

EcoSystem Digital Ballasts

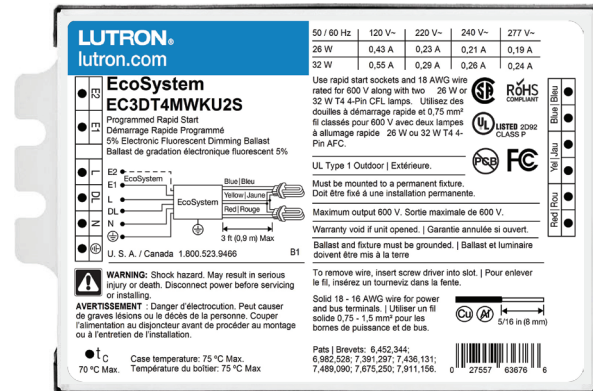
EcoSystem compact ballasts provide high-performance dimming for any compact fluorescent application, including within an EcoSystem Lighting Control System. EcoSystem compact ballasts offer 100% to 5% dimming, providing both energy savings and lighting flexibility.

Features

- Continuous, flicker-free dimming from 100% to 5%
 - Compatible with Energi Savr Node with EcoSystem devices, GRAFIK Eye QS with EcoSystem connection, PowPak dimming module with EcoSystem connection, and Quantum systems, allowing for integration into an existing/planned EcoSystem lighting control system
 - Supports standard 3-wire line-voltage phase control technology.
 - Programmed rapid start design ensures full-rated lamp life while dimming and cycling.
 - Lamps turn on to any dimmed level without flashing to full brightness.
 - Low harmonic distortion throughout the entire dimming range.
 - Frequency of operation ensures that ballast does not interfere with infrared devices.
 - Inrush current limiting circuitry eliminates circuit breaker tripping, switch arcing, and relay failure.
 - Ultra-quiet operation.
 - 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
 - Nonvolatile memory restores all ballast settings after power failure
 - 100% compatible with all Lutron 3-wire fluorescent controls and EcoSystem digital controls.
 - 100% performance tested at factory.
 - Custom ballast factors available.
- Design tool and specifications can be found at www.lutron.com/ballasttool
- BAA-compliant (Buy American Act) model numbers available. Add a "U" prefix to the model number.

SPECIFICATION SUBMITTAL

Job Name:	Model Numbers:
Job Number:	



EcoSystem ballast, case type K

Specifications

Regulatory Approvals

- UL Listed (evaluated to the requirements of UL935)
- UL Type 1 Outdoor for damp locations
- CSA Certified (evaluated to the requirements of C22.2 No. 74)
- Class P thermally protected
- Meets ANSI C82.11 High Frequency Ballast Standard
- 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 ISO 9001.2008

Environment

- Minimum lamp starting temperature: 50 °F (10 °C)
- Relative humidity: less than 90% non-condensing
- Sound Rating: Class A
- Maximum ballast case temperature: 167 °F (75 °C)

Lamp Seasoning

Refer to lamp manufacturer for lamp seasoning requirements prior to dimming

Performance

- Operating Voltage: 120 V~, 220/240 V~, 277 V~ at 50 or 60 Hz
- Grounding: ballast and fixture must be grounded for proper dimming
- Dimming Range: 100% to 5% measured relative light output
- Lamp Starting: programmed rapid start
- Lamp Current Crest Factor: less than 1.7
- Light Output Variation: Constant $\pm 2\%$ light output for line voltage variations of $\pm 10\%$
- Lamp Life: Average lamp life meets or exceeds specified lamp ratings
- Power Factor: 0.95 minimum
- Total Harmonic Distortion (THD): Less than 10%
- Inaudible in a 27 dBA ambient
- Maximum Inrush Current: 3 A per ballast at 277 V~, 7 A per ballast at 120 V~
- Standby power: Less than 1 W

Ballast Wiring & Mounting

- Ballast is grounded by the specified terminal or by a mounting screw to the fixture
- Terminal blocks on the ballast accept the following wire gauges:
 - Power Wiring and EcoSystem Bus: one 18 AWG or 16 AWG (0.75 mm² or 1.5 mm²) solid per terminal
 - Lamp Wiring: one 18 AWG or 16 AWG (0.75 mm² or 1.5 mm²) solid per terminal
- Ballast mounts using two mounting tabs or studs within a fluorescent fixture
- Wiring from the ballast to lamp sockets shall not exceed 3 ft (0.9 m) for T4 compact lamps
- Ballast does not have sensor terminals

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/TechnicalDocumentLibrary/Ballast%20and%20Driver%20Warranty.pdf

Job Name:	Model Numbers:
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EcoSystem Compact Fluorescent Ballast Models

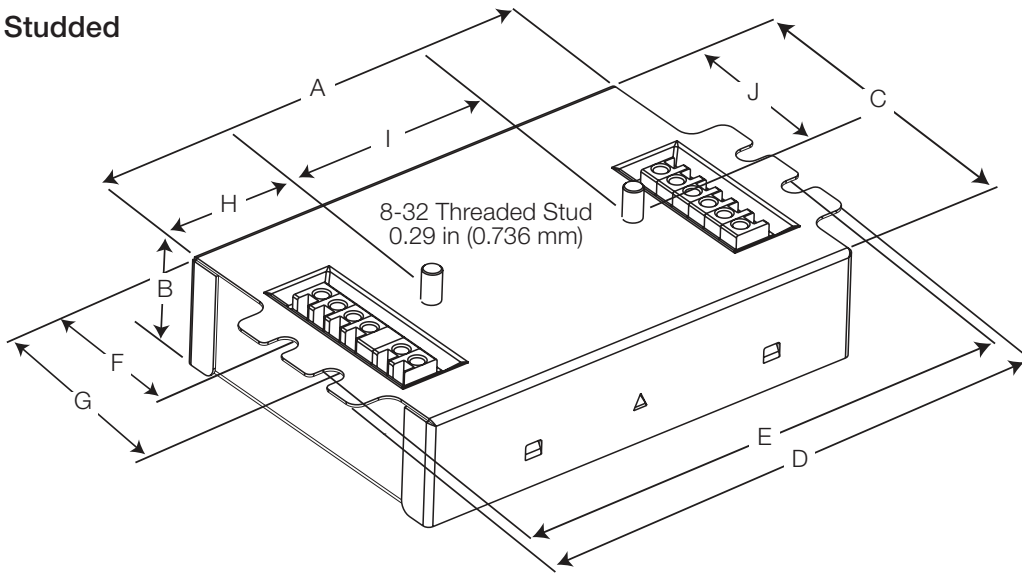
Lamp Type	Lamp Watts	No. of Lamps	Model	Case Size	Input Voltage (V~)	Input Current (A)	Input Power (W)	Ballast Factor (BF)	System Lumens (lm)	System Efficacy (lm/W)	Ballast Efficacy Factor	Relative Efficacy (RSE)
T4 4-Pin Quad-Tube or Triple-Tube	18 W	1	EC3DT418KU1S (Studded)	K	120	0.18	21.3	0.95	1140	53.5	4.46	0.80
				K	220	0.10	21.1	0.95	1140	54.0	4.50	0.81
			EC3DT418KU1 (Non-studded)	K	240	0.09	21.4	0.95	1140	53.3	4.44	0.80
				K	277	0.08	20.8	0.95	1140	54.8	4.57	0.82
		2	EC3DT418KU2S (Studded)	K	120	0.34	41.1	0.95	2280	55.5	2.31	0.83
				K	220	0.18	39.6	0.95	2280	57.6	2.40	0.86
			EC3DT418KU2 (Non-studded)	K	240	0.17	39.4	0.95	2280	57.9	2.41	0.87
				K	277	0.15	39.9	0.95	2280	57.1	2.38	0.86
	26 W	1	EC3DT4MWKU1S (Studded)	K	120	0.22	26.4	0.95	1710	64.8	3.60	0.94
				K	220	0.12	26.8	0.95	1710	63.9	3.55	0.92
			EC3DT4MWKU1 (Non-studded)	K	240	0.11	26.9	0.95	1710	63.7	3.54	0.92
				K	277	0.10	27.0	0.95	1710	63.4	3.52	0.92
		2	EC3DT4MWKU2S (Studded)	K	120	0.43	51.6	0.95	3420	66.3	1.84	0.96
				K	220	0.23	49.9	0.95	3420	68.5	1.90	0.99
			EC3DT4MWKU2 (Non-studded)	K	240	0.21	50.6	0.95	3420	67.5	1.88	0.98
				K	277	0.19	51.4	0.95	3420	66.6	1.85	0.96
T4 4-Pin Triple-Tube	32 W	1	EC3DT4MWKU1S (Studded)	K	120	0.29	34.8	0.95	2280	65.5	2.73	0.87
				K	220	0.15	33.0	0.95	2280	69.1	2.88	0.92
			EC3DT4MWKU1 (Non-studded)	K	240	0.14	33.6	0.95	2280	67.9	2.83	0.90
				K	277	0.12	33.2	0.95	2280	68.6	2.86	0.91
		2	EC3DT4MWKU2S (Studded)	K	120	0.55	66.0	0.95	4560	69.1	1.44	0.92
				K	220	0.29	64.5	0.95	4560	70.7	1.47	0.94
			EC3DT4MWKU2 (Non-studded)	K	240	0.26	63.0	0.95	4560	72.3	1.51	0.96
				K	277	0.24	65.5	0.95	4560	69.7	1.45	0.93
	42 W	1	EC3DT442KU1S (Studded)	K	120	0.36	43.2	0.95	3040	70.4	2.20	0.92
				K	220	0.20	42.9	0.95	3040	70.8	2.21	0.93
			EC3DT442KU1 (Non-studded)	K	240	0.18	42.7	0.95	3040	71.2	2.23	0.93
				K	277	0.15	42.6	0.95	3040	71.3	2.23	0.94
		2	EC3DT442KU2S (Studded)	K	120	0.73	87.6	0.95	6080	69.4	1.08	0.91
				K	220	0.39	85.9	0.95	6080	70.8	1.11	0.93
			EC3DT442KU2 (Non-studded)	K	240	0.35	85.1	0.95	6080	71.5	1.12	0.94
				K	277	0.31	85.4	0.95	6080	71.2	1.11	0.93

NOTE: The "S" at the end of the ballast model number indicates a studded option. Remove the "S" for a non-studded ballast.

Job Name:	Model Numbers:
Job Number:	

EcoSystem Compact Fluorescent Ballast Case Dimensions

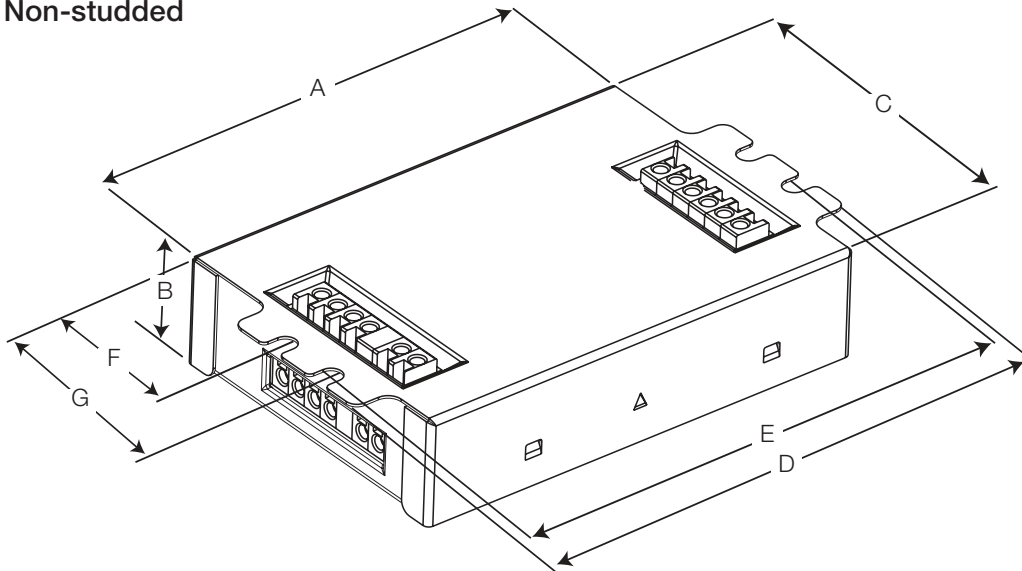
Studded



- 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)
- H 1.09 in (28 mm)
- I 2.00 in (51 mm)
- J 1.60 in (41 mm)

NOTE: Studded version does not have side connectors.

Non-studded

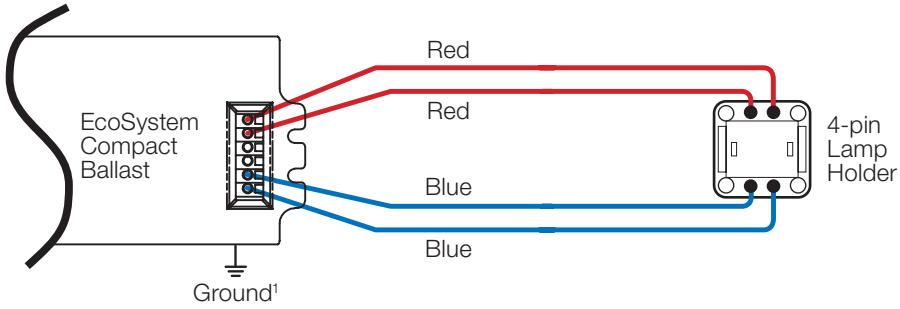


- A 4.20 in (107 mm)
- B 1.00 in (25 mm)
- C 3.00 in (76 mm)
- D 4.90 in (124 mm)
- E 4.60 in (117 mm)
(mounting centers)
- F 1.42 in (36 mm)
- G 1.99 in (51 mm)

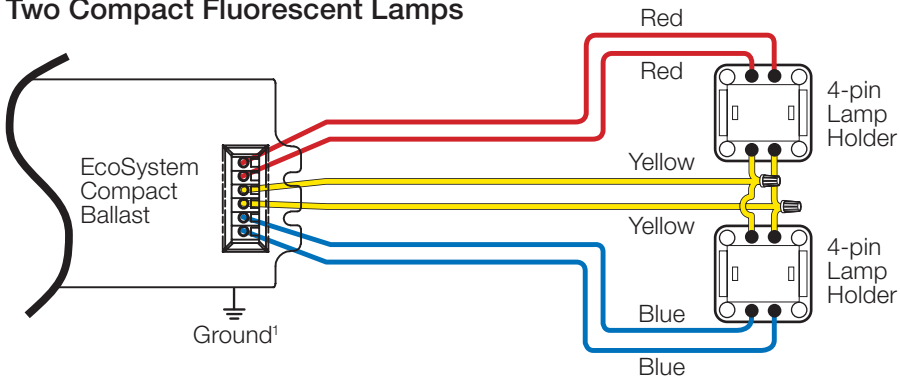
Job Name:	Model Numbers:
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Lamp Wiring Diagrams

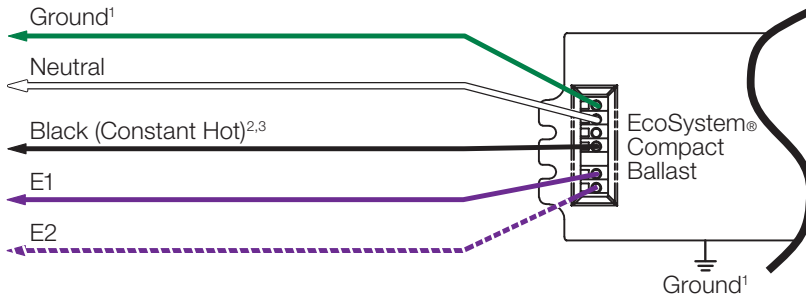
One Compact Fluorescent Lamp



Two Compact Fluorescent Lamps



EcoSystem Power Wiring Diagrams



¹ Ballast is grounded via the case or terminal.

² Wire colors shown are for Lutron controls and ballasts only. Dimming control wires may not match ballast wire colors.

³ The Constant Hot must not be wired to a switching device.

Note: For T4 compact lamps, maximum lamp-to-ballast wire length is 3 ft (0.9 m) to guarantee proper performance.

Job Name:	Model Numbers:
Job Number:	

EcoSystem Bus Wiring Diagrams

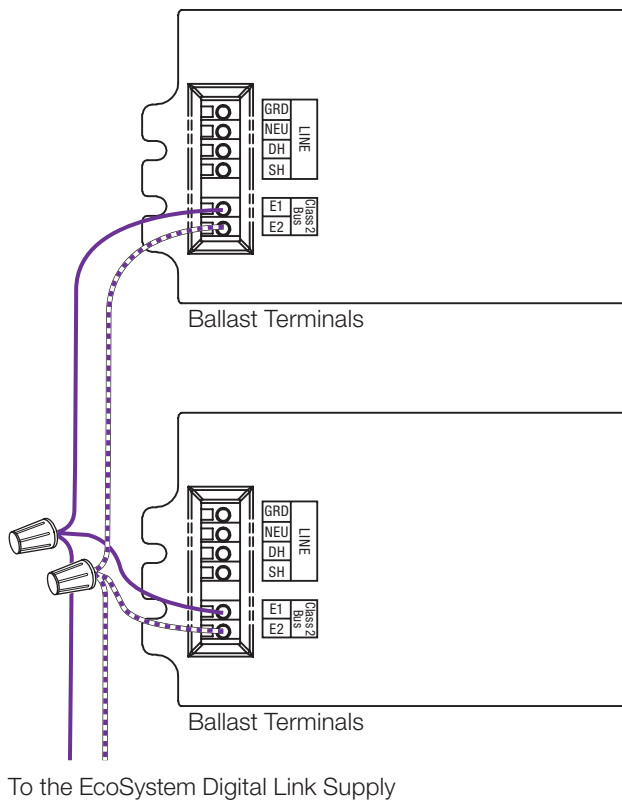
EcoSystem Digital Link Overview

- The EcoSystem Digital Link wiring (E1 and E2) connects the digital ballasts and drivers together to form a lighting control system.
- Each EcoSystem Digital Link supports up to 64 digital ballasts or LED drivers, 64 occupant sensors, 16 daylight sensors, and 64 wallstations or IR receivers.*
- 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 system provides power for the EcoSystem Digital Link and supports system programming.
- All EcoSystem Digital Link programming is completed by using the Energi Savr App for an *Apple iPad* or *iPhone* mobile digital devices, GRAFIK Eye QS with EcoSystem, PowPak dimming module with EcoSystem, or Quantum System.
- For complete information, see the **EcoSystem Design & Application Guide** (P/N 367-1533) at www.lutron.com.

EcoSystem Digital Link Wiring

- Ballast EcoSystem Digital Link terminals only accept one 18 AWG or 16 AWG (0.75 mm² or 1.5 mm²) solid copper wire per terminal.
- 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 Class 2. Consult applicable electrical codes for proper wiring practices.

* PowPak dimming module with EcoSystem can support 32 ballasts or LED drivers.



Notes

- The EcoSystem Digital Link Supply does not have to be located at the end of the Digital Link.
- EcoSystem Digital Link length is limited by the wire gauge used for E1 and E2 as follows:

Wire Gauge	Digital Link Length (max)
12 AWG	2200 ft
14 AWG	1400 ft
16 AWG	900 ft
18 AWG	550 ft

Wire Size	Digital Link Length (max)
4.0 mm ²	828 m
2.5 mm ²	517 m
1.5 mm ²	310 m
1.0 mm ²	207 m
0.75 mm ²	155 m

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Job Name:	Model Numbers:
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EcoSystem Ballast Wiring: Line Voltage Dimmers

EcoSystem Ballasts and 3-wire dimmers

- Lutron 3-wire dimmers only control the ballasts they are wired to; EcoSystem ballasts do not support grouping of 3-wire control input.

3-Wire Control Wiring

- Make sure that the supply breaker to the Digital Ballast is OFF when wiring.
- Wire as shown

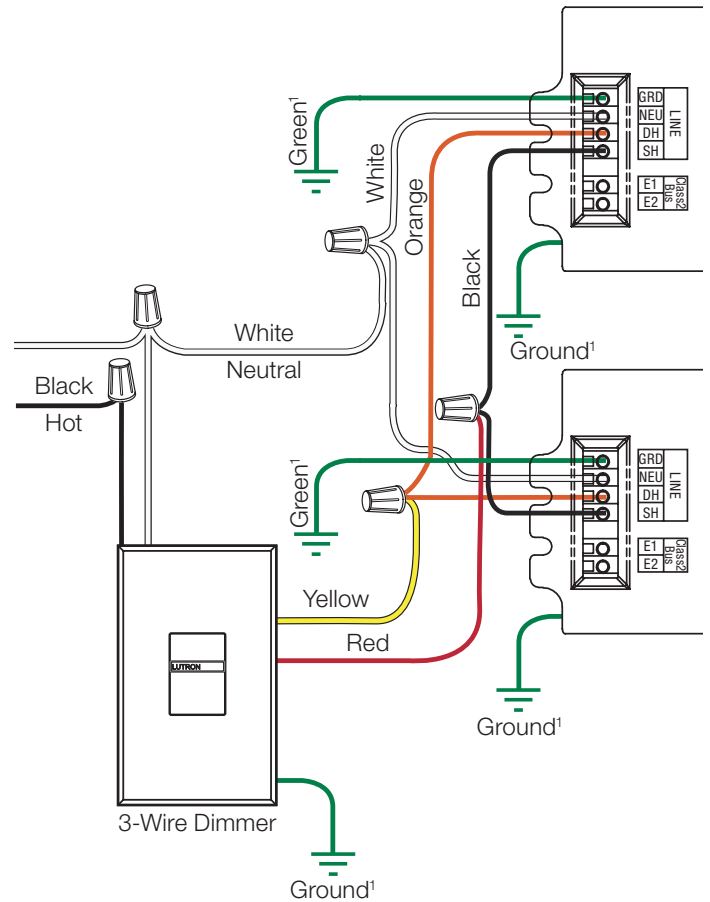
Line input	Connects to
Hot	Dimmer Black Wire
Neutral	Dimmer White Wire

Dimmer wire	Connects to
Yellow	Ballast Orange (DH)
Red	Ballast Black (SH)
White	Ballast White (NEU)
Green	Earth Ground (GND)

- EcoSystem ballast line voltage and 3-wire input terminals only accept one 18 AWG (0.75 mm²) or 16 AWG (1.5 mm²) solid wire.

Emergency and 3-wire

- EcoSystem ballasts controlled by a wallbox dimmer should not be used for emergency/egress lighting unless an external emergency ballast is used in the fixture. See Lutron App Note #50 at www.lutron.com.
- EcoSystem ballasts may be used for emergency/egress lighting when controlled by a Lutron dimming panel (GP); where the panel is a dedicated emergency panel.



¹ Ballast is grounded via the case or terminal

Notice

3-Wire control turns off digital ballasts when the control is in the off position.

Job Name:	Model Numbers:
Job Number:	

ATTENTION ELECTRICIANS AND CONTRACTORS

ATTENTION FACILITIES MANAGERS

Ballast/Socket Leads

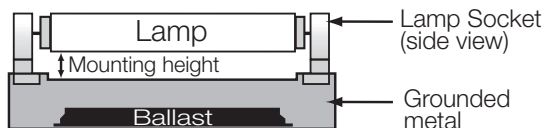
Lead lengths from ballast to socket must not exceed 7 ft (2 m) for T8, T5, and T5HO linear lamps.

Lamp Sockets

Lamp sockets as per IEC 60400 are required to ensure positive lamp-pin to socket contact.

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 T4 Lamps

Do not allow lamp glass to come in direct contact with any grounded metal surface.

Ballast Operating Temperature

Ballast case temperature must not exceed 167 °F (75 °C) at any point on 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.

PERFORMANCE

Lamp Seasoning

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


SERVICE

Replacement Parts

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

Further Information

For further information, please visit us at www.lutron.com/ballasts or contact Lutron Customer Assistance at 1-844.LUTRON1.

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LUTRON SPECIFICATION SUBMITTAL

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