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.

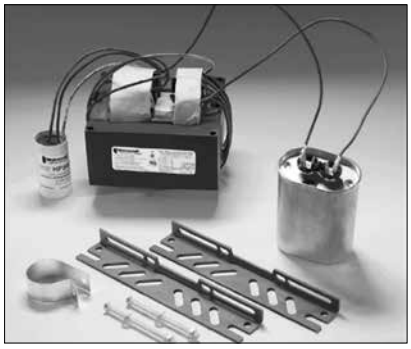
Universal's Universal Precise™ is the next generation in core & coil technology, featuring a smaller, light-weight design and improved temperature performance. Universal Precise™ fits virtually all applications, and has no exposed live metal parts. There are no plastic extrusions, which prevents breakage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

UNIVERSAL PRECISE™

ABBREVIATIONS

CWA	Constant Wattage Autotransformer
CWI	Constant Wattage Isolated
ISO	Regulated Lag
R-HPF	Reactor—High Power Factor
R-NPF	Reactor—Normal Power Factor
HX-HPF	Lag Type — High Reactance Autotransformer—High Power Factor
HX-NPF	Lag Type — High Reactance Autotransformer—Normal Power Factor

UL Bench Top Rise Temperature Code

To facilitate UL inspection, the UL Bench Top Rise Temperature Code is shown on the Universal Core & Coil Ballast label as 1029X. 1029 is the UL Standard for HID Ballasts, and the X is the temperature code. If a fixture is UL listed for 1029D, then automatically all ballasts with an A, B, C or D temperature classification are acceptable for use within that same fixture.

UL Bench Top Rise Letter Code Temperature Range for Class H (180° C) Ballasts

A<75°C B 75°C < 80°C C 80°C < 85°C
D 85°C < 90°C E 90°C < 95°C F 95°C < 100°C

Field

1	2	3	4	5	6	7	8	9

Number of Digits

1	2 to 4	3	1	1	1	1	3	1
M	2000	MLT	A	C	5	M	000	C
Lamp Type (M/P/S/H)	Wattage	Primary Voltage (MLT/ML5/TRI/ 48T/120/277/ 230)	Circuit Type (R/A/I/O/L/M)	Style (C/F/W/E/I/P)	Frame Size (E/3/4/5/X)	Socket Type & Other Oddities (M/D/X/L)	Pack Code (000 TO 999)	Container Type (C/T/I/K)

Field	Description
1	(M) Metal Halide, (P) Pulse Start Metal Halide, (S) High Pressure Sodium
2	35 to 1500 Watts (Varies from two to four digits)
3	(MLT) Quad, (ML5) Multi-5, (TRI) TriVolt, (48T) 480/120, (120) 120, (277) 277, (230) 230V/50Hz
4	(R) Reactor, (A) CWA, (I) CWI, (O) IsoReg, (L) High Reactance/Lag, (M) MagLag
5	(C), C&C, (F) F-Can, (W) Weatherproof, (E) Encased/Potted C&C (I) Indoor Encased
6	(E) E&I, (3) 3x4, (4) 4-3/4, (5) 5-3/4, (X) Non Core and Coil
7	(M) Mogul or Medium, (D) Double Ended, (L) Low Loss
8	Pack Code (000 to 999, per pack code listing)
9	(C) Carton, (T) Tray, (I) Individual, (K) Kit

HID CORE & COIL BALLASTS
HIGH PRESSURE SODIUM

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

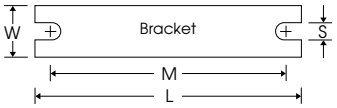
Input Volts	Catalog* Number	Circuit Type	Watts Input	Max Input Current	Nom Open Circuit Voltage	Fuse Rating	Wir Dia	Dimensions			Capacitor						Total Weight (lbs.)	Ignitor		UL Bench Top Rise
								Ref Dwg	A	B	µF	Min Volt	Dry Film Dia	Dry Film Ht	Oil Filled Oval	Oil Filled Ht		Catalog Number	Max Distance to lamp (ft)	
(1) 150 WATT S55 HIGH PRESSURE SODIUM LAMP																				
120[1]	1233-154W♦	R-HPF[3]	170	2.35 4.40	120	6 12	11	1	2.0	3.4	52	240	1.85	3.82	2.12	2.9	3.5	HPS150-3A Permanently Attached	3	A
120	S150120RCEM	RX-NPF RX-HPF	170	2.35 4.40	120	12 6	7	5	2.0	3.05	50	120	1.87	n/a	2.0	2.9	3.25	HPS150-3A	3	A
120 or 277	S15027TLC3M	HX-HPF	188	3.10 1.30	120	10 5	12	PC1	2.5	3.85	14	280	1.65	2.83	1.56x2.69	2.7	7.0	HPS150-3A	10	B A
120 or 277 or 347	S150TRILC3M	HX-HPF	188	3.00 1.35 1.00	120	10 5 4	9	PC1	2.38	3.68	14	300	1.6	2.8	1.56x2.69	2.7	7.0	HPS150-3A	10	B C B
120 or 208 or 240 or 277	S150MLTLC3O	HX-HPF	188	3.00 1.65 1.50 1.30	120	10 5 5 4	10	PC1	2.5	3.85	14	280	1.6	2.8	2.7	2.7	7.0	HPS150-3A	10	E D E D
480	S15048TLC3M	HX-HPF	189	0.72	120	2	8	PC1	3.0	4.5	14	280	1.6	2.83	1.56x2.69	2.7	8.75	HPS150-3A	10	D
(1) 200 WATT S66 HIGH PRESSURE SODIUM LAMP																				
120 277 347	S200TRIAC4M	CWA	240	2.00 0.86 0.68	184	7 3 3	3	PC2	1.45	3.25	28	280	1.65	4.76	1.91x2.91	3.1	8.65	HPS400-3A	10	C
120 or 208 or 240 or 277	S200MLTAC4M	CWA	240	2.10 1.20 1.00 0.88	175	7 4 4 4	1	PC2	1.2	3.0	28	280	1.65	4.76	1.91X2.91	3.1	8.5	HPS400-3A	10	B
480	S20048TAC4M	CWA	240	0.56	172	2	4	PC2	1.2	3.0	28	280	1.65	4.76	1.91x2.91	3.1	8.5	HPS400-3A	10	C
(1) 250 WATT S50 HIGH PRESSURE SODIUM LAMP																				
120	S250120AC4M	CWA	295	2.50	185	8	13	PC2	1.8	3.65	35	330	n/a	n/a	1.8	3.1	10.3	HPS400-3A	10	A
120 or 277 or 347	S250TRIAC4M	CWA	295	2.40 1.05 0.85	185	7 3 3	3	PC2	1.8	3.55	35	240	1.65	3.82	1.91x2.91	3.1	10	HPS400-3A	10	B B C
120 or 208 or 240 or 277	S250MLTAC4M	CWA	295	2.50 1.45 1.25 1.10	190	7 4 4 3	1	PC2	1.8	3.55	35	240	1.65	3.82	1.91x2.91	3.1	10	HPS400-3A	10	B
120 or 208 or 240 or 277 or 480	S250ML5AC4O	CWA	300	2.50 1.55 1.25 1.05 0.65	188	8 4 4 3 2	2	PC2	1.95	3.70	35	240	1.65	3.82	1.91x2.91	3.1	11	HPS400-3A	10	C C B B B
480	S25048TAC4M	CWA	298	0.65	190	2	4	PC2	1.85	3.65	35	240	1.65	3.82	1.91x2.91	3.1	10	HPS400-3A	5	A

* Ballast has built-in starter.
* Also can be used on a 277 volt line in conjunction with the step-down transformers described on page 5-53.
[3] Capacitors are available as an option for high power factor operation.

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

HID CORE & COIL BALLASTS
HIGH PRESSURE SODIUM

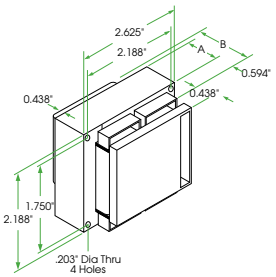
DESCRIPTION	SUFFIX *
For **Ballast Only**	**000**
For **Bracket Only** (see pg. 5-7)	**200**
For **Capacitor Only** (see pg. 5-5, 5-6)	**500**
For **Distributor Replacement Kit** (see pg. 5-13 thru 5-15)	**500K**
For **Canadian Distributor** Replacement Kit (see pg. 5-16)	**502K**
For **Dry-Capacitor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



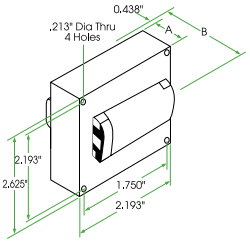
Ref. Dwg.	L	W	M	S
1, 1a, 5	4.00”	0.75”	3.35”	0.25”
PC1, 4	5.25”	1.25”	4.60”	0.25”
PC2, PC3	7.75”	1.25”	5.75”	0.25”

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

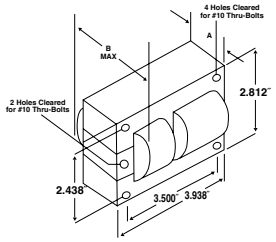
REFERENCE DRAWING 1



REFERENCE DRAWING 5



REFERENCE DRAWING PC1



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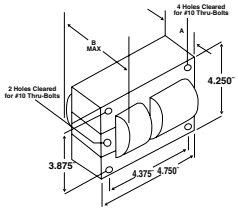

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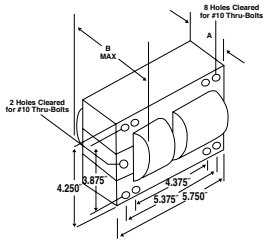
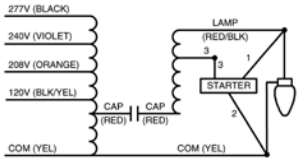


Note: Nominal dimensions provided above
Contact Universal for drawings and/or tolerances

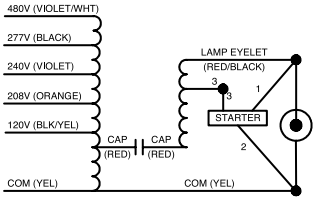
HID CORE & COIL BALLASTS
HIGH PRESSURE SODIUM

WIRING DIAGRAMS

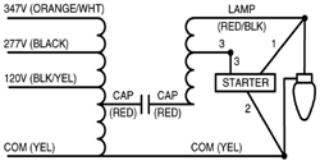
Wiring Diagram 1



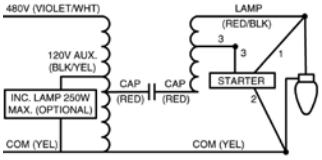
Wiring Diagram 2



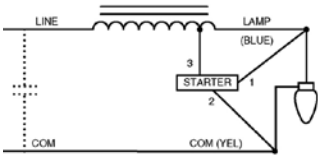
Wiring Diagram 3



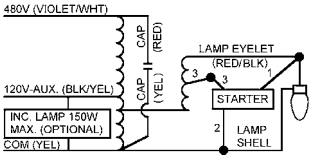
Wiring Diagram 4



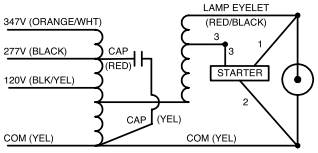
Wiring Diagram 7



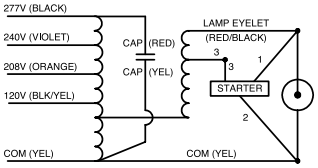
Wiring Diagram 8



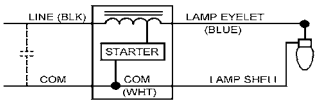
Wiring Diagram 9



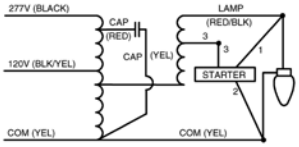
Wiring Diagram 10



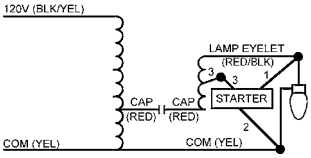
Wiring Diagram 11



Wiring Diagram 12



Wiring Diagram 13



Wiring Diagram 14