



# For Your Information ...



## Use of Reduced-Wattage Lamps with *Lutron* Ballasts

### Overview

Many lamp manufacturers have lamps that have a lower wattage than a standard lamp but can be used with standard ballasts. These reduced-wattage lamps allow users to easily reduce energy through re-lamping. However, several of these lamps are not capable of being dimmed, or are not able to be used with dimming ballasts not specifically designed for them. This application note offers a further explanation of reduced-wattage lamps and provides an alternate solution to achieve additional energy savings through dimming.

### Reduced Wattage Lamps

Reduced-wattage lamps, sometimes referred to as “energy saving” lamps, are designed to be a drop-in replacement for their standard wattage equivalents, allowing customers to quickly save a fixed amount of energy through re-lamping alone. These lamps are advertised to be compatible with any electronic switching ballast designed for the standard wattage version of the lamps. They often achieve their energy savings through lower lumen output. For example, while a 32 W T8 lamp may provide 3000 lumens, the energy saving 28 W version provides only 2590 lumens.

Although advertised as very similar to standard wattage lamps, reduced-wattage lamps differ from their standard counterparts in several ways.

- Full-wattage lamps are designed with an argon fill gas. Energy saving lamps are designed with a different fill gas. This alternate gas typically requires a higher voltage to start the lamp (known as striking voltage). Since *Lutron* dimming ballasts are designed to tight specifications in order to maximize the lifetime of the ballast and lamps, this increased striking voltage may exceed the *Lutron* dimming ballast’s specifications, causing the lamp to not light.
- Specification sheets of some reduced-wattage lamps state they may not be used with dimming ballasts.
- Reduced-wattage lamps may have higher minimum starting temperatures than their full-wattage equivalents. This may pose problems if fixtures are located near cold A/C ducts or in a plenum space.
- Reduced-wattage lamps may demonstrate light to moderate striations (moving bands of bright and dark spots) across the lamp at certain dimming levels. While striations do not harm the bulb or ballast, it can be distracting in fixtures where the lamp is visible.
- Because standard wattage *Lutron* ballasts are designed for use with full-wattage lamps, use of these ballasts with reduced-wattage lamps may have a detrimental effect on lamp life.

Need additional assistance? Call the Lutron Technical Support Center 1-800-523-9466.  
Please provide exact model number when calling.

## Reduced Wattage Lamps (continued)

Besides the differences between reduced wattage and standard wattage lamps listed above, reduced-wattage lamps may pose several other less obvious problems.

- There may be several different reduced wattages available for a given standard-wattage lamp. For example, reduced wattage lamps of 25 W, 28 W, or 30 W are all available to replace a standard 48-inch, 32 W T8 lamp. Not all manufacturers make all values of reduced-wattage lamps, possibly restricting lamp replacement options to a single vendor.
- Ballasts must be UL-rated for each lamp they are to control. Because reduced-wattage lamps are new, not all ballasts will be UL-rated to control them. Putting a reduced-wattage lamp into an already-installed ballast may void the ballast's UL rating.

Because of these differences, Lutron does not support the dimming of reduced-wattage lamps with Lutron® dimming ballasts designed for full-wattage lamps.

## Solution: Save Energy Without Compromising Aesthetics or Flexibility

Lutron's broad line of EcoSystem® and Hi-lume® 3D ballasts are uniquely designed to offer an alternative to reduced wattage lamps that delivers better energy savings than reduced-wattage lamps without compromising aesthetics or flexibility. Lutron is able to deliver this superior solution through its factory-tuned ballast factor program. This allows the customer to select a lower wattage ballast factor, matching the energy savings and light reduction of reduced wattage lamps.

For reference, some ballast factor equivalents to reduced-wattage lamps are included below. Note that different families of lamps from different manufacturers may vary from the table.

Reduced Wattage Lamp			Reduced Ballast Factor Equivalent			
Lamp Type and Wattage	Lumen Output	Input Power <sup>1</sup>	Lamp Type and Wattage	Ballast Factor	Lumen Output	Input Power <sup>2</sup>
T8 28 W	2590	58 W	T8 32 W	0.86	2590	57 W
T8 25 W	2425	55 W	T8 32 W	0.81	2425	55 W

<sup>1</sup> Input power based on a two-lamp dimmable ballast with a 1.0 BF at 120 V~

<sup>2</sup> Input power based on a two-lamp *Lutron EcoSystem* ballast at 120 V~

Ballast factor (BF) is a measure of how much light the ballast-lamp combination is able to deliver. A 1.00 BF ballast will deliver 100% of the rated output of the lamp (as compared to a "standard" lamp and ballast, set by ANSI® standards for each lamp type). A 0.85 BF ballast will deliver 85% of the rated output of the lamp. For example, a ballast-lamp combination where the ballast has a 0.85 BF and the lamp it is controlling is rated for 1000 lumens will deliver 850 lumens, or 85% of the rated output of the lamp.

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## Solution (continued)

Because reduced wattage lamps often achieve their energy savings through lowered lumen output, the same energy savings can be achieved with a normal (full wattage) lamp and a *Lutron EcoSystem*® or *Hi-lume*® 3D ballast with a lower-than-normal ballast factor. This can deliver the equivalent performance of an energy saving lamp in both lumen output and energy consumption as shown in the table. The additional capabilities and flexibility of these ballasts can increase energy savings by using daylight or occupancy/vacancy sensors and allowing individual control of personal lighting. This not only saves energy but also improves the comfort and productivity of the occupants.

An additional feature of factory-tuned ballast factors is the ability to have the ballast's printed rating changed to reflect the reduced energy consumption of the ballast. This allows for a lower wattage-per-square-foot value, as well as an increased number of ballasts on a given circuit. Finally, factory-tuned ballast factor ballasts will have no detrimental effect on lamp life or UL listing.

Note that according to NEMA's position on fluorescent lamp burn-in, running the lamps at the maximum output of the ballast (regardless of ballast factor) is sufficient to ensure maximum lamp performance.

NEMA is a registered trademark of the National Electrical Manufacturers Association.

## Conclusion

Factory-tuned ballast factors with *Lutron EcoSystem* and *Hi-lume* 3D ballasts offer an alternative to reduced wattage lamps that saves more energy and improves the aesthetics, usability, and comfort of the space. Using reduced wattage lamps can pose several challenges when designing and specifying the lighting system of a commercial space. For proper performance, ballasts must be specifically designed to operate reduced wattage lamps in order to avoid many issues. For more information or to order factory-tuned ballast factors with *Lutron EcoSystem* and *Hi-lume* 3D ballasts, contact your local sales representative.

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