Venture's Technical Information:
Ballasts Types:

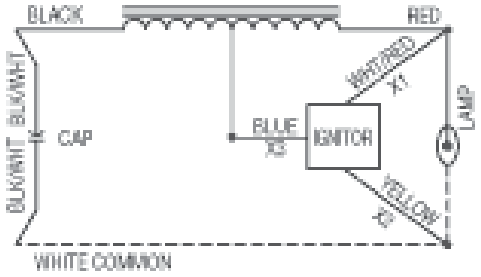
Venture makes a full line of high performance ballasts for metal halide and high-pressure sodium lamps. Our Single Voltage Hybrid and HX family of ballasts is designed especially for Uni-Form® pulse start metal halide lamps.

CHOOSING THE RIGHT BALLAST

Characteristic	Opti-Wave® 277V	Opti-Wave Multi-tap	Opti-E® Electronic	CWA	Isolated CWI
Ballast Efficiency	Excellent	Good	Excellent	Good	Fair
Lamp Wattage Regulation (over lamp voltage range)	Excellent	Excellent	Excellent	Good	Good
Lamp Wattage Regulation (over line voltage range)	Good	Good	Excellent	Excellent	Excellent
Circuit Loading	Excellent	Excellent	Excellent	Excellent	Excellent
Current Crest Factor	Excellent 1.5	Excellent 1.5	Excellent 1.0	Good 1.6 – 1.8	Good 1.6 – 1.8
Input Voltage Dip Tol.	Good	Good	Excellent	Excellent	Excellent
Isolation	No	No	Yes or No	No	Yes

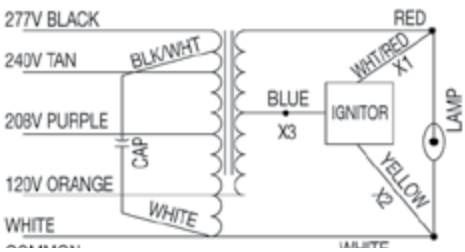
Single Voltage Hybrid and HX ballasts

The Single Voltage Hybrid and HX family of ballasts includes single voltage lag and multi-tap HX circuit designs and incorporates ignitors. They are carefully matched to Uni-Form pulse start lamps to provide peak lamp performance. Single voltage designs offer the most overall value to the end user. Multi-Tap; and CWA designs offer flexibility and lower inventories for distributors, OEMs, and contractors. Venture also offers a full line of multi-tap CWA ballasts for Uni-Form pulse start lamps where CWA ballasts have been specified.



Single Voltage Hybrid 277V·

These are optimized lag/reactor ballasts. The flux density, losses and power factor capacitor are chosen for good circuit loading and modest lamp power variation with respect to lamp voltage variation. These ballasts provide more consistent color from lamp-to-lamp than constant current designs. The circuit loading (250W — 875W) is similar to that of CWA ballasts, providing better value and performance without the need for higher capacity circuits.



High Reactance Autotransformer (HX-HPF)

These are two coil ballasts, consisting of a primary winding that provides the voltage transformation for OCV requirements, coupled with a secondary coil for limiting current. The ballast uses more material and has higher losses than its lag/reactor counterpart. In return, it offers multi-tap capability to serve a wide variety of applications. A capacitor is typically connected to the highest voltage tap to increase input power factor. Lamp performance is excellent.

High Muti-Tap

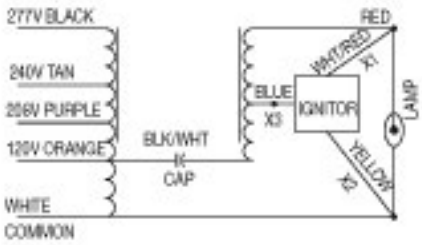
Our multi-tap ballasts are HX circuits that have the same lamp power regulation characteristic as 277V Single Voltage Hybrid ballasts. They are multiple tap HX autotransformers with all of the common US input voltages. The flux density, losses and power factor capacitor are chosen for good circuit loading. They generate modest lamp power variations, with respect to lamp voltage variations. As a result, these ballasts provide more consistent color from lamp-to-lamp than CWA. Multi-tap ballasts can be used in a wider range of applications than 277V Single Voltage Hybrid ballasts, while providing the same performance benefits. Circuit loading is similar to comparable CWA ballasts.

Venture's Technical Information:
Ballasts Types:.

Constant Wattage Autotransformer (CWA)

Present day CWA ballasts for metal halide lamps have changed very little from early designs dating back to the 1960's. Versions with ignitors to operate pulse start lamps are available, along with a wide range of wattages. CWA ballasts have a large installed base in the US. Note that low wattage metal halide lamp performance with CWA ballasts has proven to be poor. Most ballasts sold for lamps of 150 watts or less are either lag or HX types.

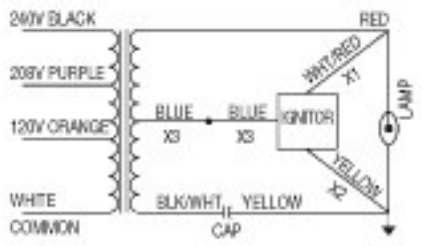
CWA ballasts have two coils. One acts as an autotransformer with multiple input taps and a second provides inductance that in series with a capacitor controls lamp current. For standard probe start designs, the capacitor usually connects between the lamp and the secondary coil of the ballast. In pulse start designs, the capacitor usually connects between the primary and secondary coils. A tap near the lamp output on the secondary coil is connected to the ignitor circuit.



"Constant wattage" is actually a misnomer. The circuit provides more or less constant current to the lamp. This is undesirable for lamp loads that do not provide constant voltage. HPS lamps are unstable when they are operated at constant current. CWA circuits have been modified for HPS lamps, but use more materials and result in higher losses. This is also an issue for metal halide lamps that rise in voltage with aging. The result is lamp-to-lamp power variation that shows up as lamp-to-lamp color variation. As long as demand for CWA ballasts continues, Venture will provide them with the best technology available.

Constant Wattage Isolated Transformer (CWI)

CWI ballasts share the same features as the CWA versions, but have electrically isolated secondary coils to meet the Canadian Electrical Code. These ballasts use slightly more material than CWA types, making them less energy efficient and more costly.



Magnetically Regulated Ballasts (a.k.a. Regulated Lag)

Magnetically regulated ballasts use three coils and saturable magnetic elements to provide a high degree of power regulation to the lamp. From the perspective of the lamp, operation is the same as on a lag ballast with a well-regulated input voltage. These typically have twice the material content of comparable CWA ballasts and higher losses. They are primarily used in heavy industrial settings where switching of large electrical loads impacts lighting circuits (for example, a downlight hanging from a crane in a steel mill). Venture currently does not offer these because demand is small.

Venture's Technical Information:
Ballasts Types:.

Electronic Ballasts

Fluorescent lighting now uses electronic ballasts for essentially all new commercial lighting in the US, largely because of energy legislation. Fluorescent lamps generate more lumens per watt when operated at high frequency and have no compatibility issues. HID lamps have two issues. There is no demonstrable LPW improvement at high frequency and they exhibit acoustic resonances that disturb lamp operation at the frequencies used for fluorescent lamps. As a result, the adoption of electronic HID ballasts has been slow.The most mature metal halide electronic ballasts operate low wattage (150 watts and less) metal halide lamps. The lower the lamp wattage, the higher the resonant frequency. Designers have opted for low frequency circuits that drive low wattage lamps with square wave current. The small size and light weight of low watt electronic ballasts fit retail track lighting applications very well. High wattage lamps have lower resonant frequencies, so ballast designs that operate lamps in the 100 KHz range and above work quite well. These ballasts have low losses, control/program lamp power, and are small and light. Dimming, in conjunction with the use of natural daylight, is a workable strategy with a shorter payback period.

Venture is investigating a number of exciting performance phenomena. Some lamps operating on electronic ballasts (HF, DC, or square wave) provide higher maintained lumens over life. This is a rapidly evolving topic. Look to our website for new developments.

Ballasts that Venture sells in North America include the following versions:

- Quad-tap: 120V, 208V, 240V and 277V
- Tri-tap: 120V, 277V, 347V
- 480V/120T: A 480V ballast with a 120V tap for standby quartz lighting.
- 600V (Canada)
- Most Lag and HX ballasts are rated for supply voltage variations of ±5%.
- CWA and magnetically regulated circuits are rated for supply voltage variations of ±10%.

Venture Lighting International
6675 Parkland Blvd.
Suite 100
Solon, Ohio 44139
Phone: 800-451-2606

U.S. Northeast: neorders@venturelighting.com
U.S. Southeast: seorders@venturelighting.com
U.S. Central: centralorders@venturelighting.com
U.S. Western: westorders@venturelighting.com