

USHIO, INC. - THE LIGHTING SPECIALIST

USHIO, Inc. was established in 1964, with the aim of developing illumination and energy-related applications for light. Throughout its history, USHIO has focused on developing light sources and units in tandem with the evolution of industrial technologies.

USHIO, Inc. is Japan's foremost producer of high-quality light sources, units, and systems. USHIO has earned its reputation by developing products that integrate state-of-the-art lighting technologies and designs with the specific application needs of industry-leading clients in a wide range of fields, from semiconductors, electronics, image information and processing of biotechnology, medicine and horticulture. You may be surprised to learn that USHIO supplies majority of the exposure lamps used for commercial copy machines, IMAX theater projector machines, and provide essential light sources to make computer chips that you rely daily in your computer and cell phone.

USHIO maintains ISO9001 certified production facilities in Japan, North America, Europe, and Asia and they are complemented by a worldwide sales and marketing network.

As the market for light sources and their application products grow, USHIO is expanding its group of highly specialized companies into an ever-increasing range of countries and regions. Through the internal synergy of the USHIO Group, we are able to produce and market a diverse lineup of the high-quality light sources and their application products and services that are essential to manufacturers. The USHIO Group aims to be the world's leading provider of lighting-edge technology products. Visit www.USHIO.com for more information.

E-BALLAST FRIENDLY

USHIO has seen the development of electronic ballasts in the lighting industry since its first introduction into the fluorescent lamp market. Once a new technology for fluorescent lamp is now a mass produced item that has achieved consistency in its high performance and reliability.

Since then, electronic ballasts continues to evolve in capacity to operate higher pressure lamps up to 12,000W in high technology industrial markets. (as of 3/2009)

Electronic ballast for HID lamps will become the preferred technology of the future, and it will become the horticulture industry standard, just like the evolution that happened in the fluorescent lamp era. That is why we support the electronic ballast technology in the horticulture market, and work with various electronic ballast manufacturers in strategic alliance to improve the industry standard.

APPLICATION NOTES

To achieve optimum lamp performance, the manufacturer's recommended length of lamp cord from the ballast is less than 5ft.

When operating lamps on a longer range, lamp operator must make sure specified ignition voltage is supplied to the lamp.

Please make sure your igniter and capacitor is well maintained on magnetic ballasts, and make sure the electronic ballast of your choice is designed to ANSI standards electronic characteristics.

With any HID lamp, operation voltage will increase as the lamp ages. If you notice misfiring of lamps, please make sure specified ignition voltage is supplied to the lamp.

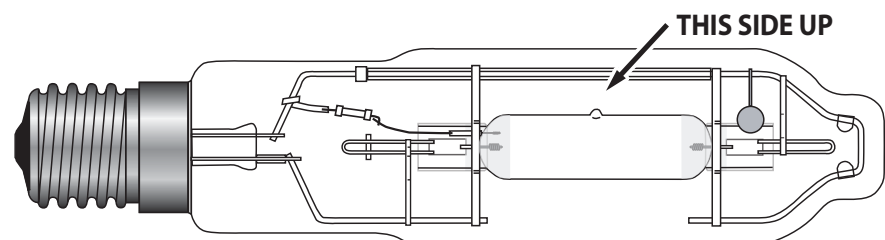
USHIO horticulture lamps are filled with higher pressure to achieve higher output in comparison to standard HID lamps. Higher pressure in the arc tube requires ignition voltage to be at the specified range.

Super HPS and Super MH lamps achieve their unique spectrum by mixing proprietary gas and chemical into the arc tube. HID lamps require approximately 100 hours burn-in time for these gasses and chemicals to blend properly resulting in the correct spectrum output.

Over cooling or uneven cooling may cause cool spots in the lamp causing spectrum shift.

Overheating may cause seal leaks or bulb deformation resulting in short life.

When operating the Metal Halide Dual Core bulbs in horizontal position, please install the lamp with the "tip-off" of the Metal Halide burner pointing UP. This lamp positioning will allow better circulation of the gas mixture inside the burner, optimizing the lamp operation, ensuring best spectrum and maximum output. It will also improve ignition characteristics and extend lamp's life.



LAMP SAFETY

METAL HALIDE & HIGH PRESSURE SODIUM DISCHARGE LAMPS

- ANSI Type E = Enclosed Fixture Required
Lamps that are enclosed fixture rated should only be operated in an enclosed fixture that safely contains all lamp parts in the event of a lamp burst or rupture. These lamps operate at a high internal pressure and at high temperatures which can emit harmful ultraviolet light if the outer glass bulb is broken. A lamp may burst causing physical injury and property damage unless protective safety glass is used with the fixture. Use fixture that meets requirements per UL standard #1572.
- Metal Halide discharge lamps can emit ultraviolet radiation that may be harmful to eyes and skin. Metal Halide discharge lamps that are not open fixture rated should only be used in enclosed fixtures with ultraviolet absorbing filter glass. Do not operate these lamps if the ultraviolet absorbing filter glass is broken or not installed.
- Metal Halide and High Pressure Sodium discharge lamps should only be operated with the compatible ballast, rated ignition voltage, and socket. (See lamp specification for electronic characteristic information.)
- Only operate the lamp in its designated operating position. (See lamp specification for lamp operation position)
- Metal Halide lamps should be turned off for a minimum of 15 minutes per week.
- Lamps should never be operated beyond their rated useful life. The risk of a lamp burst increases with lamp age, temperature, improper operation and improper handling. Replace the lamp at or before the end of its rated life. Group relamping is always recommended.
- Never bump, drop, apply excessive stress, or scratch the lamp. This could cause the lamp to burst! Do not operate any lamps with any traces of scratches, cracks, or physical damage.
- Never operate a lamp above or below its rated current or voltage. This may cause the lamp to leak or burst.
- Always turn off the electrical power before inserting, removing, or cleaning the lamp.
- Clean any dirt, oil, or lint away from the lamp with alcohol and a lint-free cloth or tissue. Dirt or other contaminants will affect light output and may cause the lamp to overheat and decrease lamp life.
- Electrical connections should be clean and in good condition. Replace lamp holders and sockets when needed. Affix the lamp securely in the socket. Improper installations will cause electrical arcing, overheating and short life to lamp and socket.
- Never touch the lamp when it is on, or soon after it has been turned off, as it is hot and will cause serious burns. Lamps should be allowed to cool for a minimum of ten (10) minutes after the lamp is turned off.
- Do not use lamp in close proximity of paper, cloth or other combustible material that can cause a fire hazard.
- Do not look directly at the operating lamp for any period of time; this may cause serious eye injury.
- Metal Halide discharge lamps contain mercury. USHIO strives to preserve the environment and make efficient use of resources. Please refer to your local environmental laws regarding disposal and recycling of mercury containing lamps. For more information, please go to www.lamprecycle.org.

R - NON SELF-EXTINGUISHING LAMPS

- **WARNING:** This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available. Complies with the USA Federal Standard 21 CFR 1040.30 and Canada Standard SOR/80-381.

USHIO
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Form No. B-HILUXGRO-14

Hi-LUX GRO™

made in Germany

USHIO Lighting—Edge Technologies
professional grade horticulture lamps



professional grade horticulture lamps

- Commercial horticulture for year-round production of plants and vegetables.
- Research plant growth for Biotechnology and Pharmaceutical purposes.

HiLUX GRO™
by USHIO * made in Germany



Opti-Red

**Super HPS
AHS 1000
Opti-Red
#5001671**

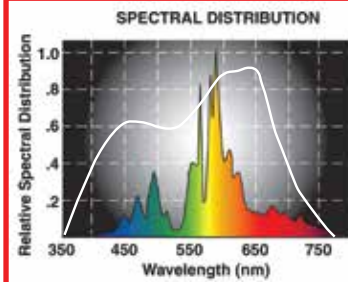
Wattage: **1000**
Initial PAR: **1810 micromol/s**
Color Temp: **2,100k**
Life: **24,000 hours**
Burn Position: **Any**
Bulb Type: **T23**
MOL (mm): **390**
DIA (mm): **65**
Base: **E39**
Lamp Voltage: **200v - 280v**
Operating Current: **4.7a**
MAX Starting Current: **7.0a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **7 minutes**
Reignition Time: **2 minutes**
Ballast: **HPS S52**

**Super HPS
AHS 600
Opti-Red
#5001670**

Wattage: **600**
Initial PAR: **1150 micromol/s**
Color Temp: **2,100k**
Life: **19,000 hours**
Burn Position: **Any**
Bulb Type: **T15**
MOL (mm): **265**
DIA (mm): **46**
Base: **E39**
Lamp Voltage: **95v - 125v**
Operating Current: **6.2a**
MAX Starting Current: **8.1a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **5 minutes**
Reignition Time: **2 minutes**
Ballast: **HPS S106**

**Super HPS
AHS 400
Opti-Red
#5001669**

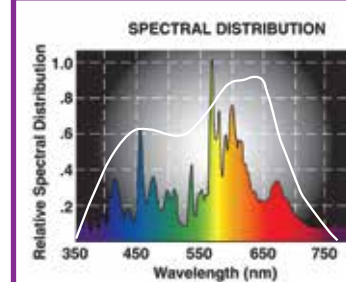
Wattage: **400**
Initial PAR: **720 micromol/s**
Color Temp: **2,100k**
Life: **24,000 hours**
Burn Position: **Any**
Bulb Type: **T15**
MOL (mm): **271**
DIA (mm): **46**
Base: **E39**
Lamp Voltage: **90v - 120v**
Operating Current: **4.45a**
MAX Starting Current: **6.0a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **4 minutes**
Reignition Time: **2 minutes**
Ballast: **HPS S51**



Dual Core

**HPS / MH
AMX-1000
Dual Core
#5002114**

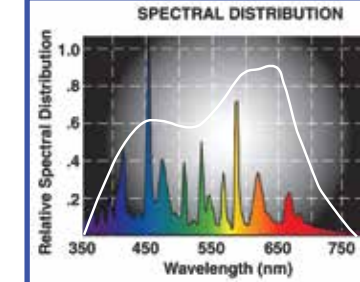
Wattage: **1000**
Initial Lumens: **117,000**
Color Temp: **2,800k**
Life: **9,000 hours**
Burn Position: **Horizontal 45**
Bulb Type: **T21**
MOL (mm): **385**
DIA (mm): **66**
Base: **E39**
Lamp Voltage: **210v - 275v**
Operating Current: **4.7a**
MAX Starting Current: **8.0a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **3 minutes**
Reignition Time: **10 minutes**
Ballast: **HPS S52**



Opti-Blue

**Super MH /
Conversion
AMH-1000
Opti-Blue
#5001673**

Wattage: **1000**
Initial PAR: **1250 micromol/s**
Color Temp: **7,000k**
Life: **12,000 hours**
Burn Position: **Any**
Bulb Type: **T25**
MOL (mm): **284**
DIA (mm): **76**
Base: **E39**
Lamp Voltage: **230v - 280v**
Operating Current: **4.2a**
MAX Starting Current: **5.6a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **3 minutes**
Reignition Time: **10 minutes**
Ballast: **HPS S52**



**Super MH /
Conversion
AMH-600
Opti-Blue
#5001675**

Wattage: **600**
Initial PAR: **695 micromol/s**
Color Temp: **7,000k**
Life: **12,000 hours**
Burn Position: **Any**
Bulb Type: **T25**
MOL (mm): **284**
DIA (mm): **76**
Base: **E39**
Lamp Voltage: **90v - 120v**
Operating Current: **6.2a**
MAX Starting Current: **8.0a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **3 minutes**
Reignition Time: **10 minutes**
Ballast: **HPS S106**

**Super MH /
Conversion
AMH-400
Opti-Blue
#5001674**

Wattage: **400**
Initial PAR: **480 micromol/s**
Color Temp: **7,000k**
Life: **12,000 hours**
Burn Position: **Any**
Bulb Type: **T15**
MOL (mm): **248**
DIA (mm): **46**
Base: **E39**
Lamp Voltage: **80v - 110v**
Operating Current: **4.6a**
MAX Starting Current: **6.0a**
Ignition Voltage: **4KV - 5KV**
Warm-up Time: **3 minutes**
Reignition Time: **10 minutes**
Ballast: **HPS S51**



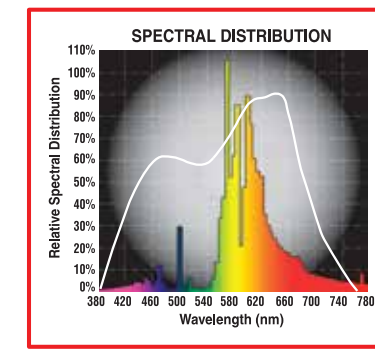
Opti-Red

Super HPS / AHS-DE 1000 / Opti-Red / #5002272

Wattage: **1000**
Initial PAR: **1950 micromol/s**
Color Temp: **2,100k**
Life: **10,000 hours**
Burn Position: **Horizontal**
Bulb Type: **T10**
MOL (mm): **325**
DIA (mm): **30**
Base: **L/W**
Lamp Voltage: **230v**
Operating Current: **4.8a**
MAX Starting Current: **7.0a**
Ignition Voltage: **2440V**
Warm-up Time: **7 minutes**
Reignition Time: **2 minutes**
Ballast: **HPS S52 Electronic**

Super HPS / AHS-DE 1000 / PRO-PLUS / #5002442

Wattage: **1000**
Initial PAR: **2100 micromol/s**
Color Temp: **2,100k**
Life: **10,000 hours**
Burn Position: **Horizontal**
Bulb Type: **T10**
MOL (mm): **323**
DIA (mm): **30**
Base: **L/W**
Lamp Voltage: **230v**
Operating Current: **4.8a**
MAX Starting Current: **7.0a**
Ignition Voltage: **2440V**
Warm-up Time: **7 minutes**
Reignition Time: **2 minutes**
Ballast: **HPS S52 Electronic**



WARRANTY

USHIO horticulture lamps are warranted for 1 year when used in conjunction with major brand, UL-Listed ballasts. USHIO horticulture lamps are said to be free from defects in materials and workmanship for the one year period beginning on the date of sale or if unknown, from date of production. If the lamps fail to operate for the warranty period, USHIO America, Inc. will provide a free replacement lamp (no labor allowance).

TERMS AND CONDITIONS

USHIO horticulture lamps must be installed and operated under suitable environmental conditions and in accordance with the latest National Electrical Code, Underwriters Laboratory Bulletins, and ANSI specifications. This warranty will not apply in the event of conditions demonstrating abnormal use or stress, such as operating temperatures in excess of maximum rated temperatures, under/over voltage conditions, excessive switching cycles or operating hours, dirty or cracked sockets, or improper lamp or ballast installation.

REPLACEMENT OF PRODUCT, LIMITS OF LIABILITY

The foregoing shall constitute the sole and exclusive remedy of the purchaser and the sole and exclusive liability of USHIO AMERICA. NO WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE OR IS TO BE IMPLIED. USHIO AMERICA will not, under any circumstance, whether as a result of breach of contract or warranty, tort, or otherwise, be liable for any costs or damages, including lost profits or revenues, incidental, special or consequential damages.

USHIO America, Inc. reserves the right to examine all failed lamps and/or ballasts and reserves the right to be the sole judge as to whether any lamps and/or ballasts are defective and covered under this warranty.