

HIGH INTENSITY DISCHARGE (HID) BALLASTS

HID Ballast Kits

Electronic
Ballasts

New Kit Model #	Core and Coil Model
Metal Halide	
M-175-4T-CWA-K	M0175-71C-2XX
M-175-5T-CWA-K	M0175-81C-2XX
M-250-4T-CWA-K	M0250-71C-2XX
M-250-5T-CWA-K	M0250-81C-2XX
M-400-4T-CWA-K	M0400-71C-2XX
M-400-5T-CWA-K	M0400-81C-2XX
M-1000-4T-CWA-K	M1000-71C-2XX
M-1000-5T-CWA-K	M1000-81C-2XX
M-1500-4T-CWA-K	M1500-71C-2XX
Pulse Start Metal Halide	
MP-50-2T-HXH-K	M0050-23C-1XX
MP-70-4T-HXH-K	M0070-71C-5XX
MP-100-4T-HXH-K	M0100-71C-5XX
MP-150-4T-HXH-K	M0150-71C-5XX
MP-250-4T-PSCWA-K	M0250-71C-6XX
MP-320-4T-PSCWA-K	M0320-71C-6XX

Compact
Fluorescent Ballasts

New Kit Model #	Core and Coil Model
MP-350-4T-PSCWA-K	M0350-71C-6XX
MP-400-4T-PSCWA-K	M0400-71C-6XX
MP-750-4T-PSCWA-K	M0750-71C-6XX
MP-1000-4T-PSCWA-K	M1000-71C-6XX
MP-50-2T-HXH-K	M0050-23C-1XX
MP-70-4T-HXH-K	M0070-71C-5XX
MP-100-4T-HXH-K	M0100-71C-5XX
MP-150-4T-HXH-K	M0150-71C-5XX
MP-250-4T-PSCWA-K	M0250-71C-6XX
MP-320-4T-PSCWA-K	M0320-71C-6XX
MP-350-4T-PSCWA-K	M0350-71C-6XX
MP-400-4T-PSCWA-K	M0400-71C-6XX
MP-750-4T-PSCWA-K	M0750-71C-6XX
MP-1000-4T-PSCWA-K	M1000-71C-6XX
High Pressure Sodium	
S-35-120-RXN-K*	S0035-02C-111-K
S-35-120-RXH-K	S0035-02C-111

New Kit Model #	Core and Coil Model
S-50-120-RXN-K*	S0050-02C-111-K
S-50-120-RXH-K	S0050-02C-111
S-70-120-RXN-K*	S0070-02C-111-K
S-70-120-RXH-K	S0070-02C-111
S-70-4T-HXH-K	S0070-71C-5XX
S-100-120-RXN-K*	S0100-02C-111-K
S-100-120-RXH-K	S0100-02C-111
S-100-4T-HXH-K	S0100-71C-5XX
S-150-120-RXN-K*	S0150-02C-111-K
S-150-120-RXH-K	S0150-02C-111
S-150-4T-HXH-K	S0150-71C-5XX
S-250-4T-CWA-K	S0250-71C-2XX
S-250-5T-CWA-K	S0250-81C-2XX
S-400-4T-CWA-K	S0400-71C-2XX
S-400-5T-CWA-K	S0400-81C-2XX
S-1000-4T-CWA-K	S1000-71C-2XX
S-1000-5T-CWA-K	S1000-81C-2XX

Specifications

Performance:

- Ballast shall be designed in accordance with all applicable ANSI specifications including ANSI C82.4.
- Ballast shall be designed with Class "H" (180°C) or higher insulation system.
- Ballasts shall be designed to operate for 60,000 hours of continuous operation at their maximum rated temperature.
- Ballast and starter combinations shall operate reliably at starting temperatures of -40°C for High Pressure Sodium ballasts and -30°C for Metal Halide ballasts at nominal line voltage of plus or minus 10%.
- All HID ballast shall have a nominal ballast factor of 1.0.

Regulatory:

- Manufacturer shall provide written warranty against defects in material or workmanship for 2-Years from date of manufacture.
- Manufacturer shall have been manufacturing HID ballasts for at least ten years.
- All HID ballasts shall be UL component recognized.
- Ballast must be Howard Lighting Products (or approved equal).

Capacitors & Starters for HID

Capacitors:

- All capacitors provided shall have a self-contained internal bleeder resistor where required according to UL1029.
- All oil-filled capacitors shall be housed in aluminum or corrosion-resistant steel cans and contain .25" quick disconnect terminals.
- Oil filled capacitors shall have a 90°C max. Case temperature rating.
- Dry film capacitors shall have a 100°C max. case temperature rating cap.

Starters:

- All starters will be epoxy-filled with a plastic external housing or aluminum external housing.
- All starters shall be designed to provide six months of open circuit operation without failure.
- All starters shall have a case rating temperature of 105°C.
- All starters shall be designed to withstand 10,000 hours of continuous pulsing.
- All starters shall have no exposed live parts.

HID Kits:

- All HID kits shall be precision wound to insure proper insulation.
- HID core and coil shall be interchangeable with prior ballast or include mounting bracket to adapt ballast to intended fixture.
- All HID kits shall be supplied with pre-insulated input voltage leads.
- There are to be no exposed live parts on the core & coil, starter, or dry capacitor.
- Must meet all ANSI Specifications for the specified lamp.
- Kit must include installation instructions and 1-800# for field assistance.
- Ballast must be Howard Lighting Product (or approved equal).

*Ballast operates without a capacitor. Therefore a capacitor is not included with the standard kit.

Energy Policy • • • • •

Metal Halide Legislation

(EISA) Energy Independence & Security Act of 2007

Implementation Date: January 1, 2009

Products Affected: All metal halide fixtures (indoor or outdoor) from 150 to 500 watts. Products not compliant can no longer be manufactured after December 31, 2008.

Inventory: Replacement lamps and ballast for probe start (standard metal halide) will remain available and are not affected by the legislation. Remaining probe start fixture inventory may be sold after January 1, 2009, provided it was manufactured prior to January 1, 2009.

Purpose/Intent: Shift the US to energy independence and utilization of higher efficiency lighting products.

Luminaire Exemptions:

Standards do not apply to fixtures that:

- Use electronic ballast rated for 480 volts
- Use regulated lag ballast
- Fixtures that meet all of the following criteria (within a single fixture):
 1. Contain a ballast rated to operate at an ambient air temperature above 50° C as specified by UL 1029-2001
 2. Rated for wet location use as defined by National Electrical Code 2002 Section 410.4(A)
 3. Are only rated for 150W lamps

Federal Trade Commission (FTC)

Label Identification:

- Circle E logo is required on ballast contained in the fixture, product packaging, all advertising and marketing materials (merchandising, catalogs, website content, point of purchase, etc.)*.
- Affected products (150W - 500W) manufactured on or after January 1, 2009, require the identification mark.

Probe Start (watts)	ANSI	Lamp Size	Mean Lumens	Pulse Start Watts	ANSI	Lamp Size	Mean Lumens
150	M107/E	Medium	8500	150	M102/E	Medium	10000
175	M57/E	Medium Mogul	9300	175	M152/E M137/E	Mogul	12800
				200	M136/E	Mogul	13500
250	M58/E	Mogul	17000	250	M153/E M138/E	Mogul	19000
				320	M154/E M132/E	Mogul	21000
				350	M131/E	Mogul	27000
400	M59/E	Mogul	23500	400	M155/E M135/E	Mogul	31000

EISA Minimum Ballast Efficiency:

Ballast Type	Minimum Ballast Efficiency Rating	Fixture Wattage
Magnetic Probe Start	94%	150W - 250W
Magnetic or Electronic Pulse Start	88%	
Electronic (non-Pulse Start)	90% 92%	251W - 500W

Ⓔ Compliant Efficiency Calculation (examples):

Fixture Wattage	Minimum Efficiency	Input Watt Calculation (maximum fixture input watts)
250 Watt Probe Start	94%	$250 / .94 = 266$
250 Watt Pulse Start	88%	$250 / .88 = 284$
250 Watt Electronic Pulse Start	90%	$250 / .90 = 278$

Benefits of Pulse Start Metal Halide vs Probe Start :

- Faster restrike time (3-4 minutes)
- Half the warm up time (2 minutes)
- 25% to 50% improved lumen output (efficacy)
- Improved illumination levels over life (better lumen maintenance)
- Colder starting temperatures

Contact your local Howard Lighting District Manager or Agent to receive:

- Howard Lighting product information
- Product specification details
- Other energy saving lighting products from Howard Lighting
- Energy audit information

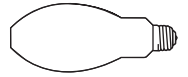
Electronic
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Compact
Fluorescent Ballasts

HID
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HIGH INTENSITY DISCHARGE (HID) BALLASTS

Metal Halide Ballasts



Electronic Ballasts

Compact Fluorescent Ballasts

HID Ballasts

Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Nom. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code
175 WATT, ANSI Code M-57, CWA Kit Model#: M-175-4T-CWA-K, M175-5T-CWA-K													
120V 208V 240V 277V	M0175-71C-214	210 210 210 210	2.20 1.30 1.10 1.00	305	C	1	2.42	4.00	10.0/400	7.00	-	C/A	D D D D
120V 208V 240V 277V	M0175-71C-215	210 210 210 210	3.00 1.15 1.00 0.90	300	C	1	2.4	3.8	10.0/400	7.00	-	C/A	B C C C
120V 208V 240V 277V	M0175-71C-216	215 215 215 215	1.80 1.10 0.90 0.90	320	C	1	2.4	3.8	10.0/400	7.00	-	C/A	B C C B
120V 208V 240V 277V 480V	M0175-81C-213	202 202 202 202 202	2.20 1.30 1.10 0.90 0.50	295	C	1	2.50	4.10	10.0/400	8.00	-	C/A	D D D D D
120V 208V 240V 277V 480V	M0175-81C-214	220 220 220 220 220	2.40 1.40 1.20 1.00 0.60	303	C	1	2.42	4.0	10.0/400	6.90	-	C/A	D D D D D
250 WATT, ANSI Code M-58, CWA KIT Model#: M-250-4T-CWA-K, M-250-5T-CWA-K													
120V 208V 240V 277V	M0250-71C-214	295 295 295 295	3.50 2.0 1.80 1.50	305	C	2	1.6	3.5	15.0/400	8.40	-	C/A	A A A A
120V 208V 240V 277V	M0250-71C-216	290 290 290 290	2.50 1.40 1.30 1.10	305	C	2	1.5	3.3	15.0/400	8.30	-	C/A	A A A A
120V 208V 240V 277V 480V	M0250-81C-215	295 295 295 295 295	3.90 2.40 2.00 1.80 1.00	310	C	2	1.90	3.80	15.0/400	10.00	-	C/A	A A A A A
120V 208V 240V 277V 480V	M0250-81C-216	280 280 280 280 280	2.70 1.60 1.40 1.20 0.70	308	C	2	1.65	3.6	15.0/400	9.00	-	C/A	A A A A A

Metal Halide Ballasts



Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Nom. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code
400 WATT, ANSI Code M-59, CWA Kit Model#: M-400-4T-CWA-K; M400-5T-CWA-K													
120V 208V 240V 277V	M0400-71C-213	453 453 453 453	4.00 2.30 2.00 1.80	300	C	2	2.20	4.20	24.0/400	11.00	-	A/A	D D D D
120V 208V 240V 277V	M0400-71C-214	458 458 458 458	4.50 2.80 2.40 2.20	310	C	2	2.0	4.1	24.0/360	10.00	-	A/A	D E E E
120V 208V 240V 277V 480V	M0400-81C-212	459 459 459 459 459	4.00 2.30 2.00 1.80 1.00	305	C	2	2.30	4.23	24.0/360	12.00	-	C/A	B B C C C
120V 208V 240V 277V 480V	M0400-81C-213	457 457 457 457 457	2.70 1.80 1.40 1.20 0.70	305	C	2	2.15	4.2	24.0/365	11.00	-	C/A	C E E E E
1000 WATT, ANSI Code M-47, CWA KIT Model#: M-1000-4T-CWA-K, M-1000-5T-CWA-K, M-1000-480T-CWA-K													
120V 208V 240V 277V	M1000-71C-214	1085 1085 1085 1085	9.30 5.30 4.60 4.00	445	C	5	3.50	5.70	24.0/480	21.00	-	A/A	C C C C
120V 208V 240V 277V 480V	M1000-81C-213	1100 1100 1100 1100 1100	9.20 5.30 4.60 4.00 2.30	420	C	5	3.20	5.20	24.0/480	21.00	-	C/A	D D D D D
480V	M1000-29C-214	1085	2.0	420	C	5	2.8	4.9	24.0/480	18.5	-	C/A	D
1500 WATT, ANSI Code M-48, CWA KIT Model#: M-1500-4T-CWA-K, M-1500-480T-CWA-K													
120V 208V 240V 277V	M1500-71C-215	1605 1605 1605 1605	7.9 4.6 3.9 3.4	440	C	3	4.1	6.1	32.0/525	31.00	-	C/C	G E E E
480V	M1500-29C-214	1625	2.1	450	C	3	4.2	6.2	32.0/525	31.00	-	C/C	E

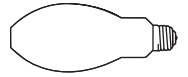
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Pulse Start Metal Halide Ballasts



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HID Ballasts

Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Norm. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code
50 WATT, ANSI Code M-110, HX-HPF Kit Model#: MP-50-2T-HXH-K													
120V 277V	M0050-23C-512	68 68	1.45 0.60	265	B	1	1.05	2.1	6.0/280	3.50	ST1001	C/A	A A
70 WATT, ANSI Code M-98, HX-HPF KIT Model#: MP-70-4T-HXH-K													
120V 208V 240V 277V	M0070-71C-511	85 85 86 85	2.00 1.20 1.00 0.90	305	B	1	1.44	2.75	8.0/280	4.60	ST1001	C/C	A A A A
120V 208V 240V 277V	M0070-71C-512	92 92 92 92	2.00 1.20 1.00 0.90	250	B	1	1.45	2.85	8.0/280	4.60	ST1001	C/A	A A A A
120V 208V 240V 277V 480V	M0070-71C-513	85 85 85 85	2.00 1.10 1.00 0.90	250	B	1	1.50	2.90	8.0/280	4.5	ST1001	C/A	A A A A
100 WATT, ANSI Code M-90, HX-HPF KIT Model#: MP-100-4T-HXH-K													
120V 208V 240V 277V	M0100-71C-512	129 129 129 129	3.00 1.75 1.50 1.30	270	B	1	1.50	2.90	12.0/280	5.50	ST1001	C/C	B B B B
120V 208V 240V 277V	M0100-71C-516	125 125 125 125	4.50 2.80 2.40 2.20	270	B	1	1.70	3.10	12.0/280	5.20	ST1001	C/A	A A A A
150 WATT, ANSI Code M-102, HX-HPF KIT Model#: MP-150-4T-HXH-K													
120V 208V 240V 277V	M0150-71C-513	182 182 182 182	5.10 3.00 2.40 2.10	255	B	1	2.30	3.80	16.0/280	6.80	ST1001	C/A	B B A A
250 WATT, ANSI Code M-153, PS-CWA Kit Model#: MP-250-4T-PSCWA-K													
120V 208V 240V 277V	M0250-71C-6E2 	283 283 283 283	3.50 1.90 1.70 1.50	275	D	2	2.00	3.75	17.0/480	12.0	ST1000 Or ST1001	A/A	A A A A
120V 208V 240V 277V	M0250-71C-6E3 	284 284 284 284	2.25 1.35 1.15 1.00	275	D	2	2.00	4.10	16.0/370	11.00	ST1001	A/A	A A A A

Circle E logo indicates that this product complies with federal energy efficiency requirements.



Pulse Start Metal Halide Ballasts



Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Norm. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code
320 WATT, ANSI Code M-135/M-154, PS-CWA Kit Model#: MP-320-4T-PSCWA-K													
120V 208V 240V 277V	M0320-71C-6E5 	364 364 364 364	1.90 1.20 1.00 0.90	280	D	2	2.00	4.15	22.0/330	10.00	ST1001	A/A	B B B C
350 WATT, ANSI Code M-131, PS-CWA Kit Model#: MP-350-4T-PSCWA-K													
120V 208V 240V 277V	M0350-71C-6E4 	397 397 397 397	2.40 1.40 1.10 1.10	275	D	2	2.30	4.20	24.0/400	12.00	ST1000 Or ST1001	C/A	A A A A
400 WATT, ANSI Code M-135/M-155, PS-CWA Kit Model#: MP-400-4T-PSCWA-K													
120V 208V 240V 277V	M0400-71C-6E5 	450 450 450 450	2.10 1.10 1.00 0.90	250	D	2	1.92	4.10	26.0/345	10.00	ST1001	A/A	C C C D D
750 WATT, ANSI Code M-149, PS-CWA Kit Model#: MP-750-4T-PSCWA-K, MP-750-5T-PSCWA-K													
120V 208V 240V 277V	M0750-71C-613	815 815 815 815	5.80 3.30 2.90 2.50	370	D	5	2.30	4.30	24.0/480	18.00	ST1003	C/C	B C B B
120V 208V 240V 277V 480V	M0750-81C-612	823 820 820 825 821	7.40 4.10 3.70 3.20 1.90	355	D	5	2.80	5.50	28.0/400	19.30	ST1003	C/C	B C C C C C
875 WATT, ANSI Code M-166, PS-CWA Kit Model#: MP-875-4T-PSCWA-K													
120V 208V 240V 277V	M0875-71C-611	970 930 973 972	6.35 3.00 3.15 2.70	420	D	5	3.00	5.50	22.0/480	19.50	ST2002	C/A	B A A A
1000 WATT, ANSI Code M-141, PS-CWA Kit Model#: MP-1000-4T-PSCWA-K													
120V 208V 240V 277V	M1000-71C-613	1077 1077 1077 1077	8.70 5.10 4.50 4.10	404	D	5	3.00	4.90	24.0/480	21.20	ST2002	C/A	C C C C C
120V 208V 240V 277V	M1000-71C-914	1080 1080 1080 1080	7.30 5.30 4.00 3.40	420	D	5	2.80	5.0	24.0/480	18.5	ST2002	C/A	D D C C D

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Compact
Fluorescent Ballasts

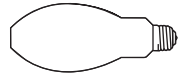
HID
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HIGH INTENSITY DISCHARGE (HID) BALLASTS

High Pressure Sodium Ballasts



Electronic Ballasts

Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Norm. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code
35 WATT, ANSI Code S-76, R-HPF, R-NPF Kit Model#: S-35-120-RXH-K, S-35-120-RXN-K													
120V	S0035-02C-111	42	1.10	120	A	7	0.63	1.70	20.0/120	1.17	ST2001	C	A

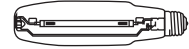
Compact Fluorescent Ballasts

50 WATT, ANSI Code S-68, R-NPF Kit Model#: S-70-120-RXN-K													
120V	S0050-02C-111	61	1.10	120	A	7	0.90	1.80	20.0/120	1.43	ST2001	C	A
70 WATT, ANSI Code S-62, R-HPF, R-NPF, HX-HPF Kit Model#: S-70-120-RXH-K, S-70-120-RXN-K, S-70-4T-HXH-K													
120V	S0070-02C-111	80	1.60	120	A	7	1.30	2.50	28.0/120	2.10	ST2001	C	A
120V	S0070-02C-112	83	0.90	120	A	7	1.30	2.50	28.0/120	2.00	ST2001	C	A
120V 208V 240V 277V	S0070-71C-512	68 107 119 149	1.70 1.00 0.90 0.70	120	B	1	1.50	3.10	7.0/280	5.00	ST2001	C	A A A A

HID Ballasts

100 WATT, ANSI Code S-54, R-HPF, R-NPF, HX-HPF Kit Model#: S-100-120-RXH-K, S-100-120-RXN-K, S-100-4T-HXH-K													
120V	S0100-02C-111	115	2.10	120	A	7	1.54	2.60	46.0/120	2.50	ST2001	C	A
120V	S0100-02C-113	112	2.00	120	A	7	1.54	2.80	36.0/120	2.40	ST2001	C	A
120V 208V 240V 277V	S0100-71C-512	128 129 130 128	2.55 1.60 1.40 1.20	125	B	1	2.00	3.40	10.0/280	7.20	ST2001A	C	B A A A
150 WATT, ANSI Code S-55, R-HPF, R-NPF, HX-HPF Kit Model#: S-150-120-RXH-K, S-150-120-RXN-K, S-150-4T-HXH-K													
120V	S0150-02C-111	167	3.00	120	A	7	2.20	3.50	55.0/120	3.40	ST2001	C	A
120V 208V 240V 277V	S0150-71C-512	188 188 188 188	3.50 1.95 1.70 1.50	120	B	1	2.50	3.80	14.0/280	8.00	ST2001	C	C C C C

High Pressure Sodium Ballasts



Input Voltage	Model Number	Input Power (Watts)	Max. Input Current	Norm. Open Cir. Volt.	Wir. Dia. pgs. 56-60	Dim. Fig pg. 61	A (in.)	B (in.)	Capacitor pg. 52-54	Total Wt. (lbs.)	Ignitor Part Number	Pri/Sec Conductor C-Copper A-Alum	U.L. Bench Top Rise Code	Electronic Ballasts
250 WATT, ANSI Code S50, CWA Kit Model#: S-250-4T-CWA-K, S-250-5T-CWA-K														
120V 208V 240V 277V	S0250-71C-214	290 290 290 290	1.80 1.10 0.90 0.80	185	D	2	1.83	3.60	35.0/240	10.90	ST2000	C/C	A A A A	Compact Fluorescent Ballasts
120V 208V 240V 277V 480V	S0250-81C-214	292 292 292 292 292	2.40 1.40 1.20 1.10 0.60	186	D	2	2.00	3.60	35.0/240	11.70	ST2000	C/C	A A A A A	
400 WATT, ANSI Code S-51, CWA Kit Model#: S-400-4T-CWA-K, S-250-5T-CWA-K														
120V 208V 240V 277V	S-400-71C-212	464 464 464 464	2.00 1.25 1.00 0.90	190	D	2	2.28	4.23	55.0/240	13.50	ST2000	C/C	C D C B	HID Ballasts
120V 208V 240V 277V 480V	S-400-81C-212	475 475 475 475 475	2.50 1.40 1.25 1.10 0.65	190	D	2	2.62	4.25	55.0/240	15.0	ST2000	C/C	D D D D D	
1000 WATT, ANSI Code S-52, CWA Kit Model#: S-1000-4T-CWA-K, S-1000-5T-CWA-K														
120V 208V 240V 277V	S1000-71C-212	1087 1038 1091 1084	5.80 3.25 2.90 2.65	525	D	3	3.75	5.88	26.0/525	27.00	ST2002	C/C	B B B B	HID Ballasts
120V 208V 240V 277V 480V	S1000-81C-212	1124 1072 1126 1133 1127	8.00 4.70 3.90 3.60 2.10	435	D	3	4.0	6.1	26.0/525	28.20	ST2002	C/C	D D D D D	