Fluorescent ballast and LED driver

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 fluorescent dimming options. The company offers an extensive selection of ballasts, drivers and controls, providing complete fluorescent and LED dimming solutions.

How to use this selection guide

The Fluorescent Ballast and LED Driver Selection Guide helps you:

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

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

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

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

Fluorescent ballast and LED driver selection guide

Solutions for projects of every size

Applications

Single space

Multiple room

Lutron offers an extensive selection of fluorescent ballasts and LED drivers, and can control a variety of sources including EcoSystem®, 3-wire and 2-wire loads, down to 1%.

Lutron® | Scalable light management solutions

The extensive selection of Lutron ballasts, drivers and controls offers a flexible, energy-saving dimming solution

Ballasts

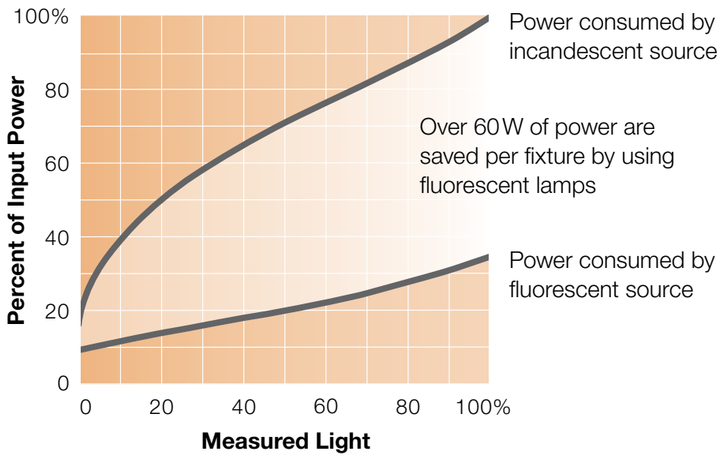
- Available for 1%, 5% and 10% low-end dimming levels, suitable for a variety of applications
- Compatible with several lamp types including T8 linear and U-bent, T5, T5 HO linear, T5 twin-tube and T4 compact lamps
- Digitally addressable dimming ballasts available, with easy setup and increased flexibility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

Drivers

- Offers smooth, continuous 1% dimming for virtually any LED fixture
- Works with Lutron 2-wire forward phase controls, 3-wire fluorescent controls and EcoSystem digital controls
- Available in multiple form factors
- Supports a wide range of current and voltage levels

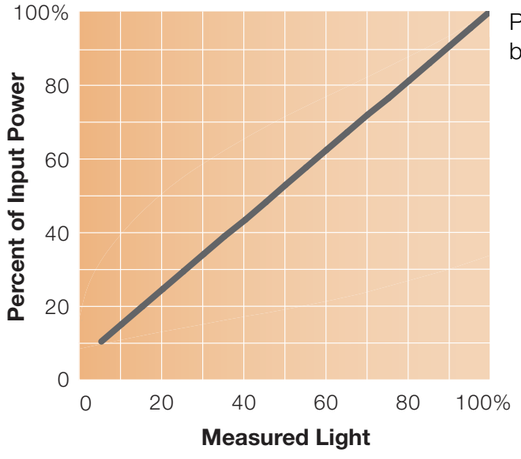
Dimming fluorescent light saves energy

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.



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.



Lutron® | Understanding Lutron ballasts and drivers

Lutron quality

Superior components

Lutron ballasts and drivers 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 ballast and driver reliability.

Additionally, Lutron uses metal enclosures for ballasts and drivers allowing for optimal heat transfer to the lighting fixture.

100% Test

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

100% Burn-in

Lutron “burns in” every ballast and driver prior to shipment. Defects due to faulty components are screened out in this process, resulting in a dramatic reduction of early failures in the field.

Extending lifetime

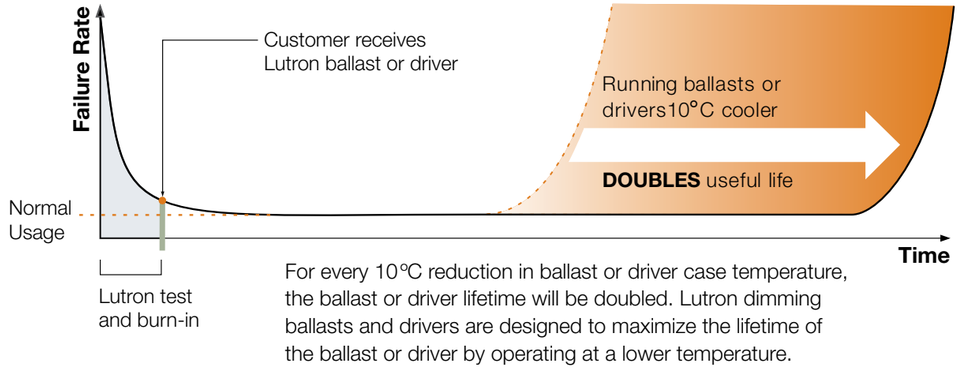
All electronic ballasts and drivers use components with a finite lifetime. A major factor for ballast and driver lifetime is operating temperature. For every 10°C reduction in case temperature, the lifetime of the ballast or driver will be doubled. Lutron dimming ballasts and drivers are designed to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

Thermal foldback

Lutron-patented “Thermal Foldback Technology” is included in most Lutron ballast and driver models. This feature actively monitors the ballast or driver temperature and adjusts the output power to ensure that the ballast or driver 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 ballast or driver temperature, with minimal impact on light output. Thermal foldback is designed to activate only if the ballast or driver is operated in an environment that exceeds its temperature. This technology prevents premature ballast or driver failure due to overheating. In a properly designed application, thermal foldback will not activate.

Lutron product reliability curve



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

Measured light vs. perceived light

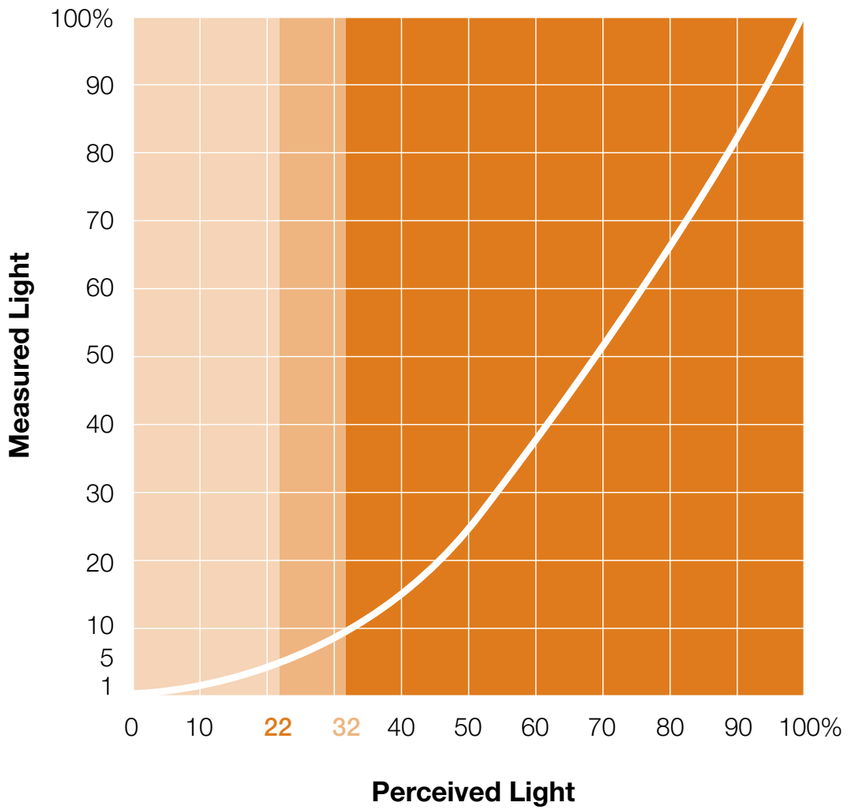
The human eye responds to low light levels by enlarging the pupil, allowing more light to enter the eye. This response results in a difference between measured and perceived light levels.

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)

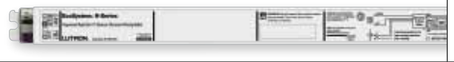


Lutron® | Understanding Lutron ballasts and drivers

Selecting a Lutron ballast or driver

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

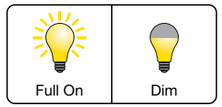
Fluorescent Ballasts

Low-end dimming level	Control options	Ballast family	Available lamp types
1%	EcoSystem® 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
	3-Wire	Hi-lume 	T5 HO linear, T4 compact
5%	EcoSystem digital link and 3-wire	EcoSystem compact 	T4 compact
		Hi-lume 3D 	T5 twin-tube T5 HO linear
	2-Wire	Tu-Wire® 	T8 linear and U-bent, T4 compact
10%	EcoSystem digital link and 3-wire	EcoSystem 	T8 linear and U-bent, T8 reduced wattage, T5 linear, T5 HO linear, T5 twin-tube, T5 twin-tube reduced wattage

LED Drivers

Low-end dimming level	Control options	Driver family	Compatible LED types
1%	EcoSystem digital link, 3-wire and 2-wire forward phase	Hi-lume A-Series LED driver 	Most LED loads of 40W or less
	EcoSystem digital link	EcoSystem LED driver (CE) 	Most LED loads of 25W or less

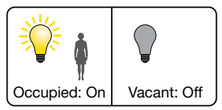
Energy-saving control strategies



Personal control

Provide personal choice and control of light levels to accommodate different tasks and activities. Permit control from multiple locations.

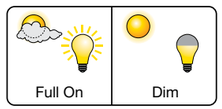
Typical lighting energy savings:
10-20%[1]



Occupancy/vacancy sensing

Gradually dim lights to a low level or turn lights off when space is unoccupied; turn lights on when someone enters.

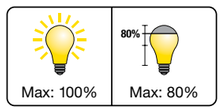
Typical lighting energy savings:
20-60%[2]



Daylight harvesting

Dim electric light or switch it off during the day to take advantage of available daylight.

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



High-end trim

Set the maximum light level in a space based on customer preference or design requirements.

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

[1] Galasiu AD, et al. 2007. Energy saving lighting control systems for open-plan offices: A field study. Leukos. 4(1) pg. 7-29.
[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] Brambley MR, et al. 2005. Advanced sensors and controls for building applications: Market assessment and potential R&D pathways. *Pacific Northwest National Laboratory:* prepared for U.S. Department of Energy.
[4] Pacific Gas and Electric Company. 1997. Dimming Controls for Lighting.

Lutron® | Energy-saving strategies

Additional energy-saving strategies

While it is true that manual dimming of fluorescent lamps and LEDs saves energy, that is only the beginning of the energy-saving features that Lutron ballasts and drivers offer. Utilize one or more of the following features to maximize energy efficiency.

1 Use occupancy/vacancy sensors

Wasted lighting can account for a majority of a building's total energy usage. Lights left on in unoccupied spaces are a real energy drain. EcoSystem® ballasts communicate through the EcoSystem digital link and are the only ballasts that can connect directly to wired occupancy/vacancy sensors. Other ballasts and drivers can also utilize wireless or wired occupancy/vacancy sensors with a QS sensor module.

2 Optimize ballast efficiency

Low standby power: The EcoSystem H-Series ballast offers extremely low standby power—less than 1 W of power is used when the light source is off.

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 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.

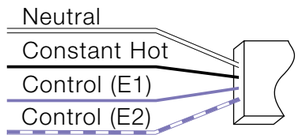
Custom ballast factor

- **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**

Custom ballast factor of 0.55 offers a maximum light level at 55% of the nominal lamp output

Lutron ballast and driver control options

In addition to offering ballasts and drivers with different low-end dimming levels, Lutron offers a variety of control options.

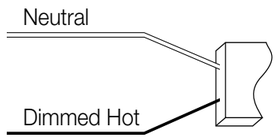


EcoSystem® digital link
The EcoSystem digital link is a wired communication technology that facilitates individual ballast addressing, connection of multiple control devices and control of ballasts individually or in groups.

Control type	Features	Ideal applications
EcoSystem digital link	• Polarity insensitive, may be wired in any topology • May be run with line-voltage wiring (Class 1) or separately from the line-voltage wiring (Class 2) • Allows for rezoning without rewiring and all 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™

Available for:

- EcoSystem H-Series ballasts (UL and global models)
- Hi-lume® 3D ballasts
- EcoSystem ballasts
- EcoSystem compact ballasts
- Hi-lume A-Series LED drivers
- EcoSystem LED drivers (CE)



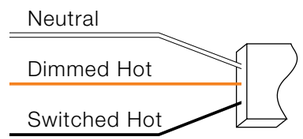
Tu-Wire®
Tu-Wire control is a line-voltage phase control dimming method that uses two wires: Dimmed Hot, which carries the dimming signal; and Neutral.

Control type	Features	Ideal applications
Tu-Wire	• All wires are rated Class 1 • Easy to wire, used to implement dimming in existing fluorescent fixtures	• Small-scale retrofit applications

Available for:

- Tu-Wire ballasts

Lutron® | Control options

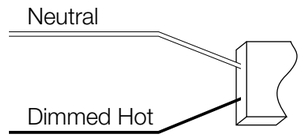


3-Wire
3-Wire control is a line-voltage phase control dimming method that communicates the dimming signal through a wire called Dimmed Hot.

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 • 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	• Typically used for incandescent and magnetic low-voltage (MLV) light sources • Easy to wire	• Retrofit projects • Residential and commercial system applications • Applications that have a neutral wire in the backbox

Available for:

- Hi-lume A-Series LED drivers

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

Control type	Product family	Compatible systems
EcoSystem® digital link	• EcoSystem H-Series • Hi-lume® 3D • EcoSystem • EcoSystem Compact • Hi-lume A-Series LED • EcoSystem LED (CE models)	• PowPak™ dimming module with EcoSystem • GRAFIK Eye® QS with EcoSystem • Energi Savr Node™ with EcoSystem • Quantum®
3-Wire	• Hi-lume 3D • EcoSystem • EcoSystem Compact • Hi-lume • Hi-lume A-Series LED	• 3-Wire wallbox controls • Maestro Wireless® • GRAFIK Eye QS* • GRAFIK Eye 3000* • GRAFIK Eye 4000 • GRAFIK 5000™/6000®/7000™ • LCP128™* • Quantum • RadioRA® 2 • HomeWorks® QS* • HomeWorks*
Tu-Wire®	• Tu-Wire	• Tu-Wire wallbox controls • 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	• Select wallbox controls (neutral required) • 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. It uses Lutron EcoSystem technology in intelligent fluorescent and LED lighting control solutions, creating space flexibility that adjusts to the changing needs of any building.
www.lutron.com/energitripak

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. You'll save energy while meeting the aesthetic, functional, and regulatory needs of any project. GRAFIK Eye QS with EcoSystem includes direct control of EcoSystem, EcoSystem H-Series, and Hi-lume 3D ballasts, and Hi-lume A-Series LED drivers. Using wireless technology, GRAFIK Eye QS with EcoSystem also 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 ballasts and drivers. It communicates with wireless devices through the QS sensor module to minimize wiring for easy installation. Energi Savr Node with EcoSystem is simple to setup and manually customize, and has the option of preconfigured occupancy sensing and daylight modes for out-of-the box functionality.
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 your building. Quantum automatically dims or switches all electric lighting and controls daylight using automated window shades. It manages, monitors, and reports on all the lighting usage in your building for optimal energy performance and productivity while minimizing maintenance and operating costs.
www.lutron.com/quantum

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

Dimming fluorescent lighting instead of repeated switching helps maintain lamp life and also saves energy. All Lutron® fluorescent dimming ballasts and LED drivers 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.

The ballasts and drivers 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. 92.

Fluorescent ballasts

EcoSystem® H-Series digital ballasts
EcoSystem digital control
pg. 24

CE, CSA, CCC AND INMETRO MODELS AVAILABLE

Hi-lume® 3D digital ballasts
EcoSystem digital control
3-wire control
pg. 26

EcoSystem digital ballasts
EcoSystem digital control
3-wire control
pg. 28

EcoSystem digital ballasts for compact fluorescent lamps (CFL)
EcoSystem digital control
3-wire control
pg. 30

Hi-lume ballasts
3-wire control
pg. 32

Tu-Wire® ballasts
Tu-Wire control
pg. 34

LED drivers

Hi-lume A-Series digital LED drivers
EcoSystem digital control
3-wire control
2-wire forward phase control
pg. 36

EcoSystem digital LED drivers
EcoSystem digital control
pg. 38

CE MODELS ONLY

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

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

Ballasts and drivers | **Quick reference guide**

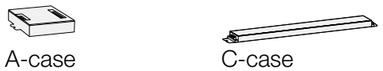
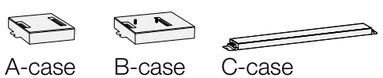
EcoSystem® compatible ballasts and drivers

Family	Compatible Lamp Types and Wattages	Input Voltage	Control Options	Available Case Types (pg. 20)	Low-end dimming level	Integral Sensor Connections
Fluorescent ballasts						
EcoSystem H-Series ballasts pg. 24 	• 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	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz	• EcoSystem digital link	 M-case  G-case	0.7% for T8 1% for T5 and T5 HO	No
EcoSystem H-Series ballasts pg. 24 **Global models** 	• T8 linear: 32 W • T5 HO linear: 24 W, 39 W, 54 W • T5 linear: 14 W, 21 W, 28 W NOTE: For model availability, please refer to page 60.	• 127–220 V INMETRO @ 50/60 Hz • 220–240 V CE @ 50/60 Hz • 220–240 V CCC @ 50/60 Hz • 347 V CSA @ 60 Hz	• EcoSystem digital link	 M-case  C-case (for 347 V only)	1%	No
Hi-lume® 3D ballasts pg. 26 	• 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	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz	• EcoSystem digital link • 3-Wire	 C-case  G-case	0.7% for T8 1% for T5 and T5 HO 5% for T5 twin-tube	No
EcoSystem ballasts pg. 28 	• T8 linear and U-bent: 17 W, 25 W 32 W • T8 linear Reduced Wattage: 25 W, 28 W, 30 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	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz	• EcoSystem digital link • 3-Wire control • Low-voltage wallbox controls, occupancy and daylight sensors	 J-case  G-case	10%	Yes
EcoSystem compact ballasts pg. 30 	• T4 4-pin quad-tube CFL: 18 W, 26 W • T4 4-pin triple-tube CFL: 26 W, 32 W, 42 W	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz	• EcoSystem digital link • 3-Wire	 K-case	5%	No
LED drivers						
Hi-lume A-Series LED drivers pg. 36 	• LED light engines, up to 40 W	• UNV: 120 V, 220/240 V, 277 V @ 50/60 Hz • 120 V only for forward phase control models	• EcoSystem digital link • 3-Wire • 2-Wire forward phase control (neutral required)	 K-case  M-case	1%	No
EcoSystem LED drivers pg. 38 **CE model** 	• LED light engines, up to 25 W	• 220–240 V CE @ 50/60 Hz	• EcoSystem digital link	 P-case	1%	No

Ballasts and drivers | **Quick reference guide**

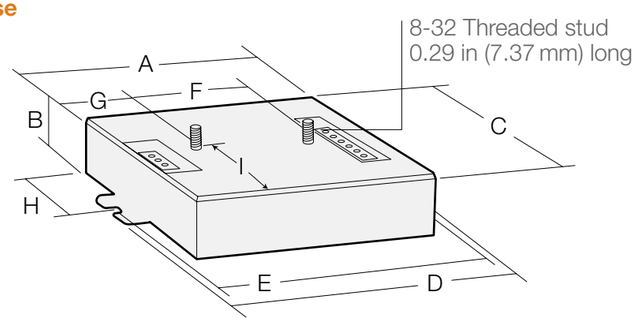
3-Wire and Tu-Wire® compatible ballasts

(For other 3-wire compatible ballasts, see pgs 16-17)

Family	Compatible Lamp Types and Wattages	Input Voltage	Control Options	Available Case Types (pg. 20)	Low-end dimming level	Integral Sensor Connections
Fluorescent ballasts						
Hi-lume® ballasts pg. 32 	• T5 HO linear: 24 W, 39 W, 54 W • T4 4-pin triple-tube CFL: 26 W, 32 W	• 120 V, 277 V @ 60 Hz	• 3-Wire	 A-case C-case	1%	No
Tu-Wire ballasts pg. 34 	• T8 linear and U-bent: 25 W, 32 W • T4 4-pin quad-tube CFL: 18 W, 26 W • T4 4-pin triple-tube CFL: 18 W, 26 W, 32 W	• 120 V @ 60 Hz	• Tu-Wire (fluorescent)	 A-case B-case C-case	5%	No

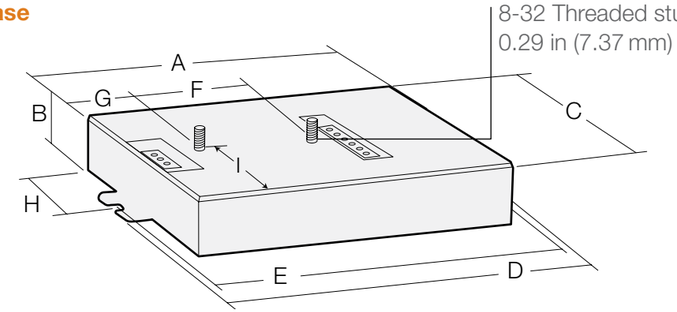
Case dimensions

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

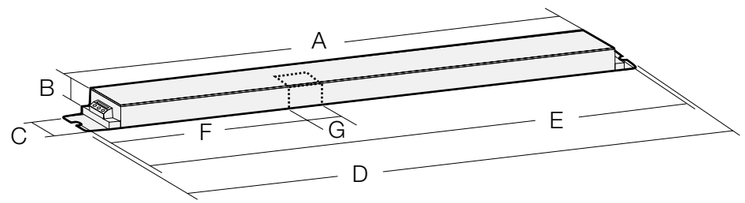


A 6.00 in (152 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 6.75 in (171 mm)
E 6.50 in (165 mm) (mounting centers)
F 2.00 in (51 mm)
G 1.16 in (29 mm)
H 1.60 in (41 mm)
I 1.39 in (35 mm)

Ballasts and drivers | **Quick reference guide**

Case dimensions

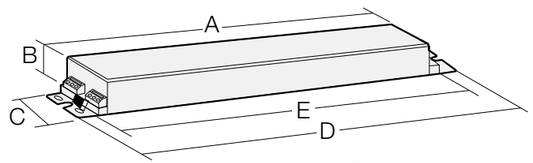
C- or J-case



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



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

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

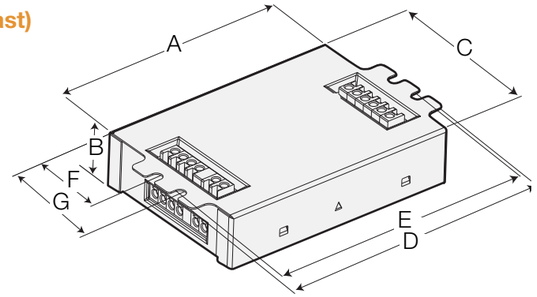
A 7.13 in (181 mm)
B 1.00 in (25 mm)
C 2.38 in (60 mm) (slot mounting centers)
D 9.50 in (241 mm)
E 8.91 in (226 mm)

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

Case dimensions

K-case (Ballast)

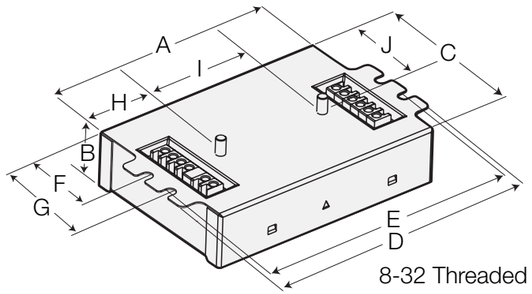
Non-studded:



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)

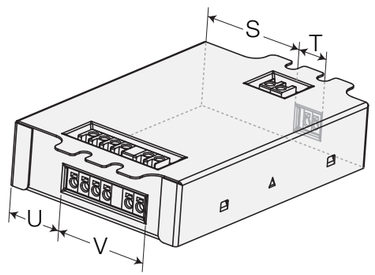
Studded:



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

K-case (LED Driver)

Non-studded:

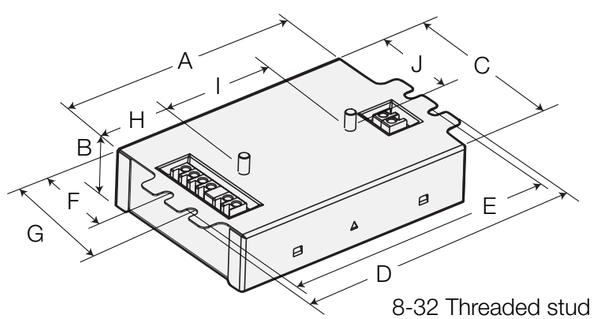


A 4.20 in (107 mm)
B 1.00 in (25 mm)
C 3.00 in (76 mm)
D 4.90 in (124 mm)
E 4.60 in (117 mm) (mounting centers)
F 1.42 in (36 mm)
G 1.99 in (51 mm)

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)

Studded:

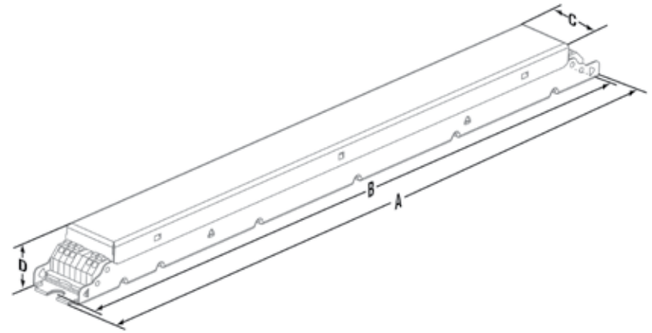


8-32 Threaded stud
0.29 in (7.37 mm) long

Ballasts and drivers | **Quick reference guide**

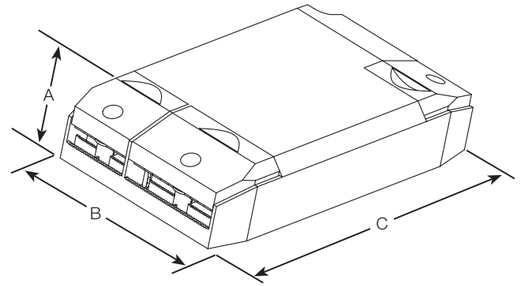
Case dimensions

M-case



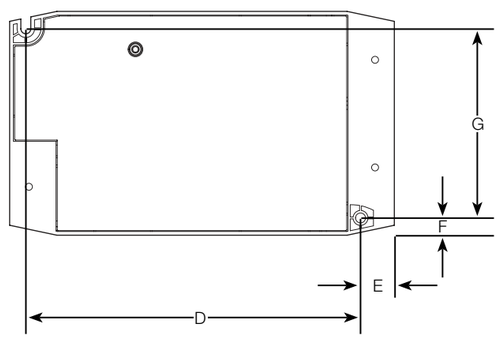
A 14.13 in (359 mm)
B 13.78 in (350 mm) (mounting centers)
C 1.18 in (30 mm)
D 0.98 in (25 mm)

P-case (International models only)



A 31.8 mm
B 90 mm
C 154.7 mm
D 134.6 mm
E 13.6 mm
F 6.95 mm
G 76.05 mm

Mounting centers



Highest performance dimming to 1% at a low cost

EcoSystem digital link controlled

CE, CSA, CCC AND INMETRO MODELS AVAILABLE

Shown above: EcoSystem H-Series, M-case

Model numbers are organized by lamp type, refer to pg. 41 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 from a small area to an entire building.

Operating voltage

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

Lamp types and wattages

UL Listed (for North America):

- 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

Global models:

- T8 linear: 32 W
- T5 HO linear: 24 W, 39 W, 54 W
- T5 linear: 14 W, 21 W, 28 W

Control option

- EcoSystem digital link

Available case types

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

Key standards

- California Energy Commission Listed
- 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
- Models are also available to meet global country-specific standards. See pg. 60 for a listing of global model numbers

For system compatibility information, see pg. 12.

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
- The EcoSystem digital link allows for re-zoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- The EcoSystem digital link supports up to 64 digital ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak™ dimming module with EcoSystem supports 32 EcoSystem ballasts or drivers, 9 Pico® wireless controls, 6 occupancy/vacancy sensors and 1 daylight sensor
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Sensors cannot connect directly to EcoSystem H-Series ballasts
- Communicates with wired or wireless sensors and controls via compatible device
- Line-voltage miswire protection of EcoSystem link
- 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
- 100% performance-tested, including burn-in at the factory

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
- 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.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

Specifications

- Total Harmonic Distortion (THD): less than 10%
- 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 all international models
- Non-volatile memory restores all ballast settings after power failure
- Frequency of operation greater than 42 kHz
- Built-in inrush current-limiting circuitry (maximum of 7 amps at 120 V and 3 amps at 277 V)
- Factory-tuned ballast factors available to customize the ballast for different applications (not available for models outside the US)

Environment

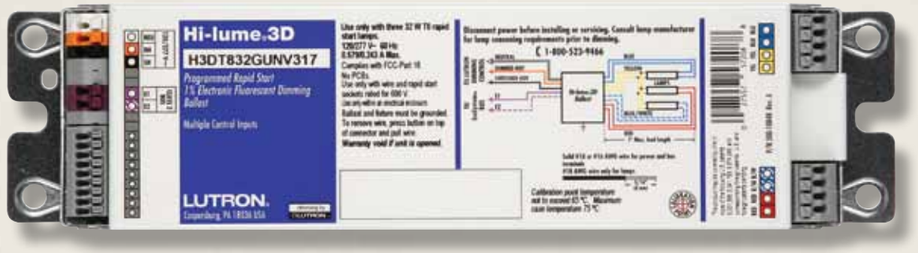
- Sound rating: Class A
- Minimum lamp starting temperature 10°C (50°F)
- Maximum ballast case temperature 75°C (167°F)

Wiring

- EcoSystem H-Series ballasts require 4 wires plus Ground (E1, E2, Constant Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal
- The 16 AWG control wire must not exceed 900 ft, and the 18 AWG must not exceed 550 ft; maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T8, T5 and T5 HO linear lamps
- For control wiring diagrams, see pg. 68, and for lamp wiring diagrams, see pg. 78

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, refer to pg. 41 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[1]: 36 W, 40 W, 50 W

Control options

- EcoSystem digital link
- 3-Wire control

Available case types

- C-case
- G-case

Key standards

- California Energy Commission Listed
- 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
- Select models are NOM listed

[1]T5 twin-tube models dim to 5%

For system compatibility information, see pg. 12.

Features

- Industry-leading ballast efficacy of up to 100 lumens per watt
- 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
- The EcoSystem digital link supports up to 64 digital ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak™ dimming module with EcoSystem supports 32 EcoSystem ballasts or drivers, 9 Pico® wireless controls, 6 occupancy/vacancy sensors and 1 daylight sensor
- EcoSystem digital link allows for re-zoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Sensors cannot connect directly to the Hi-lume 3D ballasts
- Communicates with wired or wireless sensors and controls via compatible device
- Line-voltage miswire protection of EcoSystem link
- 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
- 100% performance-tested, including burn-in at the factory

Specifications

- 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
- Frequency of operation greater than 42 kHz
- 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
- 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.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

Wiring

- **EcoSystem digital link:** Hi-lume 3D ballasts require 4 wires plus Ground (E1, E2, Constant Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal

  3-Wire: Hi-lume 3D ballasts require 3 wires plus Ground (Dimmed Hot, Switched Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal
- The 16 AWG control wire must not exceed 900 ft, and the 18 AWG must not exceed 550 ft; 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
- For control wiring diagrams, see pg. 68, and for lamp wiring diagrams, see pg. 78.

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, refer to pg. 41 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: 25 W, 28 W, 30 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

- California Energy Commission Listed
- UL Listed (evaluated to the requirements of UL 935)
- CSA Certified (evaluated to the requirements of C22.2 No. 74)
- Select models are NOM listed
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions

For system compatibility information, see pg. 12.

Features

- Continuous, flicker-free dimming from 100% to 10%
- EcoSystem digital link allows for re-zoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- The EcoSystem digital link supports up to 64 digital ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak™ dimming module with EcoSystem supports 32 EcoSystem ballasts or drivers, 9 Pico® wireless controls, 6 occupancy/vacancy sensors and 1 daylight sensor
- Low-voltage, 2-conductor EcoSystem digital link provides individual, reconfigurable fixture control
- Supports digital control and standard 3-wire line-voltage phase control technology
- Sensors can connect directly to EcoSystem ballasts; all sensor and wallstation wiring is Class 2
- Communicates with wired or wireless sensors and controls via local wired sensor connections or compatible device
- Line-voltage miswire protection of EcoSystem link
- 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
- 100% performance-tested, including burn-in at the factory

Specifications

- 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
- 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
- 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.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

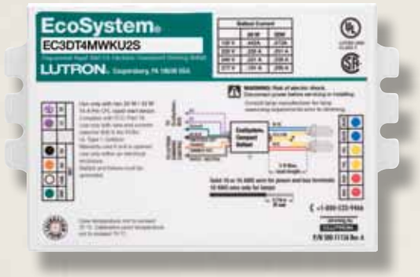
Wiring

- **EcoSystem digital link:** EcoSystem ballasts require 4 wires plus Ground (E1, E2, Constant Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal

  3-Wire: EcoSystem ballasts require 3 wires plus Ground (Dimmed Hot, Switched Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal
- The 16 AWG control wire must not exceed 900 ft, and the 18 AWG must not exceed 550 ft; 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
- For control wiring diagrams, see pg. 68, and for lamp wiring diagrams, see pg. 78.

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, refer to pg. 41 for additional information.

EcoSystem compact ballasts provide high-performance dimming for any compact fluorescent 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 (120 V, 220/240 V, 277 V @ 50/60 Hz)

Lamp types and wattages

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

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)
- Select models are NOM listed
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions

Control options

- EcoSystem digital link
- 3-Wire control

Available case type

- K-case

Quick comparison

Feature	EcoSystem Compact	EcoSystem pg. 28
Dimming Level	5%	10%
Integral sensor connection	No	Yes
Maximum number of lamps per ballast	2	3
Maximum ballast to lamp socket lead length	3 ft (1 m)	7 ft (2 m)

For system compatibility information, see pg. 12.

Features

- Continuous, flicker-free dimming from 100% to 5% for T4 CFL lamps
- EcoSystem digital link allows for re-zoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- The EcoSystem digital link supports up to 64 digital ballasts, 64 occupancy sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak™ dimming module with EcoSystem supports 32 EcoSystem ballasts or drivers, 9 Pico® wireless controls, 6 occupancy/vacancy sensors and 1 daylight sensor
- Low-voltage, 2-conductor EcoSystem digital link provides individual fixture control
- Communicates with wired or wireless sensors and controls via compatible device
- Sensors cannot connect directly to EcoSystem compact ballasts
- Line-voltage miswire protection of EcoSystem link
- One model can control both 26 W and 32 W T4 lamps
- Ultra-low standby power (<1W) when lamps are off
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- 100% performance-tested, including burn-in at the factory

Specifications

- 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
- 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
- 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.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

Wiring

- **EcoSystem digital link:** EcoSystem compact ballasts require 4 wires plus Ground (E1, E2, Constant Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal

  3-Wire: EcoSystem compact ballasts require 3 wires plus Ground (Dimmed Hot, Switched Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal
- The 16 AWG control wire must not exceed 900 ft, and the 18 AWG must not exceed 550 ft; maximum ballast-to-lamp-socket lead length is 3 ft (1 m) for T4 compact lamps
- Ballast is grounded via case
- For control wiring diagrams, see pg. 68, and for lamp wiring diagrams, see pg. 78.

Highest performance dimming to 1%

3-Wire controlled

Shown above: Hi-lume ballast, A-case

Model numbers are organized by lamp type, refer to pg. 41 for additional information.

Experience the benefits of full-range, 100% to 1% fluorescent dimming. Designed to meet the most demanding lighting requirements, Hi-lume ballasts enable you to provide the ideal visual environment for any application. The Hi-lume family is extensive, featuring the world's only 100% to 1% dimming ballasts for T4 compact fluorescent lamps. Integrating Hi-lume 1% technology into your designs affords you full control over the lighting in any space.

Operating voltage

- 120 V or 277 V @ 60 Hz

Lamp types and wattages

- T5 HO: 24 W, 39 W, 54 W
- T4 4-pin triple-tube CFL: 26 W, 32 W

Control options

- 3-Wire control

Available case types

- A-case
- C-case

Key standards

- California Energy Commission Listed
- UL Listed (evaluated to the requirements of UL 935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)
- MIL Std. 461E compliant (meets the requirements of CE101, RE101 and RE102)
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions

For system compatibility information, see pg. 12.

Features

- Continuous, flicker-free dimming from 100% to 1%
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity
- 3-Wire line voltage control for consistent fixture-to-fixture dimming
- Sensors cannot connect directly to Hi-lume ballasts
- Line-voltage miswire protection
- Slim-profile design
- Lamps turn on at any dimmed level without going to full brightness
- 100% performance-tested, including burn-in at the factory

Specifications

- Total Harmonic Distortion (THD): less than 10%
- Power factor greater than 0.95
- Ballast factor equal to 0.95 for T4 lamps
- Ballast factor equal to 1.0 for T5 HO lamps

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
- 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.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

Wiring

- Hi-lume ballasts require 3 wires plus Ground (Dimmed Hot, Switched Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal
- Maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T5 HO linear lamps, and 3ft (1m) for T4 compact lamps
- Ballast is grounded via case
- For control wiring diagrams, see pg. 70, and for lamp wiring diagrams, see pg. 78.

High performance dimming to 5%

Tu-Wire controlled

Shown above: Tu-Wire ballast, B-case

Model numbers are organized by lamp type, refer to pg. 41 for additional information.

Tu-Wire ballasts offer high performance 100% to 5% dimming for linear and compact fluorescent lamps. Retrofit applications can benefit from the ease of installation offered by Lutron® Tu-Wire dimming ballasts. Tu-Wire ballasts require only two wires (dimmed hot and neutral) for power and control. Lutron offers a wide range of compatible Tu-Wire controls, making Tu-Wire ballasts a perfect choice for many applications. Additionally, one-lamp T4 models have been designed to meet FCC Part 18 consumer requirements for residential applications.

Operating voltage

- 120 V @ 60 Hz

Lamp types and wattages

- T8 linear and U-bent: 25 W, 32 W
- T4 4-pin quad-tube CFL: 18 W, 26 W
- T4 4-pin triple-tube CFL: 18 W, 26 W, 32 W

Control option

- Tu-Wire control

Available case types

- A-case
- B-case
- C-case

Key standards

- California Energy Commission (CEC) Listed
- UL Listed (evaluated to the requirements of UL 935)
- CSA certified (evaluated to the requirements of C22.2 No. 74)—all models except T8 25 W
- 1-lamp ballasts for T4 CFL meet FCC Part 18 requirements for residential use
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions

For system compatibility information, see pg. 12.

Features

- Continuous, flicker-free dimming from 100% to 5%
- Works with all Lutron Tu-Wire fluorescent controls for consistent dimming performance
- Sensors cannot connect directly to Tu-Wire ballasts
- 2-Wire line voltage control ideal for retrofit
- Line-voltage miswire protection
- Slim-profile design
- Low-line voltage protection circuitry prevents damage to the ballast or lamps if the ballast is connected to an incompatible dimmer
- Lamps turn on at any dimmed level without going to full brightness
- 100% performance-tested, including burn-in at the factory

Specifications

- Total Harmonic Distortion (THD) less than 20%
- Power factor greater than 0.95
- Ballast factor greater than 0.95 for T4 lamps
- Ballast factor equal to 1.0 for T8 lamps

Environment

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

Mounting

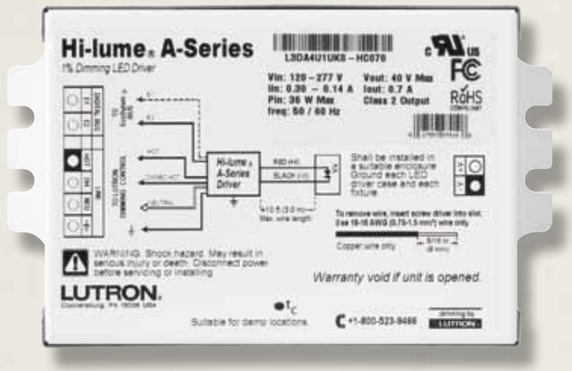
- Ballast mounts using two mounting tabs or studs within a fluorescent fixture
- Lutron and NEMA® recommend sockets complying with IEC 60400. Sockets must have a UL mark as well. Use rapid start sockets, not instant start sockets.
- Terminals accept 16-18 AWG (0.75 to 1.5 mm^2) solid copper or tinned stranded wire

Wiring

- Tu-Wire ballasts require 2 wires plus Ground (Dimmed Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal
- Maximum ballast-to-lamp-socket lead length is 7 ft (2 m) for T8 lamps and 3 ft (1 m) for T4 compact lamps
- Ballast is grounded via case
- For control wiring diagrams, see pg. 72, and for lamp wiring diagrams, see pg. 78.

Highest performance dimming to 1%

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



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

Model number is determined by load and control type. See pg. 63 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 (120 V, 220/240 V and 277 V @ 50/60 Hz)
- 120 V only for 2-wire forward phase models

Control options

- 2-Wire forward phase control (neutral required at control)*
- EcoSystem digital link
- 3-Wire control

Lamp types and wattages

- LED light engines, up to 40 W*

Available case types

- K-case
- M-case

LED operating specifications

Constant Current

- 200 mA–2.1 A (in 10 mA steps)
- 5 W–40 W
- Pulse width modulation (PWM) or constant current reduction (CCR) dimming

Constant Voltage

- 10 V–40 V (in 0.5 V steps)
- 5 W–40 W
- Pulse width modulation (PWM) dimming

For system compatibility information, see pg. 12.

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

Key standards

- UL 8750 Recognized
- FCC Part 15 compliant for commercial applications at 120 V or 277 V and for residential applications at 120 V
- Meets ANSI C62.41 category A surge protection standards up to and including 4 kV
- 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 40 W
- A rated lifetime of 50,000 hours
- EcoSystem digital link allows for re-zoning without rewiring, and can be wired as Class 1 or Class 2—perfect for retrofit and new construction
- Standard 3-wire line-voltage phase-control technology for consistent dimming performance and compatibility with all Lutron 3-wire fluorescent dimmers
- 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.
- Sensors cannot connect directly to the driver
- Line-voltage miswire protection
- Instant light output at any level when turned on, without flashing to full on

Specifications

- Power factor greater than 0.90 at 40 W
- Inrush current less than 2 A

Environment

- Sound rating: Class A
- Maximum case temperature is 65°C (149°F)

Mounting

- K-case driver typically mounts via studs or tabs to the outside of an LED fixture or on a junction box
- "No studs" case option available
- Any fixture type (downlight, cove light, sconce, under-cabinet, etc.) will work with the Hi-lume A-Series driver family, if the LED light engine operates at either the constant current or constant voltage levels specified

Wiring

- **EcoSystem digital link:** Hi-lume A-Series LED drivers require 4 wires plus Ground (E1, E2, Constant Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal

  3-Wire: Requires 3 wires plus Ground (Dimmed Hot, Switched Hot and Neutral); one 16-18 AWG solid copper Class 1 wire per terminal

  2-Wire forward phase: Requires 2 wires plus Ground (Dimmed Hot and Neutral); one 16-18 AWG solid copper Class 1 or Class 2 wire per terminal
- The 16 AWG control wire must not exceed 900 ft, and the 18 AWG must not exceed 550 ft; maximum driver-to-LED light engine wire length is 10 ft (3 m)
- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K-case)
- For control wiring diagrams, see pg. 74, and for lamp wiring diagrams, see pg. 80.

Highest performance dimming to 1%

EcoSystem digital link controlled

CE MODELS ONLY

Shown above: EcoSystem LED driver, P-case

Model number is determined by load and control type. See pg. 64 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

- LED light engines, 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–38 V (in 0.5 V increments)
- 5 W–25 W
- Pulse width modulation (PWM) dimming

For system compatibility information, see pg. 12.

Key standards

- CE and ENEC Mark
- RoHS 2006 Compliant
- IEC Rated

Features

- Continuous, flicker-free dimming from 100% to 1%
- Efficiency of 80% at 25 W
- Protected from miswires of input power to EcoSystem control inputs
- 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
- A rated lifetime of 50,000 hours
- Independent control gear with integral strain relief
- LEDs turn on to any dimmed level without flashing to full brightness
- Sensors cannot connect directly to the driver

Specifications

- Power factor greater than 0.95 at 25 W
- Low harmonic distortion
- Inrush current less than 2 A

Environment

- Sound rating: inaudible in a 27 dB ambient environment

Mounting

- Independent control gear, driver requires no particular mounting means

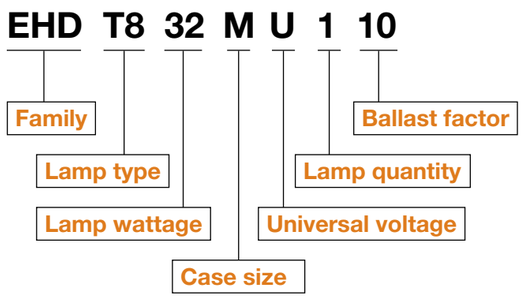
Wiring

- EcoSystem LED drivers require 4 wires plus Ground (E1, E2, Live and Neutral); one 0.75 mm^2 to 1.5 mm^2 solid copper Class 1 or Class 2 wire per terminal
- The 1.5 mm^2 control wire must not exceed 310 m, and the 0.75 mm^2 must not exceed 50 m; maximum driver-to-LED light engine wire length is 3 m for any output type
- For control wiring diagrams, see pg. 75, and for lamp wiring diagrams, see pg. 80.

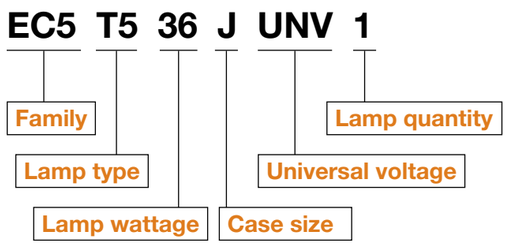
Understanding ballast model numbers

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

EcoSystem® H-Series ballasts



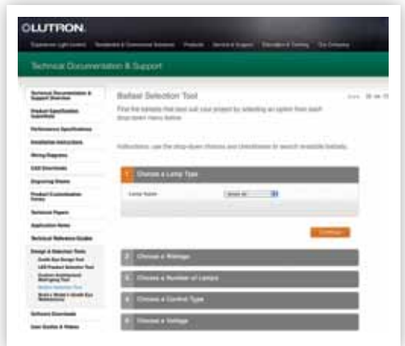
EcoSystem ballasts



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



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

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

T8 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
- Energy saving and cost effective

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
17W (24 in)	1	**EHD T817 M U 1 10**	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**	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
25W (36 in)	1	**EHD T825 M U 1 10**	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**	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
32W (48 in)	1	**EHD T832 M U 1 10**	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	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**	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	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**	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	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T8 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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
17W (24 in)	1	**H3D T817 C U 1 10** **H3D T817 G U 1 10**	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 **H3D T817 G U 1 17**	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** **H3D T817 G U 2 10**	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 **H3D T817 G U 2 17**	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**	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	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
25W (36 in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

T8 and U-bent (continued)

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

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
32W (48 in)	1	**H3D T832 C U 1 10** **H3D T832 G U 1 10**	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 **H3D T832 G U 1 17**	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** **H3D T832 G U 2 10**	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 **H3D T832 G U 2 17**	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**	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	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
40W (60 in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T8 and U-bent (continued)

Tu-Wire® (5% dimming) 120V dimming ballasts

- Dimming to 5%
- Compatible with Lutron® Tu-Wire fluorescent controls
- Energy saving

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
25W (36 in)	1	**2W-T825-120-1**	C	120	0.30	36.0	0.85	1,828	51	2.36	0.76
	2	**2W-T825-120-2**	C	120	0.50	60.0	0.85	3,655	61	1.42	0.91
32W (48 in)	1	**2W-T832-120-1**	C	120	0.37	44.4	0.85	2,550	57	1.91	0.61
	2	**2W-T832-120-2**	C	120	0.70	84.0	0.85	5,100	61	1.01	0.65

Refer to the online ballast selection tool for additional information, **www.lutron.com/BallastTool**

*For case type information see pgs. 20-23.
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

T8 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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
17W (24 in)	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
25W (36 in)	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
32W (48 in)	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**	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††	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††**	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††	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
††Ballast ships with leads.

Reduced Wattage T8 and U-bent

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

- Dimming to 10% for reduced wattage (energy saving) lamps
- Compatible with Lutron® 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
25W (48 in)	1	**EC5 T8RW J UNV 1**	J	277	0.09	24.8	0.85	2,061	83	3.43	0.86
				240	0.10	24.5	0.85	2,061	84	3.47	0.87
				120	0.21	24.9	0.85	2,061	83	3.41	0.85
	2	**EC5 T8RW J UNV 2**	J	277	0.17	46.6	0.85	4,123	88	1.82	0.91
				240	0.19	45.9	0.85	4,123	90	1.85	0.93
				120	0.38	46.5	0.85	4,123	89	1.83	0.91
	3	**EC5 T8RW G UNV 3L††**	G	277	0.25	67.9	0.85	6,184	91	1.25	0.94
				240	0.28	67.4	0.85	6,184	92	1.26	0.95
				120	0.58	69.0	0.85	6,184	90	1.23	0.92
28W (48 in)	1	**EC5 T8RW J UNV 1**	J	277	0.10	26.3	0.85	2,202	84	3.23	0.90
				240	0.11	26.2	0.85	2,202	84	3.24	0.91
				120	0.22	26.5	0.85	2,202	83	3.21	0.90
	2	**EC5 T8RW J UNV 2**	J	277	0.18	48.9	0.85	4,403	90	1.74	0.97
				240	0.20	48.6	0.85	4,403	91	1.75	0.98
				120	0.42	50.0	0.85	4,403	88	1.70	0.95
	3	**EC5 T8RW G UNV 3L††**	G	277	0.26	71.1	0.85	6,605	93	1.20	1.00
				240	0.30	70.4	0.85	6,605	94	1.21	1.01
				120	0.60	71.6	0.85	6,605	92	1.19	1.00
30W (48 in)	1	**EC5 T8RW J UNV 1**	J	277	0.11	28.9	0.85	2,350	81	2.94	0.88
				240	0.12	28.7	0.85	2,350	82	2.96	0.89
				120	0.24	29.2	0.85	2,350	80	2.91	0.87
	2	**EC5 T8RW J UNV 2**	J	277	0.19	52.5	0.85	4,701	90	1.62	0.97
				240	0.22	52.5	0.85	4,701	90	1.62	0.97
				120	0.44	53.4	0.85	4,701	88	1.59	0.96
	3	**EC5 T8RW G UNV 3L**	G	277	0.28	76.3	0.85	7,051	92	1.11	1.00
				240	0.32	76.3	0.85	7,051	92	1.11	1.00
				120	0.65	78.1	0.85	7,051	90	1.09	0.98

Please consult lamp manufacturer's specification to determine the dimmability of the reduced wattage lamp.

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

T5 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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
14W (21.6 in)	1	**EHD T514 M U 1 10**	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**	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
14W (549 mm)	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
21W (33.4 in)	1	**EHD T521 M U 1 10**	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**	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
21W (848 mm)	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
28W (45.2 in)	1	**EHD T528 M U 1 10**	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**	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
28W (1 148 mm)	1	**EHD T528 M E1 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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
14W (21.6 in)	1	**H3D T514 C U 1 10**	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**	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
21W (33.4 in)	1	**H3D T521 C U 1 10**	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**	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
28W (45.2 in)	1	**H3D T528 C U 1 10**	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**	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
14W (21.6 in)	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
21W (33.4 in)	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
28W (45.2 in)	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
35W (57.1 in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
24W (21.6 in)	1	**EHD T524 M U 1 10**	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**	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
24W (549 mm)	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
39W (33.4 in)	1	**EHD T539 M U 1 10**	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**	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
39W (848 mm)	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
54W (45.2 in)	1	**EHD T554 M U 1 10**	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**	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
54W (1 148 mm)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

Ballasts and drivers | **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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
24W (21.6 in)	1	**H3D T524 C U 1 10**	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**	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
39W (33.4 in)	1	**H3D T539 C U 1 10**	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**	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
54W (45.2 in)	1	**H3D T554 C U 1 10**	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**	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

T5 HO Linear (continued)

Hi-lume® (1% dimming) 120V and 277V dimming ballasts

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

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
24W (21.6in)	1	**FDB-T524-277-1**	C	277	0.15	36.0	1.00	2,000	56	2.78	0.67
		FDB-T524-120-1		120	0.31	31.2	1.00	2,000	64	3.21	0.77
	2	**FDB-T524-277-2**	C	277	0.24	55.4	1.00	4,000	72	1.81	0.87
		FDB-T524-120-2		120	0.62	54.0	1.00	4,000	74	1.85	0.89
39W (33.4in)	1	**FDB-T539-277-1**	C	277	0.19	47.1	1.00	3,500	74	2.12	0.83
		FDB-T539-120-1		120	0.38	45.6	1.00	3,500	77	2.19	0.86
	2	**FDB-T539-277-2**	C	277	0.32	85.9	1.00	7,000	82	1.16	0.91
		FDB-T539-120-2		120	0.76	91.2	1.00	7,000	77	1.10	0.86
54W (45.2in)	1	**FDB-T554-277-1**	C	277	0.25	69.3	1.00	5,000	72	1.44	0.78
		FDB-T554-120-1		120	0.58	69.6	1.00	5,000	72	1.44	0.78
	2	**FDB-T554-277-2**	C	277	0.45	124.7	1.00	10,000	80	0.80	0.87
		FDB-T554-120-2		120	1.10	132.0	1.00	10,000	76	0.76	0.82

Select Hi-lume ballasts have been discontinued. Please refer to the Cross-reference guide for discontinued ballasts and drivers on pg. 81.

Refer to the online ballast selection tool for additional information, **www.lutron.com/BallastTool**

*For case type information see pgs. 20-23.
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
24W (21.6in)	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
39W (33.4in)	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
54W (45.2in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
36W (15.5 in)	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
40W (22.5 in)	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
50W (22.5 in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
36/39W (15.5 in)	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
40W (22.5 in)	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††**	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
50W (22.5 in)	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
55W (20.7 in)	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
††Ballast ships with leads.

Reduced Wattage T5 Twin-Tube

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

- Dimming to 10% for reduced wattage (energy saving) lamps
- Compatible with Lutron® 3-wire fluorescent controls and EcoSystem digital controls
- Integral sensor connections

Lamp Watts (Length)	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
25W (22.5 in)	1	**EC5 T540 RW J UNV 1**	J	277	0.12	34.3	1.00	2,600	76	2.91	0.73
				240	0.14	34.5	1.00	2,600	75	2.89	0.72
				120	0.28	34.1	1.00	2,600	76	2.93	0.73
	2	**EC5 T540 RW J UNV 2**	J	277	0.21	59.3	1.00	5,200	88	1.68	0.84
				240	0.25	61.0	1.00	5,200	85	1.64	0.82
				120	0.49	59.3	1.00	5,200	88	1.68	0.84

Please consult lamp manufacturer's specification to determine the dimmability of the reduced wattage lamp.

Refer to the online ballast selection tool for additional information, **www.lutron.com/BallastTool**

*For case type information see pgs. 20-23.

Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool

†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

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

T4 Compact

Hi-lume® (1% dimming) 120V and 277V dimming ballasts

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

Lamp Watts	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
26W (Triple Tube)	1	**HL3-T426-277-1-S‡**	A	277	0.12	33.2	0.95	1,710	51	2.86	0.74
		HL3-T426-120-1-S‡		120	0.26	31.2	0.95	1,710	55	3.04	0.79
32W (Triple Tube)	1	**HL3-T432-277-1-S‡**	A	277	0.13	36.0	0.95	2,280	63	2.64	0.84
		HL3-T432-120-1-S‡		120	0.35	37.2	0.95	2,280	61	2.55	0.82

Refer to the online ballast selection tool for additional information, **www.lutron.com/BallastTool**

*For case type information see pgs. 20-23.

†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.

‡Mounting studs standard. Delete -S suffix in the model number if mounting studs are not needed.

T4 Compact (continued)

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*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)**	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
18W (Triple/ Quad Tube)	1	**EC3D T418 K U 1 S‡**	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‡**	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
26W (Triple/ Quad Tube)	1	**EC3D T4MW K U 1 S‡**	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‡**	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
32W (Triple Tube)	1	**EC3D T4MW K U 1 S‡**	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‡**	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
42W (Triple Tube)	1	**EC3D T442 K U 1 S‡**	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‡**	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

*For case type information see pgs. 20-23.
Factory-tuned ballast factors available. To customize, visit **www.lutron.com/BallastTool
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
‡Mounting studs standard. Delete -S suffix in the model number if mounting studs are not needed.

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

T4 Compact (continued)

Tu-Wire® (5% dimming) 120V dimming ballasts

- Dimming to 5%
- Designed for retrofit applications
- Compatible with Lutron Tu-Wire fluorescent controls
- Energy saving

Lamp Watts	Lamps per Ballast	Model Number	Case Type*	Input Voltage (VAC)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)†	System Efficacy (lm/W)†	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
18W (Triple/ Quad Tube)	2	**2W-T418-120-2-S‡**	B	120	0.41	49.2	0.95	2,280	46	1.93	0.70
26W (Triple/ Quad Tube)	1	**2W-T426-120-1-S‡**	A	120	0.27	32.4	0.95	1,710	53	2.93	0.76
	2	**2W-T426-120-2-S‡**	B	120	0.53	63.6	0.95	3,420	54	1.49	0.78
32W (Triple Tube)	1	**2W-T432-120-1-S‡**	A	120	0.33	39.6	0.95	2,280	58	2.40	0.77
	2	**2W-T432-120-2-S‡**	B	120	0.58	69.6	0.95	4,560	66	1.36	0.87

Refer to the online ballast selection tool for additional information, **www.lutron.com/BallastTool**
*For case type information see pgs. 20-23.
†Actual number may vary with lamp model. Please consult the lamp manufacturer for lamp-specific data.
‡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

NOTE: For specification information, please reference page 50

Canada (CSA)

EHD T832 C 347 110
EHD T832 C 347 210
EHD T832 C 347 117
EHD T832 C 347 217
EHD T528 C 347 110
EHD T528 C 347 210
EHD T554 C 347 110
EHD T554 C 347 210

Brazil (INMETRO)

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

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

Japan (PSE)

H3 T432 K 100 1 J
H3 T832 G UNV 1 J
H3 T832 G UNV 2 J

Argentina (S)

H3D T817 C 220 1 10	H3D T540 G 220 2 10	EC5 T521 J 220 1
H3D T817 C 220 2 10	H3D T540 G 220 3 10	EC5 T521 J 220 2
H3D T817 C 220 1 17	H3D T550 G 220 1 10	EC5 T528 J 220 1
H3D T817 C 220 2 17	H3D T550 G 220 2 10	EC5 T528 J 220 2
H3D T817 G 220 1 10	HL3 T426 220 1 S	EC5 T535 J 220 1
H3D T817 G 220 2 10	HL3 T426 220 1	EC5 T817 J 220 1
H3D T817 G 220 1 17	HL3 T432 220 1 S	EC5 T817 J 220 2
H3D T817 G 220 2 17	HL3 T432 220 1	EC5 T825 J 220 1
H3D T817 G 220 3 10	EC3D T418 K 220 1	EC5 T825 J 220 2
H3D T817 G 220 3 17	EC3D T418 K 220 1 S	EC5 T832 G 220 2L
H3D T825 C 220 1 10	EC3D T418 K 220 2	EC5 T832 G 220 3L
H3D T825 C 220 2 10	EC3D T418 K 220 2 S	EC5 T832 G 220 3 17L
H3D T825 C 220 1 17	EC3D T442 K 220 1	EC5 T832 J 220 1
H3D T825 C 220 2 17	EC3D T442 K 220 1 S	EC5 T832 J 220 2
H3D T832 C 220 1 10	EC3D T442 K 220 2	
H3D T832 C 220 2 10	EC3D T442 K 220 2 S	
H3D T832 C 220 1 17	EC3D T4MW K 220 1	
H3D T832 C 220 2 17	EC3D T4MW K 220 1 S	
H3D T832 G 220 1 10	EC3D T4MW K 220 2	
H3D T832 G 220 2 10	EC3D T4MW K 220 2 S	
H3D T832 G 220 1 17	EC5 T536 J 220 1	
H3D T832 G 220 2 17	EC5 T536 J 220 2	
H3D T832 G 220 3 10	EC5 T540 J 220 1	
H3D T832 G 220 3 17	EC5 T540 J 220 2	
H3D T840 C 220 1 10	EC5 T540 G 220 3L	
H3D T840 C 220 2 10	EC5 T550 J 220 1	
H3D T840 C 220 1 17	EC5 T550 J 220 2	
H3D T840 C 220 2 17	EC5 T555 J 220 1	
H3D T514 C 220 1 10	EC5 T555 J 220 2	
H3D T514 C 220 2 10	EC5 T524 J 220 1	
H3D T521 C 220 1 10	EC5 T524 J 220 2	
H3D T521 C 220 2 10	EC5 T539 J 220 1	
H3D T528 C 220 1 10	EC5 T539 J 220 2	
H3D T528 C 220 2 10	EC5 T554 J 220 1	
H3D T536 G 220 1 10	EC5 T554 J 220 2	
H3D T536 G 220 2 10	EC5 T514 J 220 1	
H3D T540 G 220 1 10	EC5 T514 J 220 2	

LED

How to build a Hi-lume® A-Series LED model number:

L__ __A4U1U__ __ – __ __ __ __ __

Example: L3DA4U1UKS-HC070

For assistance, contact our LED Center of Excellence at 1-877-346-5338 or LEDS@lutron.com, or use the online model number tool at www.lutron.com/LEDBuildAModel

1 Control type:*

3D = EcoSystem® or 3-wire control

TE = 2-Wire forward phase control (neutral required)

Case size:

K = Compact

M = Stick

Case style:

S = Studded (K-case only)

N = Non-studded

2

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 (contact fixture manufacturer for specifications)

Class 2 constant voltage

A = 10.0V–12.0V 3.3 A maximum

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

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 (30W maximum)

Isolated Non-class 2 constant current

Y = 0.20A–0.50A 30V–60V

Z = 0.51A–1.00A 30V–60V

*For details on control types, see pg. 65

For current/voltage level and driver output information, see pgs. 66 and 67.

LED

How to build an EcoSystem® LED model number (CE models):

L DE A2E1C PA – _ _ _ _ _

1 Control type:*
DE = Digital Only EcoSystem

2

Current level (for constant current):*
020 = 0.20 A; 021 = 0.21 A … 105 = 1.05 A

Voltage level (for constant voltage):*
100 = 10.0 V; 105 = 10.5 V … 400 = 40.0 V

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 (see following pages for explanation and examples):

Constant voltage	Constant current
A = 8.0 V–12.0 V	G = 0.20 A–0.70 A 8 V–20 V
B = 12.5 V–20.0 V	H = 0.20 A–0.70 A 15 V–40 V
C = 20.5 V–24.0 V	I = 0.71 A–1.05 A 8 V–20 V
D = 24.5 V–40.0 V	J = 0.71 A–1.05 A 15 V–40 V
1.05 A and 25 W maximum	40 V and 25 W maximum

*For details on control types, see pg. 65
For current/voltage level and driver output information, see pgs. 66 and 67.

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

Details for building a Lutron® LED driver model number

1 Choosing a control type input

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 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.

Selection of a control is typically driven by the requirements of the project.

Control type	Features	Ideal applications
2-Wire forward phase control	• Typically used for incandescent and MLV light sources • Generally the only control used for LED retrofit lamps • Most common method of dimming control	• Retrofit projects • Residential and commercial system applications • Applications that have a neutral wire in the backbox
EcoSystem digital link control	• Digitally addressable and allows LED drivers to communicate and react to environmental changes • Allows for rezoning without rewiring, and all links are miswire protected	• Projects requiring digital control for individual fixture addressability • Upgrade from analog 0-10 V control • Multi-zone applications • Small, retrofit applications using Lutron Energi TriPak™
3-Wire control	• Requires a third line voltage control wire, resulting in more precise performance and less electrical noise • Stable over long wire runs • Easily wired	• LED dimming applications requiring precise control

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 driver output

Lutron LED drivers offer models for both constant current and constant voltage applications. These two types of drivers are not interchangeable, and the design of the LED array, decided upon by the fixture manufacturer, determines which driver is appropriate.

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

	Typical applications	Details
Constant current	• Down light 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 12 V and 24 V outputs

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)

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

Details for building a Lutron LED driver model number

❷ Choosing an LED dimming method

For constant current LED drivers, there are two mechanisms for dimming: 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 set amount to achieve a given light level.

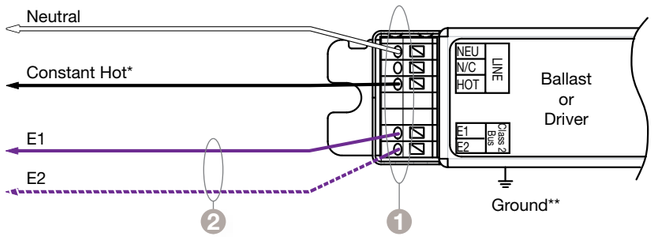
Certain applications may favor a particular dimming method for best results. In most cases, either approach is suitable.

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 • Most commonly used driver output
Constant current reduction (CCR)	• Fixtures requiring a UL Class 2 rated output with an output voltage higher than the UL Class 2 PWM voltage level • Applications where long wire runs may exist between the driver and the light engines and high performance dimming is required • Applications that have strict EMI requirements, such as medical suites • Applications with high motion activity or rotating machinery

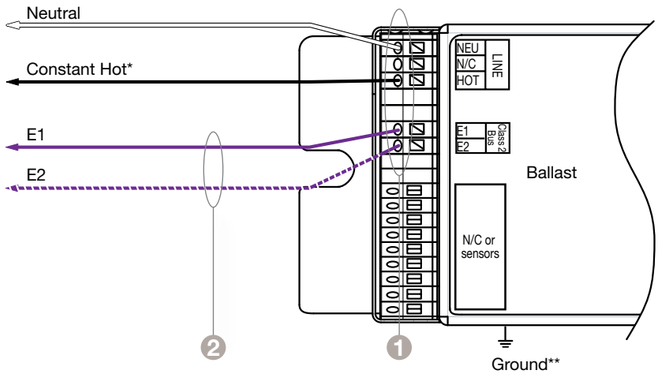
For more information, please use the following resources:
- LED Driver Selection Tool (**www.lutron.com/LEDBuildAModel**)
- Lutron LED Control Center of Excellence (1-877-DIM-LED8 or email LEDs@lutron.com)
- Controlling LEDs whitepaper P/N 367-2035 REV B

EcoSystem® digital link control

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

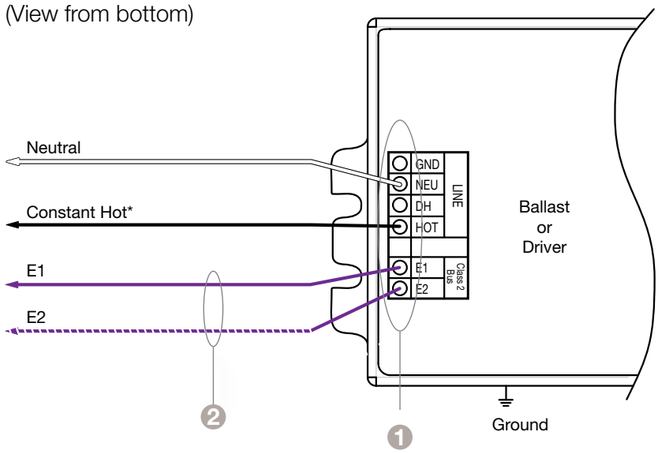


EcoSystem digital link control, G-case



EcoSystem digital link control, K-case

(View from bottom)



Terminals may be located on side and bottom.

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

Features

1. Power and digital link terminals accept only one 16-18 AWG (0.75 to 1.5 mm²) wire
2. See charts on pg. 69 for EcoSystem digital link wiring length details

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

Appendix | **Control wiring diagrams**

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 occupant sensors, 16 daylight sensors, and 64 wallstations or IR receivers
- The PowPak™ dimming module with EcoSystem supports 32 EcoSystem ballasts or drivers, 9 Pico® wireless controls, 6 occupancy/vacancy sensors and 1 daylight sensor
- Control wire colors may not match ballast or driver wire colors

Technical wiring details

- The EcoSystem digital link and power terminals only accept one 16-18 AWG (0.75 mm²-1.5 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
- Ballasts and drivers must be installed per national and local electrical codes
- Driver is grounded by a mounting screw to the grounded fixture (or by terminal connection on the K-case)

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)

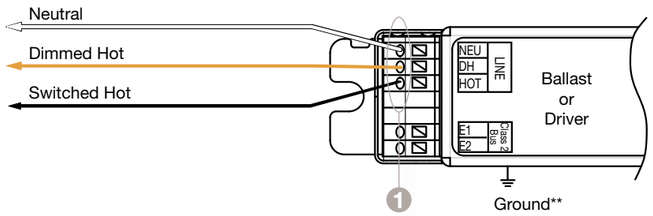
(Use for North America)

Wire size	Digital link length (max)
4.0 mm²	830 m
2.5 mm²	520 m
1.5 mm²	310 m
1.0 mm²	210 m
0.75 mm²	155 m

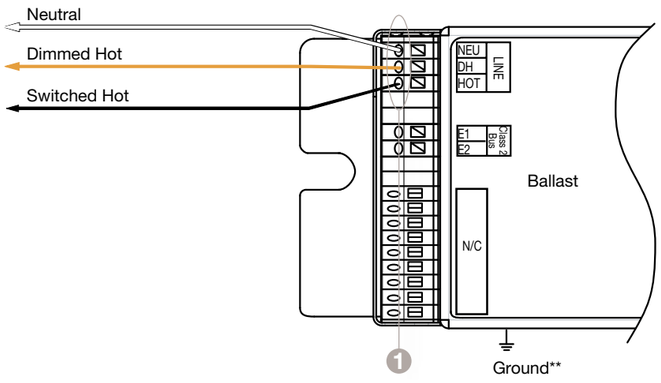
(Use outside of North America)

3-Wire control

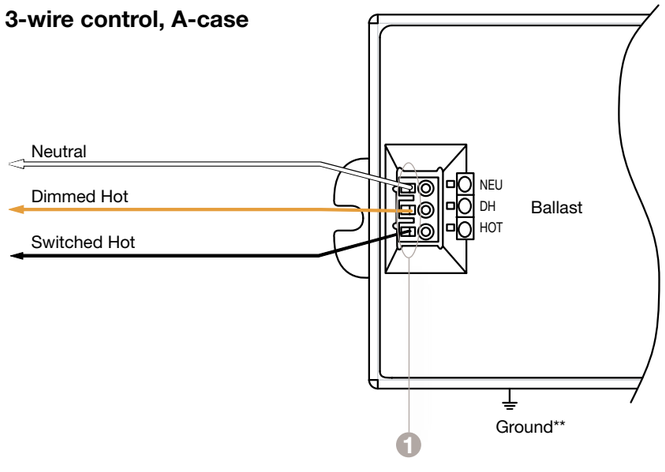
3-wire control, C-case, J-case or M-case



3-wire control, G-case



3-wire control, A-case



Features

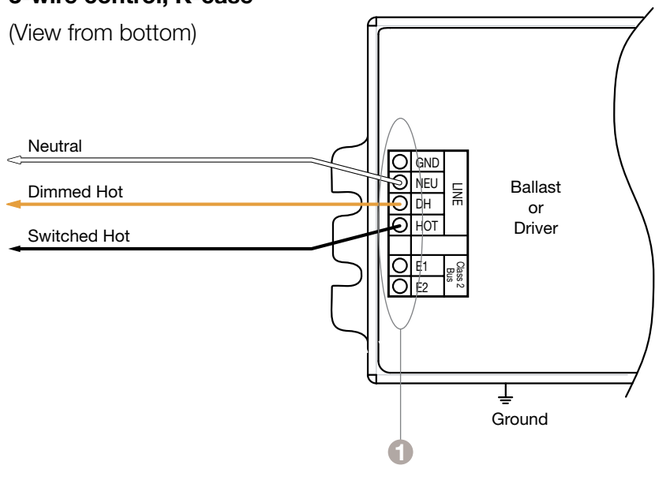
1. Power and terminals accept only one 16-18 AWG (0.75 to 1.5 mm²) wire

****** Ballast is grounded via case.

Appendix | **Control wiring diagrams**

3-wire control, K-case

(View from bottom)



Terminals may be located on side and bottom.

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

Control wiring overview

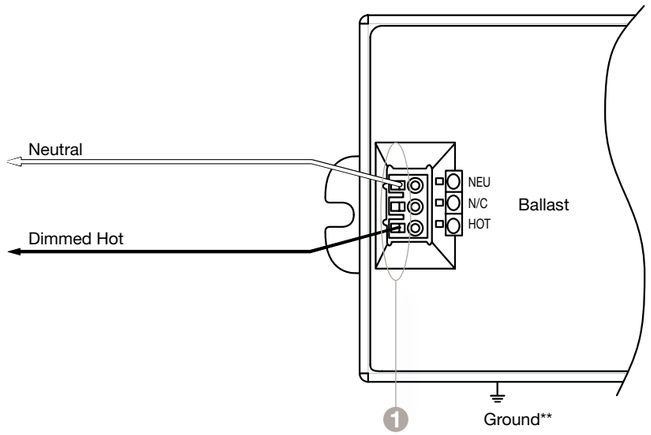
- Class 2 must be separated from Class 1 and line voltage wiring by 0.25 in (6 mm) or a physical barrier
- Sensors cannot connect directly to the ballast or driver
- Control wire colors may not match ballast or driver wire colors

Technical wiring details

- Power input terminals only accept one 16-18 AWG or 0.75 mm²-1.5 mm² solid copper wire per terminal
- Ballasts, drivers and lighting fixtures must be effectively grounded
- Ballasts and drivers must be installed per national and local electrical codes

Tu-Wire® control

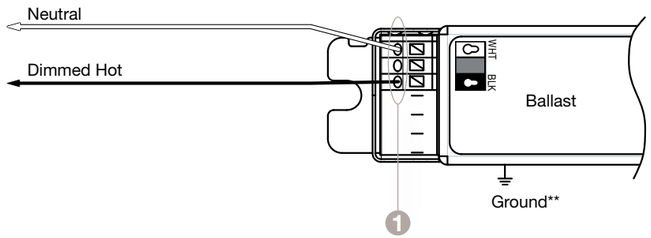
Tu-Wire control, A-case or B-case



Features

1. Power terminals accept only one 16-18 AWG wire

Tu-Wire control, C-case



**Ballast is grounded via case.

Appendix | **Control wiring diagrams**

Control wiring overview

- Ballasts that dim T4 compact fluorescent lamps are intended for factory installation by OEM fixture manufacturers
- Control wire colors may not match ballast or driver wire colors

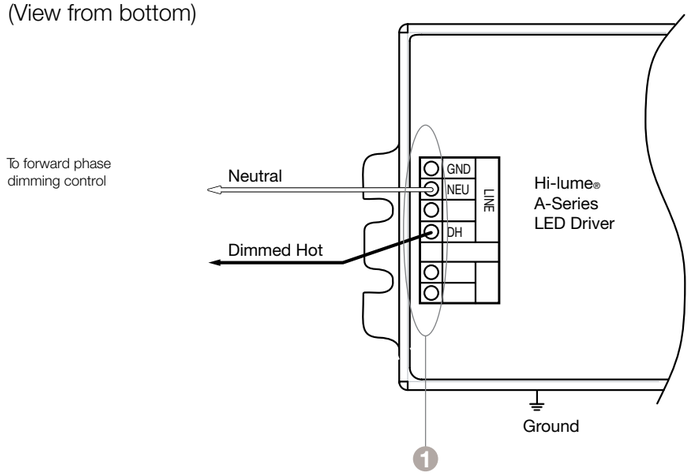
Technical wiring details

- All wiring from the dimming control to Tu-Wire ballasts is line-voltage wiring and may be run together in the same conduit as other line-voltage wires
- Ballasts and lighting fixtures must be effectively grounded
- Ballast must be installed per national and local electrical codes

2-Wire forward phase control

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

(View from bottom)



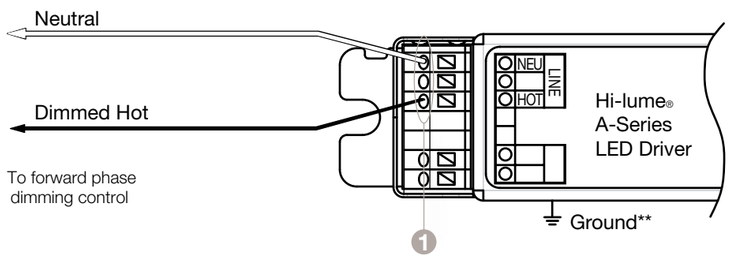
Features

1. Power terminals accept only one 16-18 AWG wire

Terminals may be located on side and bottom.

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

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 ballast or driver wire colors

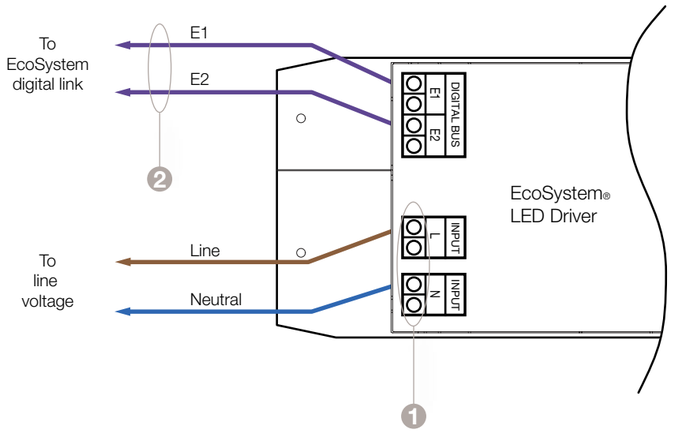
Technical wiring details

- Power input terminals only accept one 16-18 AWG or 0.75 mm^2-1.5 mm^2 solid copper wire per terminal
- Ballasts, drivers and lighting fixtures must be effectively grounded
- Ballasts and drivers must be installed per national and local electrical codes

** Driver is grounded via case.

EcoSystem® digital link control for the EcoSystem LED driver

EcoSystem digital link control, P-case



Features

1. Power terminals accept only one 0.75 mm^2-1.5 mm^2 wire per terminal
2. See table below for EcoSystem digital link wiring details

Control wiring overview

- The EcoSystem digital link wiring (E1 and E2) connects the drivers together to form a lighting control system
- Sensors cannot connect directly to the driver
- E1 and E2 are polarity insensitive and can be wired in any topology
- Each EcoSystem digital link supports up to 64 drivers or ballasts

Technical wiring details

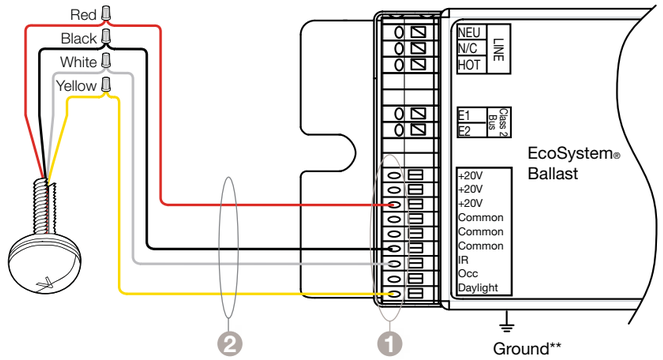
- Terminal blocks on the driver accept one 0.75 mm^2 to 1.5 mm^2 solid copper wire per terminal
- Drivers must be installed per national and local electrical codes

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

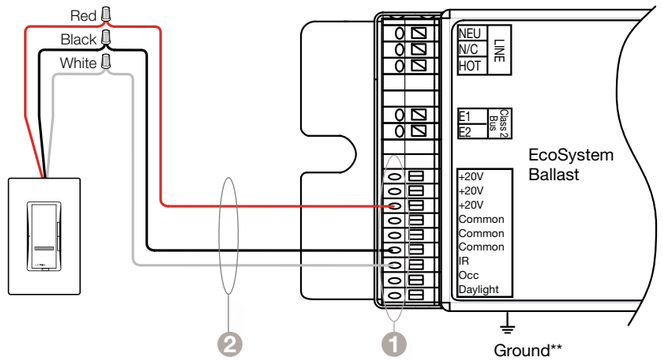
Wire size	Digital link length (max)
4.0 mm^2	830 m
2.5 mm^2	520 m
1.5 mm^2	310 m
1.0 mm^2	210 m
0.75 mm^2	155 m

Class 2 sensor wiring

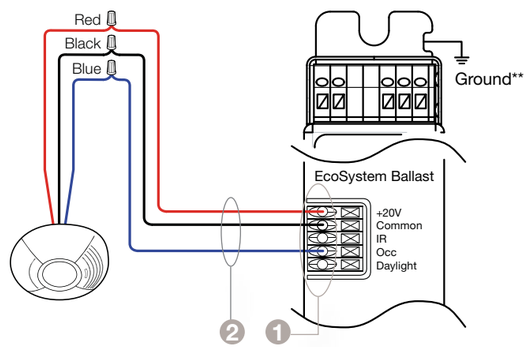
G-can with daylight sensor



G-can with wallstation



J-can with occupancy sensor



Features

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

**Ballast is grounded via case.

Appendix | **Sensor control wiring diagrams**

Sensor wiring overview

- Sensors connect directly to EcoSystem ballasts; all sensor and wallstation wiring is Class 2
- Occupancy 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

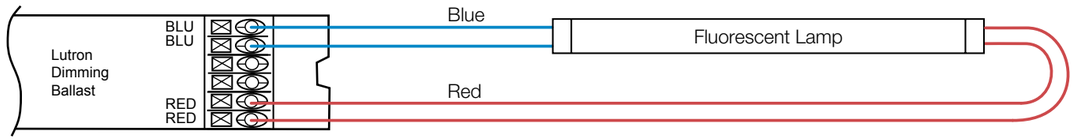
For EcoSystem digital link ballasts without integral sensor connections, wired or wireless sensors can connect to ballasts using the following devices:

- 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. 12.

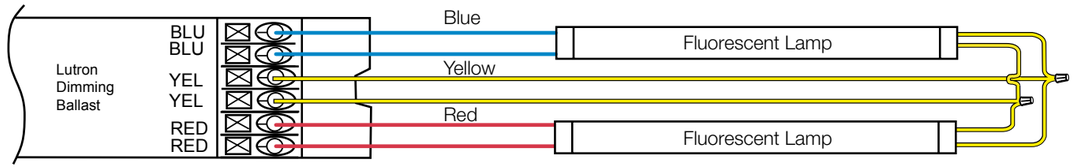
Lamp wiring diagrams

Linear 1-lamp



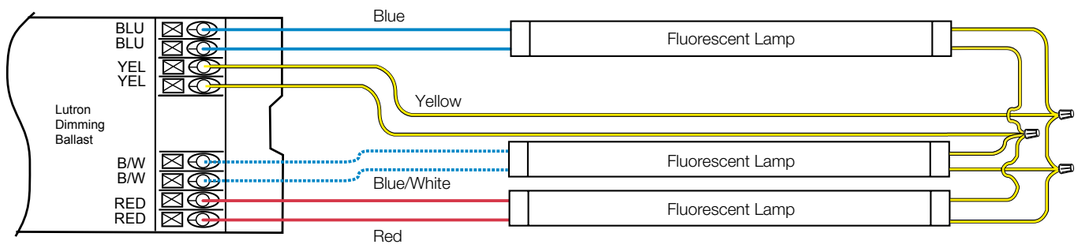
Available in M-case, C-case, J-case, and G-case

Linear 2-lamp



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

Linear 3-lamp



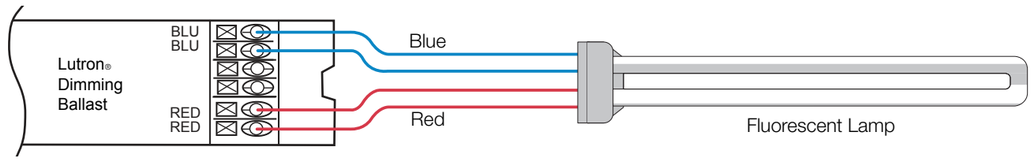
Available in C-case, J-case, and G-case

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.

Appendix | **Lamp wiring diagrams**

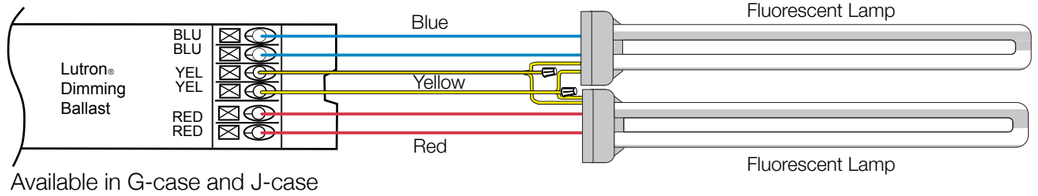
Lamp wiring diagrams

T5 twin-tube 1-lamp



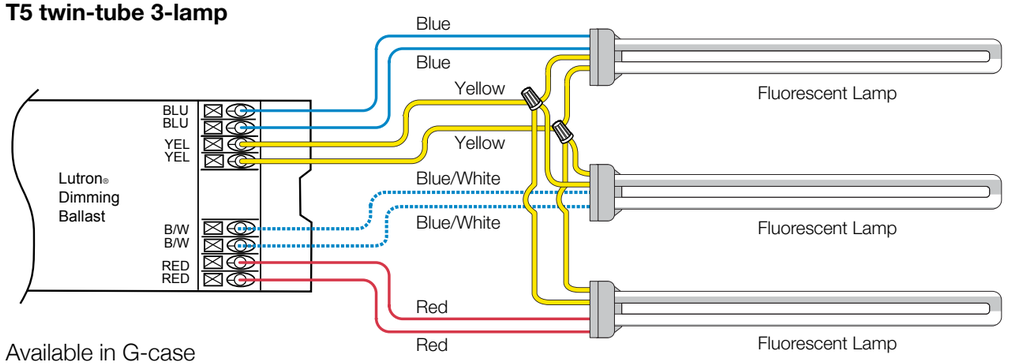
Available in G-case and J-case

T5 twin-tube 2-lamp



Available in G-case and J-case

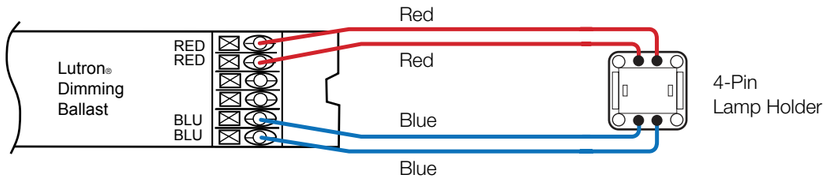
T5 twin-tube 3-lamp



Available in G-case

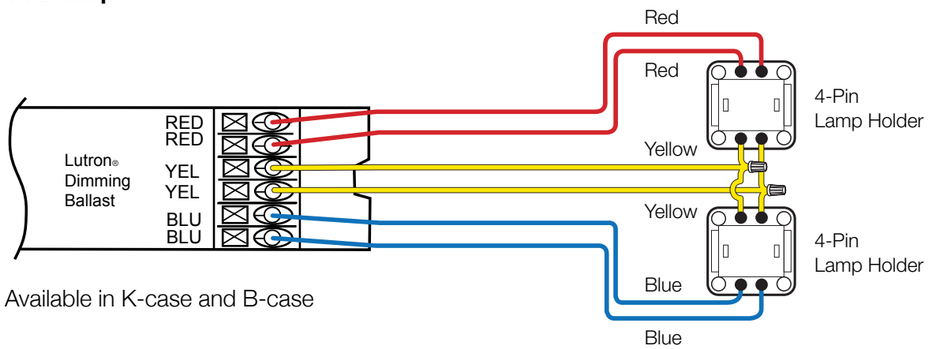
Note: Lamp terminals accept only one 18 AWG (0.75 mm²) wire. Ballast-to-lamp lead lengths must not exceed 3 ft (1 m) for all wiring scenarios shown above.

T4 1-lamp



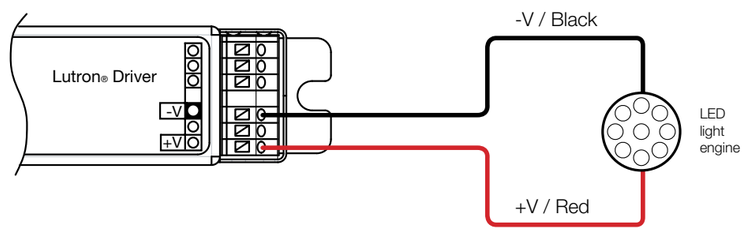
Available in K-case and A-case

T4 2-lamp



Available in K-case and B-case

LED light source



Available in M-case and K-case

Note: Lamp terminals accept only one 18 AWG (0.75 mm^2) wire. Ballast-to-lamp lead lengths must not exceed 3 ft (1 m) for T4 lamps shown above. The maximum wire length from driver to LED light source is 10 ft (3 m).

As Lutron has continued to innovate and develop new products, older technologies have been discontinued. The following list is a summary of all Lutron ballast and driver model numbers that have been discontinued since September 2009. Contact Lutron Customer Service if you have any questions regarding this summary of discontinued ballasts and drivers.

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	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
		EHDT554CU110	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

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

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	1.00	H3DT514CU110	1%	C	1.00
		E3T514C1202	10%	C	1.00	H3DT514CU210	1%	C	1.00
		E3T514C2771	10%	C	1.00	H3DT514CU110	1%	C	1.00
		E3T514C2772	10%	C	1.00	H3DT514CU210	1%	C	1.00
		E3T521C1201	10%	C	1.00	H3DT521CU110	1%	C	1.00
		E3T521C1202	10%	C	1.00	H3DT521CU210	1%	C	1.00
		E3T521C2771	10%	C	1.00	H3DT521CU110	1%	C	1.00
		E3T521C2772	10%	C	1.00	H3DT521CU210	1%	C	1.00
		ECO-T524-120-1	10%	C	1.00	H3DT524CU110	1%	C	1.00
		ECO-T524-120-2	10%	C	1.00	H3DT524CU210	1%	C	1.00
		ECO-T524-277-1	10%	C	1.00	H3DT524CU110	1%	C	1.00
		ECO-T524-277-2	10%	C	1.00	H3DT524CU210	1%	C	1.00
		ECO-T528-120-1	10%	C	1.00	H3DT528CU110	1%	C	1.00
		ECO-T528-120-2	10%	C	1.00	H3DT528CU210	1%	C	1.00
		ECO-T528-277-1	10%	C	1.00	H3DT528CU110	1%	C	1.00
		ECO-T528-277-2	10%	C	1.00	H3DT528CU210	1%	C	1.00
		ECO-T554-120-1	10%	C	1.00	H3DT554CU110	1%	C	1.00
		ECO-T554-120-2	10%	C	1.00	H3DT554CU210	1%	C	1.00
		ECO-T554-277-1	10%	C	1.00	H3DT554CU110	1%	C	1.00
		ECO-T554-277-2	10%	C	1.00	H3DT554CU210	1%	C	1.00
		ECO-T5H39-120-1	10%	C	1.00	H3DT539CU110	1%	C	1.00
		ECO-T5H39-120-2	10%	C	1.00	H3DT539CU210	1%	C	1.00
		ECO-T5H39-277-1	10%	C	1.00	H3DT539CU110	1%	C	1.00
		ECO-T5H39-277-2	10%	C	1.00	H3DT539CU210	1%	C	1.00
		EC3T817GU110	10%	G	1.00	H3DT817GU110	1%	G	1.00
		EC3T817GU210	10%	G	1.00	H3DT817GU210	1%	G	1.00
		EC3T817GU310	10%	G	1.00	H3DT817GU310	1%	G	1.00
		EC3T817CU110	10%	C	1.00	H3DT817CU110	1%	C	1.00
		EC3T817CU210	10%	C	1.00	H3DT817CU210	1%	C	1.00
		EC3T825GU110	10%	G	1.00	Contact Technical Support	–	–	–
		EC3T825GU210	10%	G	1.00	Contact Technical Support	–	–	–
		EC3T825CU110	10%	C	1.00	H3DT825CU110	1%	C	1.00
		EC3T825CU210	10%	C	1.00	H3DT825CU210	1%	C	1.00
		EC3T832GU110	10%	G	1.00	H3DT832GU110	1%	G	1.00
		EC3T832GU210	10%	G	1.00	H3DT832GU210	1%	G	1.00
		EC3T832GU310	10%	G	1.00	H3DT832GU310	1%	G	1.00

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

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)	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%	G	1.17
		EC3T832CU110	10%	C	1.00	H3DT832CU110	1%	C	1.00
		EC3T832CU210	10%	C	1.00	H3DT832CU210	1%	C	1.00
		EC3T832CU117	10%	C	1.17	H3DT832CU117	1%	C	1.17
		EC3T832CU217	10%	C	1.17	H3DT832CU217	1%	C	1.17
	12/31/09	ECO-T817-120-1	10%	F	0.85	H3DT817GU110	1%	G	1.00
		ECO-T817-277-1	10%	F	0.85	H3DT817GU110	1%	G	1.00
		ECO-T817-120-2	10%	F	0.85	H3DT817GU210	1%	G	1.00
		ECO-T817-277-2	10%	F	0.85	H3DT817GU210	1%	G	1.00
		ECO-T817-120-3	10%	F	0.85	H3DT817GU310	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	H3DT825CU110	1%	C	1.00
		ECO-T825-277-1	10%	F	0.85	H3DT825CU110	1%	C	1.00
		ECO-T825-120-2	10%	F	0.85	H3DT825CU210	1%	C	1.00
		ECO-T825-277-2	10%	F	0.85	H3DT825CU210	1%	C	1.00
		ECO-T832-120-1	10%	D	0.85	H3DT832GU110	1%	G	1.00
		ECO-T832-277-1	10%	F	0.85	H3DT832GU110	1%	G	1.00
		ECO-T832-277-1-L	10%	D	0.85	H3DT832GU110	1%	G	1.00
		ECO-T832-277-1-T	10%	D	0.85	H3DT832GU110	1%	G	1.00
		ECO-T832-120-2	10%	D	0.85	H3DT832GU210	1%	G	1.00
		ECO-T832-277-2	10%	F	0.85	H3DT832GU210	1%	G	1.00
		ECO-T832-277-2-L	10%	D	0.85	H3DT832GU210	1%	G	1.00
		ECO-T832-277-2-T	10%	D	0.85	H3DT832GU210	1%	G	1.00
		ECO-T832-120-3	10%	F	0.85	H3DT832GU310	1%	G	1.00
		ECO-T832-277-3	10%	F	0.85	H3DT832GU310	1%	G	1.00
		ECO-T539-120-1	10%	F	0.85	H3DT536GU110	5%	G	1.00
		ECO-T539-277-1	10%	F	0.85	H3DT536GU110	5%	G	1.00
		ECO-T539-120-2	10%	F	0.85	H3DT536GU210	5%	G	1.00
		ECO-T539-277-2	10%	F	0.85	H3DT536GU210	5%	G	1.00
		ECO-T539-120-3	10%	F	0.85	None Available	–	–	–
		ECO-T539-277-3	10%	F	0.85	None Available	–	–	–
		ECO-T540-120-1	10%	F	0.85	H3DT540GU110	5%	G	1.00
		ECO-T540-277-1	10%	F	0.85	H3DT540GU110	5%	G	1.00
		ECO-T540-120-2	10%	F	0.85	H3DT540GU210	5%	G	1.00
		ECO-T540-277-2	10%	F	0.85	H3DT540GU210	5%	G	1.00

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

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-T540-120-3	10%	F	0.85	H3DT540GU310	5%	G	1.00
		ECO-T540-277-3	10%	F	0.85	H3DT540GU310	5%	G	1.00
		ECO-T550-120-1	10%	F	0.85	H3DT550GU110	5%	G	1.00
		ECO-T550-277-1	10%	F	0.85	H3DT550GU110	5%	G	1.00
		ECO-T550-120-2	10%	F	0.85	H3DT550GU210	5%	G	1.00
		ECO-T550-277-2	10%	F	0.85	H3DT550GU210	5%	G	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	None Available	–	–	–
		ECO-T818-240-2	10%	F	0.95	None Available	–	–	–
		ECO-T832-240-2	10%	F	0.95	H3DT832GU210	1%	G	1.00
		ECO-T836-240-1	10%	F	0.95	EHDT836ME110	1%	M	1.00
		ECO-T836-240-2	10%	F	0.95	EHDT836ME210	1%	M	1.00
		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	–	–	–

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

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	None Available	–	–	–
		FDB-3627-277-3	1%	F	0.85	None Available	–	–	–
		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	None Available	–	–	–
		FCE-0626-240-2	5%	F	0.85	None Available	–	–	–
		FCE-1226-240-1	5%	F	0.85	None Available	–	–	–
		FCE-1226-240-2	5%	F	0.85	None Available	–	–	–
		FCE-1526-240-1	5%	F	0.85	None Available	–	–	–
		FCE-1526-240-2	5%	F	0.85	None Available	–	–	–
		FCE-1826-240-1	5%	F	0.85	None Available	–	–	–
		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	None Available	–	–	–
		FCE-CFL36-240-2	5%	F	0.85	None Available	–	–	–
		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 90.

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 90.

Appendix | **Discontinued ballasts and drivers**

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	None Available	–	–	–
		FDB-1643-277-3	5%	F	0.85	None Available	–	–	–
		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 90.

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 Technical Support	–	–
		TVE-T832-347-2	10%	F	0.85	Contact Technical Support	–	–
	10/1/09	BTVF-T832-120-2	10%	F	0.85	Contact Technical Support	–	–
		BTVF-T832-120-3	10%	F	0.85	Contact Technical Support	–	–
		BTVF-T832-277-2	10%	F	0.85	Contact Technical Support	–	–
		BTVF-T832-277-3	10%	F	0.85	Contact Technical Support	–	–
		TVE-T540-120-2	10%	F	0.85	Contact Technical Support	–	–
		TVE-T540-120-3	10%	F	0.85	Contact Technical Support	–	–
		TVE-T540-277-2	10%	F	0.85	Contact Technical Support	–	–
		TVE-T817-120-1	10%	F	0.85	Contact Technical Support	–	–
		TVE-T825-120-1	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-120-1	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-120-2	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-120-3	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-277-1	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-277-2	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-277-3	10%	F	0.85	Contact Technical Support	–	–
		TVE-T832-277-3N	10%	F	0.85	Contact Technical Support	–	–

Appendix | **Discontinued ballasts and drivers**

Hi-lume® LED drivers								
Driver Family	Date of Discontinuation	Discontinued Model	Case Size	Current Level	Replacement Model*	Voltage Range	Case Size	Current Level
Hi-lume LED	6/30/11	L3D25070AUNV1S	A	700 mA	L3DA4U1UKS-HC070	15-38V	K	700 mA
					L3DA4U1UKS-GC070	8-20V	K	700 mA
		L3D25070AUNV1	A	700 mA	L3DA4U1UKN-HC070	15-38V	K	700 mA
					L3DA4U1UKN-GC070	8-20V	K	700 mA
		L3D25105AUNV1S	A	1.05 Amp	L3DA4U1UKS-JC105	15-38V	K	1.05 Amp
					L3DA4U1UKS-IC105	8-20V	K	1.05 Amp
		L3D25105AUNV1	A	1.05 Amp	L3DA4U1UKN-JC105	15-38V	K	1.05 Amp
					L3DA4U1UKN-IC105	8-20V	K	1.05 Amp
		L3D25140AUNV1S	A	1.4 Amp	L3DA4U1UKS-LC140	15-38V	K	1.4 Amp
					L3DA4U1UKS-KC140	8-20V	K	1.4 Amp
		L3D25140AUNV1	A	1.4 Amp	L3DA4U1UKN-LC140	15-38V	K	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

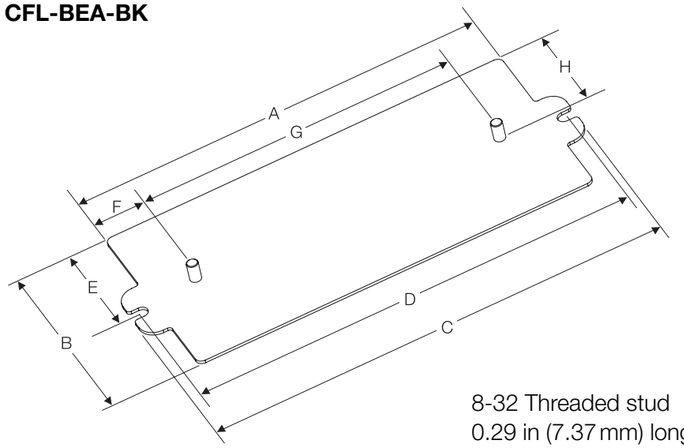
* The model number suffix will depend on the voltage range that the LED fixture needs. An update to the OEM luminaire UL file may be needed. For questions, please contact the LED Control Center of Excellence at 1-877-DIM-LED8.

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.

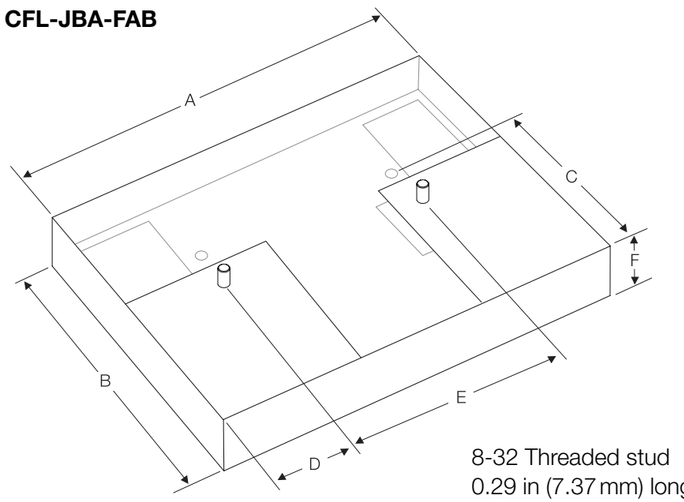
CFL-BEA-BK



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 ballasts and drivers**

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

*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.

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 (former 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

* Currently available, but soon to be phased out.

[1] Scheduled to require products with CE marking in 2011.

Appendix | **Voltages by country**

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
Jamaica	110V
Martinique	220V

[1] Scheduled to require products with CE marking in 2011.

Note: Only EcoSystem® H-Series ballasts and EcoSystem LED drivers meet CE standards.

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: Only EcoSystem® H-Series ballasts and EcoSystem LED drivers meet CE standards.

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.

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

efficiency
See luminous efficacy

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

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.

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.

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 incorporate inrush-current-limiting circuitry.

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

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 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.

load
The device which a dimmer is controlling (e.g., incandescent lamp, ceiling fan, fluorescent lamp).

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 4 or more locations.

phase control
A common method of dimming that removes part of the line cycle, therefore reducing the RMS voltage.

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 and ballast to reduce this noise. Also called electromagnetic interference (EMI). See filter.

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

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

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

Appendix | **Glossary**

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).

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

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.

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.

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.

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).

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

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, and are 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 45 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

LUTRON®

save energy with Lutron™ ®