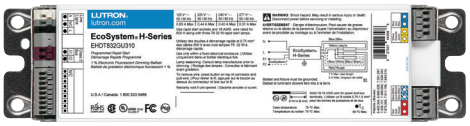
369266o 1 11.29.17

EcoSystem H-Series Ballasts

EcoSystem H-Series digitally addressable ballasts provide a low-cost, flexible solution for any space in any application. Industry leading dimming to less than 1% meets the needs of the most demanding applications. Individual control with the EcoSystem Digital Link eliminates the need to rewire, reduces design time, and provides a scalable solution from a small area to an entire building.

EcoSystem H-Series, case type M

1.18 in (30 mm) W x 1.00 in (25 mm) H x 14.125 in (359 mm) L



EcoSystem H-Series, case type G

2.38 in (60 mm) W x 1.0 in (25 mm) H x 9.5 in (241 mm) L

Features

- Continuous, flicker-free dimming from 100% to 1% or less for T8, and 1% for T5 and T5HO lamps.
- Compatible with Energi Savr Node with EcoSystem unit, GRAFIK Eye QS control unit, PowPak dimming module with EcoSystem unit, and Quantum software, allowing for integration into an existing or planned EcoSystem lighting control solution.
- Programmed rapid start design preheats lamp cathodes before applying full arc voltage to ensure full-rated lamp life while dimming and cycling.
- 100% performance tested and burned in at factory.
- Lamps turn on to any dimmed level without going to full brightness.
- Low harmonic distortion throughout the entire dimming range maintains power quality.
- Frequency of operation ensures that ballast does not interfere with infrared devices operating between 38 kHz and 42 kHz.
- Ballasts maintain consistent light output for different lamp lengths, ensuring fixture-to-fixture uniformity.
- Ultra-quiet operation.
- Ballast protected from miswires of any input power to control lead, or from lamp leads to each other and/or ground.
- End-of-lamp-life protection circuitry ensures safe operation throughout entire lamp life.
- Non-volatile memory restores all ballast settings after power failure.
- 100% compatible with all EcoSystem digital controls.
- Custom ballast factors available for UL or CSA listed products. Design tool and specifications can be found at www.lutron.com/ballasttool
- Buy American Act (BAA) models available. See Model List for specific availability.
- RoHS compliant.
- NOM certified models available. See Model List for specific availability.
- Models available for markets outside North America. — See International EcoSystem H-Series spec sheet.

LUTRON SPECIFICATION SUBMITTAL Page 1

Job Name:	Model Numbers:	
Job Number:		

369266o 2 11.29.17

Specifications

Regulatory Approvals

- UL Listed (evaluated to the requirements of UL935).
- CSA certified (evaluated to the requirements of C22.2 No. 74).
- Class P thermally protected.
- Meets ANSI C82.11 High Frequency Ballast Standard.
- Meets FCC Part 18 Non-Consumer requirements for EMI/RFI emissions.
- This device complies with Part 18 (Non-Consumer Limits) of the FCC Rules. Operation is subject to the following conditions: (1) This device may cause interference to radio equipment. (2) This device should not be installed near maritime safety communications equipment or other critical navigation or communication equipment operating between 0.45–30 MHz.

  Modification not expressly approved by Lutron Electronics Co., Inc. could void the users authority to operate this equipment.

  This Non-Consumer RFLD complies with the Canadian standard ICES-005.
- Meets ANSI C62.41 Category A surge protection standards up to and including 4 kV.
- Manufacturing facilities employ ESD reduction practices that comply with the requirements of ANSI/ESD S20.20.
- Lutron Quality Systems registered to ISO9001.2008.
- Some models are affected by California Title 20 regulation. Customers in California may need to order alternative models to comply. For more information on alternative models, see CEC Title 20 Regulation App Note #601 (P/N 048601) at www.lutron.com/title20ballasts and spec submittal 369280 at www.lutron.com

Ballast Wiring & Mounting

- Ballast is grounded via a mounting screw to the fixture.
- Ballast mounts using two screws (or sheet metal feature and one screw) within a fluorescent fixture.
- Power and lamp wiring terminals accept one 18 AWG to 16 AWG (0.75 mm^2 to 1.5 mm^2) solid copper wire per terminal.

Lamp Seasoning

Refer to the lamp manufacturer's requirements for lamp seasoning requirements prior to dimming.

Environment

- Minimum lamp starting temperature: 50 °F (10 °C)
- Relative humidity: less than 90% non-condensing
- Sound Rating: Class A
- Maximum ballast case temperature: 80 °C

Performance

- Dimming Range: 100% to 0.7% measured Relative Light Output (RLO) for T8, 100% to 1% RLO for T5 and T5HO.
- Lamp Starting: programmed rapid start
- Lamp Current Crest Factor: less than 1.7
- Lamp Flicker: none visible
- Light Output Variation: constant ±2% light output for line voltage variations of ±10%
- Lamp Life: average lamp life meets or exceeds rating of lamp manufacturer.
- Power Factor: greater than 0.95
- Typical Total Harmonic Distortion (THD) less than 10% *
- Operating Voltage: Universal input 120 V~, 220/240 V~, 277 V~ at 50 or 60 Hz
- Frequency of Operation: greater than 42 kHz
- Ballast Factor (BF): 1.0 / 1.17 for T8 lamps and 1.0 for T5 and T5HO lamps
- Standby Power: less than 1 W

Dimming Range for T8 lamps:

BF	Dimming Range (Max/Min [BF])	Dimming Ratio
1.17	1.17 / 0.0085	138:1
1.0	1.00 / 0.0085	118:1

Dimming Range for T5 and T5HO lamps:

BF	Dimming Range (Max/Min [BF])	Dimming Ratio
1.0	1.00 / 0.01	100:1

Warranty

- 5-year limited warranty with Lutron field service commissioning (3-year standard warranty) from date of purchase. For additional Warranty information, please visit: www.lutron.com/ballastwarranty

* Typical THD for models EHDT817MU110, EHDT514MU110, and EHDT521MU110 less than 15%.

Job Name:	Model Numbers:	
Job Number:		

369266o 3 11.29.17

EcoSystem H-Series Ballasts for Linear and U-Bend T8 Lamps

For proper dimming all lamps must comply to accepted standards, 17, 25 and 32 W lamps (NEMA LL9-2000)
Not for use with Reduced Wattage Lamps

Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens[3] (lm)	System Efficacy[3] (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T8 and U-Bend 	32 W (48 in [122 cm])	1	M	EHD T832 M U 1 10[1,2]	120 240 277	0.29 0.14 0.12	1.00 1.00 1.00	34.8 33.6 33.2	3000 3000 3000	86 89 90	2.87 2.98 3.01	0.92 0.95 0.96
		1	M	EHD T832 M U 1 17[1,2]	120 240 277	0.34 0.17 0.15	1.17 1.17 1.17	40.8 40.8 41.6	3510 3510 3510	86 86 84	2.87 2.87 2.82	0.92 0.92 0.90
		2	M	EHD T832 M U 2 10[1,2]	120 240 277	0.57 0.28 0.24	1.00 1.00 1.00	68.4 67.2 66.5	6000 6000 6000	88 89 90	1.46 1.49 1.50	0.94 0.95 0.96
		2	M	EHD T832 M U 2 17[1,2]	120 240 277	0.65 0.32 0.28	1.17 1.17 1.17	78.0 76.8 77.6	7020 7020 7020	90 91 91	1.50 1.52 1.51	0.96 0.98 0.97
		3	G	EHD T832 G U 3 10[1, 4]	120 240 277	0.83 0.40 0.37	1.00 1.00 1.00	99.6 96.0 102.5	9000 9000 9000	90 94 88	1.00 1.04 0.98	0.96 1.00 0.94
		3	G	EHD T832 G U 3 17[1, 4]	120 240 277	0.95 0.47 0.41	1.17 1.17 1.17	114.0 112.8 113.6	10,530 10,530 10,530	92 93 93	1.03 1.04 1.03	0.99 1.00 0.99
	25 W (36 in [91 cm])	1	M	EHD T825 M U 1 10[1,2]	120 240 277	0.26 0.13 0.11	1.00 1.00 1.00	31.2 31.2 30.5	1900 1900 1900	61 61 62	3.21 3.21 3.28	0.80 0.80 0.82
		2	M	EHD T825 M U 2 10[1,2]	120 240 277	0.47 0.23 0.20	1.00 1.00 1.00	56.4 55.2 55.4	3800 3800 3800	67 69 69	1.77 1.81 1.81	0.89 0.91 0.90
	17 W (24 in [61 cm])	1	M	EHD T817 M U 1 10[1,2]	120 240 277	0.18 0.09 0.08	1.00 1.00 1.00	21.6 21.6 22.2	1300 1300 1300	60 60 59	4.63 4.63 4.51	0.79 0.79 0.77
		2	M	EHD T817 M U 2 10[1,2]	120 240 277	0.33 0.16 0.14	1.00 1.00 1.00	42.0 43.2 41.6	2600 2600 2600	62 60 63	2.38 2.31 2.41	0.81 0.79 0.82

[1] BAA models available. Add a "U" to prefix of model number when ordering (ie: UEHD T832 M U 1 10).
[2] NOM approved models available. Add an "N" to suffix of model number when ordering (ie: EHD T832 M U 1 10N).
[3] Actual number may vary with lamp model. Please consult lamp manufacturer for lamp-specific data.
[4] Not for sale in California. For more information on alternative models, see CEC Title 20 Regulation App Note #601 (P/N 048601) at www.lutron.com/title20ballasts and spec submittal 369280 at www.lutron.com

Job Name:	Model Numbers:	
Job Number:		

EcoSystem H-Series Ballasts for T5 Linear Lamps

For proper dimming all lamps must comply to accepted standards, 14 W (60081-IEC-6520), 21 W (60081-IEC-6530) and 28 W (60081-IEC-6640)
Not for use with Reduced Wattage Lamps

Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens[3] (lm)	System Efficacy[3] (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T5 Linear 	28 W (45.2 in [115 cm])	1	M	EHD T528 M U 1 10[1,2]	120 240 277	0.28 0.14 0.12	1.00 1.00 1.00	33.6 33.6 33.0	2900 2900 2900	86 86 88	2.98 2.98 3.03	0.83 0.83 0.85
		2	M	EHD T528 M U 2 10[1,2]	120 240 277	0.52 0.26 0.22	1.00 1.00 1.00	62.4 62.4 59.8	5800 5800 5800	93 93 97	1.60 1.60 1.67	0.90 0.90 0.94
	21 W (33.4 in [84 cm])	1	M	EHD T521 M U 1 10[1,2]	120 240 277	0.22 0.11 0.10	1.00 1.00 1.00	26.3 26.3 26.6	2100 2100 2100	80 80 79	3.81 3.81 3.76	0.80 0.80 0.79
		2	M	EHD T521 M U 2 10[1,2]	120 240 277	0.41 0.20 0.18	1.00 1.00 1.00	48.7 48.6 48.5	4200 4200 4200	86 86 87	2.05 2.06 2.06	0.86 0.86 0.87
	14 W (21.6 in [55 cm])	1	M	EHD T514 M U 1 10[1,2]	120 240 277	0.16 0.08 0.07	1.00 1.00 1.00	19.2 19.2 19.4	1350 1350 1350	70 70 70	5.21 5.21 5.16	0.73 0.73 0.72
		2	M	EHD T514 M U 2 10[1,2]	120 240 277	0.30 0.15 0.13	1.00 1.00 1.00	36.0 36.0 36.0	2700 2700 2700	75 75 75	2.78 2.78 2.78	0.78 0.78 0.78

EcoSystem H-Series Ballasts for T5HO Linear Lamps

For proper dimming all lamps must comply to accepted standards, 24 W (60081-IEC-6620), 39 W (60081-IEC-6730) and 54 W (60081-IEC-6840)
Not for use with Reduced Wattage Lamps

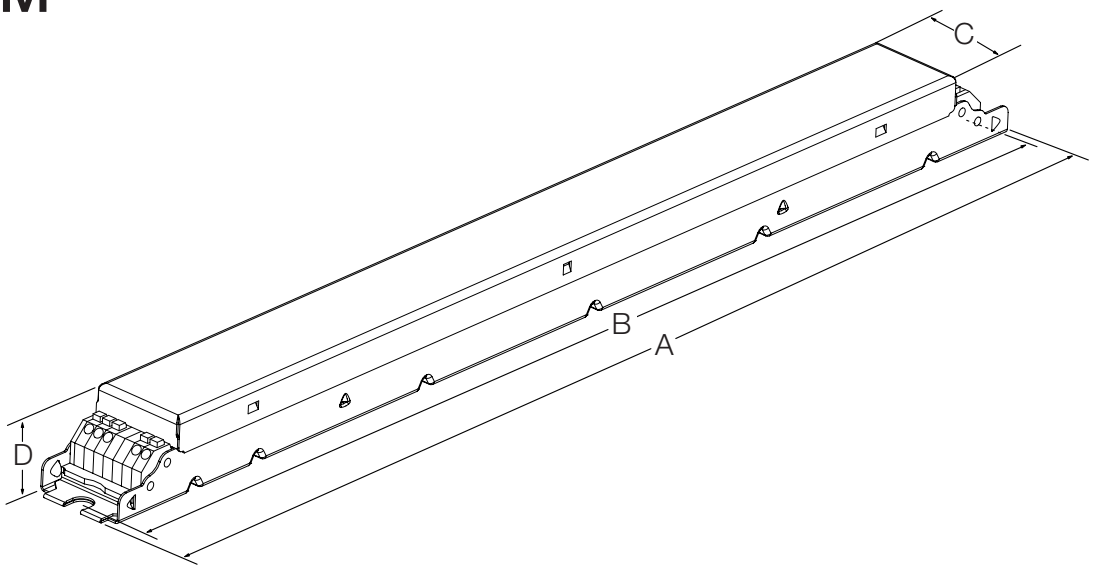
Lamp Type	Lamp Watts (length)	Lamps per Ballast	Case Size	EcoSystem H-Series Ballasts	Input Voltage (V~)	Ballast Current (A)	Ballast Factor (BF)	Input Power (W)	System Lumens[3] (lm)	System Efficacy[3] (lm/W)	Ballast Efficacy Factor (BEF)	Relative System Efficacy (RSE)
T5HO Linear 	54 W (45.2 in [115 cm])	1	M	EHD T554 M U 1 10[1,2]	120 240 277	0.54 0.26 0.23	1.00 1.00 1.00	64.8 62.4 63.7	5000 5000 5000	77 80 78	1.54 1.60 1.57	0.83 0.87 0.85
		2	M	EHD T554 M U 2 10[1,2]	120 240 277	1.02 0.50 0.43	1.00 1.00 1.00	122.4 120.0 119.1	10,000 10,000 10,000	82 83 84	0.82 0.83 0.84	0.88 0.90 0.91
	39 W (33.4 in [84 cm])	1	M	EHD T539 M U 1 10[1,2]	120 240 277	0.37 0.19 0.17	1.00 1.00 1.00	44.4 44.9 46.0	3500 3500 3500	79 78 76	2.25 2.23 2.17	0.88 0.87 0.85
		2	M	EHD T539 M U 2 10[1,2]	120 240 277	0.70 0.35 0.29	1.00 1.00 1.00	84.0 84.0 81.4	7000 7000 7000	83 83 86	1.19 1.19 1.23	0.93 0.93 0.96
	24 W (21.6 in [55 cm])	1	M	EHD T524 M U 1 10[1,2]	120 240 277	0.25 0.12 0.10	1.00 1.00 1.00	30.0 28.8 27.7	2000 2000 2000	67 69 72	3.33 3.47 3.61	0.80 0.83 0.87
		2	M	EHD T524 M U 2 10[1,2]	120 240 277	0.46 0.23 0.20	1.00 1.00 1.00	54.6 55.2 55.4	4000 4000 4000	73 72 72	1.83 1.81 1.81	0.88 0.87 0.87

1. BAA models available. Add a "U" to prefix of model number when ordering (ie: UEHD T832 M U 1 10).
2. NOM approved models available. Add an "N" to suffix of model number when ordering (ie: EHD T832 M U 1 10N).
3. Actual number may vary with lamp model. Please consult lamp manufacturer for lamp-specific data.

Job Name:	Model Numbers:	
Job Number:		

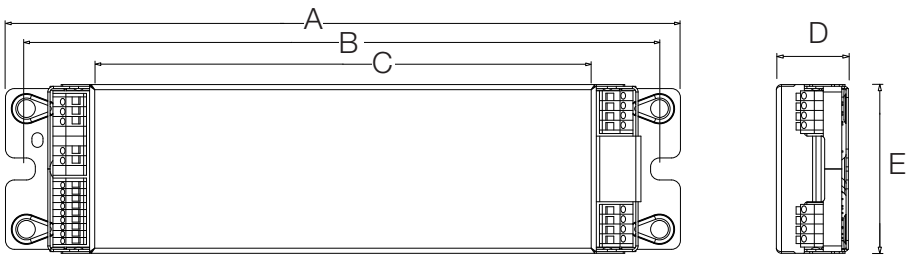
Case Dimensions

M



A	14.125 in (359 mm)
B	13.68 in (347 mm) (mounting center)
C	1.18 in (30 mm)
D	1.00 in (25 mm)

G



A	9.5 in (241 mm)
B	8.9 in (226 mm) (mounting center)
C	7.1 in (180 mm)
D	1.0 in (25 mm)
E	2.38 in (60 mm)

Job Name:	Model Numbers:	
Job Number:		

369266o 6 11.29.17

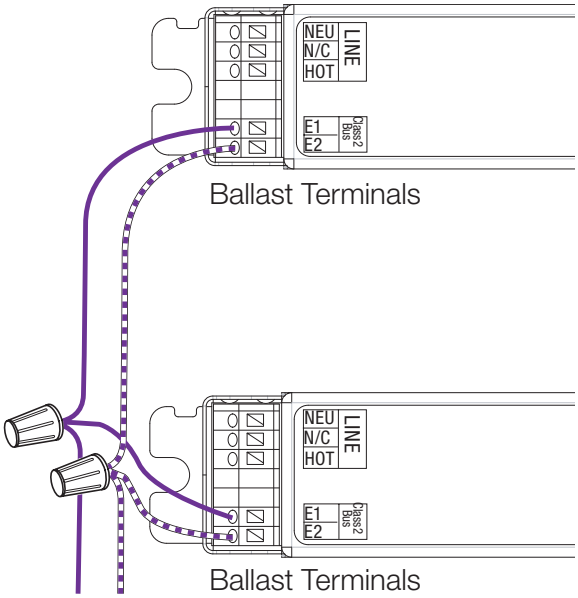
EcoSystem H-Series Wiring Diagrams

EcoSystem Digital Link Overview

- The EcoSystem Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Sensors do not directly connect to EcoSystem H-Series ballasts.
- No 3-wire phase control with EcoSystem H-Series ballasts.
- E1 and E2 (EcoSystem digital link wires) are polarity insensitive and can be wired in any topology.
- An Energi Savr Node with EcoSystem unit, GRAFIK Eye QS control unit with EcoSystem, or Quantum dimming module with EcoSystem provides power for the EcoSystem digital link which supports up to 64 digital ballasts or LED drivers, 64 occupant sensors, 16 daylight sensors and 64 wall stations or IR receivers.
- PowPak dimming module with EcoSystem provides power for the EcoSystem digital link which supports up to 32 digital ballasts or LED drivers, 6 occupant sensors, 1 daylight sensor and 9 Pico wireless controllers.
- All EcoSystem Digital Link programming is completed by using the Energi Savr App for *Apple iPad, iPod Touch* or *iPhone* mobile digital device; GRAFIK Eye QS with EcoSystem; PowPak dimming module with EcoSystem; or Quantum System.
- For complete information, see EcoSystem Design & Application guide P/N 367-1533.

EcoSystem Digital Link Wiring

- For emergency wiring please see Lutron App Note #106.
- Make sure that the supply breaker to the Digital Ballast and EcoSystem Digital Link Supply is OFF when wiring.
- Connect the two conductors to the two Digital Ballast terminals E1 and E2 as shown.
- Using two different colors for E1 and E2 will reduce confusion when wiring several ballasts together.
- The EcoSystem Digital Link may be wired Class 1 or IEC PELV/NEC® Class 2. Consult applicable electrical codes for proper wiring practices.



To the EcoSystem Digital Link Supply

Notes

- The EcoSystem Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem Digital Link terminals accept one 18 AWG to 16 AWG (0.75 mm^2 to 1.5 mm^2) solid copper wire per terminal.
- EcoSystem Digital Link length is limited by the wire gauge used for E1 and E2 as follows:

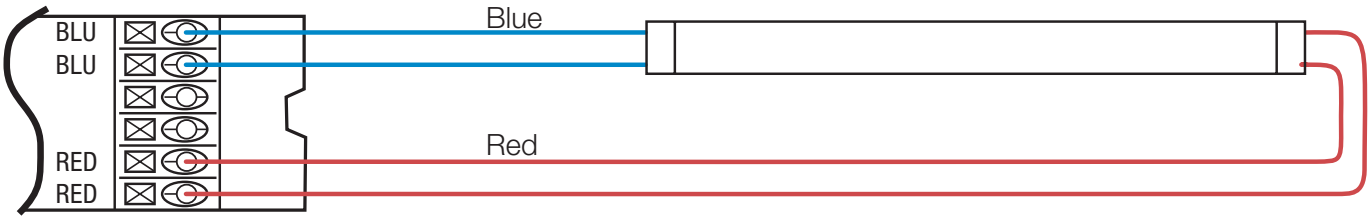
Wire Gauge	Maximum Digital Link Length
12 AWG	2200 ft
14 AWG	1400 ft
16 AWG	900 ft
18 AWG	550 ft

Wire Size	Maximum Digital Link Length
4.0 mm^2	825 m
2.5 mm^2	515 m
1.5 mm^2	310 m
1.0 mm^2	205 m
0.75 mm^2	155 m

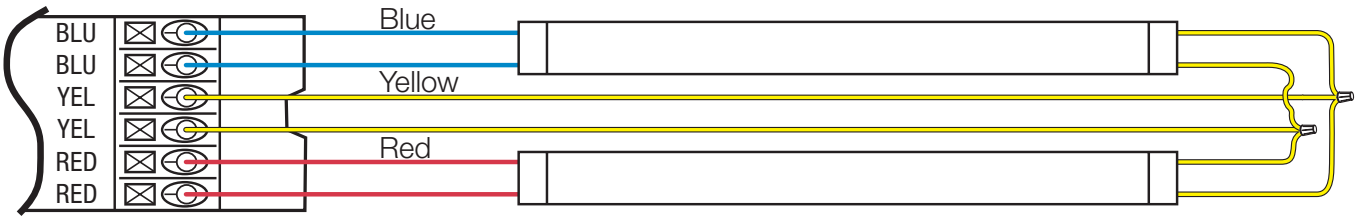
Job Name:	Model Numbers:	
Job Number:		

Wiring Diagrams for T8, T5, and T5HO linear lamps

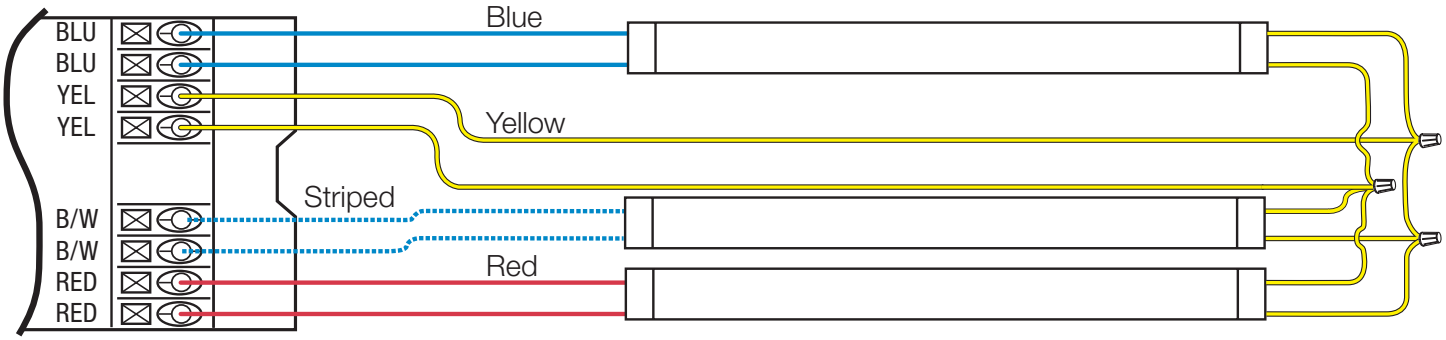
Wiring to One Lamp (C case shown)



Wiring to Two Lamps (C case shown)



Wiring to Three Lamps (G case shown)

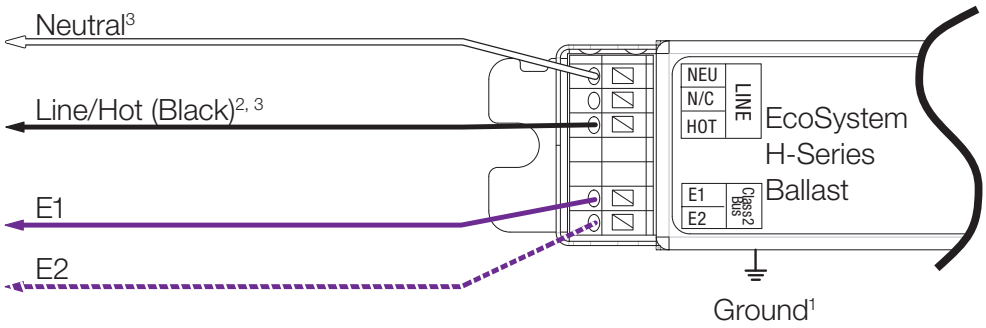


NOTICE

- Maximum ballast to lamp socket lead length is 7 ft (2 m).
- Wire colors shown are labeled on the ballast, but may vary depending upon fixture construction.

Job Name:	Model Numbers:	
Job Number:		

EcoSystem Power Wiring Diagrams



[1] Ballast is grounded via the case.
[2] Wire colors shown are for Lutron controls and ballasts only. Dimming control wires may not match ballast wire colors.
[3] Must not be wired to a switching device or system functionality will be lost.

Job Name:	Model Numbers:	
Job Number:		

ATTENTION ELECTRICIANS AND CONTRACTORS

Ballast/Socket Leads

Lead lengths from ballast to socket must not exceed 7 ft (2 m) for T8, T5, and T5HO linear lamps.

Lamp Sockets

Lutron requires and NEMA recommends sockets complying with IEC 60400. Inspect sockets for marks to ensure the socket complies with IEC 60400. Two examples of these marks are:  and  . Sockets **must** have a UL mark as well. Use Rapid Start sockets.

DO NOT use Instant Start sockets. See Lutron App Note #122 (P/N 048122) at www.lutron.com or NEMA doc LSD-34-2006.

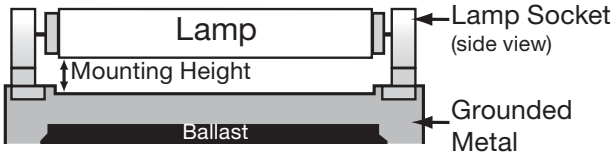
Lamp Socket Wiring Tester

Use Socket Tester (FDB-LSWT-T5/T8) to verify proper lamp holder wiring.

Available for purchase at www.lutronstore.com

Lamp Mounting

Many fluorescent lamp sockets are available with mounting slots to vary the height of the lamp away from the grounded metal surface. Having a fluorescent lamp too close to the grounded metal will reduce lamp life. Having a fluorescent lamp too far away from the grounded metal will make the lamp flicker or not turn on at all. Please note that all of the lamp heights are measured between the grounded metal surface and the glass wall of the lamp.



IMPORTANT: Lamps must never touch ground plane and should be placed without obstruction.

Mounting for T8 Lamps

Mount lamps 1/8 to 3/4 in (3.2 to 19 mm) away from the grounded metal surface.

Mounting for T5 and T5HO Lamps

Mount lamps 1/16 to 3/8 in (1.6 to 9.5 mm) away from the grounded metal surface.

Ballast Operating Temperature

Ballast case temperature must not exceed 80 °C at any point on the ballast.

Cold Air Flow

Ensure that no cold air (from HVAC system, etc) is blowing across the lamps. Cooling the lamp will cause performance issues as noted in NEMA LSD-34.

Wiring and Grounding

Ballast and lighting fixture must be effectively grounded. Ballasts must be installed per national and local electrical codes.

ATTENTION FACILITIES MANAGERS

PERFORMANCE

Lamp Seasoning

Consult lamp manufacturer's recommendations on lamp seasoning prior to dimming.

SERVICE

Replacement Parts

Use Lutron replacement parts with exact model numbers. Consult Lutron if you have any questions.

Further Information

For further information, please visit us at www.lutron.com/ballasts or contact Customer Assistance at: 1.844.LUTRON1 (1.844.588.7661).

Job Name:	Model Numbers:	
Job Number:		