

# **Ballasts For High Intensity Discharge Lamps**

## **Universal Means Higher Expectations In High Intensity Discharge**

Universal Lighting Technologies ("Universal") offers a wide array of ballasts for High Intensity Discharge (HID) lamps. Applications include Metal Halide (MH), Pulse Start Metal Halide (PSMH), and High Pressure Sodium (HPS) lamps ranging from 35 to 1500 watts.

We're the technology leader in every category of HID ballasts. Our Universal Precise™ line is the latest innovation in magnetic core & coil technology in years.



*Universal offers a complete line of HID ballasts for applications ranging from 35 - 1500 watts.*

# Product Overview

## Core & Coil

Core & coil ballasts are used in over 90% of all HID fixtures. Universal's core & coil models are available for all HID lamp types, including single-, dual-, tri-, quad- and multi-volt designs. For added versatility and reduced inventory costs, Universal has also introduced the industry's first Multi-5™ ballast (120, 208, 240, 277, or 480 volt), featuring a 480-volt tap on a conventional quad-tap ballast.

Our core & coil models are ideal for a wide variety of lighting applications, including factories, warehouses, gymnasiums and retail stores. All these ballasts feature precision-wound coils, ensuring even heat dissipation and the highest electrical integrity.

Universal's Universal Precise™ is the next generation in core & coil technology, featuring a smaller, light-weight design and improved temperature performance. Universal Precise™ fits virtually all applications, and has no exposed live metal parts. There are no plastic extrusions, which prevents breakage during shipping. Color-coded leads make installation easy.

## 50 Hertz

Universal offers 50 Hz core & coil ballasts to meet the rapid growth in demand in international markets. Our ballasts are available for 220, 230, and 240 volt electrical systems.

## F-Can

These ballasts are used primarily for indoor downlighting applications where quiet operation is essential. All the components of these ballasts are enclosed in a fluorescent-style ballast can and are thermally protected.



F-Can Ballasts



Core and Coil Ballasts



HID Ballast Kits

# Application And Operating Information

## Underwriters' Laboratories, Inc. Acceptance

All F-Can and Weatherproof ballasts listed in this catalog are Underwriters' Laboratories, Inc. white card listed, except those for 347 volt operation. All Core & Coil and Potted Core & Coil ballasts listed in this catalog are Underwriters' Laboratories, Inc. yellow card listed (component recognized).

## Ballast Replacement

Ballast replacement presents the possibility of exposure to potentially hazardous voltages and should be performed only by qualified personnel. All installation, inspection and maintenance should be performed only with the entire circuit power to fixture or equipment turned off. Installation shall be in accordance with National Electric Code.

## Heat

A ballast, like any other electrical device, generates heat during normal operation. Planning for maximum heat dissipation with proper fixture design, installation planning and ballast selection will minimize the possibility of a heat-related problem arising. Excessive temperature will have an adverse effect on ballast life.

### Normal temperature limits:

F-Can Ballasts

Maximum case temperature: 90°C

Potted Core & Coil Ballasts and  
Core & Coil Ballasts

Insulation: Class 180°C

Maximum coil temperature: 165°C

(measured by change of resistance method)

All F-Can ballasts listed in this catalog are equipped with built-in automatic resetting internal thermal protection as a standard feature.

Whenever a ballast with thermal protection is used, it is imperative that the fixture/ballast/lamp combination be heat tested under actual or simulated installation conditions to assure that the ballast will not cycle. The resetting thermal protector functions as a thermostat which will open and temporarily deactivate the ballast when it exceeds the permissible

temperature. The ballast will continue to cycle until the cause of overheating is eliminated. If the ballast is defective, it must be replaced. If the cause is external, the ballast will resume normal operation after abnormal conditions are eliminated.

To attain normal ballast life, the maximum coil temperature of the ballast should not exceed the rating of the insulation system. A temperature increase of 10° C results in a 50% reduction of ballast life.

## Low Ambient Temperature (cold)

As temperatures drop, less and less vaporized gas is available within the arc tube of a high intensity discharge lamp, thereby causing an increase in the open circuit voltage required to initiate an arc in the lamp, until a point is reached where the lamp cannot be started. The minimum temperature at which any ballast listed in this catalog will provide reliable starting is listed with the electrical characteristics.

Ballasts should be protected from weather, moisture, or other abnormal atmospheric conditions, unless specifically designed for use under adverse conditions.

## Fusing

The purpose of fusing an HID ballast is to remove the ballast from the power line in the event of a ballast system failure. A fuse does not protect the ballast from failing.

Because the temperature in the ballast compartment is high, typically 90°C, fuse ratings are specified at 25°C, and that this rating declines as the temperature increases, HID fuse recommendations are made between 2 and 3 times the maximum current the ballast will draw during all normal conditions.

Fast-blow fuses should not be used due to the possibility of high inrush currents. These currents are due to the fact that the power can be applied at any point in the AC voltage waveform. Standard and slow-blow are acceptable.

When using the 120V tap for auxiliary lighting, a slow-blow fuse should be used to protect the ballast from damage from a fault in the auxiliary lighting circuit.

## REMOTE MOUNTING DISTANCE

Maximum Length in Feet for Remote Mounting of HID Ballasts to Lamp

ANSI	Lamp Type	Watts	12 GA	14 GA	16 GA	18 GA
M57	Metal Halide	175	272	171	107	67
M58	Metal Halide	250	194	122	77	48
M59	Metal Halide	400	132	83	52	33
M47	Metal Halide	1000	196	123	77	48
M48	Metal Halide	1500	146	92	58	36

For proper installation, insure that remote ballasts are properly vented and mounted to a heat-dissipating surface.

# HID CORE & COIL BALLASTS

## HIGH PRESSURE SODIUM

- 60 Hz
- Minimum Starting Temperature: -40° C
- Normal and High Power Factor Models

**HPS**  
**35-100**  
**WATT**

Input Volts	Catalog* Number	Circuit Type	Watts Input	Max Input Current	Nom Open Circuit Voltage	Fuse Rating	Wir Dia	Ref Dwg	Dimensions		Min Volt	Capacitor				Total Weight (lbs.)	Ignitor			
									A	B		Dry Film		Oil Filled			Catalog Number	Max Distance to lamp (ft)	UL Bench Top Rise	
<b>(1) 35 WATT S76 HIGH PRESSURE SODIUM LAMP</b>																				
120 <sup>1</sup>	1233-251W <sup>•</sup>	R-HPF <sub>3</sub>	43	0.65 1.15	120	2 3	11	1	0.63	2.0	14	120	1.87	2.25	1.56x2.69	2.7	1.5	HPS150-3A Permanently Attached	3	A
120	S35120RCEM	RX-NPF RX-HPF	44	0.85 0.65	120	2 3	7	5	0.55	1.75	14	220	1.87	2.25	1.9	2.3	1.2	HPS150-3A	10	A
<b>(1) 50 WATT S68 HIGH PRESSURE SODIUM LAMP</b>																				
120 <sup>1</sup>	1233-35W <sup>•</sup>	R-HPF <sub>3</sub>	60	0.90 1.50	120	3 5	11	1	0.94	2.40	20	120	1.65	2.83	1.56x2.69	3.1	2.0	HPS150-3A Permanently Attached	3	A
120	S50120RCEM	RX-NPF RX-HPF	60	0.90 1.10	120	3 4	7	5	0.83	1.95	20	240	1.87	2.25	1.9	2.3	1.5	HPS150-3A	3	A
120 or 208 or 240 or 277	S50MLTLC3M	HX-HPF	66	1.24 0.60 0.52 0.45	130	5 3 3 2	10	PC1	1.3	2.7	5	300	1.2	2.2	2.2	2.2	4.1	HPS150-3A	5	A
<b>(1) 70 WATT S62 HIGH PRESSURE SODIUM LAMP</b>																				
120	1233-142W <sup>•</sup>	R-HPF	83	1.30 2.10	120	8 8	11	1	1.32	2.7	2.8	120	1.65	4.75	n/a	n/a	2.5	HPS150-3A Permanently Attached	3	A
120	S70120RCEM	RX-NPF RX-HPF	82	1.30 2.10	120	4 6	7	5	1.10	2.25	28	120	1.87	2.25	1.3	2.7	2.0	HPS150-3A	3	A
120 or 277 or 347	S70TRILC3M	HX-HPF	94	1.50 0.65 0.50	120	4 2 2	9	PC1	1.38	2.7	7	280	1.65	2.83	1.31x2.16	2.2	4.4	HPS150-3A	10	B A A
120 or 208 or 240 or 277	S70MLTLC3M	HX-HPF	98	1.50 0.88 0.75 0.65	120	5 3 3 2	10	PC1	1.38	2.74	7	280	1.65	2.83	1.31x2.16	2.2	4.1	HPS150-3A	10	B
480	S7048TLC3M	HX-HPF	94	0.34	120	2	8	PC1	1.85	3.0	7	280	1.65	3.00	1.31x2.16	2.2	6.0	HPS150-3A	10	A
<b>(1) 100 WATT S54 HIGH PRESSURE SODIUM LAMP</b>																				
120 <sup>1</sup>	1233-10W <sup>•</sup>	R-HPF <sub>3</sub>	114	1.80 2.90	120	5 8	11	1	1.5	2.9	40	120	1.87	2.78	1.87	2.9	2.8	HPS150-3A Permanently Attached	3	A
120	S100120RCEM	RX-NPF RX-HPF	115	2.90 1.80	120	8 5	7	5	1.50	2.75	40	120	1.87	2.78	1.8	2.7	2.0	HPS150-3A	10	A
120 or 277 or 347	S100TRILC3M	HX-HPF	130	2.20 0.95 0.69	120	8 3 2	9	PC1	2.0	3.5	10	330	1.2	2.7	1.31x2.16	2.7	5.9	HPS150-3A	10	B
120 or 208 or 240 or 277	S100MLTLC3M	HX-HPF	122	2.20 1.30 1.10 0.95	120	7 5 3 3	10	PC1	2.0	3.36	10	280	1.26	2.83	1.31x2.16	2.7	6.0	HPS150-3A	10	B
480	S10048TLC3M	HX-HPF	132	0.57	120	2	8	PC1	2.0	3.3	10	280	1.26	2.83	1.31x2.16	2.2	6.0	HPS150-3A	5	E

<sup>1</sup> Also can be used on a 277 volt line in conjunction with the step down transformers  
<sup>3</sup> Capacitors are available as an option for High Power Factor operation  
<sup>•</sup> Ballast has built-in starter.

See pages 4-31 and 4-32 for Reference Drawings and Wiring Diagrams.

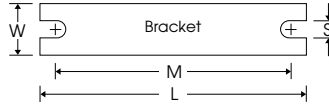
HID  
CORE & COIL

# HID CORE & COIL BALLASTS

## HIGH PRESSURE SODIUM

HPS

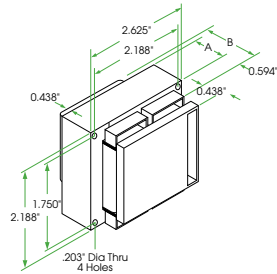
DESCRIPTION	SUFFIX *
For Ballast Only	000
For Bracket Only (see pg. 5-7)	200
For Capacitor Only (see pg. 5-5, 5-6)	500
For Distributor Replacement Kit (see pg. 5-13 thru 5-15)	500K
For Canadian Distributor Replacement Kit (see pg. 5-16)	502K
For Dry-Capacitor & Ballast (see pg. 5-6)	518
For Bracket & Capacitor (see pg. 5-5, 5-7)	700
For Bracket & Dry-Capacitor (see pg. 5-6, 5-7)	718



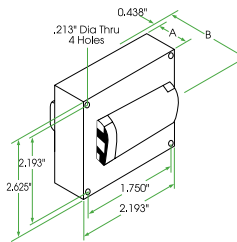
Ref. Dwg.	L	W	M	S
1, 1a, 5	4.00"	0.75"	3.35"	0.25"
PC1, 4	5.25"	1.25"	4.60"	0.25"
PC2, PC3	7.75"	1.25"	5.75"	0.25"

See p. 5-7 for adjustable mounting brackets and detailed bracket drawings.

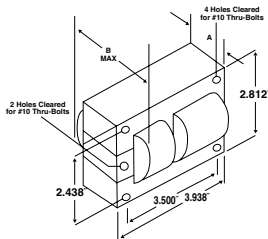
REFERENCE DRAWING 1



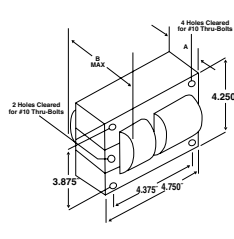
REFERENCE DRAWING 5



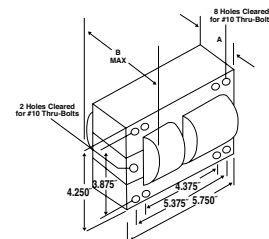
REFERENCE DRAWING PC1



REFERENCE DRAWING PC2



REFERENCE DRAWING PC3

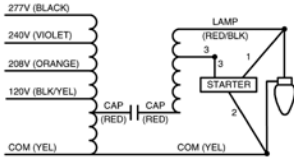


Note: Nominal dimensions provided above  
Contact Universal for drawings and/or tolerances

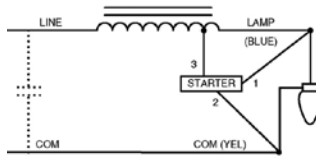
HID  
CORE & COIL

### WIRING DIAGRAMS

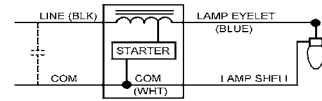
Wiring Diagram 1



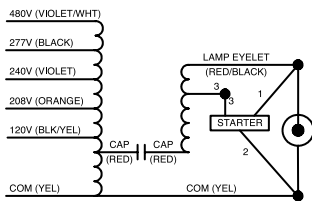
Wiring Diagram 7



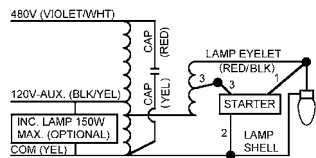
Wiring Diagram 11



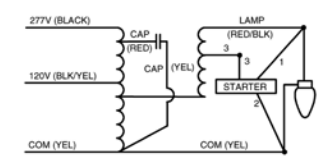
Wiring Diagram 2



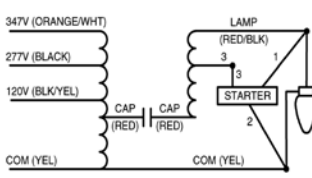
Wiring Diagram 8



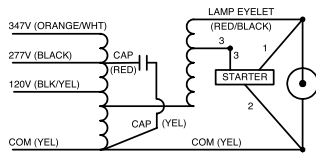
Wiring Diagram 12



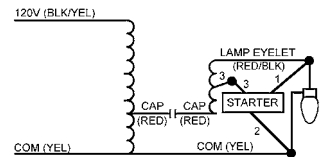
Wiring Diagram 3



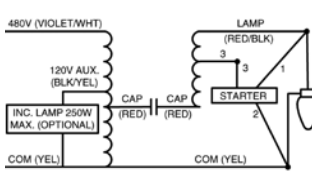
Wiring Diagram 9



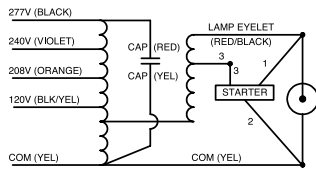
Wiring Diagram 13



Wiring Diagram 4



Wiring Diagram 10



Wiring Diagram 14

