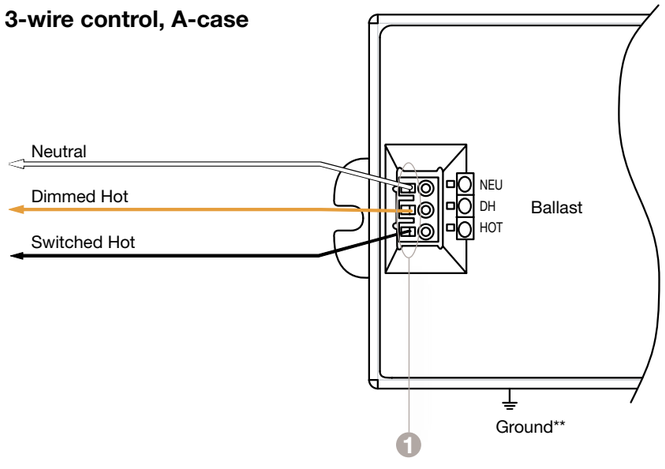
3-wire control, C-case, J-case, or M-case



3-wire control, G-case



3-wire control, A-case



Features

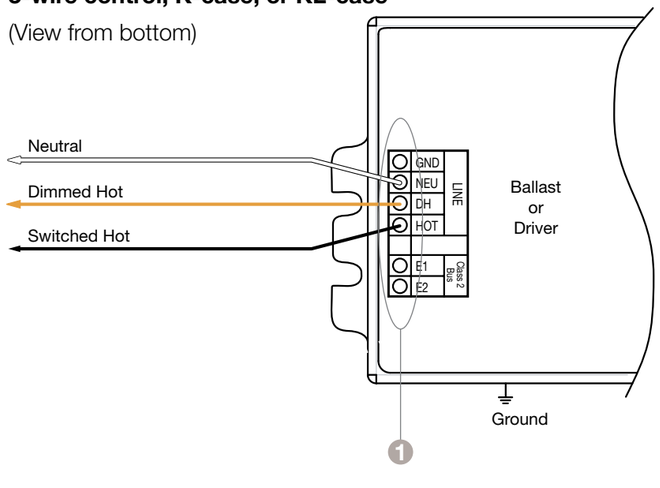
1. Power terminals accept only one 16–18 AWG (0.75 mm² to 1.50 mm²) wire—see table on pg. 82 for additional power wiring details

**Ballast is grounded via case only.

Appendix | **Control wiring diagrams**

3-wire control, K-case, or KL-case

(View from bottom)



Terminals may be located on side and bottom.

K-case can be grounded via case or ground terminal.

L-case can be grounded via ground terminal on the enclosure or in the junction box.

Control wiring overview

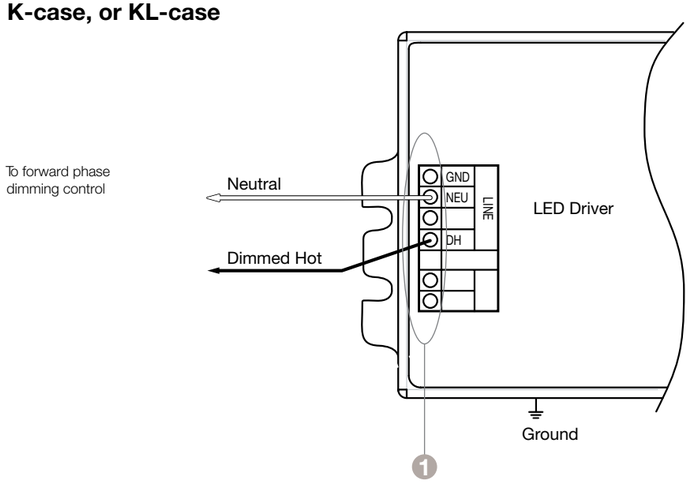
- Class 2 must be separated from Class 1 and line voltage wiring by 0.25 in (6 mm) or a physical barrier
- Control wire colors may not match driver or ballast wire colors

Technical wiring details

- Power input terminals only accept one 16–18 AWG (0.75 mm² to 1.50 mm²) solid copper wire per terminal
- Ballasts, drivers, and lighting fixtures must be effectively grounded
- Drivers and ballasts must be installed per national and local electrical codes

2-Wire forward phase control

Forward phase control (neutral required at control), K-case, or KL-case



Features

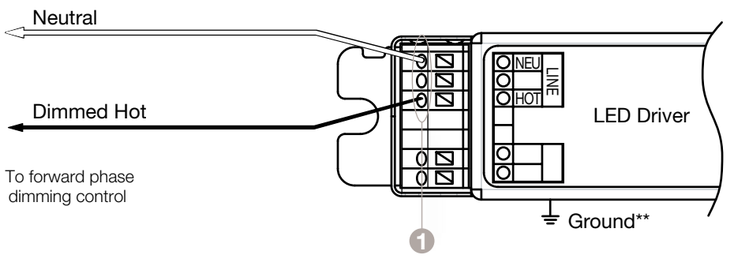
1. Power terminals accept only one 16–18 AWG (0.75 mm² to 1.50 mm²) wire

Terminals may be located on side and bottom.

K-case can be grounded via case or ground terminal.

L-case can be grounded via ground terminal on the enclosure or in the junction box.

Forward phase control (neutral required at control), M-case



Control wiring overview

- Class 2 must be separated from Class 1 and line voltage wiring by 0.25 in (6 mm) or a physical barrier
- Sensors cannot connect directly to the ballast or driver
- Control wire colors may not match driver or ballast wire colors

Technical wiring details

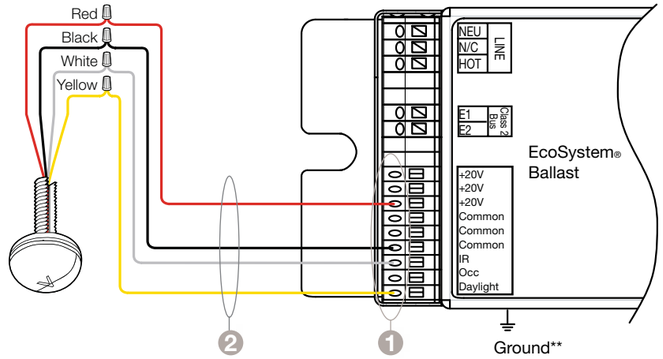
- Power input terminals accept only one 16–18 AWG (0.75 mm² to 1.50 mm²) solid copper wire per terminal
- Ballasts, drivers, and lighting fixtures must be effectively grounded
- Drivers and ballasts must be installed per national and local electrical codes

** Driver is grounded via case only.

Appendix | **Control wiring diagrams**

Class 2 sensor wiring

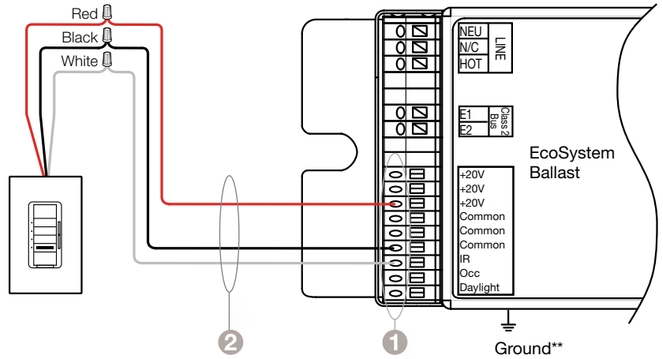
G-can with daylight sensor



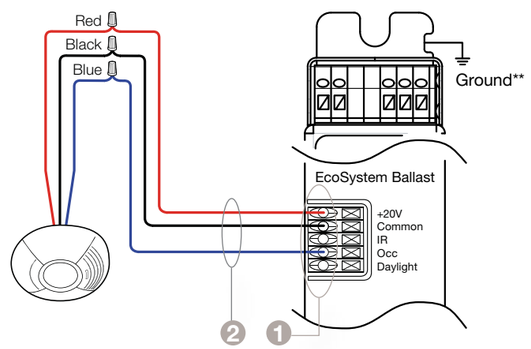
Features

1. Sensor terminals accept only one 22 AWG (1.0 mm²) wire
2. 100 ft (30 m) maximum wire length

G-can with wallstation



J-can with occupancy sensor



** Ballast is grounded via case only.

Sensor wiring overview

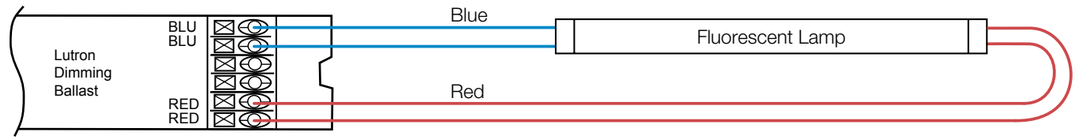
- Sensors connect directly to EcoSystem ballasts; all sensor and wallstation wiring is Class 2
- Occupancy/vacancy sensor, daylight sensor, IR receiver, and wallstation must be placed within 100 ft (30 m) of the ballast
- Sensor terminals accept one 22 AWG (1.0 mm²) solid copper wire
- G-case sensor terminals are located next to EcoSystem bus terminals; J-case sensor terminals are located on the side of the case
- Connect only one sensor to the IR and daylight inputs
- Sensors wire to one ballast only

For EcoSystem digital link ballasts without integral sensor connections, wired or wireless sensors can connect to ballasts using the following devices:

- PowPak® dimming module with EcoSystem
- GRAFIK Eye® QS with EcoSystem
- Energi Savr Node™ with EcoSystem (QS sensor module may be used)
- Quantum® system

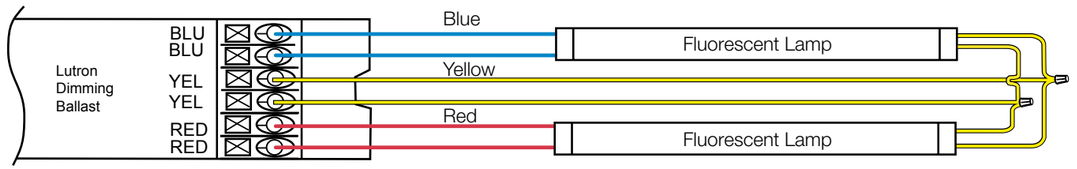
For an overview of these devices, see pg. 15.

Linear 1-lamp



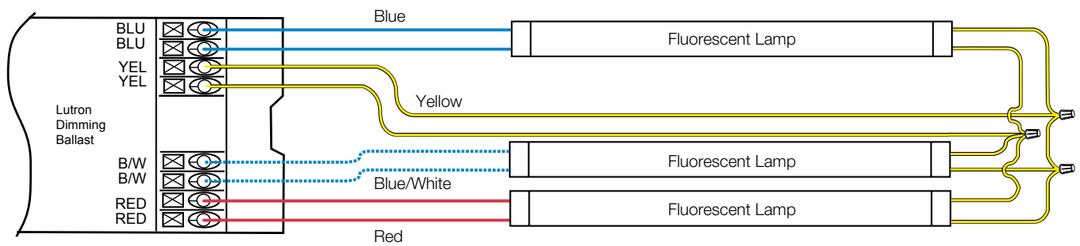
Available in M-case, C-case, J-case, and G-case

Linear 2-lamp



Available in M-case, C-case, J-case, and G-case

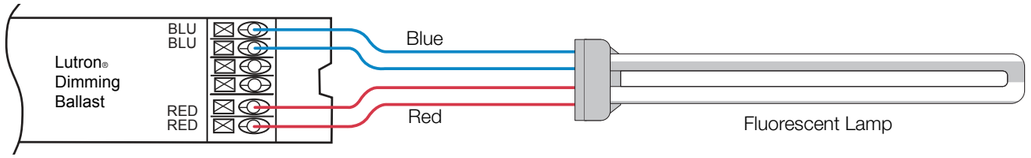
Linear 3-lamp



Available in G-case

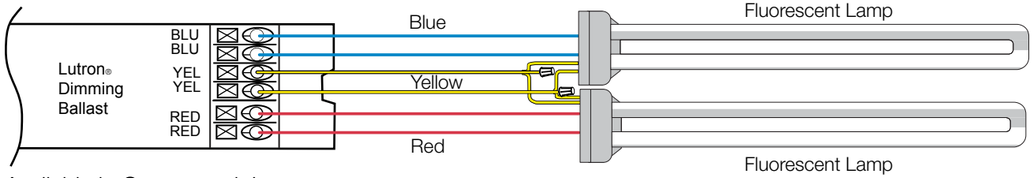
Note: Lamp terminals accept only one 18 AWG (0.75 mm²) wire. Ballast-to-lamp lead lengths must not exceed 7 ft (2 m) for all wiring scenarios shown above.

T5 twin-tube 1-lamp



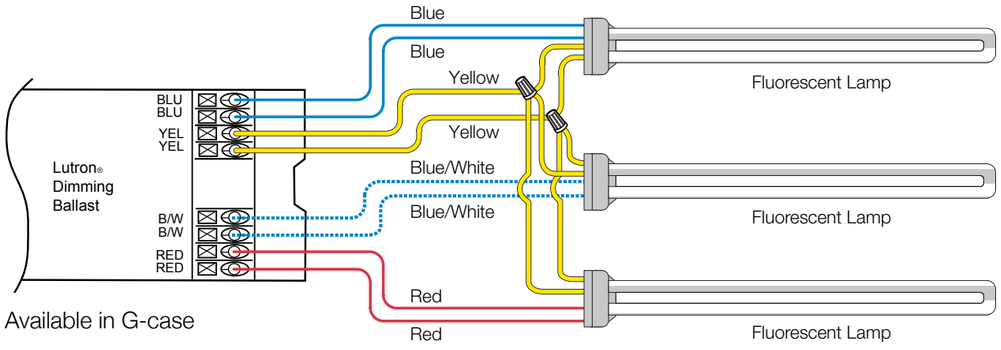
Available in G-case and J-case

T5 twin-tube 2-lamp



Available in G-case and J-case

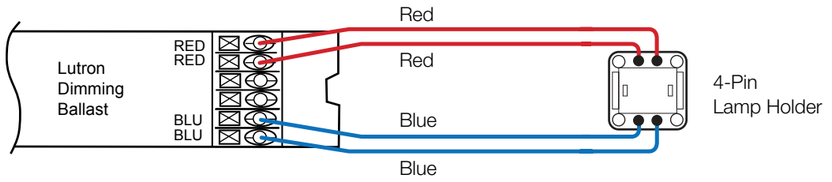
T5 twin-tube 3-lamp



Available in G-case

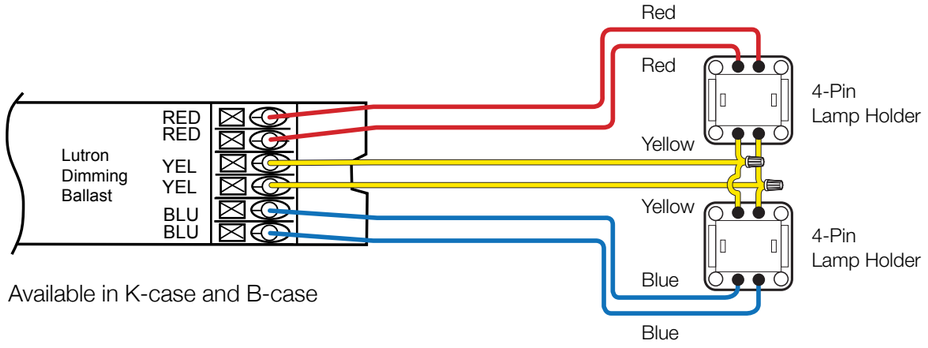
Note: Lamp terminals accept only one 18 AWG (0.75 mm²) wire. Ballast-to-lamp lead lengths must not exceed 3 ft (1 m) for all wiring scenarios shown above.

T4 1-lamp



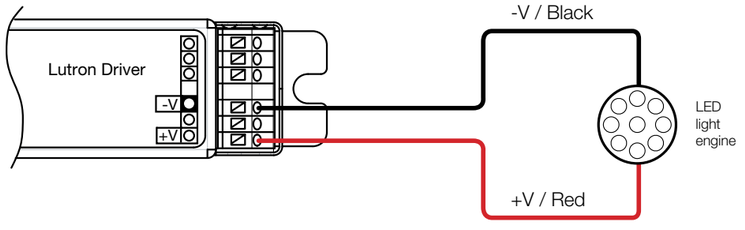
Available in K-case and A-case

T4 2-lamp



Available in K-case and B-case

LED light source



Available in M-case, K-case, KL-case, R-case, and T-case

Note: Lamp terminals accept only one 18 AWG (0.75 mm²) wire. Ballast-to-lamp lead lengths must not exceed 3 ft (1 m) for T4 lamps shown above. Please consult the driver specification submittal for maximum driver-to-LED light engine wire length.

As Lutron has continued to innovate and develop new products, older technologies have been discontinued. The following list is a summary of all Lutron driver ballast part numbers that have been discontinued since September 2009. Contact your Lutron account manager or customer service representative if you have any questions regarding this summary of discontinued ballasts.

Hi-lume® LED drivers

Driver Family	Date of Discontinuation	Discontinued Model	Case Size	Current Level	Replacement Model[1]	Voltage Range	Case Size	Current Level
Hi-lume LED	6/30/11	L3D25070AUNV1S	A	700 mA	L3DA4U1UKS-HC070	15-38V	K	700 mA
		L3D25070AUNV1S	A	700 mA	L3DA4U1UKS-GC070	8-20V	K	700 mA
		L3D25070AUNV1	A	700 mA	L3DA4U1UKN-HC070	15-38V	K	700 mA
		L3D25070AUNV1	A	700 mA	L3DA4U1UKN-GC070	8-20V	K	700 mA
		L3D25105AUNV1S	A	1.05 Amp	L3DA4U1UKS-JC105	15-38V	K	1.05 Amp
		L3D25105AUNV1S	A	1.05 Amp	L3DA4U1UKS-IC105	8-20V	K	1.05 Amp
		L3D25105AUNV1	A	1.05 Amp	L3DA4U1UKN-JC105	15-38V	K	1.05 Amp
		L3D25105AUNV1	A	1.05 Amp	L3DA4U1UKN-IC105	8-20V	K	1.05 Amp
		L3D25140AUNV1S	A	1.4 Amp	L3DA4U1UKS-LC140	15-38V	K	1.4 Amp
		L3D25140AUNV1S	A	1.4 Amp	L3DA4U1UKS-KC140	8-20V	K	1.4 Amp
		L3D25140AUNV1	A	1.4 Amp	L3DA4U1UKN-LC140	15-38V	K	1.4 Amp
		L3D25140AUNV1	A	1.4 Amp	L3DA4U1UKN-KC140	8-20V	K	1.4 Amp
		L3D25210AUNV1S	A	2.1 Amp	L3DA4U1UKS-MC210	8-20V	K	2.1 Amp
		L3D25210AUNV1	A	2.1 Amp	L3DA4U1UKN-MC210	8-20V	K	2.1 Amp
		L3D19035A1201S	A	350 mA	L3DA4U1UKS-YC035	30-60V	K	350 mA
		L3D19035A2771S	A	350 mA	L3DA4U1UKS-YC035	30-60V	K	350 mA

[1] The model number suffix will depend on the voltage range that the LED fixture needs. An update to the OEM luminaire UL file may be needed. For questions, please contact the LED Control Center of Excellence at 1.877.DIM.LED8.

EcoSystem® H-Series

Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
EcoSystem H-Series Ballasts	02/01/12	EHDT832CU110	1%	C	1.00	EHDT832MU110	1%	M	1.00
		EHDT832CU117	1%	C	1.17	EHDT832MU117	1%	M	1.17
		EHDT832CU210	1%	C	1.00	EHDT832MU210	1%	M	1.00
		EHDT832CU217	1%	C	1.17	EHDT832MU217	1%	M	1.17
		EHD T554CU110	1%	C	1.00	EHDT554MU110	1%	M	1.00
		EHDT554CU210	1%	C	1.00	EHDT554MU210	1%	M	1.00
		EHDT528CU110	1%	C	1.00	EHDT528MU110	1%	M	1.00
		EHDT528CU210	1%	C	1.00	EHDT528MU210	1%	M	1.00
		ECDT832C347110	10%	C	1.00	EHDT832C347110	1%	C	1.00
		ECDT832C347117	10%	C	1.17	EHDT832C347117	1%	C	1.17
		ECDT832C347210	10%	C	1.00	EHDT832C347210	1%	C	1.00
		ECDT832C347217	10%	C	1.17	EHDT832C347217	1%	C	1.17
		ECDT528C347110	10%	C	1.00	EHDT528C347110	1%	C	1.00
		ECDT528C347210	10%	C	1.00	EHDT528C347210	1%	C	1.00
		ECDT554C347110	10%	C	1.00	EHDT554C347110	1%	C	1.00
		ECDT554C347210	10%	C	1.00	EHDT554C347210	1%	C	1.00

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.

Eco-10®									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Eco-10	12/31/11	E3T514C1201	10%	C	1.0	EC5T514JUNV1	10%	J	1.00
		E3T514C1202	10%	C	1.0	EC5T514JUNV2	10%	J	1.00
		E3T514C2771	10%	C	1.0	EC5T514JUNV1	10%	J	1.00
		E3T514C2772	10%	C	1.0	EC5T514JUNV2	10%	J	1.00
		E3T521C1201	10%	C	1.0	EC5T521JUNV1	10%	J	1.00
		E3T521C1202	10%	C	1.0	EC5T521JUNV2	10%	J	1.00
		E3T521C2771	10%	C	1.0	EC5T521JUNV1	10%	J	1.00
		E3T521C2772	10%	C	1.0	EC5T521JUNV2	10%	J	1.00
		ECO-T524-120-1	10%	C	1.0	EC5T524JUNV1	10%	J	1.00
		ECO-T524-120-2	10%	C	1.0	EC5T524JUNV2	10%	J	1.00
		ECO-T524-277-1	10%	C	1.0	EC5T524JUNV1	10%	J	1.00
		ECO-T524-277-2	10%	C	1.0	EC5T524JUNV2	10%	J	1.00
		ECO-T528-120-1	10%	C	1.0	EC5T528JUNV1	10%	J	1.00
		ECO-T528-120-2	10%	C	1.0	EC5T528JUNV2	10%	J	1.00
		ECO-T528-277-1	10%	C	1.0	EC5T528JUNV1	10%	J	1.00
		ECO-T528-277-2	10%	C	1.0	EC5T528JUNV2	10%	J	1.00
		ECO-T554-120-1	10%	C	1.0	EC5T554JUNV1	10%	J	1.00
		ECO-T554-120-2	10%	C	1.0	EC5T554JUNV2	10%	J	1.00
		ECO-T554-277-1	10%	C	1.0	EC5T554JUNV1	10%	J	1.00
		ECO-T554-277-2	10%	C	1.0	EC5T554JUNV2	10%	J	1.00
		ECO-T5H39-120-1	10%	C	1.0	EC5T539JUNV1	10%	J	1.00
		ECO-T5H39-120-2	10%	C	1.0	EC5T539JUNV2	10%	J	1.00
		ECO-T5H39-277-1	10%	C	1.0	EC5T539JUNV1	10%	J	1.00
		ECO-T5H39-277-2	10%	C	1.0	EC5T539JUNV2	10%	J	1.00
		EC3T817GU110	10%	G	1.0	H3DT817GU110[1]	1%	G	1.00
						EC5T817JUNV1[2]	10%	J	0.85
		EC3T817GU210	10%	G	1.0	H3DT817GU210[1]	1%	G	1.00
						EC5T817JUNV2[2]	10%	J	0.85
		EC3T817GU310	10%	G	1.0	H3DT817GU310	1%	G	1.00
		EC3T817CU110	10%	C	1.0	H3DT817CU110[1]	1%	C	1.00
						EC5T817JUNV1[2]	10%	J	0.85
		EC3T817CU210	10%	C	1.0	H3DT817CU210[1]	1%	C	1.00
						EC5T817JUNV2[2]	10%	J	0.85
		EC3T825GU110	10%	G	1.0	H3DT825CU110[1]	1%	C	1.00
						EC5T825JUNV1[2]	10%	J	0.85

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.
[1] Recommended for new application
[2] Recommended for ballast replacement

Eco-10 (continued)									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Eco-10	12/31/11 (continued)	EC3T825GU210	10%	G	1.0	H3DT825CU210[1]	1%	C	1.00
						EC5T825JUNV2[2]	10%	J	0.85
		EC3T825CU110	10%	C	1.0	EC5T825JUNV1	10%	J	0.85
		EC3T825CU210	10%	C	1.0	EC5T825JUNV2	10%	J	0.85
		EC3T832GU110	10%	G	1.0	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		EC3T832GU210	10%	G	1.0	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2L[2, 3]	10%	G	0.85
		EC3T832GU310	10%	G	1.0	H3DT832GU310[1]	1%	G	1.00
						EC5T832GUNV3L[2, 3]	10%	G	0.85
		EC3T832GU117	10%	G	1.17	H3DT832GU117	1%	G	1.17
		EC3T832GU217	10%	G	1.17	H3DT832GU217	1%	G	1.17
		EC3T832GU317	10%	G	1.17	H3DT832GU317[1]	1%	G	1.17
						EC5T832GUNV317L[2,3]	10%	G	1.17
		EC3T832CU110	10%	C	1.0	H3DT832CU110[1]	1%	C	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		EC3T832CU210	10%	C	1.0	H3DT832CU210[1]	1%	C	1.00
						EC5T832JUNV2[2]	10%	J	0.85
		EC3T832CU117	10%	C	1.17	H3DT832CU117[1]	1%	C	1.17
						EC5T832JUNV1[2]	10%	J	0.85
		EC3T832CU217	10%	C	1.17	H3DT832CU217[1]	1%	C	1.17
						EC5T832JUNV2[2]	10%	J	0.85
	12/31/09	ECO-T817-120-1	10%	F	0.85	H3DT817GU110[1]	1%	G	1.00
						EC5T817JUNV1[2]	10%	J	0.85
		ECO-T817-277-1	10%	F	0.85	H3DT817GU110[1]	1%	G	1.00
						EC5T817JUNV1[2]	10%	J	0.85
		ECO-T817-120-2	10%	F	0.85	H3DT817GU210[1]	1%	G	1.00
						EC5T817JUNV2[2]	10%	J	0.85
		ECO-T817-277-2	10%	F	0.85	H3DT817GU210[1]	1%	G	1.00
						EC5T817JUNV2[2]	10%	J	0.85
		ECO-T817-120-3	10%	F	0.85	H3DT817GU309	1%	G	1.00
		ECO-T817-277-3	10%	F	0.85	H3DT817GU310	1%	G	1.00
		ECO-T825-120-1	10%	F	0.85	EC5T825JUNV1	10%	J	0.85
		ECO-T825-277-1	10%	F	0.85	EC5T825JUNV1	10%	J	0.85
		ECO-T825-120-2	10%	F	0.85	EC5T825JUNV2	10%	J	0.85

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.
[1] Recommended for new application
[2] Recommended for ballast replacement
[3] Ballast ships with leads

Eco-10 (continued)									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Eco-10	12/31/09 (continued)	ECO-T825-277-2	10%	F	0.85	EC5T825JUNV2	10%	J	0.85
		ECO-T832-120-1	10%	F	0.85	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		ECO-T832-120-1-L	10%	D	0.85	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		ECO-T832-120-2-T	10%	D	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832JUNV2[2]	10%	J	0.85
		ECO-T832-277-1	10%	F	0.85	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		ECO-T832-277-1-L	10%	D	0.85	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		ECO-T832-277-1-T	10%	D	0.85	H3DT832GU110[1]	1%	G	1.00
						EC5T832JUNV1[2]	10%	J	0.85
		ECO-T832-120-2	10%	F	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2[2]	10%	G	0.85
		ECO-T832-120-1-L	10%	D	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2L[2]	10%	G	0.85
		ECO-T832-120-2-T	10%	D	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2L[2]	10%	G	0.85
		ECO-T832-277-2	10%	F	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2[2]	10%	G	0.85
		ECO-T832-277-2-L	10%	D	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2[2]	10%	G	0.85
		ECO-T832-277-2-T	10%	D	0.85	H3DT832GU210[1]	1%	G	1.00
						EC5T832GUNV2[2]	10%	G	0.85
		ECO-T832-120-3	10%	F	0.85	EC5T832GUNV3L	10%	G	0.85
		ECO-T832-277-3	10%	F	0.85	EC5T832GUNV3L	10%	G	0.85
		ECO-T539-120-1	10%	F	0.85	H3DT536GU110[1]	5%	G	1.00
						EC5T536JUNV1[2]	10%	J	1.00
		ECO-T539-277-1	10%	F	0.85	H3DT536GU110[1]	5%	G	1.00
						EC5T536JUNV1[2]	10%	J	1.00
		ECO-T539-120-2	10%	F	0.85	H3DT536GU210[1]	5%	G	1.00
						EC5T536JUNV2[2]	10%	J	1.00
		ECO-T539-277-2	10%	F	0.85	H3DT536GU210[1]	5%	G	1.00
						EC5T536JUNV2[2]	10%	J	1.00
		ECO-T539-120-3	10%	F	0.85	Contact obsoleteproducts@lutron.com			
		ECO-T539-277-3	10%	F	0.85	Contact obsoleteproducts@lutron.com			

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.
[1] Recommended for new application
[2] Recommended for ballast replacement

Eco-10 (continued)									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Eco-10	12/31/09 (continued)	ECO-T540-120-1	10%	F	0.85	H3DT540GU110[1]	5%	G	1.00
						EC5T540JUNV1[2]	10%	J	1.00
		ECO-T540-277-1	10%	F	0.85	H3DT540GU110[1]	5%	G	1.00
						EC5T540JUNV1[2]	10%	J	1.00
		ECO-T540-120-2	10%	F	0.85	H3DT540GU210[1]	5%	G	1.00
						EC5T540JUNV2[2]	10%	J	1.00
		ECO-T540-277-2	10%	F	0.85	H3DT540GU210[1]	5%	G	1.00
						EC5T540JUNV2[2]	10%	J	1.00
		ECO-T540-120-3	10%	F	0.85	H3DT540GU310[1]	5%	G	1.00
						EC5T540GUNV3L[2,3]	10%	G	1.00
		ECO-T540-277-3	10%	F	0.85	H3DT540GU310[1]	5%	G	1.00
						EC5T540GUNV3L[2,3]	10%	G	1.00
		ECO-T550-120-1	10%	F	0.85	H3DT550GU110[1]	5%	G	1.00
						EC5T550JUNV1[2]	10%	J	1.00
		ECO-T550-277-1	10%	F	0.85	H3DT550GU110[1]	5%	G	1.00
						EC5T550JUNV1[2]	10%	J	1.00
		ECO-T550-120-2	10%	F	0.85	H3DT550GU210[1]	5%	G	1.00
						EC5T550JUNV2[2]	10%	J	1.00
		ECO-T550-277-2	10%	F	0.85	H3DT550GU210[1]	5%	G	1.00
						EC5T550JUNV2[2]	10%	J	1.00
	11/01/09	ECO-T536-240-1	10%	F	0.95	H3DT536GU110	5%	G	1.00
		ECO-T536-240-2	10%	F	0.95	H3DT536GU210	5%	G	1.00
		ECO-T818-240-1	10%	F	0.95	Contact obsoleteproducts@lutron.com			
		ECO-T818-240-2	10%	F	0.95	Contact obsoleteproducts@lutron.com			
		ECO-T832-240-2	10%	F	0.95	EC5T832GUNV2L	10%	G	0.85
		ECO-T836-240-1	10%	F	0.95	None Available	–	–	–
		ECO-T836-240-2	10%	F	0.95	None Available	–	–	–
		ECO-T858-240-1	10%	F	0.95	None Available	–	–	–
		ECO-T858-240-2	10%	F	0.95	None Available	–	–	–
		ECO-T870-240-1	10%	F	0.95	None Available	–	–	–

Tu-Wire®								
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Case Size	Ballast Factor
Tu-Wire	8/1/14	**2W-T825-120-1**	5%	C	0.85	Contact Technical Support	–	–
		2W-T825-120-2	5%	C	0.85	Contact Technical Support	–	–
		2W-T832-120-1	5%	C	0.85	Contact Technical Support	–	–
		2W-T832-120-2	5%	C	0.85	Contact Technical Support	–	–

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.
[1] Recommended for new application [2] Recommended for ballast replacement [3] Ballast ships with leads

Hi-lume®									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Hi-lume	12/31/09	FDB-2427-120-1	1%	F	0.85	H3DT817GU110	1%	G	1.00
		FDB-2427-277-1	1%	F	0.85	H3DT817GU110	1%	G	1.00
		FDB-2427-120-2	1%	F	0.85	H3DT817GU210	1%	G	1.00
		FDB-2427-277-2	1%	F	0.85	H3DT817GU210	1%	G	1.00
		FDB-2427-120-3	1%	F	0.85	H3DT817GU310	1%	G	1.00
		FDB-2427-277-3	1%	F	0.85	H3DT817GU310	1%	G	1.00
		FDB-3627-120-1	1%	F	0.85	H3DT825CU110	1%	C	1.00
		FDB-3627-277-1	1%	F	0.85	H3DT825CU110	1%	C	1.00
		FDB-3627-120-2	1%	F	0.85	H3DT825CU210	1%	C	1.00
		FDB-3627-277-2	1%	F	0.85	H3DT825CU210	1%	C	1.00
		FDB-3627-120-3	1%	F	0.85	Contact obsoleteproducts@lutron.com			
		FDB-3627-277-3	1%	F	0.85	Contact obsoleteproducts@lutron.com			
		FDB-4827-120-1	1%	F	0.85	H3DT832GU110	1%	G	1.00
		FDB-4827-277-1	1%	F	0.85	H3DT832GU110	1%	G	1.00
		FDB-4827-120-2	1%	F	0.85	H3DT832GU210	1%	G	1.00
		FDB-4827-277-2	1%	F	0.85	H3DT832GU210	1%	G	1.00
		FDB-4827-120-3	1%	F	0.85	H3DT832GU310	1%	G	1.00
		FDB-4827-277-3	1%	F	0.85	H3DT832GU310	1%	G	1.00
		FDB-6027-120-1	1%	F	0.85	H3DT840CU110	1%	C	1.00
		FDB-6027-277-1	1%	F	0.85	H3DT840CU110	1%	C	1.00
		FDB-6027-120-2	1%	F	0.85	H3DT840CU210	1%	C	1.00
		FDB-6027-277-2	1%	F	0.85	H3DT840CU210	1%	C	1.00
	11/1/09	FCE-0626-240-1	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-0626-240-2	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-1226-240-1	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-1226-240-2	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-1526-240-1	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-1526-240-2	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-1826-240-1	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-CF18-240-1	5%	F	0.85	EC3DT418KU1	5%	K**	0.95
		FCE-CF18-240-2	5%	F	0.85	EC3DT418KU2	5%	K**	0.95
		FCE-CF26-240-1	5%	F	0.85	EC3DT4MWKU1	5%	K**	0.95
		FCE-CF26-240-2	5%	F	0.85	EC3DT4MWKU2	5%	K**	0.95
		FCE-CFL36-240-1	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FCE-CFL36-240-2	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FDB-4827-240-1	1%	F	0.85	H3DT832GU110	1%	G	1.00
		FDB-4827-240-2	1%	F	0.85	H3DT832GU210	1%	G	1.00

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.

**For applications where a Hi-lume studded ballast was used, Lutron adapter plate CFL-JBA-FAB may be required to retrofit the replacement studded ballast. Dimensions for the adapter plate are shown on page 103.

For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.

Appendix | **Discontinued drivers and ballasts**

Compact SE™									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Compact SE	12/31/11	FDB-T418-120-1	5%	A	0.95	EC3DT418KU1	5%	K	0.95
		FDB-T418-277-1	5%	A	0.95	EC3DT418KU1	5%	K	0.95
		FDB-T426-120-1	5%	A	0.95	EC3DT4MWKU1	5%	K	0.95
		FDB-T426-120-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K	0.95
		FDB-T426-277-1	5%	A	0.95	EC3DT4MWKU1	5%	K	0.95
		FDB-T426-277-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K	0.95
		FDB-T432-120-1	5%	A	0.95	EC3DT4MWKU1	5%	K	0.95
		FDB-T432-120-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K	0.95
		FDB-T432-277-1	5%	A	0.95	EC3DT4MWKU1	5%	K	0.95
		FDB-T432-277-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K	0.95
		EC3T536GU110	5%	G	1.00	H3DT536GU110	5%	G	1.00
		EC3T536GU210	5%	G	1.00	H3DT536GU210	5%	G	1.00
		EC3T540GU110	5%	G	1.00	H3DT540GU110	5%	G	1.00
		EC3T540GU210	5%	G	1.00	H3DT540GU210	5%	G	1.00
		EC3T540GU310	5%	G	1.00	H3DT540GU310	5%	G	1.00
		EC3T550GU110	5%	G	1.00	H3DT550GU110	5%	G	1.00
		EC3T550GU210	5%	G	1.00	H3DT550GU210	5%	G	1.00
	9/30/10	FDB-T418-120-2	5%	B	0.95	EC3DT418KU2	5%	K**	0.95
		FDB-T418-277-2	5%	B	0.95	EC3DT418KU2	5%	K**	0.95
		FDB-T426-120-2	5%	B	0.95	EC3DT4MWKU2	5%	K**	0.95
		FDB-T426-277-2	5%	B	0.95	EC3DT4MWKU2	5%	K**	0.95
		FDB-T432-120-2	5%	B	0.95	EC3DT4MWKU2	5%	K**	0.95
		FDB-T432-277-2	5%	B	0.95	EC3DT4MWKU2	5%	K**	0.95
		FDB-T442-120-2	5%	B	0.95	EC3DT442KU2	5%	K**	0.95
		FDB-T442-277-2	5%	B	0.95	EC3DT442KU2	5%	K**	0.95
		FDB-T442-120-1	5%	B	0.95	EC3DT442KU1	5%	K**	0.95
		FDB-T442-277-1	5%	B	0.95	EC3DT442KU1	5%	K**	0.95
		FDB-T418-120-2-S	5%	B	0.95	EC3DT418KU2S	5%	K**	0.95
		FDB-T418-277-2-S	5%	B	0.95	EC3DT418KU2S	5%	K**	0.95
		FDB-T426-120-2-S	5%	B	0.95	EC3DT4MWKU2S	5%	K**	0.95
		FDB-T426-277-2-S	5%	B	0.95	EC3DT4MWKU2S	5%	K**	0.95
		FDB-T432-120-2-S	5%	B	0.95	EC3DT4MWKU2S	5%	K**	0.95
		FDB-T432-277-2-S	5%	B	0.95	EC3DT4MWKU2S	5%	K**	0.95
		FDB-T442-120-2-S	5%	B	0.95	EC3DT442KU2S	5%	K**	0.95
		FDB-T442-277-2-S	5%	B	0.95	EC3DT442KU2S	5%	K**	0.95
		FDB-T442-120-1-S	5%	B	0.95	EC3DT442KU1S	5%	K**	0.95
		FDB-T442-277-1-S	5%	B	0.95	EC3DT442KU1S	5%	K**	0.95

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.

**For applications where a Compact SE studded ballast was used, Lutron adapter plate CFL-BEA-BK may be required to retrofit the replacement studded ballast. Dimensions for the adapter plate are shown on page 103.

For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.

Compact SE (continued)									
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Dimming	Case Size*	Ballast Factor
Compact SE	12/31/09	FDB-1643-120-1	5%	F	0.85	H3DT536GU110	5%	G	1.00
		FDB-1643-277-1	5%	F	0.85	H3DT536GU110	5%	G	1.00
		FDB-1643-120-2	5%	F	0.85	H3DT536GU210	5%	G	1.00
		FDB-1643-277-2	5%	F	0.85	H3DT536GU210	5%	G	1.00
		FDB-1643-120-3	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FDB-1643-277-3	5%	F	0.85	Contact obsoleteproducts@lutron.com			
		FDB-2227-120-1	5%	F	0.85	H3DT540GU110	5%	G	1.00
		FDB-2227-277-1	5%	F	0.85	H3DT540GU110	5%	G	1.00
		FDB-2227-120-2	5%	F	0.85	H3DT540GU210	5%	G	1.00
		FDB-2227-277-2	5%	F	0.85	H3DT540GU210	5%	G	1.00
		FDB-2227-120-3	5%	F	0.85	H3DT540GU310	5%	G	1.00
		FDB-2227-277-3	5%	F	0.85	H3DT540GU310	5%	G	1.00
		FDB-2243-120-1	5%	F	0.85	H3DT550GU110	5%	G	1.00
		FDB-2243-277-1	5%	F	0.85	H3DT550GU110	5%	G	1.00
		FDB-2243-120-2	5%	F	0.85	H3DT550GU210	5%	G	1.00
		FDB-2243-277-2	5%	F	0.85	H3DT550GU210	5%	G	1.00
		FDB-T418-240-1-S	5%	A	0.95	EC3DT418KU1S	5%	K**	0.95
		FDB-T426-240-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K**	0.95
		FDB-T432-240-1-S	5%	A	0.95	EC3DT4MWKU1S	5%	K**	0.95

* In some applications, the replacement ballast case size may be different. Review dimensions for proper fit.
**For applications where a Compact SE studded ballast was used, Lutron adapter plate CFL-BEA-BK may be required to retrofit the replacement studded ballast. Dimensions for the adapter plate are shown on page 103.

For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.

Appendix | **Discontinued drivers and ballasts**

Eco-10® TVE								
Ballast Family	Date of Discontinuation	Discontinued Model	Dimming	Case Size	Ballast Factor	Replacement Model	Case Size	Ballast Factor
Eco-10 TVE	6/30/11	TVE-T832-347-1	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-347-2	10%	F	0.85	Contact obsoleteproducts@lutron.com		
	10/1/09	BTVF-T832-120-2	2%	F	0.85	Contact obsoleteproducts@lutron.com		
		BTVF-T832-120-3	2%	F	0.85	Contact obsoleteproducts@lutron.com		
		BTVF-T832-277-2	2%	F	0.85	Contact obsoleteproducts@lutron.com		
		BTVF-T832-277-3	2%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T540-120-2	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T540-120-3	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T540-277-2	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T817-120-1	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T825-120-1	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-120-1	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-120-2	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-120-3	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-277-1	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-277-2	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-277-3	10%	F	0.85	Contact obsoleteproducts@lutron.com		
		TVE-T832-277-3N	10%	F	0.85	Contact obsoleteproducts@lutron.com		

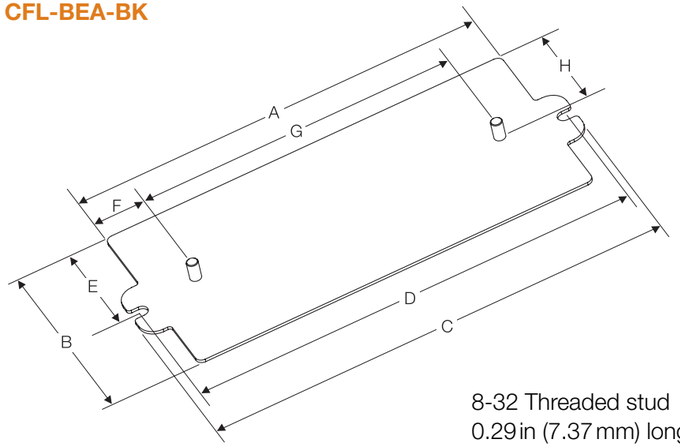
For questions about replacement ballasts or drivers, please contact Lutron Technical Support at 1.800.523.9466.

Adapter plates

Lutron adapter plates CFL-BEA-BK or CFL-JBA-FAB may be required to retrofit replacement ballasts.

The CFL-BEA-BK is used when a non-studded B-can is being replaced by a non-studded K-can. The CFL-JBA-FAB is used when a studded F-can is being replaced by a studded A-can, B-can, or K-can. Dimensions for the adapter plates are shown below.

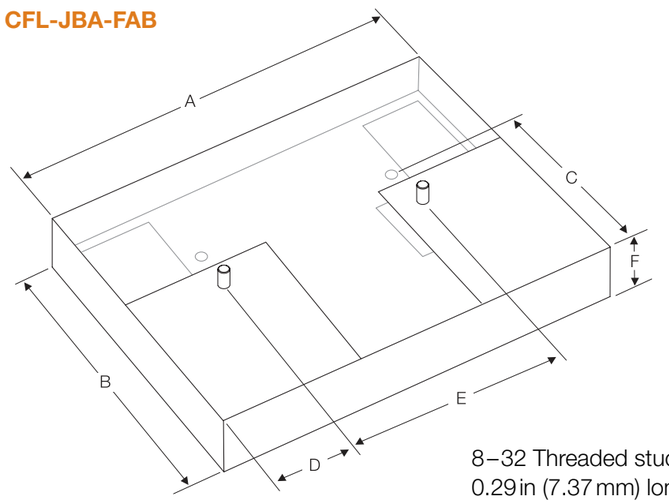
CFL-BEA-BK



A 6.00 in (152 mm)
B 2.96 in (75 mm)
C 6.73 in (171 mm)
D 6.41 in (163 mm) (mounting centers)
E 1.58 in (40 mm)
F 0.69 in (18 mm)
G 4.61 in (117 mm)
H 1.43 in (36 mm)

8-32 Threaded stud
0.29 in (7.37 mm) long

CFL-JBA-FAB



A 4.19 in (106 mm)
B 2.96 in (75 mm)
C 2.04 in (52 mm)
D 1.09 in (28 mm)
E 2.00 in (51 mm)
F 0.52 in (13 mm)

8–32 Threaded stud
0.29 in (7.37 mm) long

Appendix | **Discontinued drivers and ballasts**

Adapter plates

K-can Replacement Scenarios for T4 CFL Lamps			
		Replacement Hardware	
Existing installation	Sample Model	Ballast Can	Adapter Plate
F-can with studs	FDB-CF18-120-2-B	K-can with studs	CFL-JBA-FAB
F-can without studs	FDB-T418-120-2-E	K-can without studs	N/A*
B-can with studs	FDB-T418-120-2-S	K-can with studs	N/A
B-can without studs	FDB-T418-120-2	K-can without studs	CFL-BEA-BK
A-can with studs	FDB-T418-120-2-S	K-can with studs	N/A
A-can without studs	FDB-T418-120-2	K-can without studs	N/A

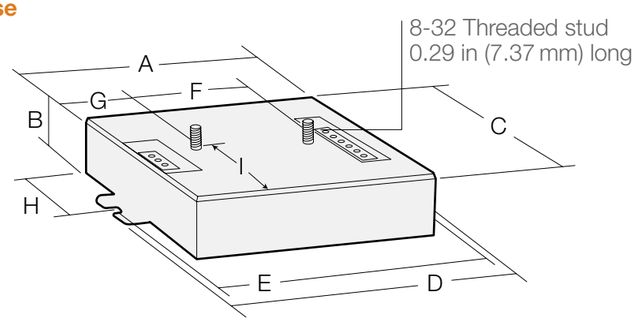
*Need to drill new mounting holes in the fixture

Notes

1. When replacing the F-can or B-can with a K-can, it is important to know whether the ballast is mounted by the studs or the flanges.
2. K-can ballast is wider than the F-can. This may be an issue in narrow fixtures.
3. K-can connector locations don't exactly match the B-can. They may not line up with fixture mounting plates in some installations.

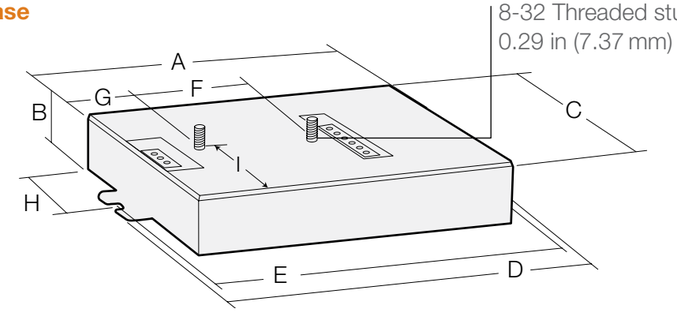
Case dimensions

A-case



A 4.20 in (107 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 4.90 in (124 mm)
E 4.60 in (117 mm)
(mounting centers)
F 2.00 in (51 mm)
G 1.08 in (27 mm)
H 1.60 in (41 mm)
I 1.39 in (35 mm)

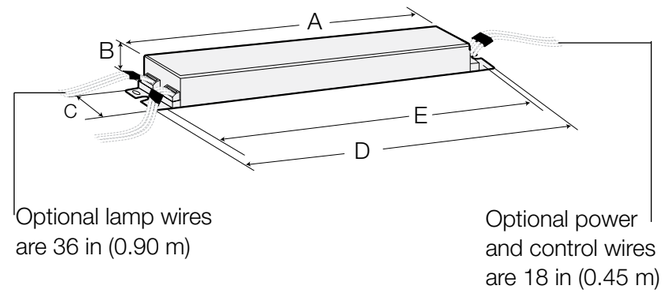
B-case



A 6.00 in (152 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 6.75 in (171 mm)
E 6.50 in (165 mm)
(mounting centers)
F 2.00 in (51 mm)
G 1.16 in (29 mm)
H 1.60 in (41 mm)
I 1.39 in (35 mm)

Case dimensions

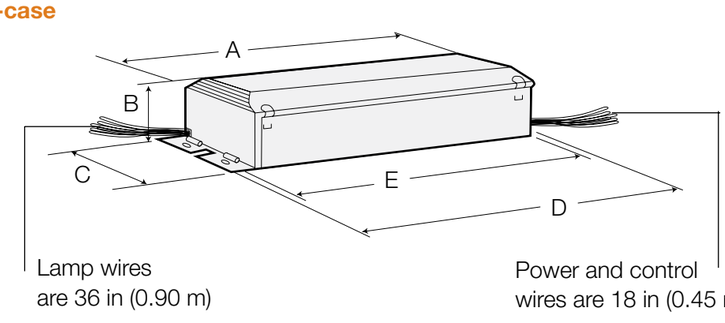
D-case



A 7.13 in (181 mm)
B 1.00 in (25 mm)
C 1.58 in (40 mm)
D 9.50 in (241 mm)
E 8.91 in (226 mm)
Slot mounting centers

If using 4-hole mount, mounting centers are 9.00 in (229 mm) X 1.06 in (27 mm).

F-case



A 8.30 in (211 mm)
B 1.50 in (38 mm)
C 2.38 in (60.5 mm)
D 9.50 in (241 mm)
E 8.91 in (226 mm)
Slot mounting centers

Slot mounting centers
If using 4-hole mount, mounting centers are 9.21 in (234 mm) X 1.70 in (43 mm).

Africa

Algeria	230V (CE)
Angola	220V
Benin	220V
Botswana	230V
Burkina Faso	220V
Burundi	220V
Cameroon	220V
Canary Islands	220V
Cape Verde	220V
Central African Republic	220V
Chad	220V
Comoros	220V
Congo, Dem. Rep. of (formerly Zaire)	220V
Congo, People's Rep. of	230V
Cote d'Ivoire	220V
Djibouti	220V
Egypt	220V
Equatorial Guinea	220V
Eritrea	230V
Ethiopia	220V
Gabon	220V
Gambia	230V
Ghana	230V
Guinea	220V
Guinea-Bissau	220V
Ivory Coast (see Cote d'Ivoire)	
Kenya	240V
Lesotho	220V
Liberia	120V
Libya	127V
Madagascar	220V
Malawi	230V
Mali	220V
Mauritania	220V
Mauritius	230V
Morocco	127/220V
Mozambique	220V
Namibia	220V
Niger	220V
Nigeria	240V
Rwanda	230V
Réunion Island	220V
São Tomé and Principe	220V
Senegal	230V
Seychelles	240V
Sierra Leone	230V
Somalia	220V
South Africa	220/230V
Swaziland	230V
Tanzania	230V
Togo	220V
Tunisia	230V
Uganda	240V
Zambia	230V
Zimbabwe	220V

Asia

Afghanistan	220V
Bahrain	230V
Bangladesh	220V
Bhutan	230V
Brunei	240V
Cambodia	230V
China, People's Republic of	220V
East Timor	220V
Hong Kong	220V
India	230V
Indonesia	127/230V
Iraq	230V
Israel	220V
Japan	100/200V
Jordan	230V
Kazakhstan	220V
Kuwait	240V
Kyrgyzstan	220V
Laos	230V
Lebanon	110/220V
Macau	220V
Malaysia	240V
Maldives	230V
Mongolia	220V
Myanmar (formerly Burma)	230V
Nepal	230V
Oman	240V
Pakistan	220V
Philippines	220V
Qatar[1]	240V
Russia	220V
Saudi Arabia[1]	127*/220V
Singapore	230V (CE)
South Korea	220V
Sri Lanka	230V
Syria	220V
Tajikistan	220V
Taiwan	110V
Thailand	220V (CE)
Turkey	230V (CE)
Turkmenistan	220V
United Arab Emirates[1]	220V
Uzbekistan	220V
Vietnam	127/220V
Yemen, Rep. of	220/230V

Europe

Albania	220V
Andorra	230V
Armenia	220V
Austria	230V (CE)
Azerbaijan	220V
Azores	220V
Balearic Islands	220V
Belarus	220V
Belgium	230V (CE)
Bosnia	220V
Bulgaria	230V (CE)
Channel Islands	230V
Croatia	230V (CE)
Cyprus	240V (CE)
Czech Republic	230V (CE)
Denmark	230V (CE)
England (see United Kingdom)	
Estonia	230V (CE)
Faroe Islands	220V
Finland	230V (CE)
France	230V (CE)
Georgia	220V
Germany	230V (CE)
Gibraltar	240V
Great Britain (see United Kingdom)	
Greece	240V (CE)
Hungary	230V (CE)
Iceland	230V (CE)
Ireland (Eire)	230V (CE)
Isle of Man	240V
Italy	230V (CE)
Latvia	220V (CE)
Liechtenstein	230V (CE)
Lithuania	230V (CE)
Luxembourg	240V (CE)
Macedonia (FYROM)	230V (CE)
Madeira	220V
Malta	240V (CE)
Moldova	220/240V
Monaco	127/220V
Montenegro	220V
Netherlands	230V (CE)
Netherlands Antilles	127/220V
Norway	230V (CE)
Northern Ireland (see United Kingdom)	
Poland	230V (CE)
Portugal	230V (CE)
Romania	230V (CE)
San Marino	230V
Scotland (see United Kingdom)	
Serbia	220V
Slovak Republic	230V (CE)
Slovenia	230V (CE)
Spain	230V (CE)
Sweden	230V (CE)
Switzerland	230V (CE)
Ukraine	220V
United Kingdom	230V (CE)
Vatican City	230V (CE)
Wales (see United Kingdom)	

North America/ Central America/ Caribbean

Anguilla	110V
Antigua	230V
Aruba	127V
Bahamas	120V
Barbados	115V
Belize	110/220V
Bermuda	120V
Canada	120/347V
Cayman Islands	120V
Costa Rica	120V
Dominica	230V
Dominican Republic	120/240V
El Salvador	115V
Greenland	220V
Grenada (Windward Is.)	230V
Guadeloupe	230V
Guatemala	120V
Haiti	110V
Honduras	110V

[1] Currently available, but soon to be phased out.

Note: EcoSystem® 5-Series, EcoSystem LED driver, and EcoSystem H-Series products meet CE requirements.

[1] Currently available, but soon to be phased out.

Jamaica	110V
Martinique	220V
Mexico	127V
Montserrat (Leeward Is.)	230V
Nicaragua	120V
Panama	110/120V
Puerto Rico	120/277V
St. Kitts and Nevis (Leeward Is.)	230V
St. Lucia (Windward Is.)	240V
St. Vincent and the Grenadines (Windward Is.)	230V
Trinidad & Tobago	115V
United States of America	120/277V
Virgin Islands (British and U.S.)	115V

Oceania

American Samoa	120V
Australia	240V
Cook Islands	240V
Fiji	240V
Guam	110V
Kiribati	240V
Marshall Islands	110V
Micronesia (Federal States of)	120V
Nauru	240V
New Caledonia	220V
New Zealand	230V (CE)
Palau	110–120V
Palmyra Atoll	120V
Papua New Guinea	240V
Samoa	230V
Solomon Islands	220V
Tahiti	110/220V
Tonga	240V
Tuvalu	220/240V
Vanuatu	230V

South America

Argentina	220V
Bolivia	220/230V
Brazil	127/220V
Chile	220V
Colombia	110V
Ecuador	120–127V
Falkland Islands	240V
French Guiana	220V
Guyana	240V
Paraguay	220V
Peru	220V
Suriname	127V
Uruguay	220V
Venezuela	120V

Contact your Lutron representative for countries not listed.

Note: EcoSystem® 5-Series, EcoSystem LED driver, and EcoSystem H-Series products meet CE requirements.

1% (architectural dimming)
A system that has a lowest achievable light level of 1% of its maximum measured light output; 1% measured light is perceived as being dimmed to only 10%. Used in applications such as conference rooms, theaters, restaurants, and retail spaces.

5% (high performance dimming)
A system that has a lowest achievable light level of 5% of its maximum measured light output; 5% measured light is perceived as being dimmed to only 22%. Used in applications such as residences, lobbies, and small meeting rooms.

10% (lighting management dimming)
A system that has a lowest achievable light level of 10% of its maximum measured light output; 10% measured light is perceived as being dimmed to only 32%. Used in applications such as private and open offices, classrooms, stairwells, and restrooms.

ballast
An electrical device used in fluorescent and HID fixtures. It furnishes the necessary circuit conditions (voltage, current, and waveform) for starting and operating a lamp.

ballast efficacy factor (BEF)
The ballast efficacy factor directly measures the efficiency of the ballast by illustrating that the higher the light output for a given power rating, the more efficiently the ballast will operate.

$$\text{BEF} = \frac{\text{Ballast factor (\%)}}{\text{Input power (W)}}$$

ballast factor
A ballast's light output with respect to a reference ballast's light output. The reference ballast is a ballast which produces full light output as defined by the American National Standards Institute (ANSI). Ballast factor is expressed in percentage form (e.g. 0.95 or 95%).

CCC mark
A mark that is placed on products that are certified to meet the required product safety standards in China.

CSA certified
Indicates that the product has been evaluated and undergoes continual assessment by CSA International to comply with safety standards established by the Canadian Standards Association.

CE mark
A mark placed on products that are declared to meet the applicable EU directives for a given product type. A CE marked product often meets the requirements of other countries that adhere to the IEC standards.

cUL listed
Indicates that the product has been evaluated and undergoes continual assessment by Underwriters Laboratories Inc. to comply with safety standards established by Underwriters Laboratories Inc. for Canada.

current crest factor
The ratio of the peak value of lamp current to the root-mean-square (RMS) value of lamp current.

driver
Auxiliary device(s) needed to operate and vary the intensity of light output from LED lamp source(s) by regulating the voltage and current powering the source. There are both dimming and non-dimming types.

driver rating
Parameters that define the operating power level output. The rating also includes both input and output specifications (voltage, current, frequency, etc.).

efficiency
See luminous efficacy

ENEC mark
A mark that is placed on electrical products that are compliant with European safety standards.

For a more detailed glossary of terms, go to **www.lutron.com/glossaryofterms**.

filament
In fluorescent lamps, the filaments are designed to emit electrons to sustain the arc.

filter
An electrical circuit (capacitor and inductor) intended to reduce radio frequency interference (RFI) and lamp buzz. Most Lutron ballasts and dimmers incorporate a filter circuit.

flicker
Noticeably unstable light output, usually involving large, quick changes in light intensity.

fluorescent lamp
A low-pressure, gas-filled electric discharge lamp in which a fluorescent coating (phosphor) transforms ultraviolet radiation into visible light.

footcandle
Defines the quantity of illumination on a surface or object; 1 footcandle = 1 lumen per square foot.

Hi-lume®
A Lutron fluorescent ballast and LED driver family with a dimming range of 100–1%. Ballasts are available for most fluorescent lamp types.

IEC rated
Indicates that the product has been certified by the International Electrotechnical Commission. Compliance with IEC's international standards propagates standardized design that is accepted in many countries around the world.

IEC standard
Standards developed and published by the International Electrotechnical Commission.

incandescent lamp
An electric lamp in which a filament gives off light when heated by an electric current.

INMETRO mark
A mark that is placed on products that are certified to meet required product safety standards in Brazil.

inrush current
The current flow occurring at the instant of turn-on. (The level of inrush current depends on the load type and can be substantially higher than the normal operating current.) All Lutron ballasts and drivers incorporate inrush-current-limiting circuitry.

instant-start lamp
A class of fluorescent lamps which do not require filament preheating and can start instantly. Lutron dimming ballasts cannot be used with instant-start lamps.

intensity
The brightness of a lamp as a percentage of maximum brightness (e.g., 66% intensity describes a lamp dimmed to 2/3 of its maximum brightness).

kilowatt hour (KWH)
A unit of energy equal to one kilowatt of power expended for one hour.

lamp
A device for producing light (such as a bulb or tube).

LED (light emitting diode)
An architectural, solid-state light source that uses multiple arrays of "white" light emitting diodes as a low wattage, low temperature source. LED arrays cannot operate without a driver, a fixture, and a control. These components **must all be compatible** in order to ensure their operation.

LED array (also called an LED light engine or LED module)
A device that incorporates LEDs into a package that may then be integrated into a fixture. It typically integrates multiple LEDs onto a PCB (printed circuit board) and may be replaceable.

For a more detailed glossary of terms, go to **www.lutron.com/glossaryofterms**.

Appendix | **Glossary**

LED driver
Auxiliary device(s) needed to operate and vary the intensity of light output from LED lamp source(s) by regulating the voltage and current powering the source. There are both dimming and non-dimming types.

line voltage
The voltage between the lines of a supplying power system. (for example, 120 V or 277 V in U.S.).

load
Any device which draws power from a power distribution system, such as any lighting fixture, ceiling fan, etc., from a power circuit.

low-end trim
Adjustable setting on a dimmer that establishes its minimum output, therefore establishing minimum light level.

lumen
The quantity of light that is emitted by a lamp, used in reference to efficacy (lumens per watt).

luminance
Describes the light emitted or reflected from a source or object in a particular direction. Luminance produces the sensation of brightness and is measured in candelas per square foot (or square meter) of a source or object surface area in the direction of viewing.

luminous efficacy
The ratio of light emitted to the power required for a light source or luminaire. Commonly used to measure energy efficiency, it is the lumens per watt from a light source (amount of light per watt of power).

lux
1 lux = 1 lumen per square meter.

multi-location dimming
A technology that allows full-range dimming from all locations in 3-way and 4-way circuits. Multi-location dimmers can be used with companion dimmers for full dimming control of the lights from four or more locations.

NEMA premium
Provides a method for identifying the most efficient T8 fluorescent ballasts available in the market; models that are consistent with the Consortium for Energy Efficiency (CEE) for high-performance lamps and ballasts.

phase control
A common method of dimming that removes part of the line cycle, reducing the RMS voltage. Available as forward phase (leading edge) or reverse phase (trailing edge)

phosphor conversion
A method used to generate white light with LEDs and fluorescent lamps. A blue or near-ultraviolet LED is coated with a yellow or multi-chromatic phosphor, resulting in white light. A fluorescent lamp uses the same principles by converting an ultraviolet arc to visible light through the use of phosphors.

power factor
Ratio of the average power delivered to the lamp ballast system to the product of voltage and current (the ratio of the average power to the VA). This shows how effectively available power is being used.

$$\text{Power factor} = \frac{\text{Input power}}{\text{Line voltage x line current}}$$

radio frequency interference (RFI)
Electrical noise that may be picked up by sensitive audio and radio equipment. Lutron builds filters into every control, driver, and ballast to reduce this noise. Also called electromagnetic interference (EMI). See "filter".

For a more detailed glossary of terms, go to **www.lutron.com/glossaryofterms**.

rapid-start lamp
A class of fluorescent lamps having filaments which must be constantly heated by an external circuit.

red, green, blue (RGB)
A method used to generate white and other mixed colors with LEDs. It stands for red, green, and blue – the three primary colors of light. When the primaries are mixed, the resulting light appears white to the human eye.

relative system efficacy (RSE)
Relative system efficacy is a metric used to rank ballast and lamp efficacy. It is used almost exclusively to describe dimming ballast efficacy and uses lamp rated efficacy to normalize ballast efficacy factor (BEF).

$$RSE = \frac{\text{Ballast factor}}{\text{Ballast input power}} \times \text{Total rated lamp power}$$

S-mark
A mark that is placed on products that are certified to meet required product safety standards in Argentina.

shimmer
Small changes in light intensity. This can usually only be noticed at medium to low light levels, and often only at the periphery of vision.

single pole
Dimming from one location.

smooth and continuous
Refers to the quality of the change in light level when the dimmer control is varied. There should be no flicker or jumps in light level output.

source
Refers to the type of lamp, (e.g., fluorescent, incandescent, low voltage, LED, HID, etc.).

square law dimming
Dimming with a direct correlation between the position of the slider and the perceived light level (e.g., if the slider is halfway down the travel, the perceived light level is 50%). With square law dimming, gradual movement of the linear slider results in a proportional change in the perceived light level—allowing for easy, precise adjustment of the light level setting.

T4
A compact fluorescent lamp which has a diameter of 1/2" (12.7 mm).

T5
A fluorescent lamp which has a diameter of 5/8" (15.9 mm).

T8
A fluorescent lamp which has a diameter of 1" (25.4 mm).

T5 HO
A fluorescent lamp which has a diameter of 5/8" (15.9 mm) and delivers high lumen output.

T5 twin-tube
A fluorescent lamp which has a diameter of 5/8" (15.9 mm) and is bent in a U-shape.

thermal management
The overall process by which the heat generated by the LED is directed away from the semiconductor device and eventually removed from the fixture. It can be any mechanical means, either active or passive.

total harmonic distortion (THD)
The total amount of current at frequencies other than 60 Hz (the main frequency), expressed as a percent of the 60 Hz current. No power is delivered to the load by current at these other frequencies.

For a more detailed glossary of terms, go to **www.lutron.com/glossaryofterms**.

Appendix | **Glossary**

UL Listed
Indicates that the product has been evaluated and undergoes continual assessment by Underwriters Laboratories Inc. to comply with safety standards established by Underwriters Laboratories Inc.

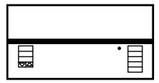
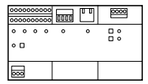
UL Recognized
Indicates that the component is suitable for factory installation only in specific end-products that are UL Listed.

3-way dimming
3-way dimming control (as opposed to single-pole or multi-location control) allows dimming from one location only (using a 3-way dimmer) and on/off switching from a second location (using a 3-way switch or companion/accessory dimmer).

4-way dimming
4-way dimming control (as opposed to single-pole or multi-location control) allows dimming from one location only (using a 3-way dimmer) and on/off switching from two additional locations (using a 3-way switch or companion/accessory dimmer).

For a more detailed glossary of terms, go to **www.lutron.com/glossaryofterms**.

EcoSystem® controls for Hi-lume® A-Series, EcoSystem 5-Series and EcoSystem H-Series LED drivers, and EcoSystem H-Series, Hi-lume 3D, and EcoSystem ballasts

	Control	Part Number	Drivers/Ballasts per Ecosystem Link
	PowPak® Dimming Module with EcoSystem	RMJ-ECO32-DV-B	32
		RMK-ECO32-DV-B	32
		RMM-ECO32-DV-B	32
		RMN-ECO32-DV-B	32
		RMP-ECO32-JA-B	32
		RMP-ECO32-JA-B	32
		RMQ-ECO32-DV-B	32
	GRAFIK Eye® QS with EcoSystem	QSGR-_E	64
		QSGRJ-_E	64
	Energi Savr Node™ with EcoSystem	QSN-1ECO-S	64
		QSN-2ECO-S	64
		QSNE-2ECO-D	64
	HomeWorks® QS	LQSE-2ECO-D	64
	Quantum®	QP2*	64

* EcoSystem link available in 120 V and 220-240 V (non-CE) models only, not available in 230 V (CE) models.

Appendix | **Control Options by LED Driver and Ballast Type**

3-wire controls for Hi-lume® A-Series LED drivers and Hi-lume, Hi-lume 3D, and EcoSystem® ballasts

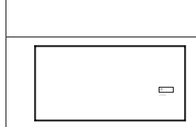
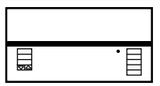
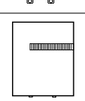
	Control Family	Part Number		Driver/Ballast per Control	
		120 V	277 V	120 V	277 V
	Nova T®	NTF-10	NTF-10-277	1–41	1–44
		NTF-103P	NTF-103P-277	1–20	1–33
	Nova®	NF-10	NF-10-277	1–41	1–44
		NF-103P	NF-103P-277	1–20	1–33
	Skylark®	SF-10P	SF-12P-277	1–20	1–33
		SF-103P	SF-12P-277-3	1–20	1–33
	Diva®	DVF-103P	DVF-103P-277	1–20	1–33
		DVSCF-103P	DVSCF-103P-277	1–20	1–33
	Ariadni®	AYF-103P	AYF-103P-277	1–20	1–44
	Vierti®	VTF-6AM		1–15	1–33
	Maestro®	MAF-6AM	MAF-6AM-277	1–15	1–20
		MSCF-6AM	MSCF-6AM-277	1–15	1–20

3-wire controls for Hi-lume® A-Series LED drivers and Hi-lume, Hi-lume 3D, and EcoSystem® ballasts

	Control Family	Part Number		Driver/Ballast per Control	
		120V	277V	120V	277V
	Maestro Wireless®	MRF2-F6AN-DV		1–15	1–33
	RadioRA® 2	RRD-F6AN-DV		1–15	1–33
	HomeWorks® QS	HQRA-F6AN-DV		1–15	1–33
		HQRD-F6AN-DV		1–15	1–33
	GP dimming panels (GRAFIK Systems and Quantum®)	Various		1–41	1–88
	Interfaces	PHPM-3F-120-WH	—	1–41	—
		PHPM-3F-DV-WH		1–41	1–88

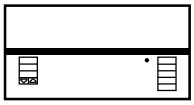
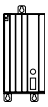
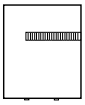
Appendix | **Control Options by LED Driver and Ballast Type**

2-wire forward phase controls for Hi-lume® A-Series LED drivers

	Control Family	Part Number	Driver per Control (120V)
	Maestro Wireless®	MRF2-6ND-120	1–8
	RadioRA® 2	RRD-10ND	1–13
		RRD-6NA*	1–8
	HomeWorks® QS	HQRD-6ND	1–8
		HQRA-6ND	1–8
		HQRD-10ND	1–13
		HQRA-10ND	1–13
		HQRD-6NA*	1–8
		HQRA-6NA*	1–8
		HQRJ-WPM-6D-120	1–10 (per output)
	Wireless Wallbox Power Module (RadioRA 2 and HomeWorks QS)	LQRJ-WPM-6P	1–10 (per output)
	GRAFIK Eye® QS	QSGR-_P	1–10 (per output)
		QSGRJ-_P	1–10 (per output)
	Adaptive dimming remote power module (LCP 128, HomeWorks QS, GRAFIK Systems and Quantum®)	HW-RPM-4A-120*	1–13 (per output)
		LP-RPM-4A-120*	1–13 (per output)
	Dimming remote power module (LCP 128, HomeWorks QS, GRAFIK Systems and Quantum)	HW-RPM-4U-120	1–26 (per output)
		LP-RPM-4U-120	1–26 (per output)
	GP dimming panels (GRAFIK Systems and Quantum)	Various	1–26 (per output)

* Phase adaptive dimmers must be configured to forward-phase mode.

2-wire forward phase controls for Hi-lume® A-Series LED drivers (PSE)

	Control Family	Part Number	Driver per Control (100 V)
	HomeWorks®	HWD-5ND-JA	1–8
	GRAFIK Eye® QS	QSGR-_PJA	1–10 (per output)
	Adaptive dimming remote power module (LCP 128 and GRAFIK Systems)	LP-RPM-4A-120*	1–13 (per output)
	Dimming remote power module (LCP 128 and GRAFIK Systems)	LP-RPM-4U-120	1–26 (per output)
	GP dimming panels (GRAFIK Systems)	GP-4-2L-JA	1–26 (per output)

* Phase adaptive dimmers must be configured to forward-phase mode.