Ballast Types

Slimline Instant Start systems produce light instantly without the assistance of a starter. These lamps are mostly T12 single pin lamps without preheat. To achieve this quick response, without preheat, the ballast must provide an open circuit voltage to the lamp electrodes about three times the normal lamp operating voltage to initiate the arc. There are magnetic and electronic ballasts for these lamps.

Instant Start Electronic ballasts start lamps without delay (<0.1 second) or flicker by providing a starting voltage that is sufficiently high to start a discharge through the lamps without the need for heating the lamp electrodes. For F32T8 systems, the starting voltage is about 600V. The elimination of electrode heating maximizes energy savings – typically saving two watts per lamp compared to rapid start ballasts. Instant start ballasts are best suited for applications with limited on – off switches each day. Lamps operated by instant start ballasts typically operate 10,000 to 15,000 switch cycles before failure.

Rapid Start electronic and magnetic ballasts start lamps quickly (0.5 – 1.0 second) without flicker by heating the lamp electrodes and simultaneously applying the starting voltage. The starting voltage for two F32T8 lamps in series produced by an electronic ballast is about 500V. This is sufficient voltage to start an arc through the lamp when the electrodes have reached adequate operation temperature. Electrode heating continues during operation and typically consumes two watts per lamp. Lamps operated by rapid start ballasts typically operate 15,000 to 20,000 on – off switch cycles before failure.

Programmed Start Electronic ballast start lamps quickly (1.0 – 1.5 seconds) without flicker. Programmed start ballasts provide maximum lamp life in frequent lamp starting applications such as in areas where occupancy sensor controls are used. Programmed start electronic ballasts precisely heat the lamp electrodes, tightly controlling the preheat duration before applying the starting voltage. This enhancement over rapid start ballasts minimizes electrode stress and depletion of emitter material during lamp starting, thereby maximizing lamp life. Lamps operated by programmed start ballasts typically operate up to 50,000 or more on/off switch cycles before failure.

Programmed start is also used for most compact lamp systems and electronic dimming systems to provide proper starting of lamps when starting in the dimmed mode.

Programmed Start ballasts should be used in motion sensor controlled applications.

Series vs. Parallel Lighting systems are typically wired in a series or parallel circuit. When a ballast is operating multiple lamps in a series circuit, if one lamp fails, the circuit is opened and all the lamps will extinguish. When a ballast operates multiple lamps in a parallel circuit, the lamps operate independently of each other so, if one lamp fails, the other can keep operating as the circuit between each lamp and the ballast remains unbroken.

Generally, rapid start and programmed start ballasts are wired with the lamps in series. However, some three- and four-lamp ballasts feature series-parallel operation; so that when a single lamp in one branch fails, the others will continue to operate. Instant start ballasts are typically wired with the lamps in parallel.