

## **Dimmable Fluorescent Troubleshooting**

**Note: All applicable safety and electrical codes must be adhered to when using this manual. In the United States, all testing/inspecting of light fixtures must be in compliance at minimum with The National Electric Code, NFPA 70E and OSHA 29 CFR 1910.333 regulations concerning electrical and elevated work safety. Refer to these regulations and other applicable local and national codes before using this manual.**

**This troubleshooting checklist is designed to offer guidance when troubleshooting Lutron fluorescent dimming systems. It is intended to be used by qualified personnel. Lutron is not responsible for its misuse and does not guarantee that all fluorescent dimming problems in field applications can be resolved with its use.**

**Questions: For technical support or to return product for analysis contact Lutron Technical Support Center at (800) 523-9466.**

**\*The Lutron socket wiring tester (model number FDB-LSWT-T5/T8) helps to decrease the amount of time troubleshooting fluorescent fixture wiring issues. It is used to verify proper filament voltage is present at all pins of fluorescent lamp sockets. This tester can be purchased at [www.Lutronstore.com](http://www.Lutronstore.com)**

## General Information

Filling out the requested information and sending it to [systemsupport@lutron.com](mailto:systemsupport@lutron.com) will help to expedite your service

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Contact Number: \_\_\_\_\_

E-mail address: \_\_\_\_\_

### For Jobs in North America

Preferred time and day to be contacted (please circle both time block and time zone):

6AM-10AM    10AM-2PM    2PM-4PM    4PM-8PM    Other: \_\_\_\_\_

Time Zone:    EST    CST    MST    PST    Alaska    Hawaii    Other: \_\_\_\_\_

## Job Specific Information

Job Name: \_\_\_\_\_

Job location: \_\_\_\_\_

Ballast Model(s) #: \_\_\_\_\_

Control Model(s) #: \_\_\_\_\_

Lamp brand(s) and Model #: \_\_\_\_\_

How long have the ballasts been installed: \_\_\_\_\_

Were the ballasts Preinstalled in the fixtures or installed on site (please circle one)

Symptom seen (Please be as descriptive as possible): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Contents

Identify the symptom you are experiencing and perform the actions listed. See glossary for explanation of terms

### Lamps:

#### **Fail to illuminate**

- Perform actions: A,B,C,G,H,I,J,L,M,N,P,R,S,T

#### **Have blackened ends**

- Perform actions: A,B,C,G,J,L,N,O,S

#### **Flash**

- Perform actions: A,B,C,G,H,I,J,K,L,M,N,O,R,S,T

#### **Flicker**

- Perform actions: A,B,C,D,E,G,H,I,J,K,L,M,N,P,R,S,T

#### **Breathing**

- Perform actions: A,B,C,G,H,I,K,Q,R

#### **“Ring-like shadows” moving across the lamp**

- Perform actions: A,B,C,D,E,G,H,I,J,K,L,M,N,O,R,S,T

#### **Extinguish when dimming**

- Perform actions: A,B,H,I,J,K,L,M,N,P,R,T

#### **Fail prematurely**

- Perform actions: A,B,C,I,J,L,M,N,O,R,S,T

#### **Are stuck at high end**

- Perform actions: A,D,E,G,H,I,K,P,Q,R

#### **Are stuck at low end**

- Perform actions: A,D,E,F,G,H,I,K,P,Q,R,S

#### **Have limited dimming range**

- Perform actions: A,B,C,D,E,F,G,H,I,J,K,L,M,P,Q,R,S,T

#### **Are pink at start up**

- Perform actions: A,B,C,G,J,L,M,O,R,S,T

#### **Are pink all the time**

- Perform actions: A,B,C,G,J,L,M,O,R,S,T

#### **Are dimmer on one end than the other**

- Perform actions: A,B,C,G,J,L,M,O,R,S,T

#### **Glow or flicker in the digital off state**

- Perform actions: A,B,C,G,I,J,L

### Other:

#### **Fixture buzzes**

- Perform actions: A,C,G,

**Fixture Contains an Emergency Ballast:** See “Advanced Troubleshooting for fixtures with both Lutron ballasts and emergency ballast”

## Actions

**A) Verify ballast model number matches the lamp wattage and number of lamps (See Figure 1).**

- Ballast model#: \_\_\_\_\_ Qty in fixture: \_\_\_\_\_
- Lamp model #: \_\_\_\_\_ Qty in fixture: \_\_\_\_\_

*\*Reduced wattage lamps must be driven by reduced wattage ballasts (Ex: EC5TXRWJUX)*

**B) Verify that the lamp wire length does not exceed the maximum length specified on the ballast label (See Figure 2 Figure 2).**

- Length of Red wires: \_\_\_\_\_
- Length of Blue wires: \_\_\_\_\_
- Length of Yellow wires: \_\_\_\_\_
- Length of Blue/White wires: \_\_\_\_\_

**C) Ensure the lamp is not touching any metal part of the fixture**

- Measured minimum distance between lamp and nearest ground plane/grounded surface: \_\_\_\_\_

**D) Verify the ballasts are dimmable (See Figure 1).**

*\*Confirm ballast does not have a custom ballast factor (model number will end in "Cxx")*

**E) Check the low end light level rating of the ballast (1%, 5% or 10%) (See Figure 1).**

**F) Ballast may be running above rated temperature. Verify case temperature on the ballast is not being exceeded (See Figure 2).**

- \_\_\_\_\_ °C or °F (circle one) Method used to measure temperature: \_\_\_\_\_

*\*Some ballast have a feature called "Thermal Foldback". Thermal Foldback will engage when the ballast is running above its rated temperature. Once engaged the output will be reduced to attempt to cool down the ballast. This may cause a cycling effect.*

**G) Make sure ballast is grounded**

- Measured resistance from ballast enclosure to known good ground \_\_\_\_\_  $\Omega$
- Reference ground used: \_\_\_\_\_

**H) Verify that the control wiring for the dimmer/dimming system is properly connected**

- Control model number: \_\_\_\_\_
- If applicable list what the load type is set to: \_\_\_\_\_

*\*Is there a high end trim set on the system?*

**I) Verify proper line voltage is present at the ballast (See Figure 1).**

- AC voltage measured from hot to neutral at the ballast: \_\_\_\_\_

## Actions continued

- J) Ensure the sockets are wired correctly according to the wiring diagram on the ballast. **Yellows must be wired in parallel, not series (See Figure 2).**  
*\*The Lutron Socket Tester can identify this issue.*
- K) If the ballast is 3-wire controlled, verify that the dimmed-hot and switched-hot inputs are not reversed.  
*\*This can be verified by placing the control to its highest setting, turning off the breaker, and disconnecting and capping the **Switched Hot** output at the controller. Turn the breaker back on and all fixtures that are wired correctly will be out. **All miswired fixtures will remain on.***
- L) Verify that the lamp sockets are rapid-start type (non- shunted), not instant-start (shunted).  
*\*The Lutron Socket Tester can identify this issue.*
- M) Replace the lamp. If this resolves the symptom, Date new lamp(s) installed and see actions “N” and “O”
- N) Lamps may be at the end of their life. Compare how long they were running with the rated lifetime of the lamp
- O) Contact lamp vendor to ensure that the lamps are compliant to the appropriate ANSI and IEC lamp specifications. Lutron cannot certify lamp compliance, only ballast compliance.
- P) Make sure the dimmer/dimming system is the proper control type for the ballast.
- Q) Check if there is a daylight sensor in the system. Daylight levels may need to be adjusted if lights are not at the desired level.  
*\*Disconnecting E1/E2 from the ballast will allow the ballast to go to its full brightness unless a 3-wire control is also connected. Using both 3-wire and digital controls is not recommended*
- R) If there is an emergency ballast in the fixture, confirm that it is wired properly and not interfering with the dimming performance. See the “Emergency Ballast Troubleshooting” sections for more advanced troubleshooting tips.
- S) Lamps may be too cold. Shield the lamps from air flow.
- T) Lamp(s) may be damaged or at the end of their life. Swap lamp(s) with known good lamp(s) to see if problem follows the lamp. Replacing the lamp with another brand or model is another option.

## **Advanced Troubleshooting for fixtures with both Lutron ballasts and emergency ballast:**

- **Exchange lamps with lamps in a working fixture.**
  - If the problem “follows the lamps” then the lamps have been damaged, possibly by excessive emergency ballast activation. Verify the customer is no de-energizing emergency sensing circuit regularly. Replace lamps and re-evaluate
- **Verify proper wiring of emergency ballast by using wiring diagram provided by EM ballast manufacturer online.**
  - If the wiring is found to be incorrect, repair the wiring as needed.
- **Verify that the socket leads to not exceed their maximum allowable length (7’ linear, 3’ T4 compact and T5 twin tube). Include socket wiring added by the EM ballast.**
  - If leads are found to exceed their maximum allowable length, shorten leads as needed.
- **Disconnect battery connector on EM ballast.**
  - If the symptom ceases after the battery connector is disconnected, report issue to EM ballast manufacturer.
- **Disconnect the single wire from the EM ballast that is connected to either a red or yellow lead of the dimming ballast.**
  - If the symptom ceases after removing the single wire, report issue to the EM ballast manufacturer.
- **Disconnect the EM ballast socket leads and connect the dimming ballast directly to the lamps as per the wiring diagram on the product label.**
  - If the symptom ceases after removing the EM ballast and wiring the Lutron ballast directly to the lamps, report issue to EM ballast manufacturer
- **If the symptoms persist:**
  - Dimming ballast is likely damaged. Check for proper connections and replace the dimming ballast. Return removed dimming ballast to Lutron for analysis and monitor the performance of the new one. If the dimming ballast fails again, elevate to engineering and EM ballast manufacturer for advance troubleshooting.

Figure 1: Sample Ballast unit label, Model number and ratings

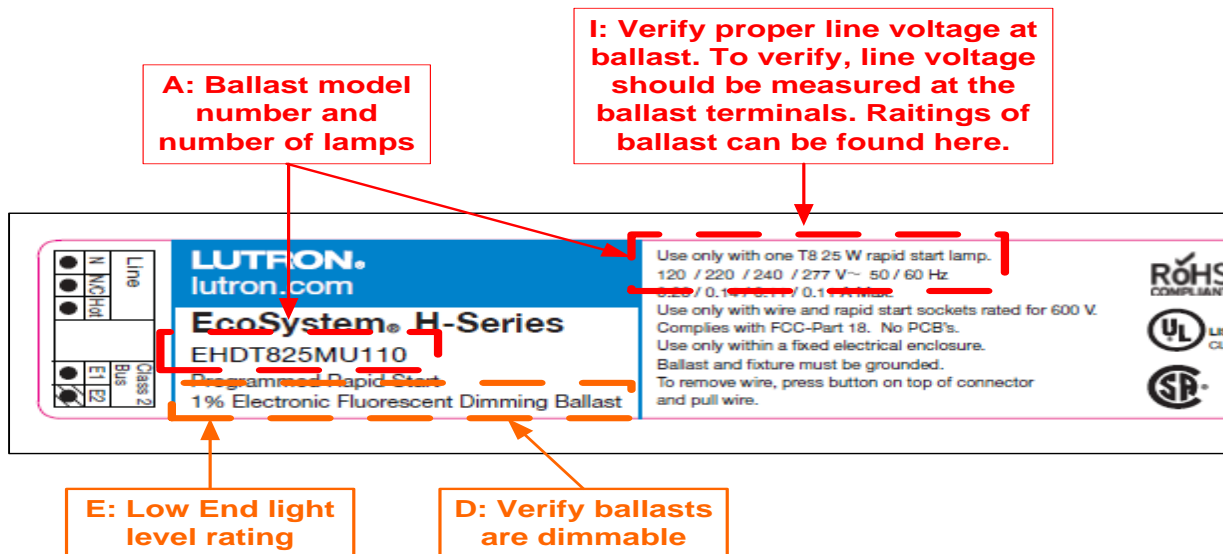


Figure 2: Sample Ballast unit label, case temperature, wiring diagram, maximum lead length

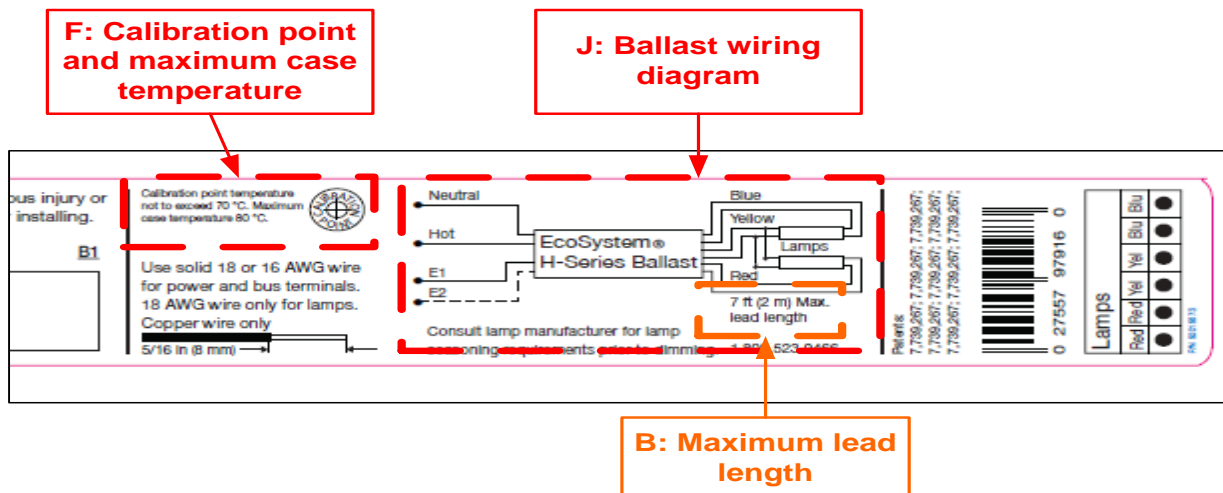
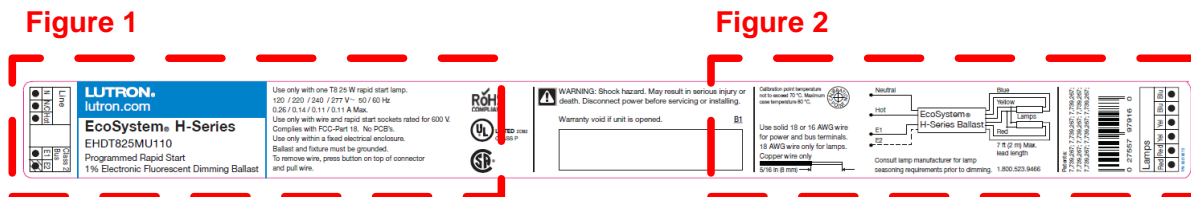


Figure 3: Overall sample Ballast label showing where Figure 1 and Figure 2 are.



## Glossary of terms

**Flash:** Lamps will ignite for a short period of time and then go out.

**Flicker:** Instability in the light level. Example: similar to the flame of a candle.

**Breathing:** A minor change in light level in a repetitive up and down pattern. This usually happens at a slower pace. Comparable to the rate of normal breathing

**Digital Off State:** Line voltage is still applied to the ballast but the lamps are turned off with a digital command (system command, sensors, ....)

**Emergency Ballast:** An emergency ballast is similar to a battery backup. This would be in addition to the Lutron ballast and would drive the lamp(s) in the event that power is removed from the Lutron ballast.

If more assistance is needed after completing troubleshooting, call Lutron's 24/7 Technical Support at 1-800-523-9466 or email at [product@lutron.com](mailto:product@lutron.com)  
Refer to [www.lutron.com](http://www.lutron.com) for Installation Instructions and Application Notes.

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### Lutron Contact Numbers

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1.800.523.9466  
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