Universal™ Lighting Technologies

Sign & Outdoor Illumination
PRODUCT CATALOG

Universal™ Lighting Technologies

THE ONLY NAME YOU NEED TO KNOW IN SIGN ILLUMINATION

Universal™ Lighting Technologies

Universal Lighting Technologies, Inc. was purchased by the Panasonic Group in 2007 and is Panasonic's North America Commercial Lighting Leadership organization. The company is part of the worldwide network of Panasonic locations. Universal has been in business since 1947 and features a comprehensive product line for nearly every lighting application. Naturally, the push for increased efficiency has contributed to an emerging line of LED sign products. This rapid growth is supported by the reliability of in-house LED design and decades of experience in ballast and driver North American manufacturing. When you say, "Universal," you can be sure of reliability, exceptionally high quality standards, precision engineering, and rugged reliability for both indoor and outdoor illumination needs. We look forward to meeting your sign and outdoor illumination needs with the following innovative solutions:

- **EVERLINE® LED Sign Tubes:** The EVERLINE® Sign Tube is an easy to install LED replacement solution for signs currently using T12HO or T8HO lamps.
- **EVERLINE® LED Vapor Tight Fixtures:** The EVERLINE® Vapor Tight fixture line introduces market leading lumen packages and features four foot and eight foot products for replacement and new construction.
- **EVERLINE® LED Wall Pack Fixtures:** The EVERLINE® Wall Pack luminaire is perfect for HID replacement or new construction, providing 5 lumen options, instant light availability with excellent color rendering and common commercial color temperatures.
- **EVERLINE® LED Retrofit Kit:** The EVERLINE® LED Retrofit Kit serves as a fluorescent lighting replacement kit, reducing energy consumption and maintenance. Universal makes it easy to upgrade to LED technology with simple installation and industry leading efficiency with the reliability of our complete in-house design (electronic, thermal and optical) including EVERLINE® "matched" modules and drivers.
- **EVERLINE® LED T8 Replacement Tubes:** The EVERLINE® LED Linear T8 Tubes are ideal for T8 fluorescent lamp replacement and install directly into existing fixtures that have electronic T8 ballast. These glass replacement tubes with wide 240º light distribution provide ease of installation, immediate energy savings of 30% or more, and low maintenance.
- **EVERLINE® LED T8 Tube & Driver Bundles:** The EVERLINE® Tube + Driver Bundles offer a complete LED replacement solution using Type C T8 Tubes and an external LED EVERLINE® Driver delivering LED system efficacies exceeding 120 LPW.
- **EVERLINE® LED Chain Systems:** These flexible products provide LED illumination, deliver high lumens, have consistent color, and feature a superior module fastening system. Applications are limited only by your imagination. Layout support is also available.
- **EVERLINE® 150W Drivers:** The EVERLINE® family of 150W drivers provides leading edge technology for high efficiency application flexibility and reliability in rugged environments. High transient protection and thermal foldback controls protect the driver and the connected modules in tough outdoor conditions.
- **EVERLINE® Surge Protectors:** EVERLINE® Surge Protectors can protect devices from extreme voltage fluctuations to ensure years of continuous operation. The increased use of LED based lighting in outdoor applications introduces unique challenges to fixture reliability. EVERLINE® Surge Protectors offer protection for line-neutral, line ground, and neutral ground connections.
- **Electronic Sign Ballasts:** Universal features a full line of electronic ballasts, perfect for indoor and outdoor sign applications. Our full family of high efficiency ballasts cover T5, T5HO, T8, T8HO, T12, and T12HO lamps. Universal offers universal input voltage (120V - 277V) and Instant and Rapid Start technologies, simplifying installation, ensuring efficiency and maximizing energy savings.
- **Wiring Blocks:** In 2014, U.S. Department of Energy banned the production of magnetic sign ballasts. Wiring Blocks allow quick and easy conversion of rapid start magnetic ballast installations (series wired) to instant start electronic ballasts (parallel wired).
- **EVERLINE® LED Drivers:** Universal is pleased to feature EVERLINE® constant voltage drivers which offer 12V and 24V class 2 output models, deisgned for long life and reliable operation.
- **HID Ballasts (F-Can):** Universal is the leader in ultra-reliable HID. When it comes to F-Can HID ballasts for sign replacement, Universal ballasts are Type 2 rated for outdoor applications and are UL listed for dry and damp locations. Perfect replacement for existing sign cabinets.
- **HID Ballast Replacement Kits:** Universal is the technology leader in every category of HID ballasts covering every lamp application – including Metal Halide, Pulse Start Metal Halide, and High Pressure Sodium. Plus, the Multi-5® Uni-Pak HID Ballast and Lamp Replacement Kit is available for High Pressure Sodium, Metal Halide, and even Pulse Start types in an easy to carry box with all items needed and a matched lamp.
- **Standard Electronic Ballasts:** Universal Lighting keeps pushing the frontier of T8 technology with innovative products that deliver dramatic energy savings, greater fixture design flexibility, longer lamp life and installation ease. You can count on Universal for some of the industry's highest efficiency and most hassle-free T5,T8 & T12 electronic ballasts.

CONTENTS

EVERLINE® LED SIGN TUBES

ST SIGN TUBE | SIGN TUBES | UNIFORM

The EVERLINE® Sign Tube offers an easy to install LED replacement solution for signs currently using T12HO or T8HO lamps.

Part Number	Length	Power (W)	Lumens	CRI	CCT
Single Sided					
ST24-865-SS	24”	6W	680lm	82	6500
ST36-865-SS	36”	9W	1020lm	82	6500
ST48-865-SS	48”	12W	1360lm	82	6500
ST60-865-SS	60”	15W	1700lm	82	6500
ST72-865-SS	72”	18W	2040lm	82	6500
ST84-865-SS	84”	21W	3060lm	82	6500
ST96-865-SS	96”	24W	2720lm	82	6500
ST108-865-SS	108”	27W	3060lm	82	6500
ST120-865-SS	120”	30W	3400lm	82	6500
Double Sided					
ST24-865-DS	24”	12W	1360lm	82	6500
ST36-865-DS	36”	18W	2040lm	82	6500
ST48-865-DS	48”	24W	2720lm	82	6500
ST60-865-DS	60”	30W	3400lm	82	6500
ST72-865-DS	72”	36W	4080lm	82	6500
ST84-865-DS	84”	42W	4760lm	82	6500
ST96-865-DS	96”	48W	5440lm	82	6500
ST108-865-DS	108”	54W	6120lm	82	6500
ST120-865-DS	120”	60W	6800lm	82	6500

Features:

Easy Installation

- 24V Constant voltage product allows for simple class II wiring.
- Run up to 32’ of single sided (16’ double sided) tubes on one 100W power supply.
- 90° Adjustable RDC style endcaps for correct lamp orientations.
- Ideal for Vertical or Horizontal installation.
- Utilizes the same spacing as standard fluorescent systems.
- Designed for daisy-chain or parallel wiring.

Superior Performance

- Up to 60% more efficient than fluorescent systems at over 113 lm/W.
- 340lm/ft delivered to the sign face for bright and even illumination.
- Mounts as close as 5” from the acrylic face.
- Rated for more than 140,000 hours of usable life at L70.
- 6500 CCT.
- 5 year warranty.

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FOR MORE INFORMATION, CALL

1-800-225-5278

VT VAPOR TIGHT | DURABLE

- Durable 4′ and 8′ LED vapor tight housing
- Equipped for 0-10V dimming
- IP65 rated for indoor or covered outdoor use
- NSF certified for food equipment
- Universal or 347 VAC Options available
- Optional Stainless Steel latches
- 140K+ hour lumen maintenance at L70
- 5 year warranty

Series	Size	Nominal Lumens	CRI (nom.)	Color Temp.	Voltage	Options
VTL4: 4 Foot Enclosed & Gasketed Vapor Tight Luminaire						
VTL = LED Vapor Tight Luminaire	**4** = 4ft	**33L** = 3,300	**8** = 85 (nom.)	**35** = 3,500K	**U** = 120-277V	**SSL** = Stainless steel latches
		40L = 4,000		**40** = 4,000K	**347** = 347V	**SSLTR** = Tamper resistant stainless steel latches
		5K = 5,000		**50** = 5,000K		
		6K = 6,000				
		8K = 8,000				
		10K[1] = 10,000				
VTL8: 8 Foot Enclosed & Gasketed Vapor Tight Luminaire						
VTL = LED Vapor Tight Luminaire	**8** = 8ft	**7K** = 7,000	**8** = 85 (nom.)	**35** = 3,500K	**U** = 120-277V	**SSL** = Stainless steel latches
		8K = 8,000		**40** = 4,000K	**347** = 347V	**SSLTR** = Tamper resistant stainless steel latches
		10K = 10,000		**50** = 5,000K		
		12K = 12,000				
		16K = 16,000				
		20K[1] = 20,000				

Data subject to change. Refer to application and performance specification sheets for current data.

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For a list of DesignLights Consortium™ QPL listed products please visit **www.designlights.org/qpl/en/saved/UBU24XJ**

FOR MORE INFORMATION, CALL

1-800-225-5278

EVERLINE® LED WALL PACK FIXTURES

WP WALL PACK | *RELIABLE*

- Perfect for HID upgrade to LED or new construction
- IP66 rated, suitable for wet locations
- 140K + hour lumen maintenance at L70
- Optional photocell and tamper-resistant mounting hardware
- Optional WCS13-BZ cutoff shield
- 5 year warranty

Part Number	Lumens*	Power (W)	CRI	xx/CCT (K)	Input
WPL13: 13 Inch LED Building Wall Mount Luminaire					
WPL13-10L8xx-U-PCBZ	914	9.4	82	40/4000K, 50/5000K	120-277VAC
WPL13-14L8xx-U-PCBZ	1,752	19.8	82	40/4000K, 50/5000K	120-277VAC
WPL13-23L8xx-U-PCBZ	2,090	24.3	82	40/4000K, 50/5000K	120-277VAC
WPL13-27L8xx-U-PCBZ	2,457	30.8	82	40/4000K, 50/5000K	120-277VAC
WPL13-33L8xx-U-PCBZ	2,813	35.4	82	40/4000K, 50/5000K	120-277VAC

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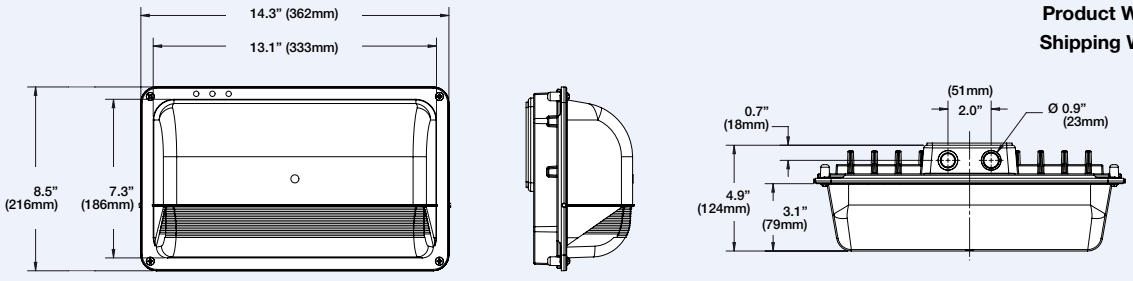

Product Weight: 7.5 lbs.
Shipping Weight: 9.0 lbs.

FOR MORE INFORMATION, CALL
1-800-225-5278

RK RETROFIT KIT | LED RETROFIT KIT | SIMPLE

- 2ft & 4ft lightbars retrofit 2ft or 4ft fluorescent luminaires to LED
- Fast and easy to install
- Kit includes (2) or (3) lightbars and 0-10V dimming driver with mounting hardware
- Design Lights Consortium™ qualified
- L70 > 140,000hrs at 40°C lumen maintenance
- 7 year warranty

Part Number*	Lamps/Kit	Lamp Length	Power (W)	Lumens	CRI	xx/CCT (K)	y/Input Voltage
LRK22 & LRK24: Lighting Retrofit Kits							
LRK22-23L8xx-y	2	2ft	21.6	2,441	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC
LRK22-30L8xx-y	2	2ft	31.4	3,361	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK32-30L8xx-y	3	2ft	31.7	3,515	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK32-45L8xx-y	3	2ft	52.9	5,568	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK24-43L8xx-y	2	4ft	37.9	4.438	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC
LRK24-46L8xx-y	2	4ft	42.8	5,124	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK24-60L8xx-y	2	4ft	61.8	7,010	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK34-46L8xx-y	3	4ft	42.1	5,350	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC
LRK34-60L8xx-y	3	4ft	60.5	7,281	82	35/3500K, 40/4000K, 50/5000K	U/120-277VAC, 347/347VAC

* Where “xx” = 35, 40, or 50. Where “y” = U or 347.
Refer to application and performance specification sheets for current data.

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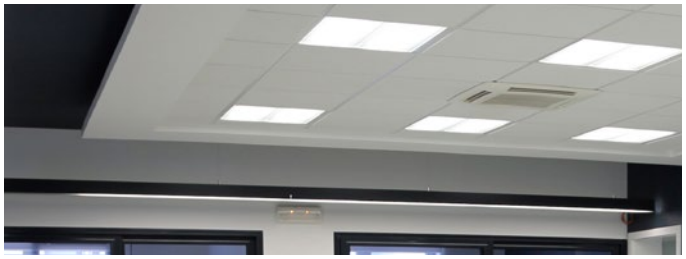

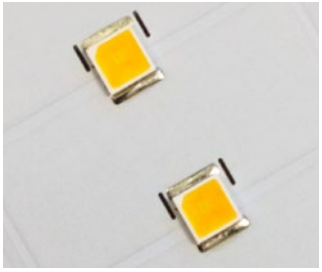

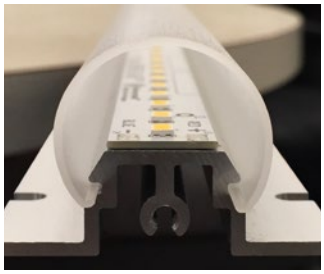

FOR MORE INFORMATION, CALL
1-800-225-5278

EVERLINE® LED T8 REPLACEMENT TUBES

LT LINEAR TUBE | LED LINEAR TUBE | AFFORDABLE

- 4', 3', 2' lengths available
- Glass construction for optimum optical efficiency.
- Beam Angle: 240°
- Compatible with most IS & PS T8 electronic ballasts, 120-277V and 347V
- Long Life: 50,000 hours (L70)
- No fixture rewiring required
- Reduces energy by up to 40%
- 5 year warranty

Description	Model Number	Bare Lamp Watts	Watts/Tubes Ballast Factor .77	Watts/Tubes Ballast Factor .88	Watts/Tubes Ballast Factor 1.18	DLC Ballast Factor .77	DLC Ballast Factor .88	DLC Ballast Factor 1.18BF
Standard								
T8LED17W 2200LM 4FT	T8LDR4F17/8xx	17	17	21	29	1860	2200	2950
T8LED14W 1800LM 4FT	T8LDR4F14/8xx	14	15	17	23	1500	1800	2400
T8LED11W 1450LM 3FT	T8LDR3F11/8xx	11	11	13	N/A	1190	1450	N/A
T8LED9W 1150LM 2FT	T8LDR2F9/8xx	9	9	10	N/A	940	1150	N/A
High Efficiency								
T8LED15W 2200LM 4FT	T8LDR4F15/8xx	15.5	16	19	26	1860	2200	2950
T8LED12W 1800LM 4FT	T8DR4F12/8xx	12.5	14	16	22	1500	1800	2400

- Lumens are nominal lumens with a .88 ballast factor ballast
*** Compatible with Emergency Ballasts*

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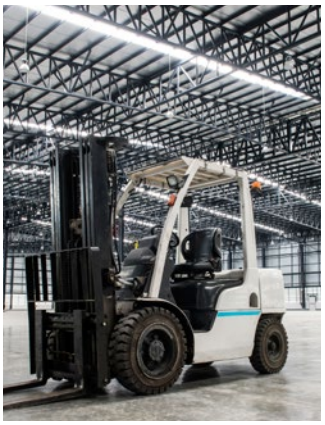
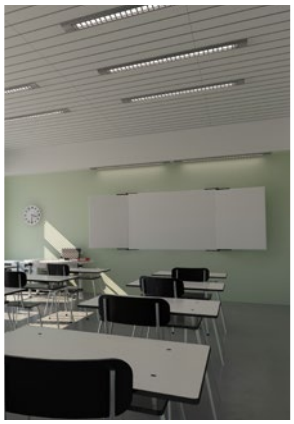
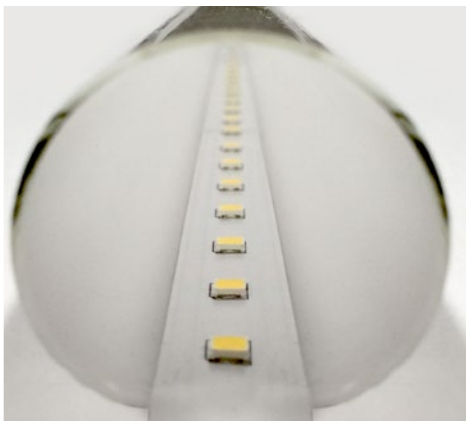






FOR MORE INFORMATION, CALL
1-800-225-5278

EVERLINE® LED TUBE + BALLAST KITS

LED T8 TUBES + BALLASTS | COMPATIBLE

- Reduces energy by more than 30%
- 65K hours lumen maintenance at L70
- 1800 & 2200 lumen options
- Full light down to -4°F
- Instant on – No warm-up period
- DesignLights Consortium™ Qualified
- RoHs Compliant – Mercury free
- No UV emissions
- 6 Year limited warranty
- Ideal for use with occupancy sensors

RoHS COMPLIANT

6 YEAR LIMITED WARRANTY

LED READY®

Ordering Code (SKU)	Ballast	LED Tube (qty 2)	Input Power	Nominal Lumens	CCT	CRI (nom.)	Kit Qty per Carton**
LTBRK-2UNVHE17/835I	B232IUNVHE-N	T8LDR4F17/835	40	2200	3500	82	10
LTBRK-2UNVHE17/840I		T8LDR4F17/840	40	2200	4000		
LTBRK-2UNVHE14/840I		T8LDR4F14/835	32	1800	3500		
LTBRK-2UNVHE14/835I		T8LDR4F14/840	32	1800	4000		

*** Kits must be ordered in full carton quantities*
** Lumen maintenance is calculated with LM-80 and TM-21 data based on 25°C ambient and installation in a parabolic fixture.*

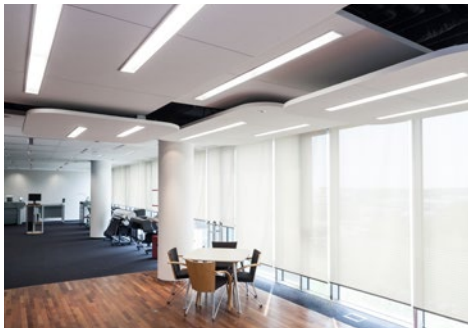
EVERLINE® T8 TUBE + DRIVER BUNDLES

LT+D TUBE+DRIVER | TUBE + DRIVER OPTIONS

- Replaces existing fluorescent lamps and ballasts
- Equipped with 0-10V dimmable LED Driver to 1%
- 240° Beam distribution for even illumination
- Three CCT options with CRI of 82
- LED System efficacies exceed 120LPW
- Kit includes LED T8 Tubes, LED Driver, and all wiring and connectors needed to complete the installation
- 60K+ hour lifetime at L70
- 6 year limited warranty

Performance Data									
	Lumen Package	Input Power (watts)	Input Current @ 120V	Input Current @ 277V	Input Current @ 347V	LT+D System Delivered Lm (nom.)	LT+D System LPW	Reference Luminaire Delivered Lm (nom.)	Reference Luminaire LPW
LR24T8	44L	36	0.30	0.13	0.10	4400	122	3328	95
LR34T8	66L	52	0.44	0.19	0.15	6600	127	5015	96
LR44T8	88L	70	0.59	0.26	0.20	8800	126	6616	95

	Model Number (2-Tube)	Model Number (3-Tube)	Model Number (4-Tube)
120-277V	LR24T8-44L835-10DU	LR34T8-66L835-10DU	LR44T8-88L835-10DU
	LR24T8-44L840-10DU	LR34T8-66L840-10DU	LR44T8-88L840-10DU
	LR24T8-44L850-10DU	LR34T8-66L850-10DU	LR44T8-88L850-10DU
347V	LR24T8-44L835-10D3	LR34T8-66L835-10D3	LR44T8-88L835-10D3
	LR24T8-44L840-10D3	LR34T8-66L840-10D3	LR44T8-88L840-10D3
	LR24T8-44L850-10D3	LR34T8-66L850-10D3	LR44T8-88L850-10D3



FOR MORE INFORMATION, CALL
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EVERLINE® LED DRIVER & CHAIN SYSTEMS

Constant Voltage Drivers

- 12V & 24V
- Class 2 Output
- High efficiency operation
- Over voltage, current & short circuit protection
- Wide operation temperature range: -40°C to 60°C
- RoHS compliant
- Dry, damp, and wet location options
- 5 year warranty

Catalog Number	D12V20UNV-JL	L12V60UNV-A	L12V60UNV-Q	L24V100UNV-A	L24V100UNV-Q
Input Voltage	100-277 VAC	100-277 VAC	100-277 VAC	100-277 VAC	100-277 VAC
Max Input Current	0.27/0.09	0.58/0.26	0.58/0.26	0.89/0.39	0.89/0.39
Output Voltage	12VDC	12VDC	12VDC	24VDC	24VDC
Output Current Range	1.7 A Max	5.0 A Max	5.0 A Max	4.0 A Max	4.0 A Max
Output Power Max	20W	60W	60W	96W	96W
UL Rating	Dry & Damp Location	Dry & Damp Locations	Dry ,Damp, & Wet Locations	Dry & Damp Locations	Dry ,Damp, & Wet Locations
Operating Temperature	-22F to 140F (-30°C to 60°C)	-22°F to 140°F (-30°C to 60°C)	-22°F to 140°F (-30°C to 60°C)	-22°F to 140°F (-30°C to 60°C)	-22°F to 140°F (-30°C to 60°C)
Dimensions (L x W x H)	5.3" x 1.34" x 1.00"	9.5" x 1.5" x 1.18"	10.7" x 2.1" x 1.5"	9.5" x 1.5" x 1.18"	10.7" x 2.1" x 1.5"
IP Rating	IP54	IP66	IP67	IP66	IP67

EVERLINE® Chain Modules

EVERLINE® LED Chain delivers high lumens, consistent color, and superior module fastening. From under counter displays to coves and backlit signage, the applications are as vast as your imagination.

- Lumen perfect output in multiple color temperatures
  - 100 Lumens brite white
  - 95 Lumens warm white
- High efficiency LED technology maximizes system performance
  - Up to 60' of white LEDs per 60W power supply
- Excellent lumen maintanence
  - L80 > 60,000 hours
- High consistency of color and brightness
  - Consistent color between modules and strips
  - Consistent performance from product to product
- For wet, damp, and dry locations
  - Sturdy module design for tough environments
- Superior module fastening design
  - 3M VHB tape provides powerful, long lasting adhesion
- LED Chains can be cut between any module to add LED strips in parallel or series

Catalog Number	LSA-25WH	LSA-25WW
Description	White	Warm White
Input Voltage	12V	
Viewing Angle	120°	
Color Temp/ Wave Length	6500K	3500K
Lumens/ Ft	100	95
Power/ Ft	1.00	1.00
Feet/ 60W PS	60'	60'
LEDs/ Module	3	
Module/ Ft	2	
Module Length	1.81"	
Module Width	0.95"	
Module Height	0.32"	
Operating Temperature	-40°C to 70°C (-40°F to 158°F)	
Storage Temperature	-40°C to 85°C (-40°F to 185°F)	
Carton Quantity	100 feet/200 Modules	
Warranty (yr)	5 year	

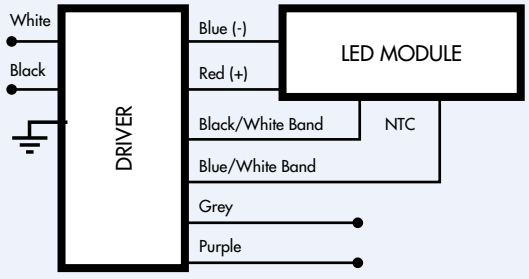
Universal can do design layouts to assist you with where to position LED Chains. Layouts can be submitted via website access.

FOR MORE INFORMATION, CALL
1-800-225-5278

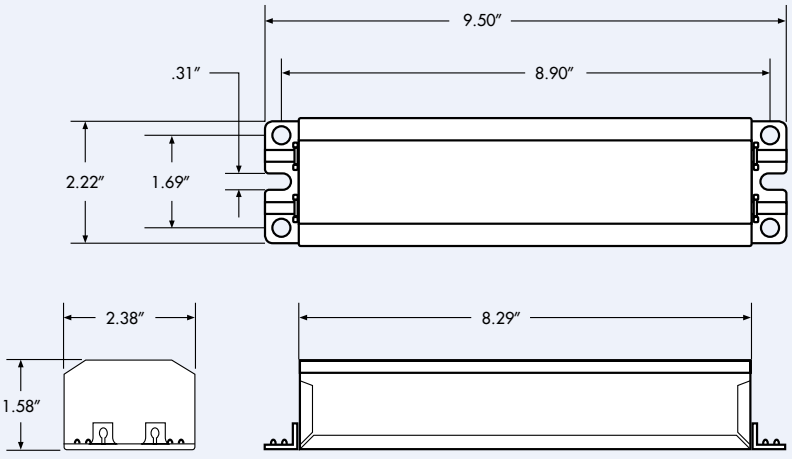
EVERLINE® 150W CONSTANT CURRENT DRIVERS

- Universal Voltage (120-277V) and High Range Voltage (347-480V) models
- Enhanced transient protection (6kV)
- 0-10V Dimming from 100% to 10%
- Reduced EMI allow multiple drivers in a single fixture.
- Thermal Foldback Control connects directly to NTC to sense module temperature
- Overload, Short Circuit, and Internal Thermal protection
- UL Dry and Damp Location Rated, Type HL

Part Number	Current (mA)	Max Power (W)	Voltage	Input Voltage	Control	Case Drawing
High-Wattage Drivers						
D530C150UV10F	530	150	99V-285V	120-277	0-10V, Thermal NTC	F
D530C150HV10F	530	150	99V-285V	347-480	0-10V, Thermal NTC	F
D700C150UV10F	700	150	75V-214V	120-277	0-10V, Thermal NTC	F
D700C150HV10F	700	150	75V-214V	347-480	0-10V, Thermal NTC	F
D10CC150UV10F	1050	150	50V-143V	120-277	0-10V, Thermal NTC	F
D10CC150HV10F	1050	150	50V-143V	347-480	0-10V, Thermal NTC	F
D14CC150UV10F	1400	150	38V-107V	120-277	0-10V, Thermal NTC	F
D14CC150HV10F	1400	150	38V-107V	347-480	0-10V, Thermal NTC	F



WIRING DIAGRAM



FOR MORE INFORMATION, CALL
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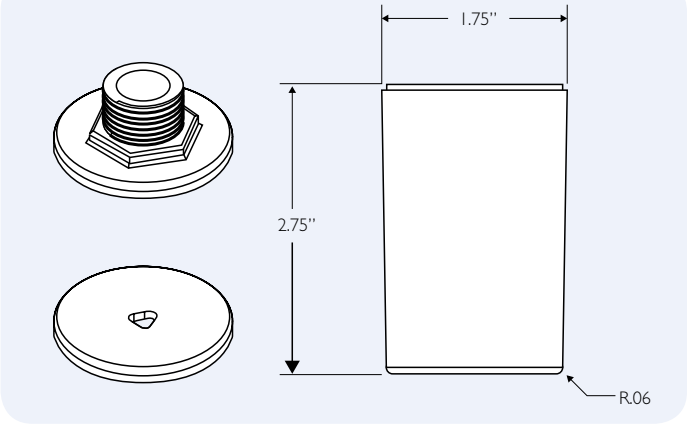
EVERLINE® SURGE PROTECTORS

SURGE PROTECTION

- Protection for line-neutral, line-ground, and neutral-ground connections
- 10kV/kA and 20kV/kA models
- 277V and 480V line voltage
- Optional threaded J-Box mount
- Thermally protected for transient over voltage (10kV/kA)
- EVERLINE® Surge Protectors are the perfect accessory for EVERLINE® Drivers

Model #	Line Voltage	Max Surge Voltage	J-Mount	Clamping Voltage
SS10-277	277V	10kV	-	840V
SS10J-277	277V	10kV	x	840V
SS10-480	480V	10kV	-	1500V
SS10J-277	480V	10kV	x	1500V
SS20-277	277V	20kV	-	840V
SS20J-277	277V	20kV	x	840V
SS20-480	480V	20kV	-	1500V
SS20J-480	480V	20kV	x	1500V



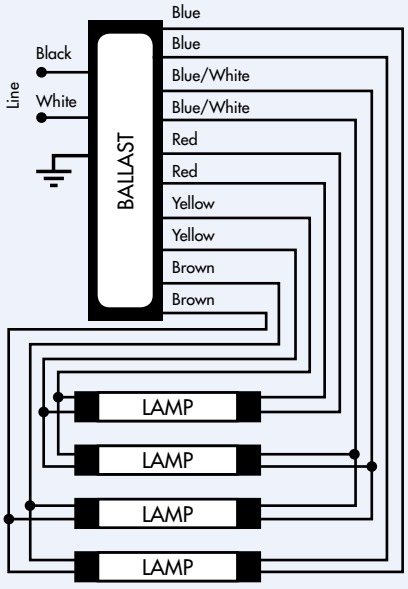
FOR MORE INFORMATION, CALL
1-800-225-5278

ELECTRONIC SIGN BALLASTS (RAPID START - SERIES WIRED)

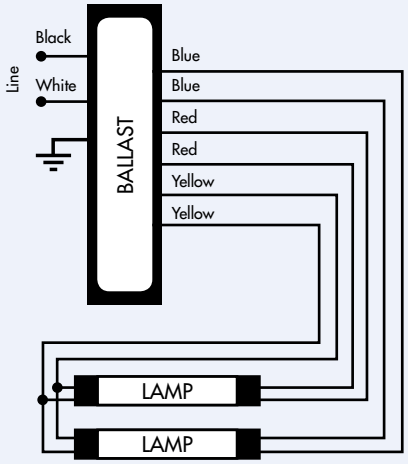
In 2014 the Department of Energy banned the production of magnetic sign ballasts for use in the United States. The ESR Series Sign Ballast is a Rapid Start electronic sign ballast designed to be a direct replacement for existing magnetic sign ballasts. For use in series-wired applications, the ESR Series ballasts provides superior lamp life even in cold temperature environments.

- Drop-In replacement for magnetic sign ballasts (No rewiring required)
- Universal Voltage (120V to 277V)
- Series Rapid Start operation
- UL and CSA listed
- UL HL listing for hazardous locations
- For T8HO & T12HO lamps
- 4 year warranty

Catalog Number	Total Lamp Footage	Start Temp (°F)	Input Volts	Input Watts (max)	Max Line Current	Case Dimensions (Inches)			Weight (lbs.)
						Case Length	Height	Width	
T12HO up to 8' long or T8HO up to 6' in length: 120 - 277Volts - 50/60 Hz									
ESR1232-24	12' min. - 32' max 2, 3, or 4 Lamps	-20	120	282	2.35	14.3	1.2	3.15	3.75
			277	275	0.99				
ESR416-12	4' min. - 16' max 1 or 2 lamps	-20	120	142	1.18	11.75	1.2	1.7	2
			277	139	0.5				



WIRING DIAGRAM FOR 4 LAMP OPERATION ESR1232



WIRING DIAGRAM FOR 2 LAMP OPERATION ESR416

FOR MORE INFORMATION, CALL
1-800-225-5278

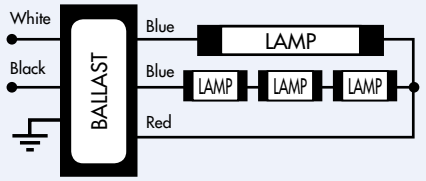
ELECTRONIC SIGN BALLASTS (INSTANT START - PARALLEL WIRED)

The ESB Series, Instant Start sign ballasts offer maximum energy efficiency for signs illuminated by fluorescent T8HO & T12HO lamps. Additionally, the universal input voltage ESB Series sign ballast uses parallel operation to maintain lamp illumination, even when one lamp fails.

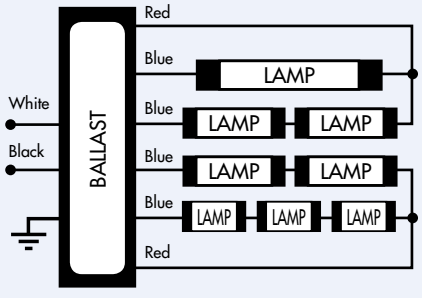
- Maximum energy efficiency
- Fewer connections – easier to wire
- Universal Voltage (120V to 277V)
- Parallel Instant Start operation
- UL and CSA listed
- UL HL listing for hazardous locations
- For T8HO & T12HO Lamps
- 4 year warranty

Catalog Number	Total Lamp Footage	Start Temp (°F)	Input Volts	Input Watts (max)	Max Line Current	Wiring Diagram	Case Dimensions (Inches)					Weight (lbs.)
							Case Length	Overall Length	Mounting Length	Height	Width	
T12HO up to 8´ in length or T8HO up to 6´ in length: 120 - 277 Volts - 50/60 Hz												
ESB216-12	2' min. - 16' max. 1 or 2 Lamps	-20	120	140	1.16	1*	10.58	11.75	11.14	1.78	3.24	4.2
			277	139	0.52							
ESB432-14	4' min. - 32' max. 1, 2, 3, or 4 Lamps	-20	120	282	2.35	2*	13.19	14.31	13.75	2.67	3.24	7.4
			277	275	1.03							
ESB848-46	8' min. - 48' max. 4, 5, or 6 Lamps	-20	120	415	3.50	3*	15.56	16.68	16.12	2.67	3.24	9.7
			277	395	1.47							
T12HO up to 10´ in length or T8HO up to 8´ in length: 120 - 277 Volts - 50/60 Hz												
ESB1040-14	10' min. - 40' max. 1, 2, 3, or 4 Lamps	-20	120	341	2.85	2*	15.56	16.68	16.12	2.67	3.24	9.7
			277	331	1.25							

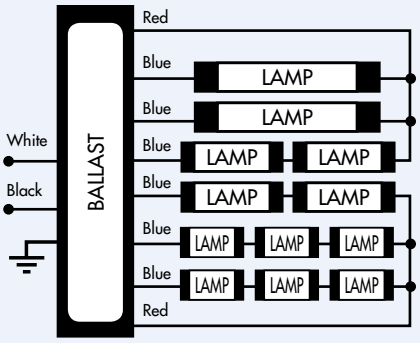
*See specification sheets for details on multiple lamp applications



Cap off un-used lead(s)
WIRING DIAGRAM 1



Cap off un-used lead(s)
WIRING DIAGRAM 2

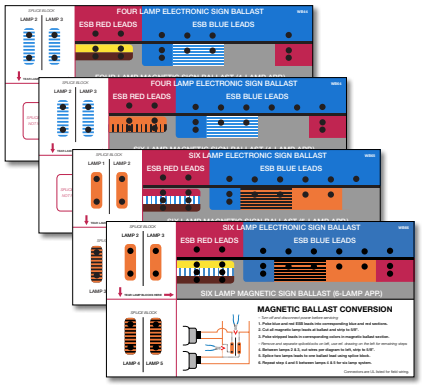


Cap off un-used lead(s)
WIRING DIAGRAM 3

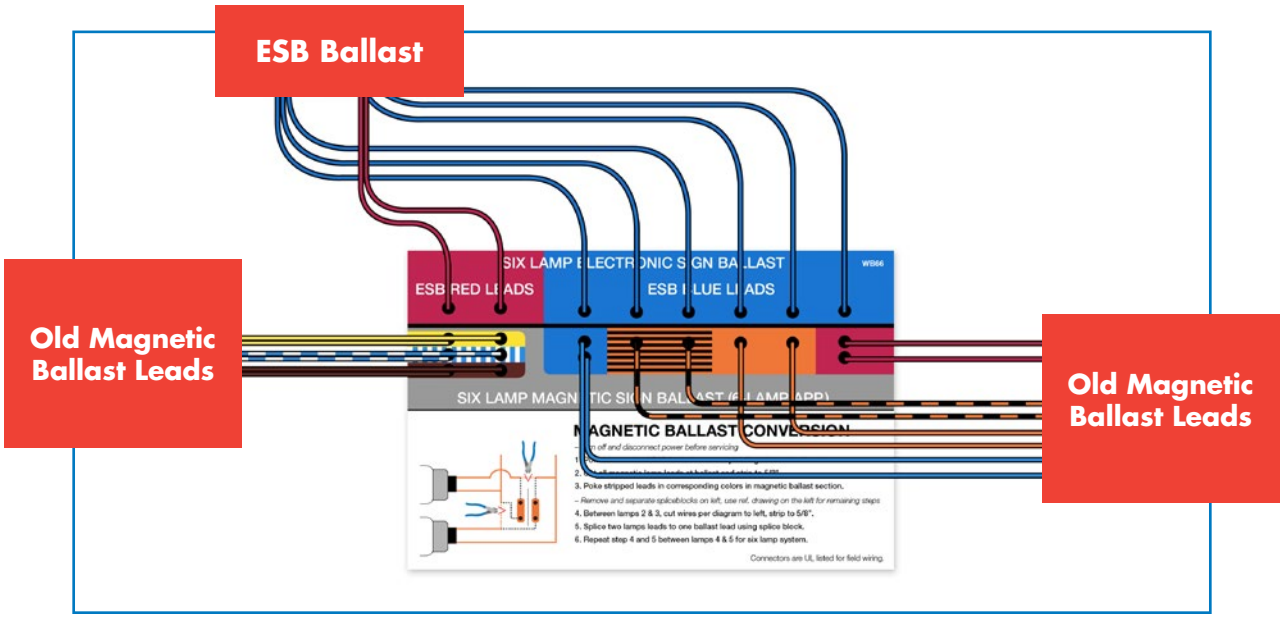
FOR MORE INFORMATION, CALL
1-800-225-5278

WIRING BLOCKS

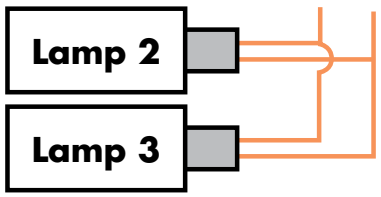
Wiring Blocks allow quick and easy conversion of rapid start magnetic ballast installations (series wired) to Instant Start electronic ballasts (parallel wired). Simply cut the existing magnetic ballast leads, mount the new electronic ballasts, then strip and insert all ballast and lamp leads into the color coded wiring block.



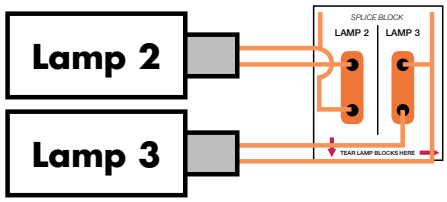
- Easy to follow step by step instructions are printed on every package.
- Detailed images are included for correct cutting and splicing of wires.
- Poke-in terminals are color-coded to match ballast wires.
- UL Listed for field wiring.



Original Lamp Wiring



Modified Lamp Wiring



- WB44-010C (4-lamp ballast operating 4 lamps)
- WB64-010C (6-lamp ballast operating 4 lamps)
- WB65-010C (6-lamp ballast operating 5 lamps)
- WB66-010C (6-lamp ballast operating 6 lamps)
- WBEXT-010C (24" wiring extension harness)

FOR MORE INFORMATION, CALL
1-800-225-5278

SIGN FLUORESCENT TROUBLESHOOTING

PROBLEM: LAMP FLICKER, LAMP OUTAGE

THE ELECTRIC SIGN AS A SYSTEM OF COMPONENTS			
SYSTEM COMPONENTS	**POSSIBLE CAUSE**	**TEST**	**POSSIBLE SOLUTION**
Supply Voltage	Poor electrical ground	Ensure that the fixture/sign is well grounded.	Improve ground bonding connections/circuit.
	Low supply voltage	Measure input voltage and insure that it is within recommended range. Verify supply wiring is of proper gauge. Guard against excessively long runs of supply wiring.	• Adjust supply transformer loading. • Install buck-boost transformer.
Supply Wiring & Connections	Poor connections	Visual inspection for broken, loose wiring	Secure & insulate connections.
Lamp Wiring & Connections	Poor lamp connection	Inspect lamps & sockets for proper fit & positioning	Mechanical adjustments as required
		Loose, broken, dirty, corroded sockets or lamp contacts	Replace/correct sockets & contacts.
	Improper lamp wiring	Compare lamp hook-up to ballast label.	Correct as necessary.
	Improper lamp filament heating	Visual inspection for end blackening of lamps	Perform electrical test.
Lamps	Defective lamp/ improper lamp type	Replace lamp.	Replace lamp.
	Excessive lamp footage	Compare to ballast rating.	Correct as necessary.
Installation & Environment	Cold ambient temperature	Check ballast rating, and lamp type.	• Correct ballast/lamp if necessary. • Reduce an drafts.
	Water	Visual inspection	Improve the physical installation as required to eliminate water intrusion.
	Overheating	Visual inspection	Ensure ballast has the opportunity for heat transfer to minimize heat build-up.

ELECTRICAL TEST PROCEDURE:

I. Remove all lamps and turn sign/fixture on.
II. Test cathode heating at each lamp socket with a filament tester.
  A. If filament tester illuminates, cathode heating is good. Try known good lamps.
  B. If filament tester doesn't illuminate, cathode heating is incorrect at that socket.
    1. Note each failed socket.
    2. Open wiring channel, disconnect ballast leads from fixture circuit, and apply filament tester to ballast leads for each failed socket.
      a. If filament tester illuminates, ballast is OK, problem is in leads/socket. Double check lamp wiring with that shown on ballast label.
      b. If filament tester illuminates poorly (or not at all), ballast is defective, a lead is shorted, or a poor connection is present.
III. After correcting (a) and/or (b), close the wiring channel and repeat test II.
  A. If no problem is indicated in the filament retest, relamp with known good lamps.
  B. If known good lamps still do not operate, replace ballast.

CAUTION:

Servicing of electric signs should only be performed by qualified personnel. Disconnect power before servicing. Observe OSHA guidelines for safe electrical practices.

Heat

Ballasts generate heat during normal operation. By design, fluorescent ballasts should operate so that their maximum hot-spot case temperature does not exceed 80°C (176°F). Operating at higher temperatures will shorten ballast life.The temperature the ballast reaches depends on the temperature of the area surrounding it— plus the heat-conducting surface touching the ballast. Ballasts should be installed in a manner that avoids future overheating. To maintain normal ballast temperature, you should:

1. Mount the ballast against a flat surface of heavy gauge metal such as the structural part of the sign.
2. Keep the ballast as far away as possible from other ballasts, lamps or reflective surfaces. (Lamps generate approximately three-fourths of the heat in a plastic sign.) The ends of the lamps are the hottest part, so you should mount the ballast as far away from the ends as possible.
3. Paint the inside of the sign with flat white paint.

Moisture Protection

1. Vent the sign as well as possible without allowing water to enter.
2. Ballasts should be mounted horizontally (except for weatherproof types). If the ballast must be mounted vertically, allow room for sufficient air circulation. Certain codes and standards may require lead wire protection on the leads as they exit the sign ballast. For these applications, a tee-pee cover can be used to protect the wires from mechanical damage. These tee-pee covers are available through electrical suppliers.

Grounding

The white lead of a 120V ballast must be connected to the neutral or ground side of the power supply. All metal parts of the sign, as well as the ballast case, must be grounded either through the conduit which holds the power supply or by direct connection with a grounding wire. An ungrounded sign is a potential hazard—and it can give misleading symptoms when looking for sign faults.

Proper Lamp Life and Starting

In rapid-start installations, proper filament heating is necessary for reliable starting and normal lamp life. To ensure that proper heating is taking place, the following steps are recommended:

1. Lamp leads should be kept as short as possible and with a minimum of splices.
2. All connections should be soldered.
3. Maintain proper alignment and spacing of lampholders to ensure good contact in the sockets.
4. Mount lamps within one inch of grounded metal. This is one lamp manufacturer's published requirement for reliable starting.

Flashing

Rapid-start lamps may be flashed without reduction in lamp life by using ballasts which are specifically designed for this operation. These ballasts are designed with slightly higher filament voltages than the conventional ballast to ensure satisfactory lamp life. Instant-start lamps cannot be flashed.

CAUTION: Use only one flasher contact per ballast.

Light Output vs. Temperature

The light output of a fluorescent lamp varies according to the mercury vapor pressure inside the lamp. This pressure is controlled by the coldest spot on the bulb wall. The ballast may start the lamp, but the light output can be very low if the bulb wall temperature is low. Several factors influence this, including ambient temperatures, wind, type of enclosure, etc. If maximum light output is critical, consult a lamp manufacturer for advice.

Lamp Starting Problems

Occasionally a field problem will arise involving improper lamp starting. The usual complaint is that the lamps start slowly (or not at all). Here are some of the causes:

1. Low line voltage
2. Improper sign grounding
3. Insufficient or no filament voltage
4. Insufficient or no open circuit voltage
5. Dirty lamps during high-humidity operating conditions
6. Lamps improperly inserted in the sockets

If lamp starting is a problem in your installation, check the sign grounding, filament voltage (3.4V - 3.9V), and open circuit voltage. If all are normal, the probable cause is dirty lamps. The lamps should be washed in clean water, drip-dried, and reinstalled. If this doesn't solve the problem, contact your nearest Universal Lighting Technologies representative for further assistance.

Short Lamp Life

If the lamp has not given proper length of service as specified by the lamp manufacturer, the following reasons for early failure should be considered:

1. Improper starting due to insufficient filament voltage
2. Frequent starting and short operating periods
3. Improper ballast
4. Improper voltage supply
5. Faulty wiring
6. Defective lamps
7. Lamps improperly inserted in sockets

Early lamp failure will be preceded by a dense blackening on either or both ends of the lamps. This blackening will extend three or four inches from the lamp base and should not be confused with a small dense spot, which is a mercury deposit that can occur any time during lamp life. Dense blackening due to early lamp failure should not be confused with the gray bands that sometimes appear toward the end of normal lamp life (about two inches from either end of the lamp).

HID BALLASTS (F-CAN)

- Support 35 to 400 watt lamps
- Metal halide and pulse start metal halide units provide bright-white light and excellent color
- Color-coded leads reduce miswiring
- UL listed and CSA certified
- Type 2 outdoor rated
- Perfect for replacement in existing outdoor fixtures

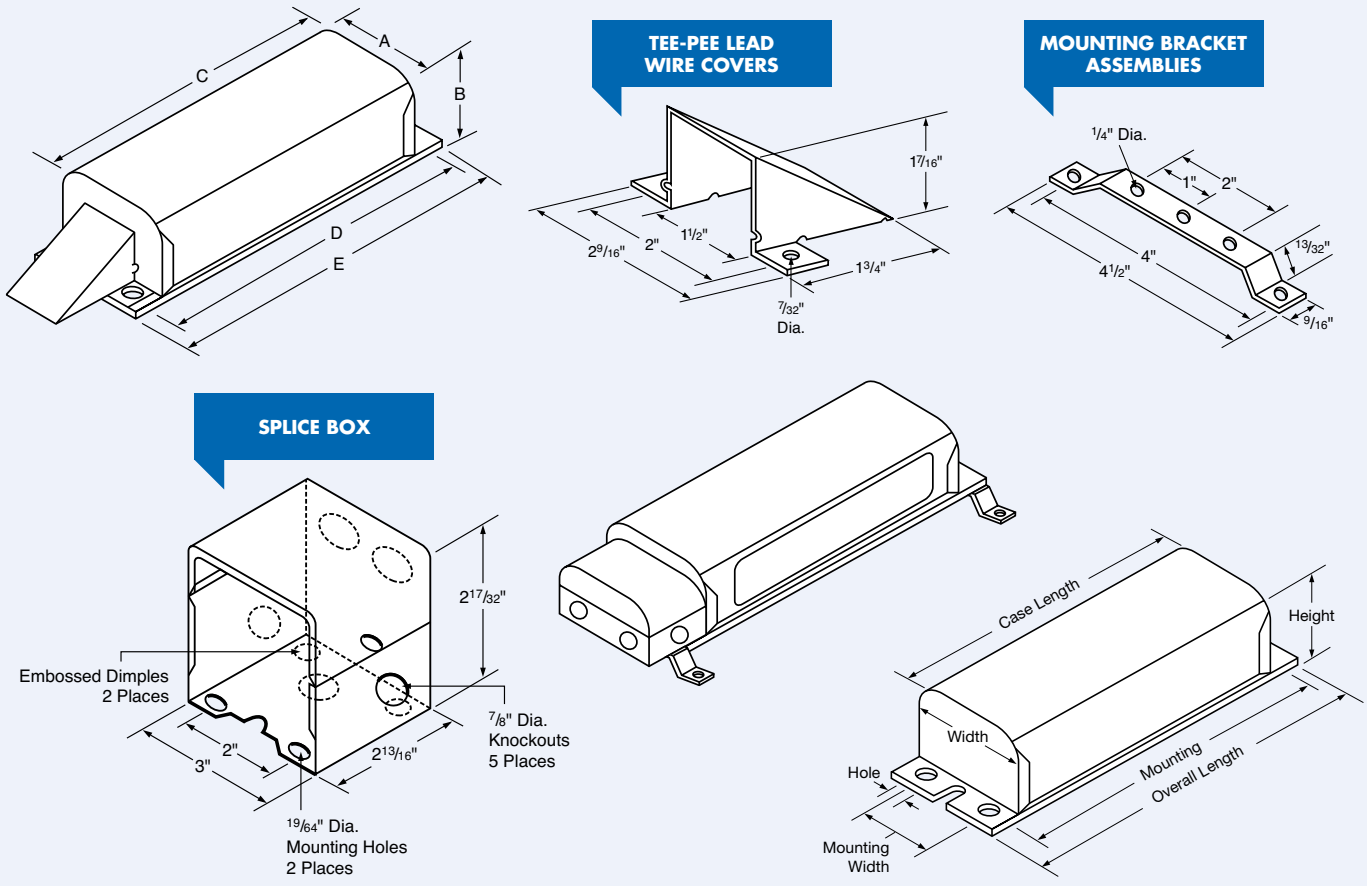
Input Volts	Catalog Number	Circuit Type	Input Watts	Max Input Current	Overall Dimensions			Case Length	Mounting Dimensions			Total Weight (lbs)	Max Distance to Lamp (ft)	Sound Rating
					Length	Width	Height		Length	Width	Height			
Pulse Start Metal Halide														
(1) 35/39 WATT M130 Metal Halide (With Built-In Ignitor)														
120	1120-251A-TC	CWA	55	0.50	9.50	3.15	2.60	8.35	8.85	2.00	0.20	3.0	20	B
(1) 50 WATT M110 Metal Halide (With Built-In Ignitor)														
120 or 277	11210-236C-TC	HX-HPF	70	0.64/0.65	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
(1) 70 WATT M85 Metal Halide (With Built-In Ignitor)														
120 or 277	11210-277C-TC[1]	HX-HPF	98	2.00/0.90	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
(1) 70 WATT M98 Metal Halide (With Built-In Ignitor)														
120 or 277	11210-506C-TC[2]	HX-HPF	90	2.00/0.90	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
120 or 347	11210-554C-TC	HX-HPF	90	2.00/0.80	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
(1) 100 WATT M90 Metal Halide (With Built-In Ignitor)														
120 or 277	11210-239C-TC	HX-HPF	125	2.20/1.00	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
120 or 347	11210-606C-TC	HX-HPF	125	2.20/0.70	11.75	3.15	2.60	10.56	11.10	2.00	0.20	11.0	20	B
(1) 150 WATT M81 Metal Halide (With Built-In Ignitor)														
120 or 277	11210-242C-TC	HX-HPF	185	3.70/1.60	14.31	3.15	2.60	13.19	13.75	2.00	0.20	14.0	20	B
(1) 150 WATT M102 Metal Halide (With Built-In Ignitor)														
120 or 347	11210-539C-TC	HX-HPF	185	3.70/1.60	14.31	3.15	2.60	13.19	13.75	2.00	0.20	14.0	20	B
Metal Halide														
(1) 175 WATT M57 Metal Halide														
120 or 277	1110-245-SC-TC	CWA	205	1.75/0.75	14.30	3.15	2.60	13.15	13.75	2.00	0.20	14.0	*	B
120 or 347	1110-564-C-TC	CWA	205	1.75/.062	11.75	3.15	2.60	10.55	11.10	2.00	0.20	14.0	*	B
(1) 250 WATT M58 Metal Halide														
120 or 277	1110-264C-TC[3]	CWA	295	2.50/1.10	16.65	3.15	2.60	15.55	16.10	2.00	0.20	17.5	*	C
120 or 277	1111-264C-TC[4]	CWA	300	2.50/1.10	11.75	3.15	2.60	10.55	11.10	2.00	0.20	11.0	*	B
120 or 347	1110-566C-TC	CWA	295	2.50/0.95	16.65	3.15	2.60	15.55	16.10	2.00	0.20	17.5	*	C
(1) 400 WATT M59 Metal Halide														
120 or 277	1110-247SC-TC	CWA	460	3.90/1.70	19.25	3.15	2.60	18.05	18.60	2.00	0.20	23.0	*	C
120 or 277	1111-247SC-TC[4]	CWA	460	3.90/1.70	14.30	3.15	2.60	13.15	13.75	2.00	0.20	14.0	*	B
120 or 347	1110-568C-TC	CWA	460	3.90/1.30	19.25	3.15	2.60	18.05	18.60	2.00	0.20	23.0	*	C

1–This ballast may also be used with (1) 70 WATT S88 High Pressure Sodium Lamp
2–M98 Designates Venture Lighting catalog numbers MH70/4/MED, C/4/MED or MS70/C/84/MED/W.
3–This ballast can be used with a MH200 Ignitor to operate (1) 250 Watt M103 lamp. Contact Universal Lighting for instructions.
4–Two of these ballasts are required to operate the lamp. Electrical Data is shown for two ballasts with the exception of Sound Rating, which is listed for each ballast.

HID BALLASTS (F-CAN)

Input Volts	Catalog Number	Circuit Type	Input Watts	Max Input Current	Overall Dimensions			Case Length	Mounting Dimensions			Total Weight (lbs)	Max Distance to Lamp (ft)	Sound Rating
					Length	Width	Height		Length	Width	Height			
High Pressure Sodium														
(1) 35 WATT S76 HIGH PRESSURE SODIUM LAMP (WITH BUILT-IN IGNITOR)														
120 or 277	12210-261C-TC	HX-HPF	55	0.80/0.35	11.75	3.15	2.60	10.55	11.10	2.00	0.20	9.0	10	B
(1) 50 WATT S68 HIGH PRESSURE SODIUM LAMP (WITH BUILT-IN IGNITOR)														
120 or 277	12210-236C-TC	HX-HPF	75	1.40/0.60	11.75	3.15	2.60	10.55	11.10	2.00	0.20	9.0	10	B
(1) 70 WATT S62 HIGH PRESSURE SODIUM LAMP (WITH BUILT-IN IGNITOR)														
120 or 277	12210-237C-TC	HX-HPF	97	1.60/0.70	11.75	3.15	2.60	10.55	11.10	2.00	0.20	9.2	10	B
120 or 277	12210-552C-TC	HX-HPF	109	1.69/0.63	11.75	3.15	2.60	10.55	11.10	2.00	0.20	9.0	10	B
(1) 100 WATT S54 HIGH PRESSURE SODIUM LAMP (WITH BUILT-IN IGNITOR)														
120 or 277	12210-239C-TC	HX-HPF	125	2.10/1.00	11.75	3.15	2.60	10.55	11.10	2.00	0.20	10.4	10	B
120 or 277	12210-606C-TC	HX-HPF	165	2.10/0.90	11.75	3.15	2.60	10.55	11.10	2.00	0.20	10.4	10	B
(1) 150 WATT S55 HIGH PRESSURE SODIUM LAMP (WITH BUILT-IN IGNITOR)														
120 or 277	12210-241C-TC	HX-HPF	185	2.80/1.20	14.30	3.15	2.60	13.15	13.75	2.00	0.20	14.1	10	B
120 or 277 120 or 347	12210-602C-TC	HX-HPF	185	2.80/1.03	14.30	3.15	2.60	13.15	13.75	2.00	0.20	14.1	10	B

ACCESSORIES



FOR MORE INFORMATION, CALL

1-800-225-5278

HID REPLACEMENT KITS (CORE & COIL)

- High Pressure Sodium, Metal Halide, and Pulse Start Metal Halide Ballasts
- Wide range of lamp wattages
- Options available (120V/208V/240V/277V/480V)
- Five taps in one ballast
- High efficiency and superior color rendering
- Includes adjustable brackets and capacitor
- Starter ignitor included if required
- Color-coded leads to save time and reduce wiring errors
- Pulse Start features cold weather starting benefits

Lamp Type	Lamp Watts	ANSI Code	Input Volts	Catalog Number	Circuit Type	Input Power (Watts)	Max. Input Current
High Pressure Sodium	150W	S55	120/208/240/277	S150MLTLC3M500K	HX-HPF	190	3.00/1.70/1.50/1.30
	200W	S66	120/208/240/277	S200MLTAC4M500K	CWA	230	2.10/1.20/1.00/0.88
	250W	S50	120/208/240/277/480	S250ML5AC4M500K	CWA	300	2.55/1.45/1.30/1.10/0.65
	400W	S51	120/208/240/277/480	S400ML5AC4M500K	CWA	465	4.00/2.30/2.00/1.70/1.10
	400W	S51	120/208/240/277/480	S400ML5AC5M500K	CWA	468	4.40/2.62/2.21/1.90/1.05
	1000W	S52	120/208/240/277/480	S1000ML5AC5M500K	CWA	1048	9.10/5.40/4.60/4.10/2.45
Metal Halide	175W	M57, H39, or M107	120/208/240/277/480	M175ML5AC3M500K	CWA	208/210	1.90/1.10/0.95/0.85/0.50
	250W	M58	120/208/277/480	M250ML5AC3M500K	CWA	280	2.50/1.50/1.25/1.10/0.65
	250W	M58	120/208/240/277/480	M250ML5AC4M500K	CWA	282	2.42/1.40/1.20/1.00/0.60
	400W	M59	120/208/240/277/480	M400ML5AC4M500K	CWA	458	4.00/2.30/2.00/1.70/1.00
	1000W	M47	120/208/240/277/480	M1000ML5AC5M500K	CWA	1060	8.80/5.20/4.40/3.90/2.30
	1500W	M48	120/208/240/277	M1500MLTAC5M500K	CWA	1610	14.00/8.00/7.00/6.00
Pulse Start Metal Halide	175W	M137 or M152	120/208/240/277/480	P175ML5AC3M500K	CWA	285	1.80/1.10/0.90/0.78/0.45
	200W	M136	120/208/240/277/480	P200ML5AC3M500K	CWA	233	2.66/1.52/1.31/1.12/0.68
	250W	M138 or M153	120/208/240/277/480	P250ML5AC4M500K	CWA	285	2.45/1.42/1.22/1.05/0.62
	320W	M132 or M154	120/208/240/277/480	P320ML5AC4M500K	CWA	405	4.00/2.40/2.10/1.85/1.06
	320W	M132 or M154	120/208/240/277/480	P320ML5AC4L500K	CWA	363	3.10/1.80/1.55/1.35/0.80
	350W	M131	120/208/240/277/480	P350ML5AC4M500K	CWA	405	4.22/2.49/2.16/1.87/1.09
	350W	M131	120/208/240/277/480	P350ML5AC4L500K	CWA	397	3.35/1.90/1.65/1.35/0.80
	400W	M135 or M155	120/208/240/277/480	P400ML5AC4L500K	CWA	454	3.90/2.25/1.90/1.65/0.95
	450W	M144	120/208/240/277/480	P450ML5AC4L500K	CWA	508	4.10/2.35/2.05/1.85/1.05
	750W	M149	120/208/240/277/480	P750ML5AC5M500K	CWA	820	6.95/4.00/3.50/3.00/1.75
	875W	M166	120/208/240/277	P875MLTAC5M500K	CWA	945	7.90/4.55/3.95/3.45
	1000W	M141	120/208/240/277	P1000MLTAC5M500K	CWA	1070	8.80/5.10/4.50/4.10

Universal offers a wide variety of lighting products for all lighting applications. Consider the EVERLINE® Wall Pack for HID upgrades.

HID TROUBLESHOOTING

PROBLEM: LAMP DOES NOT LIGHT

SYSTEM COMPONENTS	POSSIBLE CAUSE	TEST	POSSIBLE SOLUTION
Supply voltage	• No line voltage • Low line voltage	Measure input voltage at ballast with multimeter.	• **No voltage:** Inspect wiring. Check any in-line fuses or other devices such as photocells, auto-shutoff starters or sensors. • **Low voltage:** Reduce the load on the line voltage supply transformer. Install buck-boost transformer.
Secondary wiring and connections	• Incorrect ballast, lamp, capacitor and/or starter combination • Loose connections	Verify correct components using information on ballast label.	Replace incorrect components.
Lamp	Failed lamp	Test with known good lamp.	Replace lamp.
Capacitor	Failed capacitor	Test capacitor with multimeter.	Replace capacitor.
Starter	Failed starter	Test starter with multimeter.	Replace starter.
Ballast	• Ballas + starter mounted too far from lamp • Defective ballast	• Visual inspection • Test with multimeter	• Correct to proper distance or install a long distance starter. • Replace ballast.

PROBLEM: SHORT LAMP LIFE

SYSTEM COMPONENTS	POSSIBLE CAUSE	TEST	POSSIBLE SOLUTION
Lamp	• Lamp not compatible with system • Lamp operating position incorrect • Failed lamp	• Verify lamp wattage and type. • Check lamp for suitability. • Test with known good lamp.	Replace lamp with the properly rated lamp.
Capacitor	Failed capacitor	Test capacitor with multimeter.	Replace the capacitor.
Starter	Failed starter	Test starter with multimeter.	Replace the starter.
Ballast	Failed ballast	Test ballast with multimeter.	Replace the ballast.

PROBLEM: LOW LIGHT OUTPUT

SYSTEM COMPONENTS	POSSIBLE CAUSE	TEST	POSSIBLE SOLUTION
Lamp	Normal light output depreciation	Test with known good lamp.	Replace lamp.
Component compatibility	Incorrect ballast, lamp, capacitor and/or starter combination	Verify correct components using information on ballast label.	Replace incorrect components.
Supply voltage	Low line voltage	Measure input voltage at ballast with multimeter.	• Reduce the load on the line voltage supply transformer. • Install buck-boost transformer.
Capacitor	Failed capacitor	Test capacitor with multimeter.	Replace the capacitor.
Ballast	Failed ballast	Test ballast with multimeter.	Replace the ballast.

PROBLEM: LAMP CYCLING ON & OFF

SYSTEM COMPONENTS	POSSIBLE CAUSE	TEST	POSSIBLE SOLUTION
Lamp	Normal light output depreciation	Test with known good lamp.	Replace lamp.
Component compatibility	Incorrect ballast, lamp, capacitor and/or starter combination	Verify correct components using information on ballast label.	Replace incorrect components.
Socket	Damaged socket	Visual Inspoection for cracks, etc.	Replace socket.

CAUTION:

Servicing of electric signs should only be performed by qualified personnel. Disconnect power before servicing. Observe OSHA guidelines for safe electrical practices.

FOR MORE INFORMATION, CALL

1-800-225-5278

STANDARD ELECTRONIC BALLASTS

- Products for T5, T8, and T12 lamps.
- Universal input voltage available
- Light weight, low profile cases
- UL and CSA Listed
- Parallel lamp operation
- UL Type 1 outdoor

T5, T8, & T12 ELECTRONIC BALLASTS

Lamp	Catalog Number	Line Volts	Input Watts	Nominal Line Amps	Ballast Factor	Ballast Efficacy Factor	Wiring Diagram (Page 19)	Can Size (Page 19)	Weight (lbs)
For T12HO Lamps									
(2) F96T12HO	B295PUNVHE-S	UNV	170W @ 120V	1.45	0.88	0.52	5	-S	2.0
			167W @ 277V	0.61	0.88	0.53			
For T8 Lamps									
(1) F32T8	B132IUNVHP-N	UNV	30W @ 120V	0.25	0.88	2.93	1	-N	0.75
			30W @ 277V	0.11	0.88	2.93			
(2) F32T8	B232IUNVHP-N	UNV	55W @1 20V	0.46	0.88	1.60	2	-N	0.75
			53W @ 277V	0.19	0.88	1.66			
(3) F32T8	B332IUNVHP-A	UNV	84W @ 120V	0.71	0.88	1.05	3	-A	1.7
			83W @ 277V	0.31	0.88	1.06			
(4) F32T8	B432IUNVHP-A	UNV	112W @ 120V	0.93	0.88	0.79	4	-A	1.7
			108W @ 277V	0.40	0.88	0.81			
(2) F96T8	B259IUNVHP-A	UNV	113W @ 120V	0.95	0.88	0.78	2	-A	1.7
			110W @ 277V	0.40	0.88	0.8			
For T8HO Lamps									
(2) F96T8HO	B286PUNVHE-S	UNV	187W @ 120V	1.57	0.95	0.51	5	-S	2.65
			184W @ 277V	0.67	0.95	0.52			
For T5 Lamps									
(2) F28T5	B228PUNV-N	UNV	65W @ 120V	0.54	1.00	1.53	5	-N	0.75
			64W @ 277V	0.23	1.00	1.56			
For T5HO Lamps									
(2) F24T5HO	B224PUNV-C	UNV	53W @ 120V	0.45	1.00	1.89	5	-C	1
			52 W @ 277V	0.23	1.06	2.04			
(2) F54T5HO	B254PUNV-D	UNV	116W @ 120V	0.96	1.00	0.86	5	-D	1.25
			113W @ 277V	0.41	1.00	0.88			
(4) F54T5HO	B454PUNV-E	UNV	235W @ 120V	1.96	1.00	0.43	6	-E	2.5
			229W @ 277V	0.84	1.00	0.44			

DIMENSIONS

Overall Dimensions				Mounting Dimensions	
Can Size	L	W	H	M	X
-A	9.50”	1.70”	1.18”	8.9”	1.69”
-C	14.25”	1.18”	1.00”	13.75”	-
-D	16.88”	1.18”	1.00”	16.20”	-
-E	16.88”	1.74”	1.18”	16.20”	-
-N	9.5”	1.3”	1.00”	8.9”	-
-S	11.75”	1.70”	1.18”	11.2”	1.05”

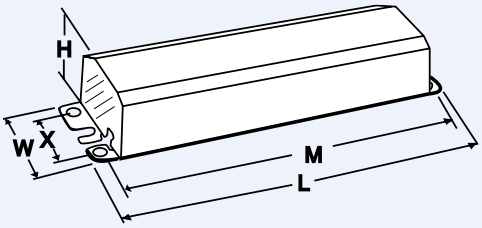


DIAGRAM 1

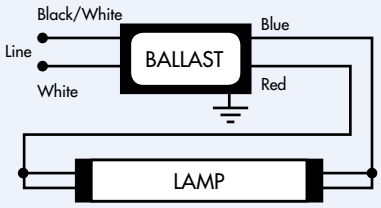


DIAGRAM 2

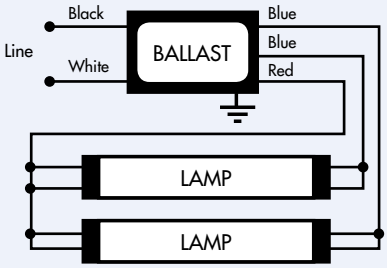


DIAGRAM 3

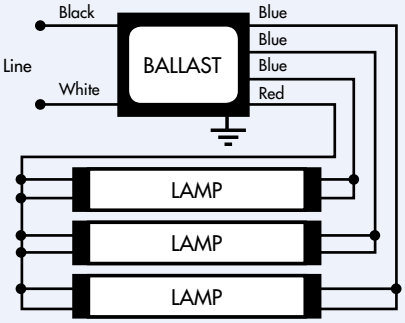
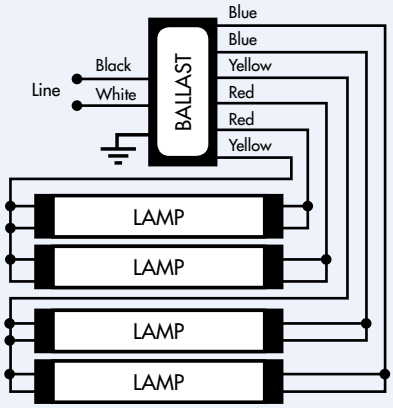


DIAGRAM 4



Note: For three lamp operation, cap any blue lead, insulate to 600 volts

DIAGRAM 5

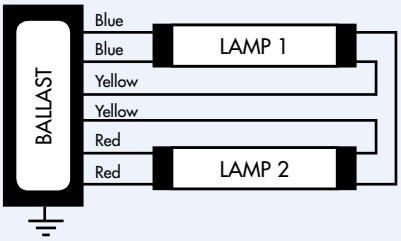
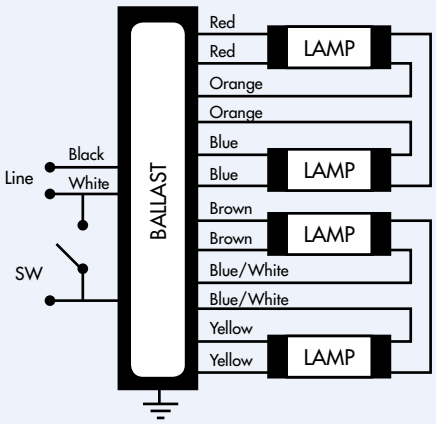


DIAGRAM 6



SW	
Closed	4 Lamps
Open	2 Lamps

FOR MORE INFORMATION, CALL
1-800-225-5278

NOTES

It's ***EASY*** *to* ***REACH US...***

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