Electronic Ballasts

A White Paper: Overview of Electronic Ballast Start Methods

Instant-start electronic ballasts are the most popular type of electronic ballast today because they provide maximum energy savings and they start lamps without delay or flashing. Since they do not provide lamp electrode heating, instant-start ballasts generally consume less energy than comparable rapid-start, program rapid-start or programmed-start ballasts. As a result, they usually provide the most energy efficient solution to fluorescent lamp ballasting. The instant-start ballast uses 1.5 to 2 watts less energy per lamp than the rapid-start alternative. The also have the least amount of output leads, making for easy wiring.

Instant-start electronic ballasts provide a high initial voltage (typically 600V for F32T8 lamps) to start the lamp. This high voltage is required to initiate discharge between the unheated electrodes of the lamp. However, the cold electrodes of lamps operated by an instant-start ballast may deteriorate more quickly than the warmed electrodes of lamps operated by a rapid-start, program rapid-start or programmed-start ballast. Lamps operated by instant-start ballasts will typically withstand 10-15K switch cycles. Instant-start ballasts are typically wired in parallel. This means that if one lamp fails, the other lamps in the circuit will remain lit.

Rapid-start ballasts have a separate set of windings which provide a low voltage (approx. 3.5 volts) to the electrodes for one second prior to lamp ignition. A starting voltage somewhat lower than that of an instant-start ballast (typically 450-550V for F32T8 lamps) is applied, striking an electrical arc inside the lamp. Most rapid-start electronic ballasts continue to heat the electrode even after the lamp has started, which results in a power loss of 1.5 to 2 watts per lamp. Lamps operated by a rapid-start electronic ballast will typically withstand 15-20K switch cycles. Rapid-start ballasts are typically wired in series. This means that if one lamp fails, all other lamps in the circuit will extinguish.

Programmed-start electronic ballasts provide maximum lamp life in frequent starting conditions (>50,000 starts). Programmed-start ballasts like the Mark 5™, Mark 7™, Mark 10™, and Optanium™ programmed-start family of products use a custom integrated circuit (IC) which monitors lamp and ballast conditions to ensure optimal system lighting performance. Programmed-start ballasts precisely heat the lamp cathodes to approximately 700°C prior to lamp ignition. This puts the least amount of stress on the lamp electrodes, resulting in maximum lamp life regardless of the number of lamp starts. Programmed-start ballasts are typically wired in series.

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A leader in the ballast industry for over 60 years, Philips Lighting Electronics, based in Rosemont, Illinois, offers a full line of Philips Advance branded ballasts and drivers for fluorescent, HID, and LED light sources to the market's broad range of lighting fixture manufacturers and electrical distributors. For more information on Philips Lighting Electronics' complete product line and range of Smart Solutions™, visit our website at www. philips.com/advance or call us at (800) 322-2086.

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