ELECTRONIC HID BALLASTS

Electronic HID Overview
Just as electronic ballast technology enhanced fluorescent lighting systems, electronic HID ballasts bring significant performance improvements to HID lighting systems:

- Higher efficiency
- Greater lumen maintenance
- Longer lamp life
- Enhanced color control

e-Vision®
Low frequency electronic ballasts are recommended by lamp manufacturers to drive the new generation of ceramic, low wattage metal halide lamps. These ceramic lamps have superior color rendition and can potentially maintain that color over the life of the lamps when operated with electronic ballasts. Since color is dependent on proper lamp wattage, the electronic ballast must be able to maintain lamp wattage precisely at its rated point throughout the rated average life of the lamp. Low frequency electronic HID ballasts such as the Philips Advance e-Vision® line constantly measure and adjust the wattage, optimizing delivery of the ceramic lamps' superior color properties. This makes metal ceramic halide operated by e-vision ballasts the premier choice for many applications previously lit by either tungsten halogen or incandescent sources, such as retail lighting.

Operational improvements are gained as greater efficiency and cooler running electronic ballasts lead to energy savings. In addition, ballasts run quieter, weigh less and have compact footprints.

DynaVision®
Improved lumen maintenance — the lamp/ballast system's ability to minimize light output depreciation over the life of the lamp — is the most fundamental and significant benefit of electronic HID ballasts, especially medium wattage, high frequency ballasts such as the Philips Advance DynaVision® ballast. DynaVision delivers a 30-50% improvement in lumen maintenance over conventional HID systems (magnetic ballasts driving probe-start metal halide lamps) and a 19% improvement over pulse-start systems. Conventional HID systems typically experience a 50-60% fall-off in light output over the published life of the lamp. By maintaining higher light levels across the rated average life of the lamp, electronic HID ballasts reduce the need for frequent re-lamping.

With more maintained lumens the overall fixture count can be significantly reduced. For example, a 400W DynaVision system produces up to 56% more mean lumens over a 400W probe-start system with magnetic ballasts. Taking advantage of this performance benefit, the fixture count can be reduced by up to 36% without sacrificing light levels. Fewer fixtures also lead to much lower operating costs in terms of both energy savings and maintenance.

The DynaVision ballast provides dimming (to 50% power) using lighting controls such as relays, occupancy sensors, building management systems (BMS) and, other 0-10V controls. Also included is a 120V output for quartz auxiliary lighting during restrike. The microprocessor-based technology incorporated in this ballast provides comprehensive lamp and ballast parameter control and is a solid platform for the future.

CosmoPolis™
CosmoPolis presents a major step forward in outdoor lighting and was developed specifically to meet the challenges of the 21st century. The CosmoPolis system simplifies outdoor lighting with the combination of a compact lamp and an optimized, rugged electronic ballast system. This highly efficient system provides end users the ability to convert to a warm white light without sacrificing color rendering or system lifetime.

MasterColor Elite
The MasterColor CDM Elite MW system offers an unrivalled level of light quality and performance. The lamp’s sparkling white light creates a natural ambiance and brings out the best in all different types of colors. The high efficiency of the lamp and ballast together means reduced energy use and a lower cost of ownership compared to traditional 400W Metal Halide HID systems. This new system is ideal for indoor lighting in both high-bay and recessed applications, as well as outdoor lighting for street and area installations.
e-Vision® Low Frequency Electronic HID Ballasts
For Low Wattage HID Lamps

E-HID Lead Wire Information

<table>
<thead>
<tr>
<th>Wire Color</th>
<th>Function</th>
<th>Lengths Lead (-LF model)</th>
<th>Lengths BLS model</th>
<th>Length Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Input Power</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>White</td>
<td>Input Power</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Black/White</td>
<td>Lamp Power Selection (IMH150A and IMH175C models only)</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Red</td>
<td>Lamp Base</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Blue</td>
<td>Lamp Screwshell</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Green</td>
<td>Ground</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Orange</td>
<td>Lamp Base</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Brown</td>
<td>Lamp Screwshell</td>
<td>11.0” +/- 1.0”</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Yellow</td>
<td>Output for 120V Self Heating Thermal protector</td>
<td>N/A</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Gray with Red Stripe</td>
<td>Output for 120V Self Heating Thermal protector</td>
<td>N/A</td>
<td>9.0” +/- 3.0” / -2.0”</td>
<td>0.5”</td>
</tr>
</tbody>
</table>

Key Features

- IntelliVolt®
  - Operates on either 120 or 277V, or any voltage in between, 50 or 60Hz

- Smaller and lighter weight than magnetic HID F-Can ballasts

- Reduced input watts compared to magnetic systems

- Low frequency lamp operation

- Square wave output waveform

- Lamp EOL detection; Shuts down system at lamp end of life

- Thermally protected, internally fused, and output short circuit protected

- Excellent lamp wattage regulation
  - Lamp wattage will change less than .5% with a +/-10% change in line voltage

- Metallic enclosure

- 1.0 Ballast Factor

Key Benefits

- Fewer SKUs required in inventory
- Broadens the range of applications

- Compact electronic HID footprints
- Provides greater design flexibility

- Energy Savings; Lower cost of ownership

- Prevents acoustic resonance in the lamp arc tube
- Recommended by lamp manufacturers

- Maximizes lamp life

- Enhanced safeguard

- Shuts system down upon abnormal failure or conditions

- Better light quality
- Optimizes lamp color stability over rated average life
- Reduces lamp-to-lamp color variations both initially and during lamp life

- Provides enhanced capability for high ambient temperatures by transferring heat away from sensitive internal components

- Lamp produces maximum light output over its rated average life.
### Catalog Number Explanation

<table>
<thead>
<tr>
<th>I</th>
<th>ZT</th>
<th>MH</th>
<th>100</th>
<th>A</th>
<th>BLS</th>
<th>ID</th>
</tr>
</thead>
</table>

- **I**: Input Voltage: 
  - I = Intellivolt (accepts input of 120 thru 277V, 50/60 Hz nominal) 
  - R = 120V, 50/60 Hz nominal

- **ZT**: Dimming Scheme: 
  - Blank = Fixed Light Output 
  - ZT = 0-10V Dimming 
  - L = LumiStep

- **MH**: Primary Lamp Type: 
  - MH = Metal Halide 
  - WSN = Mini white SON (100 W Only) 
  - SN = High Pressure Sodium 
  - CW = CosmoWhite

- **100**: Max Lamp Wattage: 
  - G20 = 20W Lamp 
  - 39 = 39W Lamp

- **A**: Number of Lamps: 
  - Blank = 1 Lamp Operation 
  - 2 = (2) Lamp Operation

- **BLS**: Can Material / Size (Dimensions include mounting feet): 
  - A/B = Metal case with dim. 5.5”L x 3.6”W x 1.5”H 
  - C = Metal case with dim. 8.0”L x 3.6”W x 1.5”H 
  - D = Metal case with dim. 5.0”L x 3.0”W x 1.5”H 
  - E = Metal case with dim. 5.5”L x 1.75”W x 1.2”H 
  - G = Metal case with dim. 3.9”L x 3.0”W x 1.2”H 
  - H = Metal case with dim. 6.4”L x 3.7”W x 1.5”H 
  - K = Metal case with dim. 4.75”L x 1.3”W x 1.2”H 
  - M = Plastic case with dim. 5.9”L x 2.6”W x 2.6”H 
  - N = Plastic case with dim. 5.3”L x 2.6”W x 2.6”H 
  - R = Metal case with dim. 8.2”L x 4.9”W x 2.2”H 
  - T = Plastic case with dim. 6.3”L x 3.9”W x 2.4”H

- **ID**: Additional Options: 
  - Blank = None 
  - 6 = 6 hours* 
  - 8 = 8 hours* 
  - 10 = 10 hours* 
  - ID = Integral 120V output to supply power to a Self Heating Thermal Protector (39W, 70W, 100W)

- **Additional Options**: 
  - ZT = 0-10V Dimming 
  - L = LumiStep

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  - R = 120V, 50/60 Hz nominal

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^ Philips 20W MiniMaster Color Lamp  
+ Philips 39W MiniMaster Color Lamp  
* Dimming time with LumiStep
e-Vision® Electronic Ballast Specifications

Section I - Physical Characteristics
1.0 The electronic ballast shall be furnished with integral, color-coded leads.

Section II - Performance Requirements
2.0 The electronic ballast shall be IntelliVolt® and operate from a nominal line voltage range of 120-277V, +/-10%, 50/60Hz unless stated otherwise.

2.1 The electronic ballast input current shall have Total Harmonic Distortion (THD) of less than 15%.

2.2 The electronic ballast shall have a Power Factor greater than 90%.

2.3 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit.

2.4 The electronic ballast shall be Sound Rated A.

2.5 The electronic ballast output frequency to the lamps shall be less than 200Hz to prevent acoustic resonance inside the lamp arc tube and to minimize visible flicker.

2.6 The electronic ballast shall provide a “Lamp Current Crest Factor” of less than 1.5.

2.7 The electronic ballast shall be thermally protected to shut off when operating temperatures reach unacceptable levels.

Section III - Regulatory Requirements
3.0 The electronic ballast shall meet the requirements of the Federal Communications Commission rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.1 The electronic ballast shall be Underwriters Laboratories (UL) Listed and CSA Certified where applicable.

Section IV - Other
4.0 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB’s).

4.1 The electronic ballast shall carry a three-year limited warranty from the date of manufacture for operation at marked maximum case temperature or less (See www.philips.com/advancewarranty for further information).

4.2 The manufacturer shall have a twenty-five year history of producing HID lamp ballasts for the North American market.

4.3 The electronic ballast shall be produced in a factory certified to ISO 9002 Quality System Standards.

Installation Notes
1. Red lead must be connected to center terminal of lamp (for Edison, screw base lamps). Do not connect red or blue lead to neutral or ground.

2. Use appropriately rated lampholder.

3. Maximum ballast-to-lamp distance is 5ft. using typical wiring methods and materials. Additional distance up to 15ft. may be possible using wire between lamp and ballast with a total measured capacitance of 100 picofarads or less. Consult Philips Lighting Electronics for application assistance.

4. Power mains must be cycled off and then on to reset ballast after failed lamps are replaced.

Ballast Hot Spot Location
Hot spot locations differ with each ballast model and are designated on the individual ballast labels. Consult ballast labels and ballast specification sheets for Hot Spot locations.
### Metal Halide and High Pressure Sodium

<table>
<thead>
<tr>
<th>Lamp Data</th>
<th>Input Volts</th>
<th>Catalog Numbera</th>
<th>Certifications</th>
<th>Line Current (Amps)</th>
<th>Input Power ANSI (Watts)</th>
<th>Max. Case Temp.</th>
<th>Wiring Diag.</th>
<th>Fig.</th>
<th>Weight (lb)</th>
<th>Max. Distance to Lamp (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>20W Lamp, ANSI Code M156 Minimum Starting Temp. -20°C/-4°F</strong></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>120</td>
<td>RMH-G20-K-LF</td>
<td>✓ ✓</td>
<td>0.23</td>
<td>26</td>
<td>90°C</td>
<td>4</td>
<td>K</td>
<td>0.4</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>277</td>
<td>IMH-G20-G-LF</td>
<td>✓ ✓</td>
<td>0.21</td>
<td>24</td>
<td>90°C</td>
<td>3</td>
<td>E</td>
<td>0.55</td>
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<tr>
<td><strong>22W Lamp, Philips Mini MasterColor, ANSI Code M175, Minimum Starting Temp. -20°C/-4°F</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>120</td>
<td>RMH-20-K-LF or RMH-20-K-LFS</td>
<td>✓ ✓</td>
<td>0.23</td>
<td>26</td>
<td>90°C</td>
<td>4</td>
<td>K</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>39W Lamp, ANSI Code M130/C130, Minimum Starting Temp. -20°C/-4°F</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>39</td>
<td>120</td>
<td>RMH-39-K-LF, RMH-39-K-BLS or RMH-39-K-LFS</td>
<td>✓ ✓</td>
<td>0.40</td>
<td>45</td>
<td>90°C</td>
<td>4</td>
<td>K</td>
<td>0.5</td>
</tr>
<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39-G-LF or IMH-39-G-BLS</td>
<td>✓ ✓</td>
<td>0.39</td>
<td>46</td>
<td>90°C</td>
<td>3</td>
<td>G</td>
<td>0.9</td>
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<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39-E-LF</td>
<td>✓ ✓</td>
<td>0.39</td>
<td>46</td>
<td>90°C</td>
<td>3</td>
<td>E</td>
<td>0.6</td>
</tr>
<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39-A-BLS-ID</td>
<td>✓ ✓</td>
<td>0.45</td>
<td>48</td>
<td>90°C</td>
<td>8</td>
<td>A</td>
<td>1.5</td>
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<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39-S-LF or IMH-39-S-BLS</td>
<td>✓ ✓</td>
<td>0.38</td>
<td>45</td>
<td>85°C</td>
<td>1</td>
<td>A</td>
<td>1.4</td>
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<tr>
<td>2</td>
<td>39</td>
<td>277</td>
<td>IMH-39-A-BLS</td>
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<td>89</td>
<td>85°C</td>
<td>5</td>
<td>A</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>39W Mini MasterColor Lamp, CDM-Tm 35W/930, ANSI Code M179 Minimum Starting Temp. -20°C/-4°F</strong></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39P-G-LF</td>
<td>✓ ✓</td>
<td>0.39</td>
<td>46</td>
<td>90°C</td>
<td>3</td>
<td>G</td>
<td>0.9</td>
</tr>
<tr>
<td>1</td>
<td>39</td>
<td>277</td>
<td>IMH-39P-G-BLS</td>
<td>✓ ✓</td>
<td>0.17</td>
<td>45</td>
<td>90°C</td>
<td>4</td>
<td>K</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>50W Lamp, ANSI Code M110 or M148, Minimum Starting Temp. -20°C/-4°F</strong></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>1</td>
<td>50</td>
<td>120</td>
<td>RMH-50-K-LF, RMH-50-K-BLS or RMH-50-K-LFS</td>
<td>✓ ✓</td>
<td>0.40</td>
<td>56</td>
<td>85°C</td>
<td>2</td>
<td>A</td>
<td>1.4</td>
</tr>
</tbody>
</table>

1. All ballasts are sound rated A, and feature high power factor (>0.9), a ballast factor of 1.0, resettable thermal protection, and a maximum Harmonic Distortion of 15%.
3. A dual-wattage ballast for 39W or 50W MH
4. A dual-wattage ballast for 150W or 175W MH
5. Maximum case temperature should not be exceeded in the application, as life will be affected and the integral resettable thermal protector may activate. A lower maximum temperature rating does not imply lesser thermal performance, and can be indicative of a cooler running ballast design. Consult factory for further application assistance.

* Ordering information:  
  — LF Side exit leads with mounting feet  
  — BLS Bottom exit leads with mounting studs

x Use any Self Heating Thermal Protector (Insulation Detector) having equivalent resistive value 5k to 25k ohm (4 wire versions only)

Refer to pages 4-9 for ballast dimensions
Refer to pages 4-3 for lead wire information