



# Lighting Catalog

**Ballast, Lamp, LED Specification Guide 2011-2012**

**Sustainable Lighting Solutions**



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Electronic Ballasts

Dimming Electronic Ballasts

Electronic HID Ballasts

Fluorescent Lamps

Compact Fluorescent Lamps

Solid State Lighting



## Who is Espen Technology?

As a manufacturer dedicated to delivering sustainable and environmentally progressive lighting solutions, Espen Technology focuses on transforming how our world utilizes light. With an acute awareness of the energy demand that lighting commands, Espen Technology continually strives to improve the efficiency of lighting technology. Our products reflect an emphasis on sustainability, quality, and reliability. Our product development is driven by a simple commitment: to improve people's lives and build a better future for generations to come.

With over 30 years of manufacturing experience and knowledge, our engineers understand the importance of producing reliable ballasts. From stringent component qualification standards to the testing of every ballast prior to shipment, quality is Espen Technology's top priority. Our ballasts are complemented by an industry-leading warranty policy. The goal is to offer our customers and end-users an invaluable asset: peace of mind.

Headquartered in Southern California, our customer service and technical support team provide full service. With manufacturing facilities and research and development teams across the world, we are committed to developing innovative products with reliability, utility, and efficiency in mind. Finding the perfect balance of innovation and practicality is Espen's forte.

# Building a Better Future

## Quality

Design, production, and quality assurance testing all reflect our adamant dedication to quality. In every stage of our manufacturing process, we carefully evaluate and ensure the quality of our products.

## Reliability

Reliability goes hand and hand with quality. Espen works tirelessly to instill confidence in our customers and build trust in our company and products. Peace of mind is the greatest product that we can offer to our customers.

## Utility

Espen Technology places much importance on simplicity, functionality, and practicality. We understand that the products we develop must be capable of seamless integration and convenient application.

## Sustainability

Espen's product line has a strong bias towards energy-efficient products. This commitment is part of a broader effort to proliferate sustainable technology and promote enduring growth.

## Commitment to Sustainability

At the core of Espen Technology's philosophy is the mission to promote sustainability. Through the proliferation of energy efficient technologies, we believe a brighter future can be achieved. It is our economic, environmental, and social responsibility to educate businesses and individuals on the benefits of implementing new lighting technology. Espen's will to catalyze change reflects an objective to improve the quality of life.





# Improving Office Lighting, Increasing Productivity and Comfort

## Espen Technology's Electronic Ballasts

offer an ideal solution for office lighting upgrades and new construction projects. With myriad lamp options and light output levels, designers, specifiers, and contractors are presented with greater versatility. Integrating system solutions can offer even greater energy savings. Espen's Elite dimming ballasts can be integrated with occupancy sensors, daylight sensors, and dimming controls to optimize and customize an office space for specific tasks.



### Espen High Performance T8 Ballast

NEMA Premium  
CEE HPT8 Qualified



PAGE 2-16 to 2-26

## Improve Performance

Consider the benefits of energy efficiency, user comfort, environmental impact and savings potential





# Lighting Upgrades for Warehouse and Industrial Spaces

**Utilizing fluorescent high bay technology can significantly improve light quality, increase energy efficiency, and reduce operating costs. Espen Technology offers a wide variety of high efficiency, high output solutions for warehouse lighting.**

## **Replacing Outdated Lighting**

Retrofitting existing T12 and Metal Halide fixtures with T8 and T5 technology can offer businesses tremendous savings. Espen's Elite Technology offers greater light output with less energy consumption. Longer lamp and ballast life offer the benefits of reduced maintenance costs and greater return on investment.

### **T5/HO High Bay Ballast**

2-lamp and 4-lamp



**PAGE 2-8**

### **T8 High Bay Ballast**

NEMA Premium

2-lamp, 3-lamp, and 4-lamp



**PAGE 2-25 to 2-26**

## Fluorescent High Bay Solutions



Sustainable Design

SMARTER TECHNOLOGY

# Promoting Greenbuilding

Sustainability is a fundamental goal of many enterprises and is a smart strategy that saves money, energy and resources. Energy efficient lighting is a crucial component in the life-cycle of a sustainable, “green” building.

Espen Technology provides the technology that is necessary to achieve sustainable building. Utilizing Espen’s high efficiency electronic ballasts will help companies reduce carbon emissions, improve energy efficiency, reduce energy consumption, and increase facility value.

## Reduced Output T8 Ballast

High Efficiency, Low Ballast Factor  
Look for Model Numbers with Suffix -LE



## High Lumen T8 and T5/HO

CEE Qualified  
3-Year System Warranty with Espen Ballast



PAGE 6-2 and 6-5



# CHANGE

With a simple change of a ballast, we move a step closer to achieving a harmonious balance between us and our environment.

## **Espen Technology's High Efficiency Products**

allow businesses and end-users to choose a high performance lighting package with a low environmental impact. Specifying Espen products not only reduces the demand on natural resources but also allows businesses to operate more effectively. The change is simple but the positive effects are profound. A simple upgrade to Espen High Efficiency ballasts is the environmentally responsible and economically reasonable choice.

### **Dimming Compact Fluorescent Ballast**

Continuous Dimming  
For Quad Tube Lamps



**PAGE 3-2**

Achieving SUSTAINABLE Growth  
through **Lighting**



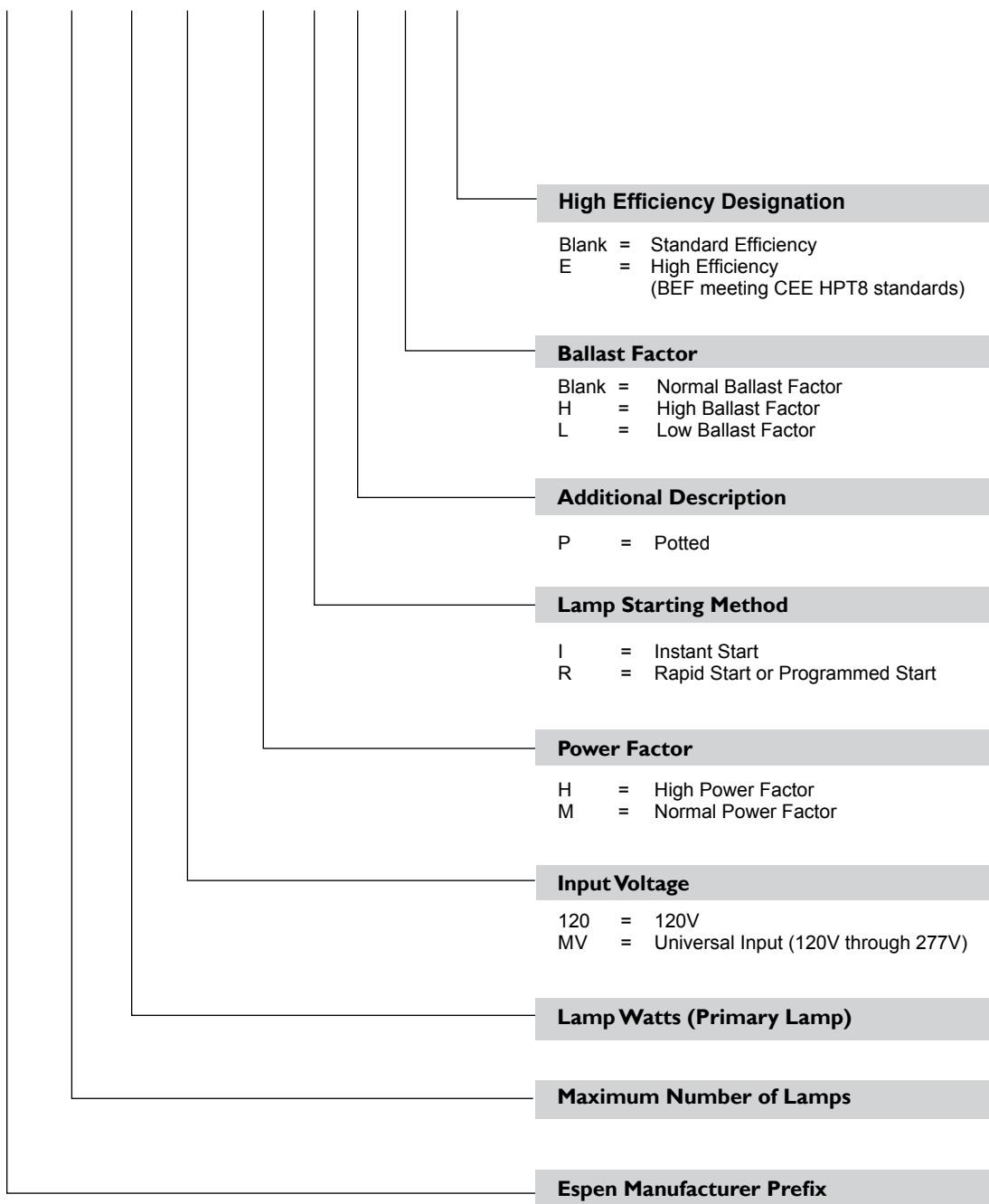
# Building Awareness of our environmental IMPACT



# ORDERING INFORMATION

## Electronic Ballast Model Number Breakdown

**VE 2 32 MV H I P H E**





## ADDITIONAL INFORMATION

### Electronic Ballast - Symbols and Footnotes

- X - Normal Power Factor
- ▲ - CEE HPT8/NEMA Premium
- - ENERGY STAR Platform Approved
- § - Energy Efficiency Verification (Canada)
- ◆ - Wall Dimming (Phase Control)
- ‡ - PWM (for LED)
- † - 0-10V or 1-10V Potentialmeter
- \* - Equal number of LED(s) on each branch

High Frequency

# Electronic Ballasts

For Fluorescent Lamps

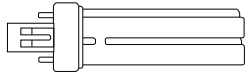
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2-8	For T5/HO Linear
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2-37	For T12/HO Linear
2-38	For T9 Circular
<b>2-39</b>	<b>Symbols and Notes</b>

Energy-Efficient Design reduces  
lighting costs by up to 30%

## Features:

- Flicker-Free, Silent Operation
- Commercial Ballasts Backed by 5-year Warranty
- Convenient Installation for Retrofits





# T4 Lamps

# ELECTRONIC BALLASTS

For 13W - 26W Quad Lamps

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## CFQ13W/G24q - 13W CFL Quad Lamp

1	120	PS	Stratus	<b>VE113120MR</b>	14	0.92	150	0.21	0/-18	I	16	X •
	120-277	PS	Elite	<b>VE213MVHRP-C</b>	18	1.00	10	0.15-0.07	0/-18	H	21	
				<b>VE213MVHRP-W</b>	18	1.00	10	0.15-0.07	0/-18	G	20	
2	120	PS	Stratus	<b>VE213120MR</b>	27	0.92	150	0.43	0/-18	J	12	X •
	120-277	PS	Elite	<b>VE213MVHRP-C</b>	30	1.00	10	0.26-0.11	0/-18	H	19	
				<b>VE213MVHRP-W</b>	30	1.00	10	0.26-0.11	0/-18	G	18	

## CFQ18W/G24q - 18W CFL Quad Lamp

1	120	PS	Stratus	<b>VE118120MR</b>	17	0.88	150	0.27	0/-18	I	16	X •
	120-277	PS	Elite	<b>VE218MVHRP-C</b>	21	1.00	10	0.17-0.08	0/-18	H	21	
				<b>VE218MVHRP-W</b>	21	1.00	10	0.17-0.08	0/-18	G	20	
2	120	PS	Stratus	<b>VE218120MR</b>	35	0.88	135	0.57	0/-18	J	12	X •
	120-277	PS	Elite	<b>VE218MVHRP-C</b>	40-39	0.95	10	0.33-0.15	0/-18	H	19	
				<b>VE218MVHRP-W</b>	40-39	0.95	10	0.33-0.15	0/-18	G	18	

## CFQ26W/G24q - 26W CFL Quad Lamp

1	120	PS	Stratus	<b>VE126120MR</b>	26	0.92	150	0.50	0/-18	I	16	X •
	120-277	PS	Elite	<b>VE226MVHRP-C</b>	30	1.00	10	0.25-0.11	0/-18	H	21	
				<b>VE226MVHRP-W</b>	30	1.00	10	0.25-0.11	0/-18	G	20	
2	120	PS	Stratus	<b>VE226120MR</b>	45	0.88	150	0.68	0/-18	J	12	X
	120-277	PS	Elite	<b>VE226MVHRP-C</b>	58-56	0.97	10	0.48-0.21	0/-18	H	19	
				<b>VE226MVHRP-W</b>	58-56	0.97	10	0.48-0.21	0/-18	G	18	

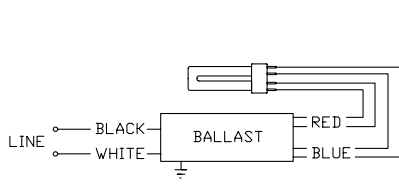


Diagram 16

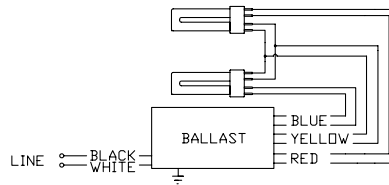


Diagram 18

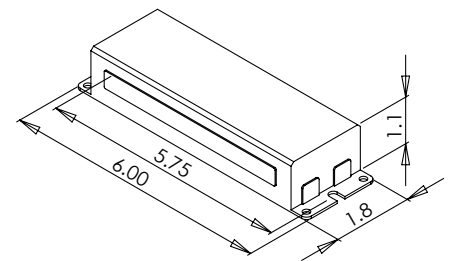


Figure J

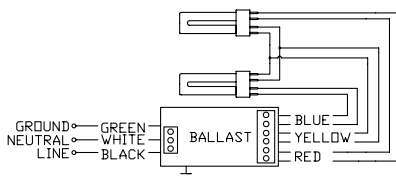


Diagram 19

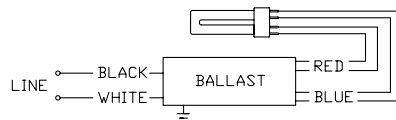
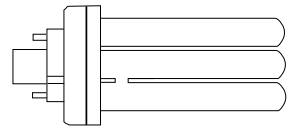


Diagram 16

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T4 Lamps

# ELECTRONIC BALLASTS

For 13W - 18W Triple Lamps

No. of Lamps	Input Volts	Lamp Start Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### CFTR 13W/GX24q - 13W CFL Triple Tube

1	120	PS	Stratus	<b>VE113120MR</b>	14	0.92	150	0.21	0/-18	I	16	<b>X</b>
	120-277	PS	Elite	<b>VE213MVHRP-C</b>	18	1.00	10	0.15-0.07	0/-18	H	21	
				<b>VE213MVHRP-W</b>	18	1.00	10	0.15-0.07	0/-18	G	20	
2	120	PS	Stratus	<b>VE213120MR</b>	27	0.92	150	0.43	0/-18	J	12	<b>X</b>
	120-277	PS	Elite	<b>VE213MVHRP-C</b>	30	1.00	10	0.26-0.11	0/-18	H	19	
				<b>VE213MVHRP-W</b>	30	1.00	10	0.26-0.11	0/-18	G	18	

### CFTR 18W/GX24q - 18W CFL Triple Tube

1	120	PS	Stratus	<b>VE118120MR</b>	17	0.88	150	0.27	0/-18	I	16	<b>X</b>
	120-277	PS	Elite	<b>VE218MVHRP-C</b>	21	1.00	10	0.17-0.08	0/-18	H	21	
				<b>VE218MVHRP-W</b>	21	1.00	10	0.17-0.08	0/-18	G	20	
2	120	PS	Stratus	<b>VE218120MR</b>	35	0.88	135	0.57	0/-18	J	12	<b>X</b>
	120-277	PS	Elite	<b>VE218MVHRP-C</b>	40-39	0.95	10	0.33-0.15	0/-18	H	19	
				<b>VE218MVHRP-W</b>	40-39	0.95	10	0.33-0.15	0/-18	G	18	

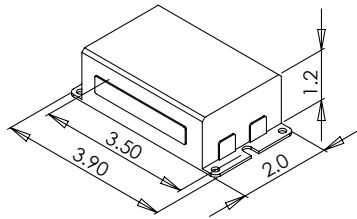


Figure I

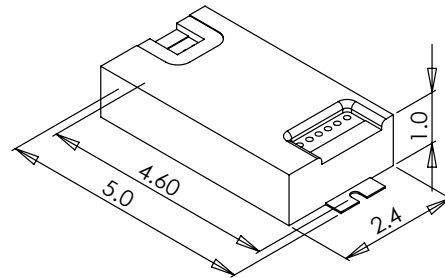


Figure H

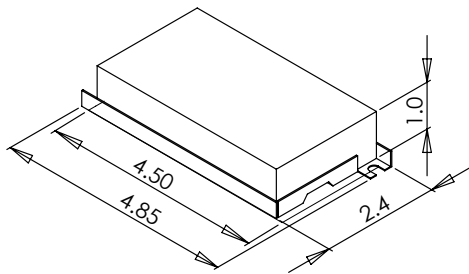


Figure G

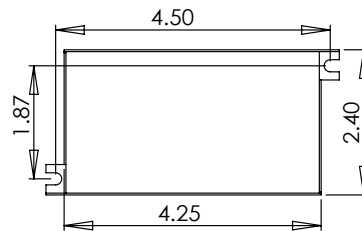
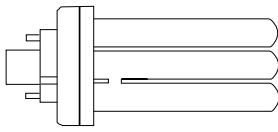


Figure G - Mounting

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T4 Lamps

# ELECTRONIC BALLASTS

For 26W - 42W Triple Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### CFTR26W/GX24q - 26W CFL Triple Tube

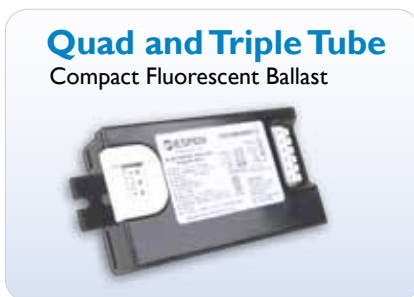
1	120	PS	Stratus	<b>VE126120MR</b>	26	0.92	150	0.50	0/-18	I	16	<b>X</b>
	120-277	PS	Elite	<b>VE226MVHRP-C</b>	30	1.00	10	0.25-0.11	0/-18	H	21	
				<b>VE226MVHRP-W</b>	30	1.00	10	0.25-0.11	0/-18	G	20	
2	120	PS	Stratus	<b>VE226120MR</b>	45	0.88	150	0.68	0/-18	J	12	<b>X</b>
	120-277	PS	Elite	<b>VE226MVHRP-C</b>	58-56	0.97	10	0.48-0.21	0/-18	H	19	
				<b>VE226MVHRP-W</b>	58-56	0.97	10	0.48-0.21	0/-18	G	18	

### CFTR32W/GX24q - 32W CFL Triple Tube

1	120-277	PS	Elite	<b>VE226MVHRP-C</b>	36	0.98	10	0.31-0.13	0/-18	H	21	
				<b>VE226MVHRP-W</b>	36	0.98	10	0.31-0.13	0/-18	G	20	

### CFTR42W/GX24q - 42W CFL Triple Tube

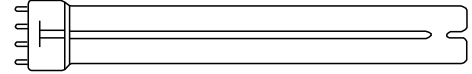
1	120-277	PS	Elite	<b>VE226MVHRP-C</b>	46	0.98	10	0.38-0.17	0/-18	H	21	
				<b>VE226MVHRP-W</b>	46	0.98	10	0.38-0.17	0/-18	JG	20	



Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

## For 36W/39W FT5 Lamps

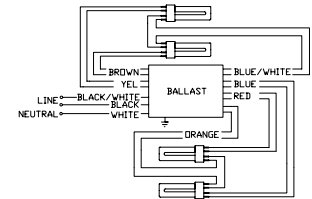
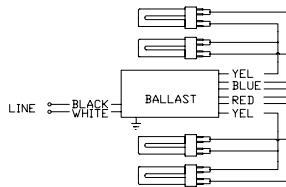
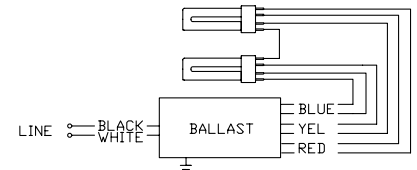
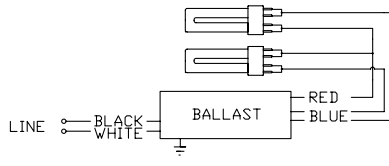
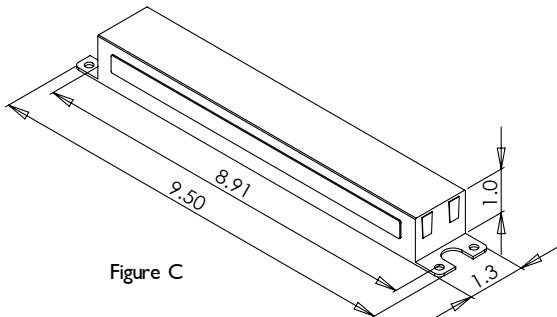
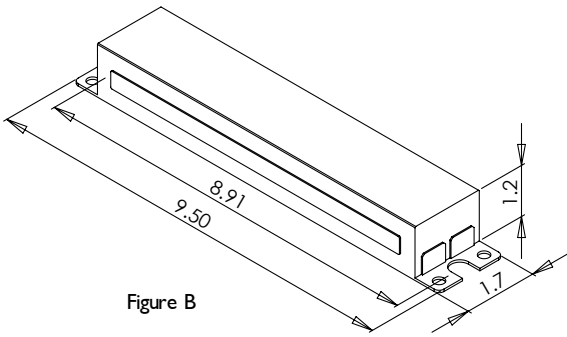


## FT5 Lamps

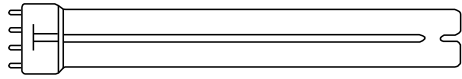
No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### FT36W/2G11 - 36/39W

1	120	IS	Apollo	<b>VE232120HIP</b>	32	0.80	30	0.30	0/-18	C	22	
		IS	Elite	<b>VE232MVHIP</b>	32	0.80	20	0.29	0/-18	C	22	
		120-277	PS	Elite	<b>VE232MVHIPH</b>	39	1.00	10	0.33-0.14	0/-18	C	22
2	120	IS	Apollo	<b>VE254MVHRP</b>	46	1.20	20	0.38-0.18	0/-18	C	24	
				<b>VE232120HIP</b>	49	0.70	25	0.42	0/-18	C	23	
				<b>VE332120HIP</b>	50	0.70	20	0.43	0/-18	C	23	
		120-277	IS	Elite	<b>VE332120HIPH</b>	67	0.88	10	0.56	0/-18	C	26
	<b>VE332MVHIP</b>				64	0.85	10	0.53-0.23	0/-18	C	26	
	<b>VE232MVHIPH</b>				52	0.72	10	0.44-0.19	0/-18	C	23	
		PS	Elite	<b>VE332MVHIPH</b>	67	0.88	10	0.56-0.24	0/-18	C	26	
3	120	IS	Apollo	<b>VE254MVHRP</b>	89-87	1.18	15	0.71-0.31	0/-18	C	25	
				<b>VE332120HIP</b>	74	0.68	20	0.62	0/-18	C	27	
				<b>VE332120HIPH</b>	91	0.83	20	0.75	0/-18	C	27	
		120-277	IS	Elite	<b>VE432120HIP</b>	76	0.68	10	0.64	0/-18	C	28
	<b>VE332MVHIP</b>				71	0.68	10	0.59-0.26	0/-18	C	27	
	<b>VE332MVHIPH</b>				91	0.82	10	0.75-0.32	0/-18	C	27	
	<b>VE432MVHIP</b>				77	0.68	10	0.65-0.28	0/-18	C	28	
	<b>VE432MVHIPH</b>				97	0.88	10	0.82-0.36	0/-18	B	28	
	<b>VE454MVHRP</b>				135-133	1.20	20	1.09-0.49	0/-18	E	30	
4	120	IS	Apollo	<b>VE432120HIP</b>	94	0.65	10	0.79	0/-18	C	29	
		IS	Elite	<b>VE432MVHIP</b>	95	0.65	10	0.80-0.35	0/-18	C	29	
		120-277	IS	Elite	<b>VE432MVHIPH</b>	118	0.82	10	0.99-0.43	0/-18	B	29
	<b>VE454MVHRP</b>				178-174	1.18	15	1.42-0.62	0/-18	E	31	



Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## FT5 Lamps

# ELECTRONIC BALLASTS

For 40W - 55W FT5 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### FT40W/2GI I - 40W

1	120	IS	Apollo	<b>VE232120HIP</b>	43	0.98	30	0.37	0/-18	C	22
	120-277	IS	Elite	<b>VE232MVHIP</b>	39	0.90	10	0.33-0.14	0/-18	C	22
				<b>VE232MVHIPH</b>	51	1.25	10	0.42-.018	0/-18	C	22
2	120	IS	Apollo	<b>VE332120HIP</b>	70	0.98	10	0.59	0/-18	C	26
				<b>VE332120HIPH</b>	92	1.10	10	0.77		C	26
	120-277	IS	Elite	<b>VE332MVHIP</b>	70	0.98	10	0.59-0.26	0/-18	C	26
				<b>VE332MVHIPH</b>	92	1.10	10	0.77-0.33	0/-18	C	26
				<b>VE332MVHIPL</b>	60	0.82	10	0.50-0.22	0/-18	C	26
				<b>VE432120HIP</b>	103	0.88	10	0.86	0/-18	C	28
3	120-277	IS	Elite	<b>VE432MVHIP</b>	104	0.88	10	0.87-0.38	0/-18	C	28
				<b>VE432MVHIPH</b>	130	1.10	10	1.08-0.47	0/-18	B	28

### FT50W/2GI I - 50W

1	120-277	PS	Elite	<b>VE254MVHRP</b>	61-60	1.20	10	0.51-0.22	0/-18	C	24
2	120-277	PS	Elite	<b>VE254MVHRP</b>	118-115	1.12	10	0.99-0.42	0/-18	C	25
3	120-277	PS	Elite	<b>VE354MVHRP</b>	173-170	1.12	10	1.46-0.62	0/-18	B	
				<b>VE454MVHRP</b>	179-176	1.15	10	1.51-0.65	0/-18	E	30
4	120-277	PS	Elite	<b>VE454MVHRP</b>	236-230	1.12	10	1.98-0.84	0/-18	E	31

### FT55W/2GI I - 55W

1	120-277	PS	Elite	<b>VE254MVHRP</b>	58	0.93	20	0.51-0.22	0/-18	C	24
2	120-277	PS	Elite	<b>VE254MVHRP</b>	112-109	0.91	10	0.94-0.40	0/-18	C	25
3	120-277	PS	Elite	<b>VE354MVHRP</b>	163-159	0.91	10	1.36-0.54	0/-18	B	
				<b>VE454MVHRP</b>	170-167	0.93	10	1.45-0.62	0/-18	E	30
4	120-277	PS	Elite	<b>VE454MVHRP</b>	224-218	0.91	10	1.88-0.80	0/-18	E	31

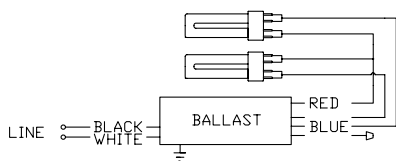


Diagram 26

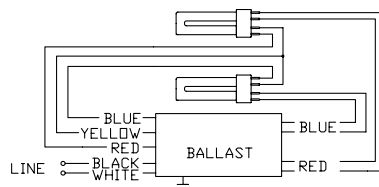


Diagram 12

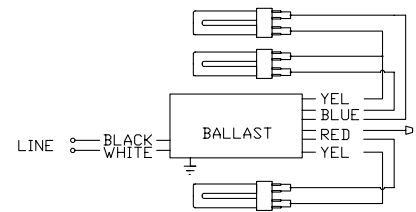


Diagram 28

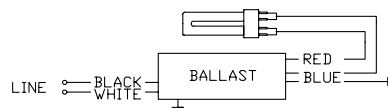


Diagram 22

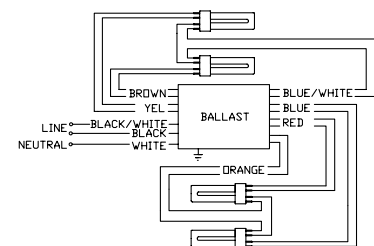
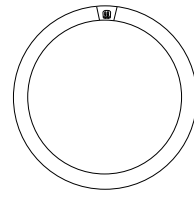


Diagram 31

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

## For 55W T5/HO Circular Lamps

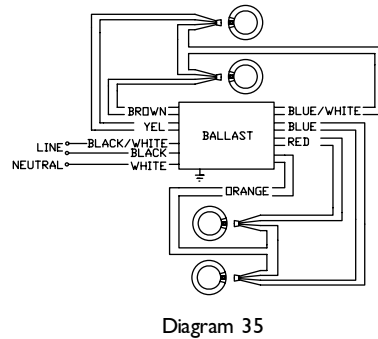
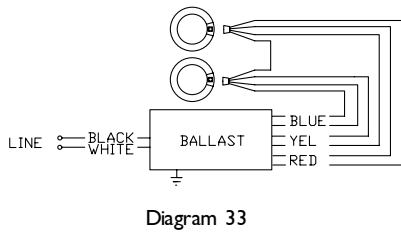
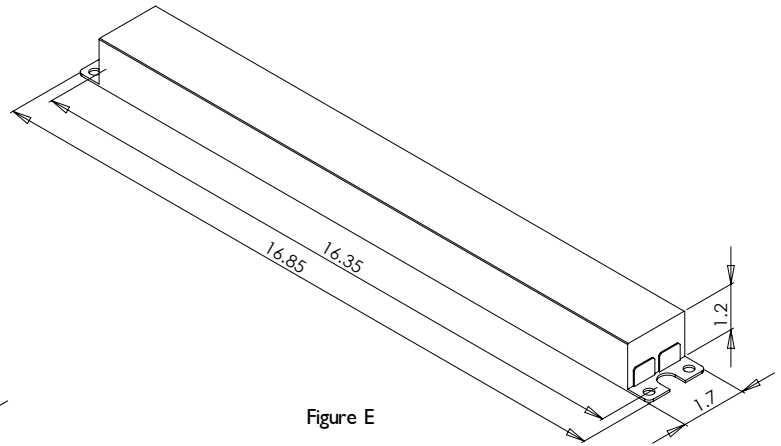
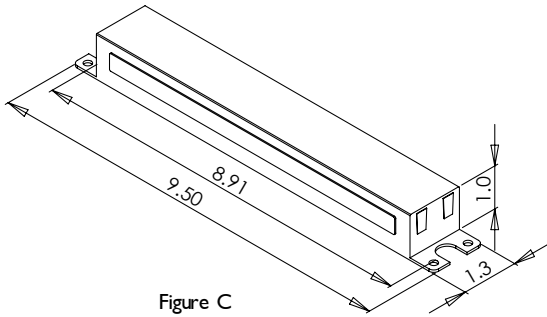


### T5/HO Circular

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### FCI2T5/HO - 55W

1	120-277	PS	Elite	<b>VE254MVHRP</b>	55	0.88	20	0.45-0.20	0/-18	C	32
2	120-277	PS	Elite	<b>VE254MVHRP</b>	106-103	0.86	10	0.87-0.37	0/-18	C	33
3	120-277	PS	Elite	<b>VE354MVHRP</b>	153-150	0.86	10	1.27-0.54	0/-18	B	
				<b>VE454MVHRP</b>	161-158	0.88	20	1.32-0.57	0/-18	E	34
4	120-277	PS	Elite	<b>VE454MVHRP</b>	212-206	0.86	10	1.74-0.74	0/-18	E	35



Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T5 Linear

# ELECTRONIC BALLASTS

For 8W - 28W T5 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F8T5 - 8W

1	120	PS	Panther	<b>VE114120MRP</b>	10	1.30	135	0.16	0/-18	F	36	<b>X</b>
2	120	PS	Panther	<b>VE214120MRP</b>	18	1.20	135	0.28	0/-18	C	8	<b>X</b>

### (I) F8T5 & (I) FI3T5 - 8W & 13W

2	120	PS	Panther	<b>VE214120MRP</b>	22	1.05	135	0.35	0/-18	C	8	<b>X</b>
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### FI3T5 - 13W

1	120	PS	Panther	<b>VE114120MRP</b>	14	1.00	135	0.21	0/-18	F	36	<b>X</b>
2	120	PS	Panther	<b>VE214120MRP</b>	26	0.92	135	0.40	0/-18	C	8	<b>X</b>

### FI4T5 - 14W

1	120	PS	Panther	<b>VE114120MRP</b>	14	0.95	135	0.21	0/-18	F	36	<b>X</b>
2	120	PS	Panther	<b>VE214120MRP</b>	26	0.88	135	0.40	0/-18	C	8	<b>X</b>

### F21T5 - 21W

1	120	PS	Panther	<b>VE128120MRP</b>	21	0.92	135	0.35	0/-18	F	36	<b>X</b>
				<b>VE228120MRP</b>	21	0.88	135	0.35	0/-18	C	37	<b>X</b>
2	120	PS	Panther	<b>VE228120MRP</b>	40	0.88	135	0.67	0/-18	C	8	<b>X</b>

### F28T5 - 28W

1	120	PS	Panther	<b>VE128120MRP</b>	28	0.92	135	0.47	0/-18	F	36	<b>X</b>
				<b>VE228120MRP</b>	28	0.88	135	0.49	0/-18	C	37	<b>X</b>
2	120	PS	Panther	<b>VE228120MRP</b>	54	0.88	135	0.90	0/-18	C	8	<b>X</b>

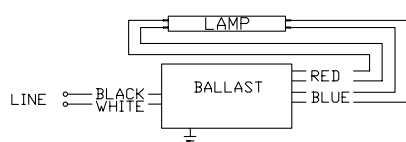


Diagram 36

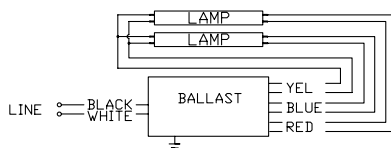


Diagram 8

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

## For 54W T5/HO Lamps

## T5/HO Linear

No. of Lamps	Input Volts	Lamp Start Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F54T5/HO - 54W

1	120-277	PS	Elite	<b>VE254MVHRP</b>	62	1.03	10	0.52-0.23	0/-18	C	37
2	120-277	PS	Elite	<b>VE254MVHRP</b>	120-117	1.00	10	1.00-0.43	0/-18	C	9
				<b>VE354MVHRP</b>	120-117	1.00	10	1.00-0.43	0/-18	B	9
3	120-277	PS	Elite	<b>VE354MVHRP</b>	174-170	1.00	10	1.46-0.62	0/-18	B	44
				<b>VE454MVHRP</b>	182-179	1.03	10	1.52-0.66	0/-18	E	39
4	120-277	PS	Elite	<b>VE454MVHRP</b>	240-234	1.00	10	2.00-0.86	0/-18	E	10

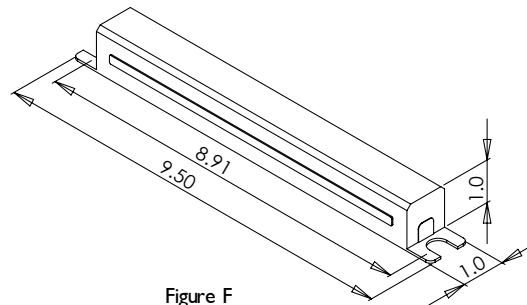


Figure F

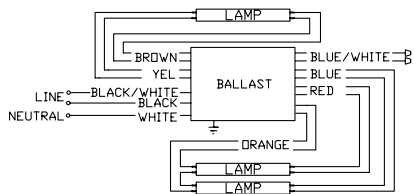


Diagram 39

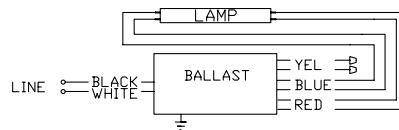


Diagram 37

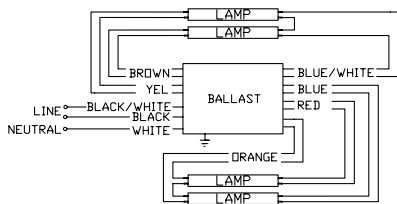


Diagram 10

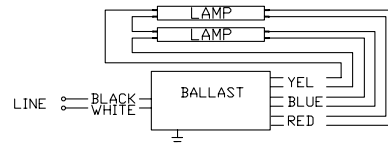
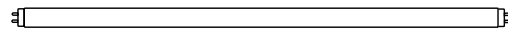


Diagram 9

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data





# T8 Linear

# ELECTRONIC BALLASTS

For 15W - 17WT8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

## FI5T8 - 15W

1	120	RS	Stratus	<b>VE118120MR</b>	15	0.88	150	0.24	0/-18	I	36	X
		IS	Panther	<b>VE232120MIP</b>	17	1.10	165	0.26	0/-18	C	40	X
				<b>VE232120MIP(S)</b>	17	1.10	165	0.26	0/-18	M	1	X
2	120	IS	Panther	<b>VE232120MIP</b>	26	0.90	165	0.37	0/-18	C	2	X
				<b>VE232120MIP(S)</b>	26	0.90	165	0.37	0/-18	M	41	X

## FI7T8 - 17W

1	120	IS	Apollo	<b>VE132120HIP</b>	18	0.94	30	0.17	0/-18	C	1	•	
				<b>VE232120HIP</b>	21	1.15	35	0.20	0/-18	C	40		
				Panther	<b>VE232120MIP</b>	19	1.05	165	0.27	0/-18	C	40	X
					<b>VE232120MIP(S)</b>	19	1.05	165	0.27	0/-18	M	1	X
120-277	IS	Elite	RS	Stratus	<b>VE118120MR</b>	17	0.88	150	0.27	0/-18	I	36	X
			<b>VE132MVHIP</b>	17	0.93	10	0.15-0.07	0/-18	C	1	•		
			<b>VE232MVHIP</b>	22	1.10	10	0.18-0.08	0/-18	C	40			
			<b>VE232MVHIPH</b>	25	1.42	20	0.22-0.11	0/-18	C	40			
			<b>VE232MVHIPL</b>	19	0.90	20	0.16-0.07	0/-18	C	40			
			<b>VE232MVHIPE</b>	19	1.06	15	0.17-0.08	0/-18	C	40	▲		
			<b>VE232MVHIPHE</b>	23	1.41	20	0.21-0.10	0/-18	C	40	▲		
			<b>VE232MVHIPL</b>	19	0.90	20	0.16-0.07	0/-18	C	40	▲		
			<b>VE232MVHIPL</b>	18	0.90	20	0.15-0.07	0/-18	C	40	▲		

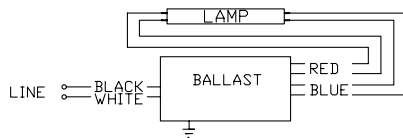


Diagram 36

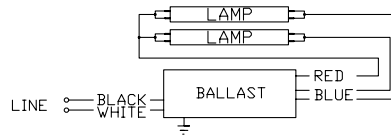


Diagram 2

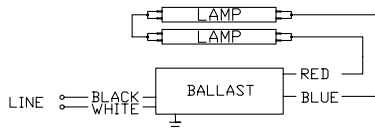


Diagram 41

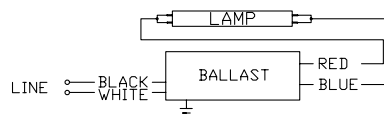


Diagram 1

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 17W T8 Lamps

T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## FI7T8 - 17W

2	120	IS	Apollo	VE232120HIP	34	0.92	30	0.30	0/-18	C	2	•
				VE332120HIP	38	1.07	25	0.32	0/-18	C	42	
			Panther	VE232120MIP	31	0.91	150	0.45	0/-18	C	2	X •
				VE232120MIP(S)	31	0.91	150	0.45	0/-18	M	41	X
				VE232120MIPH	40	1.25	150	0.70	0/-18	C	2	X
120-277	IS	Elite	VE232MVHIP	32-31	0.90	10	0.26-0.12	0/-18	C	2	•	
			VE232MVHIPH	39	1.23	15	0.33-0.15	0/-18	C	2		
			VE232MVHIPL	25	0.80	15	0.21-0.10	0/-18	C	2		
			VE232MVHIPE	30	0.90	10	0.26-0.11	0/-18	C	2	▲	
			VE232MVHIPHE	38	1.23	15	0.34-0.15	0/-18	C	2	▲	
			VE232MVHIPL E	27	0.85	10	0.23-0.10	0/-18	C	2	▲	
			VE332MVHIP	38	1.07	15	0.32-0.14	0/-18	C	42		
			VE332MVHIPH	48	1.38	10	0.39-0.20	0/-18	C	42		
			VE332MVHIPL	33	0.89	15	0.28-0.19	0/-18	C	42		
			VE332MVHIPE	36	1.07	15	0.31-0.14	0/-18	C	42	▲	
			VE332MVHIPHE	47	1.40	20	0.39-0.20	0/-18	C	42	▲	
			VE332MVHIPL E	32	0.90	20	0.27-0.13	0/-18	C	42	▲	

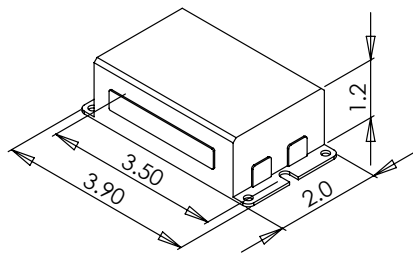


Figure I

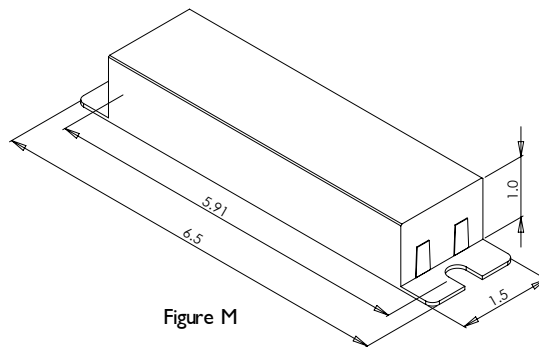


Figure M

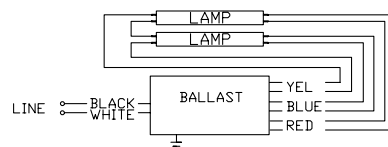
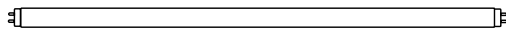


Diagram 9

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8 Linear

# ELECTRONIC BALLASTS For I7WT8 Lamps

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## FI7T8 - I7W

3	120	IS	Panther	VE332120MIP	46	0.92	150	0.79	0/-18	C	3	X •			
				VE332120MIPH	57	1.09	135	0.95	0/-18	C	3	X			
				VE432120MIP	50	0.95	150	0.76	0/-18	C	43	X			
			Apollo	VE332120HIP	46	0.92	20	0.42	0/-18	C	3	•			
				VE332120HIPH	60	1.19	10	0.49	0/-18	C	3				
				VE432120HIP	53	1.04	20	0.45	0/-18	C	43				
120-277	IS	Elite	VE332MVHIP	45	0.92	15	0.38-0.18	0/-18	C	3	•				
			VE332MVHIPH	60-58	1.19	10	0.49-0.22	0/-18	C	3					
			VE332MVHIPL	43	0.86	15	0.37-0.16	0/-18	C	3					
			VE332MVHIPE	46	0.92	10	0.39-0.18	0/-18	C	3	▲				
			VE332MVHIPHE	59	1.22	15	0.49-0.22	0/-18	C	3	▲				
			VE332MVHIPL	41	0.82	10	0.35-0.15	0/-18	C	3	▲				
			VE432MVHIP	54-52	1.04	15	0.46-0.19	0/-18	C	43					
			VE432MVHIPL	43	0.85	15	0.36-0.16	0/-18	C	43					
			VE432MVHIPH	63	1.29	10	0.52-0.24	0/-18	B	43					
			VE432MVHIPE	50	1.01	15	0.42-0.19	0/-18	C	43	▲				
			VE432MVHIPHE	66-62	1.27	10	0.52-0.24	0/-18	B	43	▲				
			VE432MVHIPL	44	0.87	20	0.37-0.18	0/-18	C	43	▲				
			4	120	IS	Apollo	VE432120HIP	61	0.96	20	0.51	0/-18	C	4	•
						Panther	VE432120MIP	55	0.83	150	1.00	0/-18	C	4	X •
120-277	IS	Elite	VE432MVHIP	59-58	0.90	10	0.49-0.22	0/-18	C	4	•				
			VE432MVHIPH	77-76	1.20	10	0.63-0.29	0/-18	B	4					
			VE432MVHIPL	54-52	0.79	10	0.46-0.19	0/-18	C	4					
			VE432MVHIPE	59	0.91	10	0.50-0.22	0/-18	C	4	▲				
			VE432MVHIPHE	79-75	1.18	10	0.63-0.29	0/-18	B	4	▲				
			VE432MVHIPL	54-52	0.81	10	0.46-0.19	0/-18	C	4	▲				

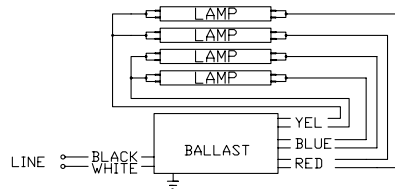


Diagram 4

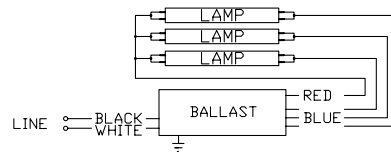


Diagram 3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 18W T8 Lamps

T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F18T8 - 18W

1	120	PS	Stratus	<b>VE118120MR</b>	18	1.00	150	0.28	0/-18	I	36	X
		IS	Panther	<b>VE232120MIP</b>	18	1.00	150	0.26	0/-18	C	40	X
				<b>VE232120MIP(S)</b>	18	1.00	150	0.26	0/-18	M	1	X
2	120	IS	Panther	<b>VE232120MIP</b>	27	0.75	150	0.38	0/-18	C	2	X
				<b>VE232120MIP(S)</b>	27	0.75	150	0.38	0/-18	M	41	X

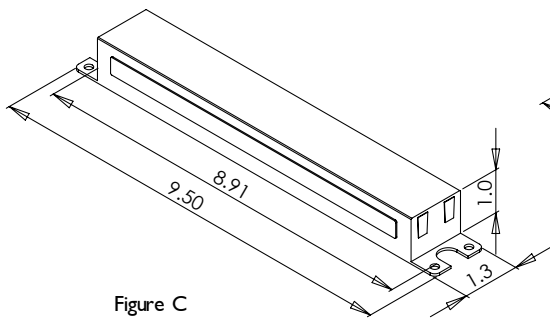


Figure C

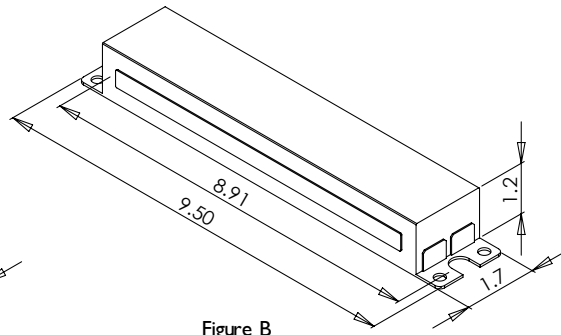


Figure B

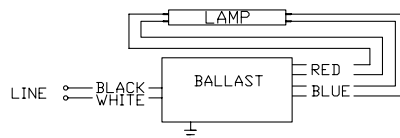


Diagram 36

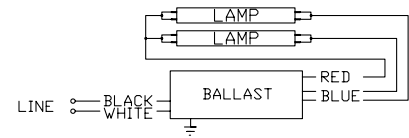


Diagram 2

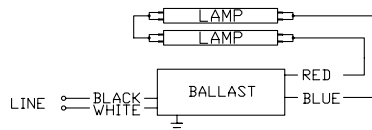


Diagram 41

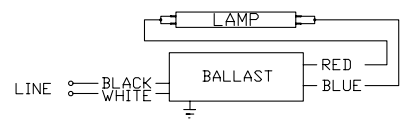
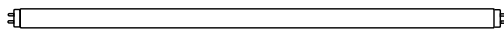


Diagram 1

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8 Linear

# ELECTRONIC BALLASTS

For 25W - 36" T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F25T8 - 25W

1	120	IS	Apollo	VE132120HIP	25	0.89	25	0.22	0/-18	C	1	•			
				VE232120HIP	30	1.05	35	0.29	0/-18	C	40				
			Panther	VE232120MIP	26	0.90	150	0.39	0/-18	C	40	X			
				VE232120MIP(S)	26	0.90	150	0.39	0/-18	M	1	X			
120-277	IS	Elite	VE132MVHIP	24	0.92	10	0.21-0.10	0/-18	C	1	•				
			VE232MVHIP	30	1.05	10	0.24-0.11	0/-18	C	40					
			VE232MVHIPH	33	1.20	15/20	0.28-0.13	0/-18	C	40					
			VE232MVHIPL	25	0.85	20	0.21-0.10	0/-18	C	40					
			VE232MVHIPE	28	1.05	10	0.23-0.10	0/-18	C	40	▲				
			VE232MVHIPHE	35	1.40	15	0.29-0.13	0/-18	C	40	▲				
			VE232MVHIPL	24	0.90	10	0.20-0.09	0/-18	C	40	▲				
			VE232MVRPE	23	0.90	10	0.19-0.09	0/-18	C	37	▲				
			2	120	IS	Apollo	VE232120HIP	49	0.90	25	0.38	0/-18	C	2	•
							VE332120HIP	49	0.90	25	0.42	0/-18	C	42	
120-277	IS	Elite	Panther	VE232120MIP	43	0.85	150	0.61	0/-18	C	2	X •			
				VE232120MIP(S)	43	0.85	150	0.61	0/-18	M	41	X			
			VE232120MIPH	55	1.09	150	0.90	0/-18	C	42	X				
			VE332120MIPH	64	1.25	135	1.04	0/-18	C	42	X				
			VE232MVHIP	45	0.88	10	0.38-0.17	0/-18	C	2	•				
			VE232MVHIPE	43	0.88	10	0.37-0.16	0/-18	C	2	▲				
			VE232MVHIPH	54	1.20	10	0.45-0.20	0/-18	C	2					
			VE232MVHIPL	40-39	0.81	10	0.34-0.15	0/-18	C	2					
			VE232MVHIPHE	57	1.20	10	0.48-0.21	0/-18	C	2	▲				
			VE232MVHIPL	39	0.78	10	0.32-0.14	0/-18	C	2	▲				
			VE332MVHIP	51	1.00	15	0.43-0.22	0/-18	C	42					
			VE332MVHIPH	66	1.35	10	0.55-0.25	0/-18	C	42					
			VE332MVHIPL	45	0.86	15	0.38-0.17	0/-18	C	42					
			VE332MVHIPE	50	1.02	10	0.43-0.19	0/-18	C	42	▲				
			VE332MVHIPHE	64	1.32	10	0.54-0.24	0/-18	C	42	▲				
			VE332MVHIPL	44	0.87	10	0.37-0.17	0/-18	C	42	▲				
			PS	Elite	VE232MVRPE	43	0.89	10	0.36-0.16	0/-18	C	9	▲		
					VE232MVRPHE	57	1.20	10	0.48-0.21	0/-18	C	9	▲		

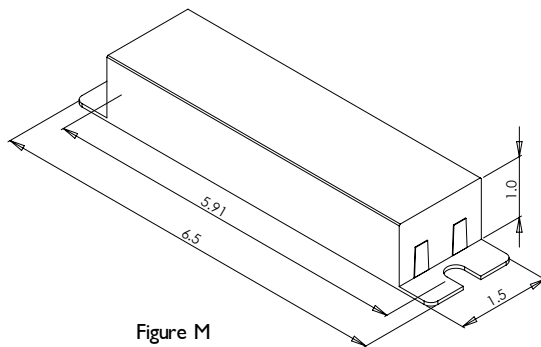


Figure M

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

Electronic Ballasts

# ELECTRONIC BALLASTS

For 25W - 36" T8 Lamps

T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F25T8 - 25W

3	120	IS	Apollo	VE332120HIP	64	0.90	20	0.55	0/-18	A	3	•	
				VE332120HIPH	83	1.16	10	0.69	0/-18	A	3		
				VE432120HIP	74	1.04	20	0.62	0/-18	A	43		
			Panther	VE332120MIPH	85	1.06	135	1.36	0/-18	A	3		
				VE332120MIP	70	0.90	135	1.14	0/-18	A	3	X •	
				VE432120MIP	64	0.87	135	1.12	0/-18	A	43	X •	
120-277	IS	Elite	VE332MVHIP	68	0.90	10	0.56-0.24	0/-18	A	3			
			VE332MVHIPH	83-81	1.16	10	0.69-0.30	0/-18	A	3			
			VE332MVHIPL	60-58	0.82	10	0.51-0.22	0/-18	A	3			
			VE332MVHIPE	65	0.90	10	0.55-0.24	0/-18	A	3			
			VE332MVHIPHE	84	1.20	10	0.70-0.31	0/-18	A	3	▲		
			VE332MVHIPL	57	0.80	10	0.48-0.22	0/-18	A	3	▲		
			VE432MVHIP	74-72	1.00	10	0.62-0.25	0/-18	A	43			
			VE432MVHIPH	90-87	1.28	10	0.75-0.32	0/-18	B	43			
			VE432MVHIPL	62-61	0.84	10	0.53-0.22	0/-18	A	43			
			VE432MVHIPE	72	0.98	10	0.60-0.27	0/-18	A	43	▲		
			VE432MVHIPHE	89-87	1.26	10	0.75-0.32	0/-18	B	43	▲		
			VE432MVHIPL	62-61	0.84	10	0.53-0.22	0/-18	A	43	▲		
			PS	Elite	VE332MVHRPE	64	0.88	10	0.53-0.23	0/-18	A	44	▲
					VE332MVHRPHE	84	1.20	10	0.70-0.31	0/-18	A	44	▲

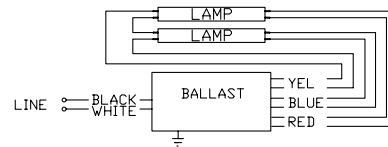


Diagram 9

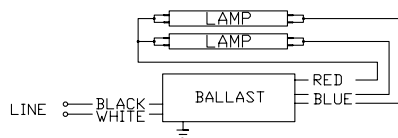


Diagram 2

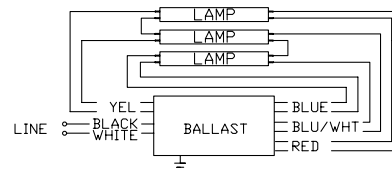


Diagram 44

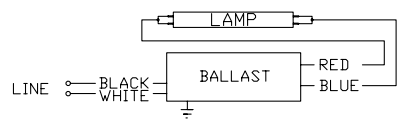


Diagram 1

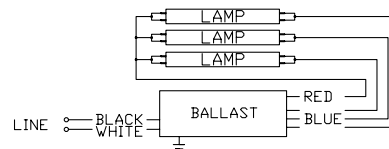
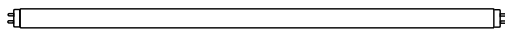


Diagram 3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T8 Linear

# ELECTRONIC BALLASTS

For 25W - 36" T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F25T8 - 25W

4	120	IS	Apollo	<b>VE432120HIP</b>	89	0.94	20	0.74	0/-18	C	4	•
			Panther	<b>VE432120MIP</b>	79	0.82	135	1.30	0/-18	C	4	X •
120-277		IS	Elite	<b>VE432MVHIP</b>	87-85	0.89	10	0.72-0.32	0/-18	C	4	•
				<b>VE432MVHIPH</b>	110-108	1.18	10	0.92-0.40	0/-18	B	4	
				<b>VE432MVHIPL</b>	76-74	0.78	10	0.64-0.27	0/-18	C	4	
				<b>VE432MVHIPE</b>	86	0.89	10	0.73-0.32	0/-18	C	4	▲
				<b>VE432MVHIPHE</b>	109-109	1.17	10	0.92-0.40	0/-18	B	4	▲
				<b>VE432MVHIPL</b>	76-74	0.78	10	0.64-0.27	0/-18	C	4	▲

Electronic Ballasts

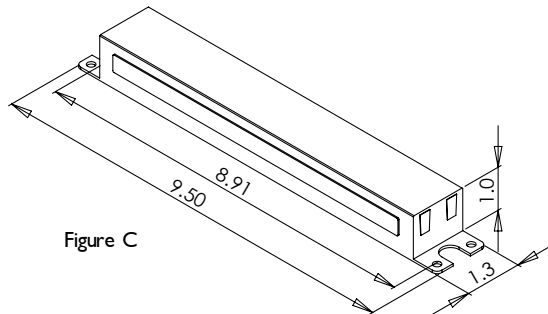


Figure C

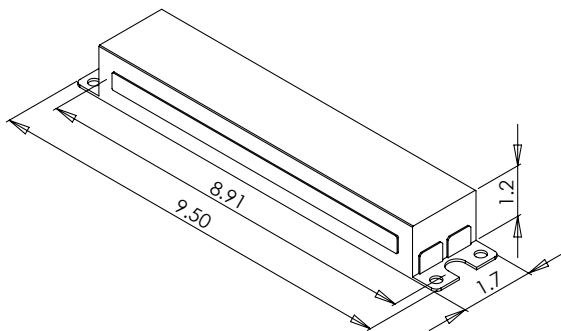


Figure B

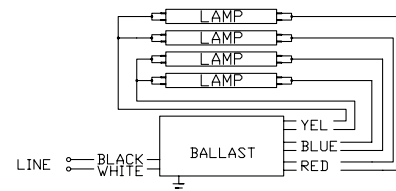


Diagram 4

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 25W - 48" T8 Lamps

T8/ES Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

## F32T8/ES - 25W

1	120	IS	Apollo	VE132120HIP	25	0.90	25	0.21	0/-18	C	1			
				VE232120HIP	30	1.10	30	0.28	0/-18	C	40			
				Panther	VE232120MIP	29	1.10	165	0.46	0/-18	C	40	X	
			VE232120MIP(S)	29	1.10	165	0.46	0/-18	M	1	X			
			120-277	IS	Elite	VE132MVHIP	25	0.90	10	0.21-0.09	50/10	C	1	
						VE232MVHIP	29	1.03	10	0.24-0.11	50/10	C	40	
	VE232MVHIPH	37				1.40	15	0.31-0.14	0/-18	C	40			
	VE232MVHIPL	27				0.85	20	0.22-0.10	0/-18	C	40			
	VE232MVHIPE	27				1.05	10	0.23-0.10	0/-18	C	40			
	VE232MVHIPHE	37				1.40	15	0.31-0.14	0/-18	C	40	▲		
	VE232MVHIPL	24				0.90	10	0.20-0.09	0/-18	C	40	▲		
	VE232MVRHPE	26				0.90	10	0.21-0.09	0/-18	C	37	▲		
	2	120	IS	Apollo	VE232120HIP	44	0.87	30	0.38	0/-18	C	2	●	
					VE332120HIP	50	1.00	20	0.41	0/-18	C	42		
VE332120HIPH					67	1.28	20	0.55	0/-18	C	42			
Panther				VE232120MIP	43	0.87	165	0.65	0/-18	C	2	X ●		
				VE232120MIP(S)	43	0.87	165	0.65	0/-18	M	41	X ●		
				VE332120MIP	50	1.10	150	0.90	0/-18	C	42	X		
		120-277	IS	Elite	VE232MVHIP	46-45	0.88	10	0.38-0.16	50/10	C	2	●	
VE232MVHIPH					60	1.20	10	0.50-0.22	0/-18	C	2			
VE232MVHIPL					39	0.77	10	0.32-0.09	0/-18	C	2			
VE232MVHIPE					44	0.89	10	0.39-0.17	0/-18	C	2	▲		
VE232MVHIPHE					60	1.19	10	0.51-0.22	0/-18	C	2	▲		
VE232MVHIPL					39	0.77	10	0.33-0.14	0/-18	C	2	▲		
VE332MVHIP					50	1.00	10	0.41-0.18	0/-18	C	42			
VE332MVHIPH					67	1.28	10	0.55-0.24	0/-18	C	42			
PS	Elite	VE332MVHIPL	47	0.85	15	0.40/0.18	50/10	C	42					
		VE332MVHIPE	50	1.02	10	0.43-0.19	0/-18	C	42	▲				
		VE332MVHIPHE	70	1.30	10	0.59-0.27	0/-18	C	42	▲				
		VE332MVHIPL	44	0.87	10	0.37-0.17	0/-18	C	42	▲				
		VE232MVRHPE	50-49	0.98	10	0.42-0.18	0/-18	C	9	▲				
		VE232MVRHPHE	60	1.19	10	0.51-0.22	0/-18	C	9	▲				

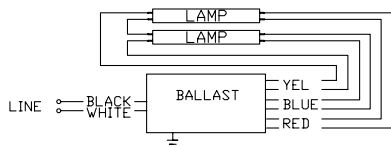


Diagram 9

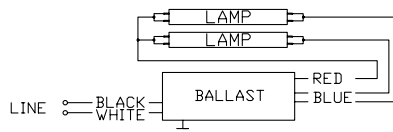


Diagram 2

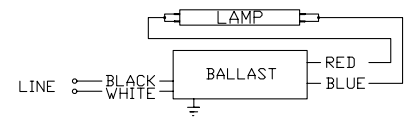
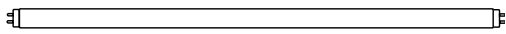


Diagram 1

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data





# T8/ES Linear

# ELECTRONIC BALLASTS

For 25W - 48" T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 25W

3	120	IS	Apollo	VE332120HIP	66	0.87	20	0.55	0/-18	C	3	•	
				VE332120HIPH	87	1.15	10	0.73	0/-18	C	3	•	
				VE432120HIP	75	1.00	20	0.63	0/-18	C	43		
			Panther	VE332120MIP	65	0.88	125	1.10	0/-18	C	3	X •	
				VE332120MIPH	87	1.12	135	1.38	0/-18	C	3		
				VE432120MIP	66	0.88	135	1.11	0/-18	C	43	X	
		120-277	IS	Elite	VE332MVHIP	66	0.87	10	0.55-0.24	0/-18	A	3	•
					VE332MVHIPH	87	1.15	10	0.73-0.31	0/-18	A	3	•
					VE332MVHIPL	60	0.78	10	0.51/0.23	50/10	C	3	
VE332MVHIPE	66				0.88	10	0.56-0.24	0/-18	C	3			
VE332MVHIPHE	86				1.17	10	0.73-0.32	0/-18	C	3	▲		
VE332MVHIPL	59				0.78	10	0.50-0.22	0/-18	C	3	▲		
VE432MVHIP	75-73				1.00	10	0.63-0.27	0/-18	C	43			
	VE432MVHIPH				100	1.26	10	0.85-0.38	0/-18	B	43		
	VE432MVHIPL				65-63	0.80	10	0.54-0.23	50/10	C	43		
VE432MVHIPE	72				0.98	10	0.60-0.27	0/-18	C	43			
	VE432MVHIPHE				93-92	1.24	10	0.77-0.34	0/-18	B	43	▲	
	VE432MVHIPL				63-62	0.85	10	0.53-0.23	0/-18	C	43	▲	
PS	Elite				VE332MVHRPE	67-66	0.88	10	0.56-0.25	0/-18	B	44	▲
					VE332MVHRPHE	86	1.17	10	0.73-0.32	0/-18	B	44	▲
4	120				IS	Apollo	VE432120HIP	92	0.88	20	0.77	0/-18	C
		Panther	VE432120MIP	90		0.87	135	1.35	0/-18	C	4	X •	
		120-277	IS	Elite	VE432MVHIP	92-91	0.88	10	0.77-0.33	0/-18	C	4	•
	VE432MVHIPH				123	1.18	10	0.91-0.40	0/-18	B	4		
	VE432MVHIPL				78-76	0.77	10	0.65-0.28	50/10	C	4		
	VE432MVHIPE				87	0.88	10	0.74-0.32	0/-18	C	4	▲	
	VE432MVHIPHE				109-108	1.16	10	0.91-0.40	0/-18	B	4	▲	
	VE432MVHIPL				76	0.77	10	0.65-0.28	50/10	C	4	▲	

Electronic Ballasts

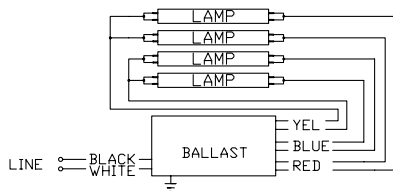


Diagram 4

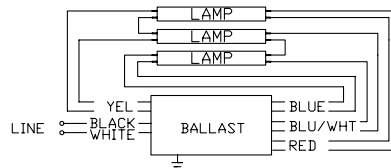


Diagram 44

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 28W - 48" T8 Lamps

T8/ES Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 28W

1	120	IS	Apollo	VE132120HIP	27	0.90	25	0.23	0/-18	C	1		
				VE232120HIP	32	1.10	30	0.29	0/-18	C	40		
			Panther	VE232120MIP	31	1.10	165	0.50	0/-18	C	40	X	
				VE232120MIP(S)	31	1.10	165	0.50	0/-18	M	1	X	
120-277	IS	Elite	VE132MVHIP	27	0.92	10	0.22-0.10	50/10	C	1			
			VE232MVHIP	31	1.02	10	0.25-0.11	50/10	C	40			
			VE232MVHIPH	39	1.38	10/15	0.33-0.15	0/-18	C	40			
			VE232MVHIPL	29	0.85	20	0.24-0.11	0/-18	C	40			
			VE232MVHIPE	31	1.05	10	0.26-0.11	0/-18	C	40	▲		
			VE232MVHIPHE	40	1.40	15	0.34-0.16	0/-18	C	40	▲		
			VE232MVHIPL	26	0.90	10	0.22-0.10	0/-18	C	40	▲		
			VE232MVHRPE	27	0.90	10	0.22-0.10	0/-18	C	37	▲		
			PS	Elite	VE232MVHRPE	27	0.90	10	0.22-0.10	0/-18	C	37	▲

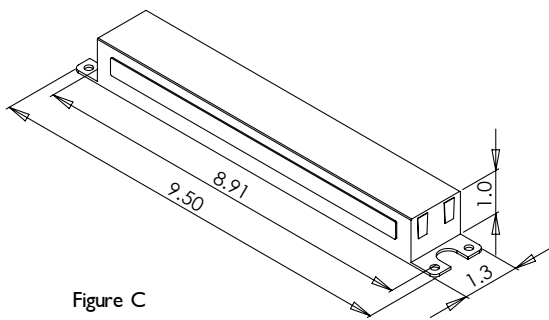


Figure C

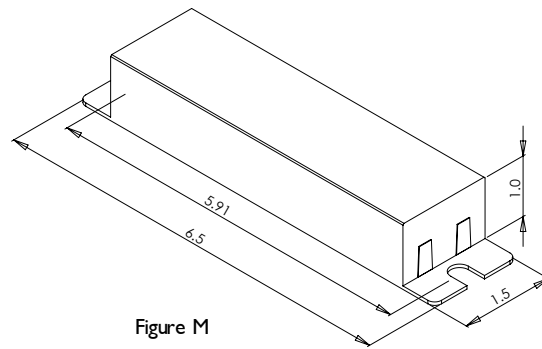


Figure M

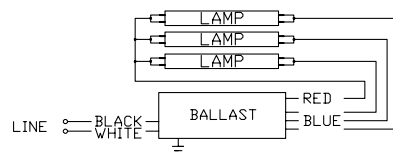


Diagram 3

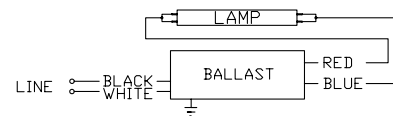
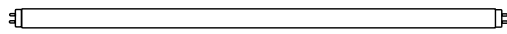


Diagram I

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8/ES Linear

# ELECTRONIC BALLASTS

For 28W - 48" T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 28W

2	120	IS	Apollo	VE232120HIP	48	0.87	25	0.41	0/-18	C	2	•	
				VE332120HIP	54	1.00	20	0.45	0/-18	C	42		
				VE332120HIPH	71	1.28	10	0.58	0/-18	C	42		
			Panther	VE232120MIP	48	0.87	150	0.71	0/-18	C	2	X •	
				VE232120MIP(S)	48	0.87	150	0.71	0/-18	M	41	X •	
120-277		IS	Elite	VE232MVHIP	49-48	0.88	10	0.40-0.17	50/10	C	2	•	
				VE232MVHIPH	64-63	1.18	10	0.54-0.24	0/-18	C	2		
				VE232MVHIPL	44	0.77	10	0.36-0.16	0/-18	C	2		
				VE232MVHIPE	48	0.89	10	0.41-0.18	0/-18	C	2	▲	
				VE232MVHIPHE	67	1.19	10	0.57-0.25	0/-18	C	2	▲	
				VE232MVHIPL	43	0.77	10	0.37-0.16	0/-18	C	2	▲	
				VE332MVHIP	54	1.00	10	0.45-0.19	0/-18	C	42		
				VE332MVHIPH	71	1.28	10	0.58-0.25	0/-18	C	42		
				VE332MVHIPL	49	0.85	10	0.41-0.19	50/10	C	42		
				VE332MVHIPE	56	1.02	10	0.47-0.21	0/-18	C	42		
				VE332MVHIPHE	74	1.30	10	0.63-0.28	0/-18	C	42	▲	
				VE332MVHIPL	48	0.87	10	0.41-0.19	0/-18	C	42	▲	
				PS	Elite	VE232MVHRPE	52-51	0.90	10	0.44-0.19	0/-18	C	9
			VE232MVHRPHE			67	1.19	10	0.57-0.25	0/-18	C	9	▲

Electronic Ballasts

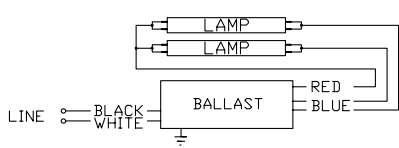


Diagram 2

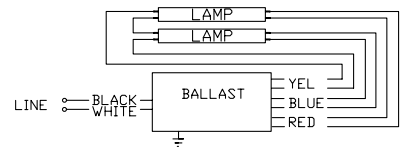


Diagram 9

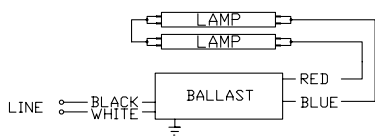


Diagram 41

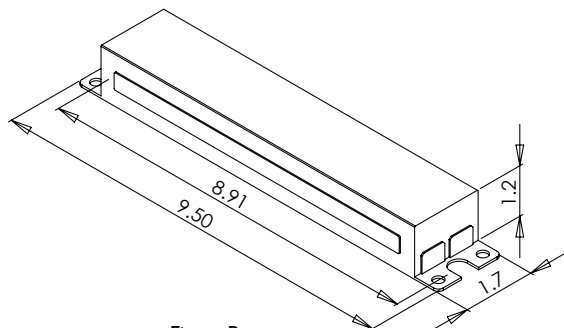


Figure B

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 28W - 48" T8 Lamps

T8/ES Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 28W

3	120	IS	Apollo	VE332120HIP	71	0.87	20	0.59	0/-18	C	3	•
				VE332120HIPH	93	1.15	10	0.78	0/-18	C	3	•
				VE432120HIP	82	1.00	20	0.68	0/-18	C	43	
			Panther	VE332120MIP	70	0.88	135	1.06	0/-18	C	3	X •
				VE332120MIPH	91	1.14	135	1.37	0/-18	C	3	X
				VE432120MIP	72	0.89	135	1.08	0/-18	C	43	X
	120-277	IS	Elite	VE332MVHIP	71	0.87	10	0.59-0.26	0/-18	C	3	•
				VE332MVHIPH	93	1.15	10	0.78-0.34	0/-18	C	3	•
				VE332MVHIPL	66	0.78	10	0.56/0.24	0/-18	C	3	
				VE332MVHIPE	74	0.88	10	0.63-0.27	0/-18	C	3	▲
				VE332MVHIPHE	97	1.17	10	0.82-0.36	0/-18	C	3	▲
				VE332MVHIPL	66	0.78	10	0.56-0.24	0/-18	C	3	▲
				VE432MVHIP	82-80	1.00	10	0.68-0.29	0/-18	C	43	
				VE432MVHIPH	107	1.24	10	0.90-0.39	0/-18	B	43	
VE432MVHIPL				69-68	0.80	10	0.57-0.25	50/10	C	43		
VE432MVHIPE				80	0.98	10	0.67-0.29	0/-18	C	43	▲	
VE432MVHIPHE				98-95	1.24	10	0.80-0.36	0/-18	B	43	▲	
VE432MVHIPL				69-68	0.85	10	0.57-0.25	0/-18	C	43	▲	
PS				VE332MVHRPE	72-71	0.88	10	0.60-0.26	0/-18	C	44	▲
				VE332MVHRPHE	97	1.17	10	0.82-0.36	0/-18	C	44	▲
4	120	IS	Apollo	VE432120HIP	99	0.88	20	0.82	0/-18	C	4	•
			Panther	VE432120MIP	97	0.88	135	1.46	0/-18	C	4	X •
120-277	IS	Elite	VE432MVHIP	99-97	0.88	10	0.82-0.36	0/-18	C	4	•	
			VE432MVHIPH	130	1.16	10	1.08-0.47	0/-18	B	4		
			VE432MVHIPL	85-83	0.77	10	0.71-0.30	50/10	C	4		
			VE432MVHIPE	97-96	0.88	10	0.82/0.36	0/-18	C	4		
			VE432MVHIPHE	116-115	1.16	10	0.98-0.42	0/-18	B	4	▲	
			VE432MVHIPL	84-82	0.77	10	0.71-0.30	50/10	C	4	▲	

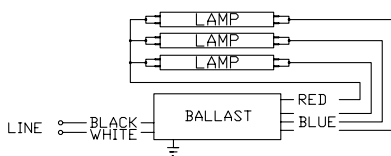


Diagram 3

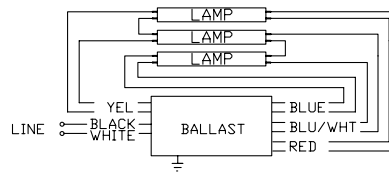


Diagram 44

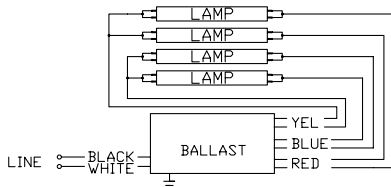
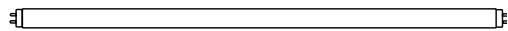


Diagram 4

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8/ES Linear

# ELECTRONIC BALLASTS

For 30W - 48" T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 30W

1	120	IS	Apollo	VE132120HIP	28	0.90	20	0.25	0/-18	C	1			
				VE232120HIP	35	1.10	30	0.31	0/-18	C	40			
			Panther	VE232120MIP	25	0.80	150	0.41	0/-18	C	40	X		
				VE232120MIP(S)	25	0.80	150	0.41	0/-18	M	1	X		
	120-277	IS	Elite	VE132MVHIP	26	0.92	10	0.22-0.10	50/10	C	1			
				VE232MVHIP	33	1.03	10	0.28-0.12	50/10	C	40			
				VE232MVHIPH	42	1.38	10	0.36-0.16	0/-18	C	40			
				VE232MVHIPL	37	0.85	10	0.24-0.11	0/-18	C	40			
				VE232MVHIPE	33	1.05	10	0.28-0.12	0/-18	C	40	▲		
VE232MVHIPHE				42	1.38	10	0.25-0.16	0/-18	C	40	▲			
VE232MVHIPL				28	0.90	10	0.24-0.11	0/-18	C	40	▲			
PS				Elite	VE232MVHRPE	28	0.92	10	0.23-0.11	0/-18	C	37	▲	
					VE232MVHRPHE	43	1.37	10	0.26-0.17	0/-18	C	37	▲	
2				120	IS	Apollo	VE232120HIP	54	0.87	20	0.46	0/-18	C	2
	VE332120HIP	60	1.00				20	0.51	0/-18	C	42			
	VE332120HIPH	75	1.28				20	0.62	0/-18	C	42			
	Panther	VE232120MIP	48			0.78	150	0.76	0/-18	C	2	X ●		
		VE232120MIP(S)	48			0.78	150	0.76	0/-18	M	41	X ●		
		VE232120MIPH	62			1.05	150	0.93	0/-18	C	2			
		VE332120MIP	55			0.87	150	0.84	0/-18	C	42	X		
	120-277	IS	Elite			VE232MVHIP	54-52	0.88	10	0.45-0.19	50/10	C	2	●
						VE232MVHIPE	51	0.89	10	0.43-0.19	0/-18	C	2	
						VE232MVHIPH	70-69	1.18	10	0.58-0.25	0/-18	C	2	
				VE232MVHIPHE	72	1.19	10	0.61-0.27	0/-18	C	2	▲		
				VE232MVHIPL	47	0.77	10	0.39-0.17	0/-18	C	2			
				VE232MVHIPL	46	0.77	10	0.39-0.17	0/-18	C	2	▲		
				VE332MVHIP	60	1.00	10	0.51-0.22	0/-18	C	42			
				VE332MVHIPE	59	1.02	10	0.49-0.22	0/-18	C	42	▲		
				VE332MVHIPH	75	1.28	10	0.62-0.27	0/-18	C	42			
				VE332MVHIPHE	78	1.30	10	0.65-0.29	0/-18	C	42	▲		
	PS	Elite	VE332MVHIPL	52	0.85	10	0.45-0.20	50/10	C	42				
			VE332MVHIPL	52	0.87	10	0.44-0.20	0/-18	C	42	▲			
	PS	Elite	VE232MVHRPE	54-53	0.90	10	0.45-0.20	0/-18	C	9	▲			
VE232MVHRPHE			72	1.19	10	0.61-0.27	0/-18	C	9	▲				

Electronic Ballasts

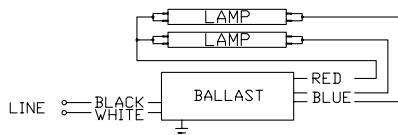


Diagram 2

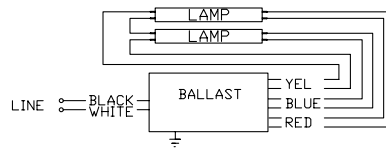


Diagram 9

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 30W - 48" T8 Lamps

T8/ES Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8/ES - 30W

3	120	IS	Apollo	VE332120HIP	78	0.87	20	0.66	0/-18	C	3	•		
				VE332120HIPH	100	1.15	20	0.85	0/-18	C	3			
				VE432120HIP	87	1.00	20	0.73	0/-18	C	43			
			Panther	VE332120MIP	70	0.82	135	1.10	0/-18	C	3	X •		
				VE332120MIPH	92	1.05	135	1.37	0/-18	C	3			
				VE432120MIP	85	1.00	135	1.27	0/-18	C	43	X		
		120-277	IS	Elite	VE332MVHIP	78	0.87	10	0.66-0.29	0/-18	C	3	•	
					VE332MVHIPH	100	1.15	10	0.78-0.34	0/-18	C	3	•	
					VE332MVHIPL	70	0.78	10	0.58/0.26	0/-18	C	3		
VE332MVHIPE	80				0.88	10	0.68-0.29	0/-18	C	3	▲			
VE332MVHIPHE	104				1.17	10	0.88-0.38	0/-18	C	3	▲			
VE332MVHIPL	71				0.78	10	0.60-0.26	0/-18	C	3	▲			
VE432MVHIP	87-85				1.00	10	0.73-0.32	0/-18	C	43				
VE432MVHIPH	114				1.24	10	0.96/0.42	0/-18	B	43				
VE432MVHIPL	75-74				0.80	10	0.62-0.27	0/-18	C	43				
VE432MVHIPE	84				0.98	10	0.71-0.31	0/-18	C	43	▲			
VE432MVHIPHE	105-101				1.24	10	0.88-0.37	0/-18	B	43	▲			
VE432MVHIPL	75-74				0.84	10	0.62-0.27	0/-18	C	43	▲			
PS	Elite				VE332MVHRPE	77-76	0.88	10	0.64-0.28	0/-18	C	44	▲	
					VE332MVHRPHE	104	1.17	10	0.88-0.38	0/-18	C	44	▲	
4	120			IS	Apollo	VE432120HIP	105	0.88	20	0.88	0/-18	C	4	•
					Panther	VE432120MIP	104	0.88	135	1.55	0/-18	C	4	X •
				120-277	IS	Elite	VE432MVHIP	105-103	0.88	10	0.88-0.38	0/-18	C	4
		VE432MVHIPH	142-139				1.16	10	1.21-0.51	0/-18	B	4		
		VE432MVHIPL	91-90				0.77	10	0.76-0.32	0/-18	C	4		
		VE432MVHIPE	105				0.88	10	0.89-0.39	0/-18	C	4	▲	
			VE432MVHIPHE	120	1.16	10	1.01-0.44	0/-18	B	4	▲			
			VE432MVHIPL	90-88	0.77	10	0.76-0.32	0/-18	C	4	▲			

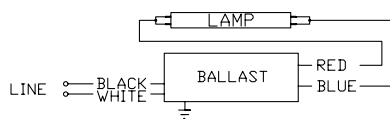


Diagram 1

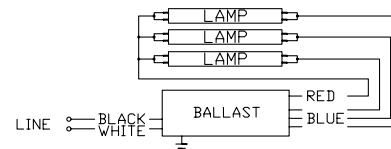


Diagram 3

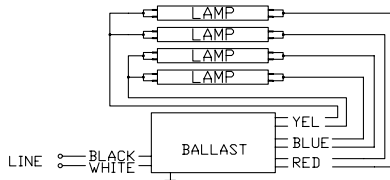


Diagram 4

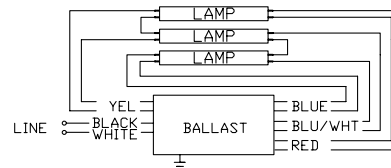
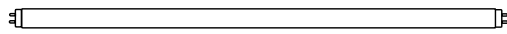


Diagram 44

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8 Linear

# ELECTRONIC BALLASTS For 32W T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8 - 32W

1	120	IS	Apollo	VE132120HIP	30	0.88	20	0.26	0/-18	C	1	•		
				VE232120HIP	38	1.10	30	0.34	0/-18	C	40			
		Panther	VE232120MIP	33	1.00	165	0.48	0/-18	C	40	X			
			VE232120MIP(S)	33	1.00	165	0.48	0/-18	M	1	X			
			VE232120MIPH	41	1.17	180	0.72	0/-18	C	40	X			
120-277	IS			VE132MVHIP	31	0.90	10	0.26-0.12	0/-18	C	1	•		
				VE232MVHIP	37-36	1.05	10	0.32-0.14	0/-18	C	40			
				VE232MVHIPH	45	1.38	10	0.37-0.17	0/-18	C	40			
				VE232MVHIPL	29-28	0.83	15	0.24-0.11	0/-18	C	40			
				VE232MVHIPE	35	1.05	10	0.30-0.13	0/-18	C	40	▲		
				VE232MVHIPHE	45	1.37	10	0.37-0.17	0/-18	C	40	▲		
				VE232MVHIPLE	31	0.90	10	0.26-0.11	0/-18	C	40	▲		
				PS	Elite	VE232MVHRPE	29	0.90	10	0.24-0.11	0/-18	C	37	▲

Electronic Ballasts

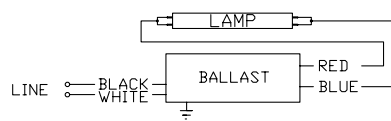


Diagram 1

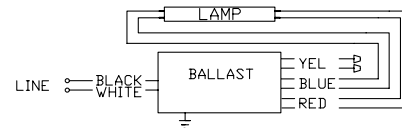


Diagram 37

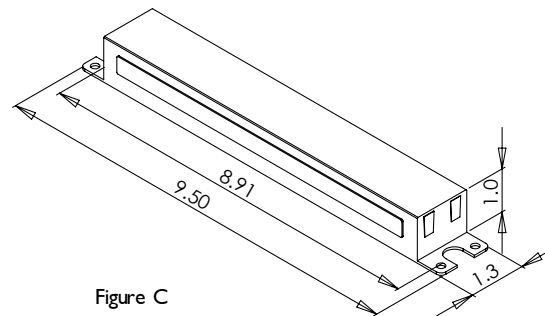


Figure C

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 32W T8 Lamps

T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8 - 32W

2	120	IS	Apollo	VE232120HIP	57	0.85	20	0.49	0/-18	C	2	•	
				VE332120HIP	64	0.85	20	0.54	0/-18	C	42		
				VE332120HIPH	83	1.27	10	0.69	0/-18	C	42		
			Panther	VE232120MIP	54	0.83	135	0.80	0/-18	C	2	X •	
				VE232120MIP(S)	54	0.83	135	0.80	0/-18	M	41	X •	
				VE232120MIPH	70	1.05	150	1.02	0/-18	C	2	X	
				VE332120MIP	65	0.97	150	1.12	0/-18	C	42	X	
			VE332120MIPH	77	1.12	135	1.20	0/-18	C	42	X		
120-277	IS	Elite	VE232MVHIP	59-58	0.89	10	0.50-0.21	0/-18	C	2	•		
			VE232MVHIPH	74-73	1.18	10	0.62-0.26	0/-18	C	2			
			VE232MVHIPL	52-51	0.80	10	0.44-0.19	0/-18	C	2			
			VE232MVHIPE	55-54	0.89	10	0.46-0.20	0/-18	C	2	▲		
			VE232MVHIPHE	76-75	1.19	10	0.64-0.27	0/-18	C	2	▲		
			VE232MVHIPL	48-47	0.77	10	0.40-0.17	0/-18	C	2	▲		
			VE332MVHIP	63	0.99	10	0.53-0.24	0/-18	C	42			
			VE332MVHIPH	83-81	1.40	10	0.69-0.30	0/-18	C	42			
			VE332MVHIPL	58-57	0.92	10	0.49-0.21	0/-18	C	42			
			VE332MVHIPE	63	1.02	10	0.53-0.24	0/-18	C	42	▲		
			VE332MVHIPHE	80-79	1.38	10	0.67-0.29	0/-18	C	42	▲		
			VE332MVHIPL	55	0.85	10	0.46-0.21	0/-18	C	42	▲		
			PS	Elite	VE232MVHRPE	57-56	0.88	10	0.48-0.21	0/-18	C	9	▲
					VE232MVHRPHE	76	1.19	10	0.64-0.27	0/-18	C	9	▲
					VE232MVHRPLE	52-51	0.78	10	0.43-0.19	0/-18	C	9	▲

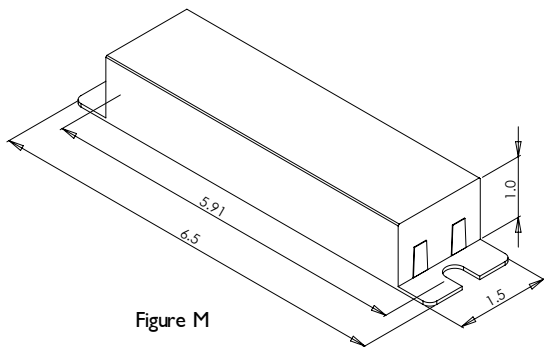


Figure M

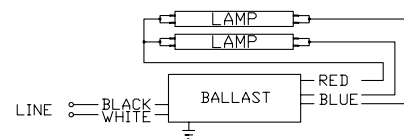


Diagram 2

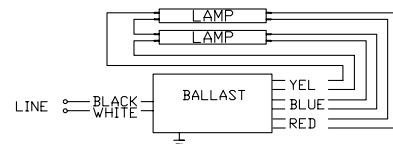


Diagram 9

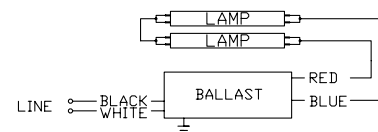
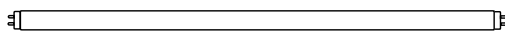


Diagram 41

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data





# T8 Linear

# ELECTRONIC BALLASTS For 32WT8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F32T8 - 32W

3	120	IS	Apollo	VE332120HIP	84	0.88	20	0.71	0/-18	C	3	•	
				VE332120HIPH	109	1.18	10	0.91	0/-18	C	3		
				VE432120HIP	94	1.00	20	0.79	0/-18	C	43		
			Panther	VE332120MIP	84	0.87	150	1.35	0/-18	C	3	X •	
				VE332120MIPH	102	1.08	135	1.60	0/-18	C	3	X	
				VE432120MIP	80	0.85	135	1.35	0/-18	C	43	X	
120-277	IS	Elite	VE332MVHIP	85	0.88	10	0.71-0.31	0/-18	C	3	•		
			VE332MVHIPH	109-107	1.18	10	0.91-0.39	0/-18	C	3	•		
			VE332MVHIPL	76-74	0.78	10	0.64-0.27	0/-18	C	3			
			VE332MVHIPE	84-83	0.88	10	0.71-0.31	0/-18	C	3	▲		
			VE332MVHIPHE	110-108	1.17	10	0.93-0.40	0/-18	C	3	▲		
			VE332MVHIPLE	76-74	0.78	10	0.64-0.27	0/-18	C	3	▲		
			VE432MVHIP	98-92	0.94	10	0.77-0.34	0/-18	C	43			
			VE432MVHIPH	122-120	1.24	10	1.01-0.45	0/-18	B	43			
			VE432MVHIPL	81-80	0.82	10	0.68-0.29	0/-18	C	43			
			VE432MVHIPE	91-90	0.98	10	0.76-0.33	0/-18	C	43	▲		
			VE432MVHIPHE	120	1.24	10	1.01-0.44	0/-18	B	43	▲		
			VE432MVHIPLE	81-80	0.82	10	0.68-0.29	0/-18	C	43	▲		
			PS	Elite	VE332MVHRPE	83-82	0.88	10	0.70-0.30	0/-18	B	44	▲
					VE332MVHRPHE	110	1.17	10	0.93-0.40	0/-18	B	44	▲

Electronic Ballasts

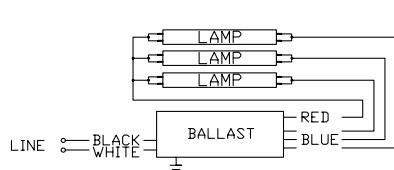


Diagram 3

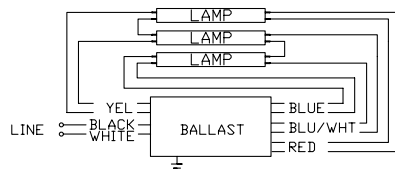
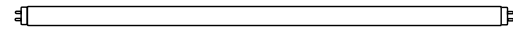


Diagram 44

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 32W T8 Lamps



## T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F32T8 - 32W

4	120	IS	Apollo	<b>VE432120HIP</b>	112	0.88	20	0.93	0/-18	C	4	•
			Panther	<b>VE432120MIP</b>	106	0.82	145	1.57	0/-18	C	4	X •
120-277		IS	Elite	<b>VE432MVHIP</b>	112-108	0.88	10	0.93-0.40	0/-18	C	4	•
				<b>VE432MVHIPH</b>	145	1.16	10	1.24-0.53	0/-18	B	4	
				<b>VE432MVHIPL</b>	98-96	0.77	10	0.82-0.35	0/-18	C	4	
				<b>VE432MVHIPE</b>	110-108	0.88	10	0.94-0.40	0/-18	C	4	▲
				<b>VE432MVHIPHE</b>	145-144	1.16	10	1.24-0.53	0/-18	B	4	▲
				<b>VE432MVHIPLE</b>	98-96	0.77	10	0.82-0.35	0/-18	C	4	▲

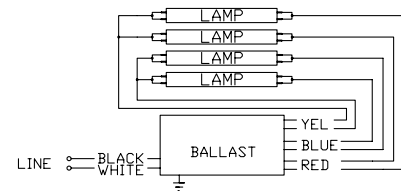


Diagram 4

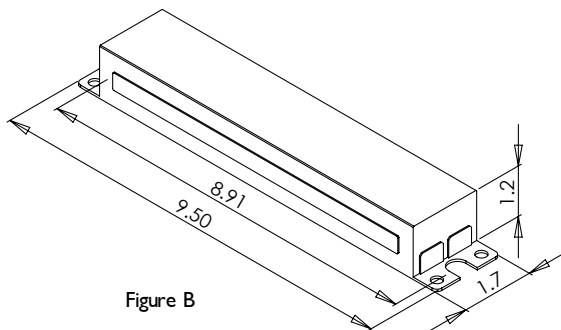


Figure B

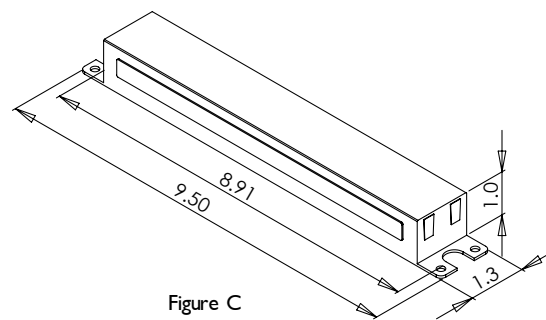
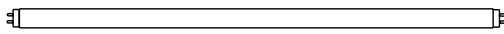


Figure C

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T8 Linear

# ELECTRONIC BALLASTS For 40W T8 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F40T8 - 40W

1	120	IS	Apollo	VE232120HIP	45	1.00	30	0.48	0/-18	C	40		
				VE259120HIP	46	1.05	10	0.40	32/0	C	40		
		IS	Panther	VE232120MIP	45	1.02	150	0.76	32/0	C	40	X	
				VE232120MIP(S)	45	1.02	150	0.76	32/0	M	1	X	
120-277	IS	Elite	VE232120MIPH	49	1.14	170	0.84	0/-18	C	40	X		
			VE132MVHIP	37	0.85	10	0.36-0.14	32/0	C	40			
			VE232MVHIP	42	1.00	10	0.35-0.15	32/0	C	40			
			VE232MVHIPH	54/53	1.35	10	0.45-0.20	32/0	C	40			
			VE232MVHIPL	41-40	0.89	10	0.35-0.15	32/0	C	40			
			VE232MVHIPE	41	1.01	10	0.35-0.15	32/0	C	40			
			VE232MVHIPHE	56-55	1.35	10	0.47-0.21	0/-18	C	40			
			VE232MVHIPL	36	0.88	10	0.29-0.13	32/0	C	40			
			VE259MVHIP	49	1.05	10	0.41-0.18	32/0	C	40			
			PS	Elite	VE232MVHRPE	37	0.92	10	0.31-0.13	0/-18	C	40	

Electronic Ballasts

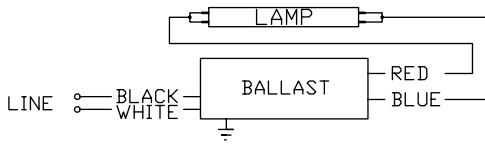


Diagram I

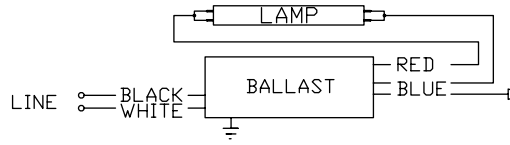


Diagram 40

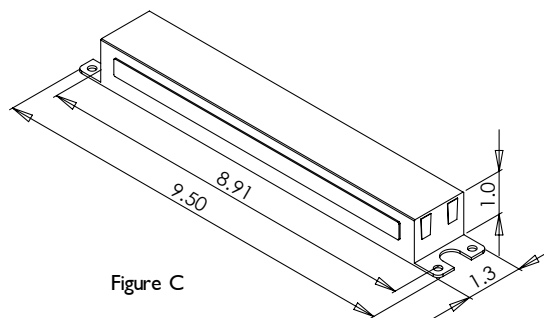
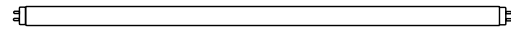


Figure C

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 40W T8 Lamps



## T8 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F40T8 - 40W

2	120	IS	Apollo	VE259120HIP	71	0.85	10	0.60	32/0	C	2		
				VE332120HIP	80	0.95	30	0.68	32/0	C	42		
				VE332120HIPH	101	1.26	10	0.84	32/0	C	42		
			Panther	VE332120MIP	77	0.99	150	1.30	0/-18	C	42	X	
				VE332120MIPH	94	1.15	135	1.50	0/-18	C	42	X	
		120-277	IS	Elite	VE259MVHIP	74	0.90	10	0.62-0.27	32/0	C	2	
					VE332MVHIP	78	0.95	10	0.65-0.29	32/0	C	42	
					VE332MVHIPH	101-100	1.26	10	0.84-0.36	32/0	C	42	
					VE332MVHIPL	71-70	0.87	10	0.60-0.26	32/0	C	42	
					VE332MVHIPE	75-74	1.03	10	0.65-0.28	32/0	C	42	▲
3	120-277	IS	Elite	VE332MVHIPHE	102	1.30	10	0.86-0.37	32/0	C	42	▲	
				VE332MVHIPL	68	0.87	10	0.50-0.26	32/0	C	42	▲	
				VE432120HIP	112	0.88	20	0.93	0/-18	C	43		
				Apollo	VE432MVHIP	114-109	0.92	10	0.95-0.41	32/0	C	43	
					VE432MVHIPH	143-142	1.25	10	1.22-0.51	0/-18	B	43	
		IS	Elite	VE432MVHIPL	98-96	0.82	10	0.82-0.35	32/0	C	43		
				VE432MVHIPE	110	0.94	10	0.93-0.39	32/0	C	43	▲	
				VE432MVHIPHE	143-139	1.25	10	1.22-0.51	0/-18	B	43	▲	
				VE432MVHIPL	98-96	0.84	10	0.82-0.35	32/0	C	43	▲	

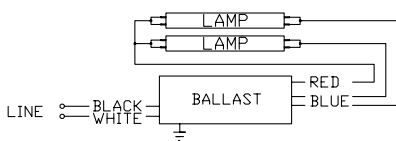


Diagram 2

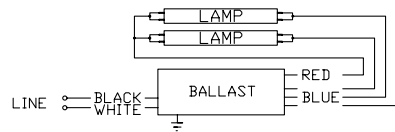


Diagram 42

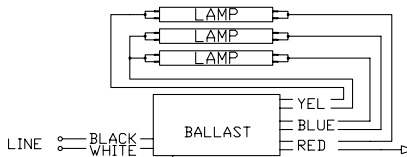


Diagram 43

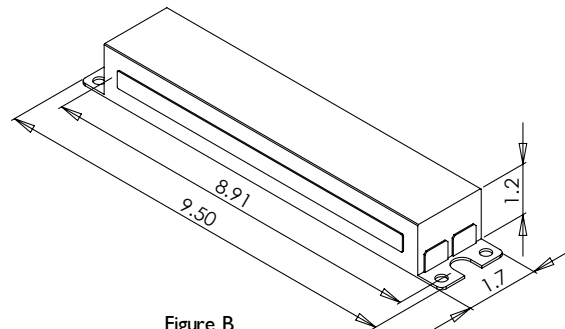


Figure B

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T8 Slimline

# ELECTRONIC BALLASTS

For 46W - 59W T8 Lamps

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

### F72T8 - 46W

1	120	IS	Apollo	<b>VE259120HIP</b>	52	1.20	10	0.44	32/0	C	46
	120-277	IS	Elite	<b>VE259MVHIP</b>	58	1.20	10	0.48-0.21	32/0	C	46
2	120	IS	Apollo	<b>VE259120HIP</b>	88	1.05	10	0.74	32/0	C	6
	120-277	IS	Elite	<b>VE259MVHIP</b>	90	1.15	10	0.75-0.32	32/0	C	6

### F96T8/ES - 51W

1	120	IS	Apollo	<b>VE259120HIP</b>	59	1.10	20	0.49	32/0	C	46
	120-277	IS	Elite	<b>VE259MVHIP</b>	59	1.10	10	0.49-0.22	32/0	C	46
2	120	IS	Apollo	<b>VE259120HIP</b>	96	1.00	20	0.81	32/0	C	6
	120-277	IS	Elite	<b>VE259MVHIP</b>	96-95	1.00	10	0.81-0.35	32/0	C	6

### F96T8/ES - 54W

1	120	IS	Apollo	<b>VE259120HIP</b>	57	1.05	20	0.47	32/0	C	46
	120-277	IS	Elite	<b>VE259MVHIP</b>	57	1.05	10	0.47-0.21	32/0	C	46
2	120-277	IS	Elite	<b>VE259MVHIPLE</b>	89-87	0.77	10	0.74-0.32	60/16	C	6
				<b>VE259120HIP</b>	93	0.87	10	0.77	32/0	C	6
				<b>VE259MVHIP</b>	93	0.87	10	0.77-0.33	32/0	C	6

### F96T8/ES - 57W

1	120	IS	Apollo	<b>VE259120HIP</b>	68	1.10	10	0.60	32/0	C	46
	120-277	IS	Elite	<b>VE259MVHIP</b>	63	1.09	10	0.53-0.23	32/0	C	46
2	120-277	IS	Elite	<b>VE259MVHIPLE</b>	93-91	0.77	10	0.79-0.34	60/16	C	6
				<b>VE259120HIP</b>	106	0.90	10	0.90	32/0	C	6
				<b>VE259MVHIP</b>	104	0.90	10	0.86-0.37	32/0	C	6

### F96T8 - 59W

1	120	IS	Apollo	<b>VE259120HIP</b>	68	1.09	10	0.57	32/0	C	46
	120-277	IS	Elite	<b>VE259MVHIP</b>	68-67	1.09	10	0.57-0.25	32/0	C	46
2	120-277	IS	Elite	<b>VE259MVHIPLE</b>	95-94	0.77	10	0.80-0.34	50/10	C	6
				<b>VE259120HIP</b>	110	0.88	10	0.93	32/0	C	6
				<b>VE259MVHIPHE</b>	144-141	1.15	10	1.20-0.52	50/10	B	6

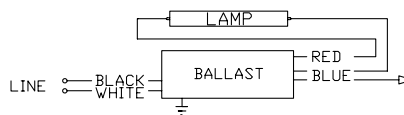


Diagram 46

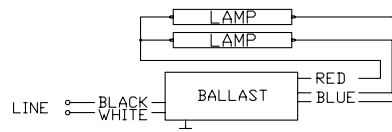
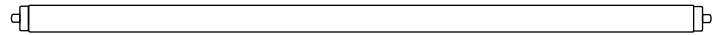


Diagram 6

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 86W T8/HO Lamps



## T8/HO Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F96T8/HO - 86W

1	120	IS	Apollo	<b>VE259120HIP</b>	92	1.05	10	0.77	32/0	C	7
	120-277	IS	Elite	<b>VE259MVHIP</b>	92-91	1.05	10	0.77-0.33	32/0	C	7

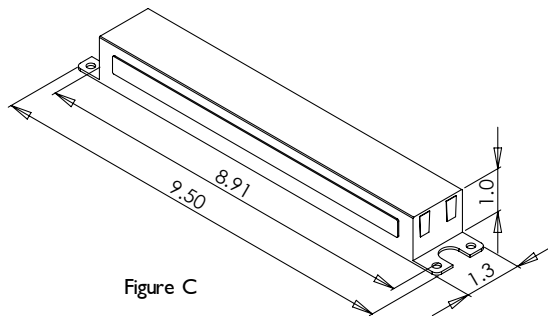


Figure C

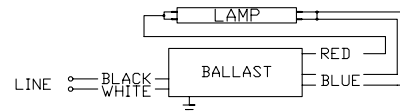


Diagram 7

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## T10 and T12 Linear

# ELECTRONIC BALLASTS

For 40W T10 and 20W - 30W T12 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F40T10 - 40W

1	120	IS	Panther	VE232120MIP	34	0.85	165	0.48	0/-18	C	40	X
				VE232120MIP(S)	34	0.85	165	0.48	0/-18	M	1	X
2	120	IS	Panther	VE232120MIP	53	0.70	150	0.74	0/-18	C	40	X
				VE232120MIP(S)	53	0.70	150	0.74	0/-18	M	1	X
120-277	RS	Elite		VE240MVHRP	77-75	0.95	10	0.66-0.28	32/0	C	8	

### F20T12 - 20W

1	120	IS	Panther	VE232120MIP	20	0.90	165	0.28	0/-18	C	40	X
				VE232120MIP(S)	20	0.90	165	0.28	0/-18	M	1	X
2	120	IS	Panther	VE232120MIP	36	0.85	165	0.50	0/-18	C	40	X
				VE232120MIP(S)	36	0.85	165	0.50	0/-18	M	1	X

### F30T12 - 30W (36")

1	120	RS	Apollo	VE140120HRP	33	1.10	20	0.27	0/-18	C	36	
		IS	Panther	VE232120MIP	27	0.85	165	0.38	0/-18	C	40	X
				VE232120MIP(S)	27	0.85	165	0.38	0/-18	M	1	X
				RS	Apollo	VE240120HRP	62	0.85	25	0.50	0/-18	C
2	120	IS	Panther	VE232120MIP	50	0.75	165	0.71	0/-18	C	40	X
				VE232120MIP(S)	50	0.75	165	0.71	0/-18	M	1	X
120-277	RS	Elite		VE240MVHRP	58-56	0.93	10	0.48-0.20	0/-18	A	8	

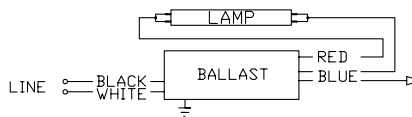


Diagram 40

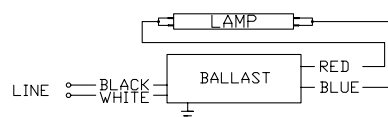


Diagram 1

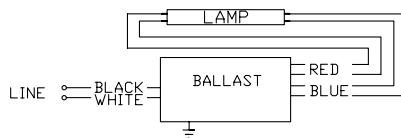


Diagram 36

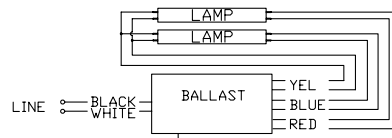
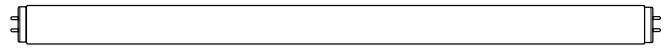


Diagram 8

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 34 - 40W T12 Lamps



## T12 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F48T12 - 25W (48")

1	120	IS	Apollo	VE132120HIP	26	0.91	25	0.22	0/-18	C	1	
			Panther	VE232120MIP	32	1.20	150	0.45	0/-18	C	40	X
				VE232120MIP(S)	32	1.20	150	0.45	0/-18	M	1	X
			Apollo	VE232120HIP	34	1.00	33	0.31	0/-18	C	2	
			RS	Apollo	VE140120HRP	40	1.35	20	0.31	0/-18	C	36
120-277	IS	Elite	VE132MVHIP	26	1.00	10	0.22-0.10	0/-18	C	1		
			VE232MVHIP	30	1.00	10	0.25-0.11	0/-18	C	40		
			VE232MVHIPH	41	1.40	10	0.35-0.15	0/-18	C	40		
2	120	IS	Panther	VE232120MIP	49	1.00	150	0.68	0/-18	C	2	X
				VE232120MIP(S)	49	1.00	150	0.68	0/-18	M	41	X
			Apollo	VE232120HIP	49	1.00	25	0.42	0/-18	C	41	
				VE332120HIP	54	1.10	20	0.45	0/-18	C	42	
				VE332120HIPH	72	1.20	10	0.61	0/-18	C	42	
RS	Apollo	VE240120HRP	74	1.20	20	0.62	0/-18	C	8			
120-277	IS	Elite	VE232MVHIP	48	0.94	10	0.40-0.17	0/-18	C	2		
			VE232MVHIPH	66	1.35	10	0.64-0.28	0/-18	C	2		
			VE332MVHIP	54	1.00	10	0.45-0.19	0/-18	C	42		
			VE332MVHIPH	72	1.20	10	0.61-0.26	0/-18	C	42		
			VE332MVHIPL	46	0.89	10	0.37-0.16	0/-18	C	42		
			RS	Elite	VE240MVHRP	70-69	1.38	10	0.58-0.24	0/-18	C	8

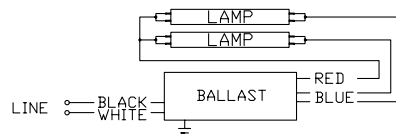


Diagram 2

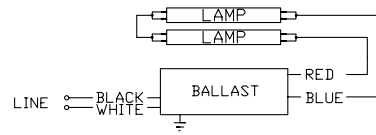


Diagram 4I

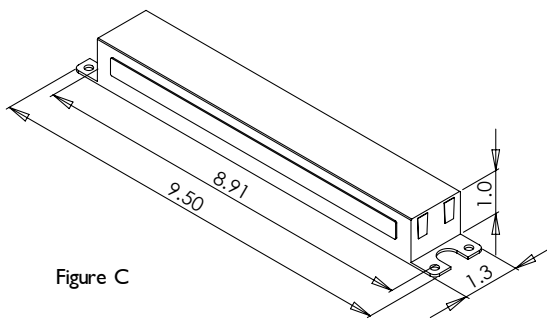


Figure C

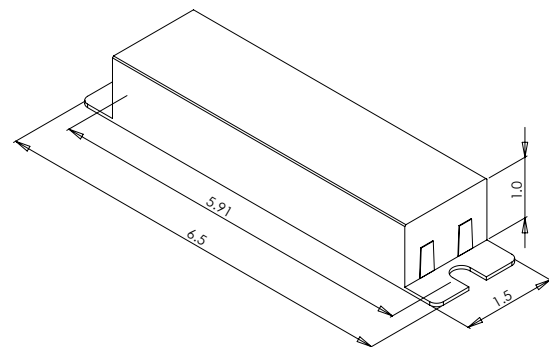


Figure M

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data





## T12 Linear

# ELECTRONIC BALLASTS

For 25W T12 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

### F48T12 - 25W (48")

3	120	IS	Apollo	VE332120HIP	70	0.94	20	0.58	0/-18	C	3		
				VE332120HIPH	95	1.20	10	0.80	0/-18	C	3		
				VE432120HIP	75	1.00	10	0.64	0/-18	C	43		
	120-277	IS	Panther	VE432120MIP	77	1.00	150	1.16	0/-18	C	43	X	
				Elite	VE332MVHIP	70	0.94	10	0.58-0.25	0/-18	C	3	
					VE332MVHIPH	95	1.20	10	0.80-0.35	0/-18	C	3	
		VE332MVHIPL	62		0.85	10	0.50-0.22	0/-18	C	3			
		VE432MVHIP	77		1.00	10	0.64-0.28	0/-18	C	43			
		IS	Elite	VE432MVHIPH	101	1.20	10	0.85-0.37	0/-18	B	43		
4	120	IS	Apollo	VE432120HIP	93	0.94	10	0.78	0/-18	C	4		
			Panther	VE432120MIP	93	0.94	150	1.42	0/-18	C	4	X	
	120-277	IS	Elite	VE432MVHIP	93	0.94	10	0.78-0.34	0/-18	C	4		
				VE432MVHIPH	123	1.20	10	1.03-0.45	0/-18	B	4		

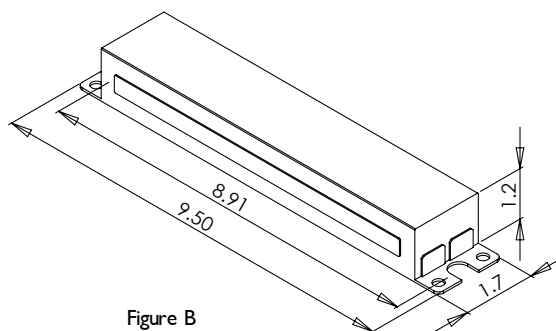


Figure B

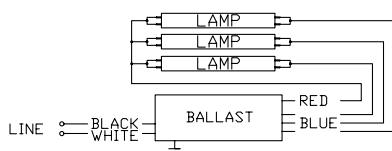


Diagram 3

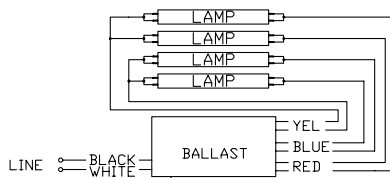


Diagram 4

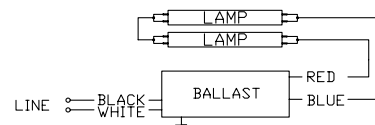


Diagram 41

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 34 - 40W T12 Lamps



## T12 Linear

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F34T12 - 34W (48")

1	120	IS	Apollo	<b>VE232120HIP</b>	29	0.65	32	0.28	0/-18	C	2		
			Panther	<b>VE232120MIP</b>	27	0.80	165	0.39	0/-18	C	40	<b>X</b>	
				<b>VE232120MIP(S)</b>	27	0.80	165	0.39	0/-18	M	1	<b>X</b>	
	120-277	IS	Apollo	<b>VE140120HRP</b>	35	1.00	20	0.29	0/-18	C	36		
			Elite	<b>VE232MVHIP</b>	26	0.60	10	0.22-0.10	0/-18	C	40		
				<b>VE232MVHIPH</b>	34	0.95	10	0.28-0.12	0/-18	C	40		
	2	120	IS	Apollo	<b>VE232120HIP</b>	43	0.70	25	0.37	0/-18	C	2	
					<b>VE332120HIP</b>	45	0.70	20	0.38	0/-18	C	42	
					<b>VE332120HIPH</b>	62	0.75	10	0.50	0/-18	C	42	
				Panther	<b>VE232120MIP</b>	42	0.65	165	0.58	0/-18	C	2	<b>X</b>
<b>VE232120MIP(S)</b>					42	0.65	165	0.58	0/-18	M	41	<b>X</b>	
<b>VE240120HRP</b>					62	0.85	25	0.53	0/-18	C	8		
120-277		IS	Elite	<b>VE232MVHIP</b>	41	0.60	10	0.35-0.15	0/-18	C	2		
				<b>VE232MVHIPH</b>	53	0.82	10	0.44-0.19	0/-18	C	2		
				<b>VE332MVHIP</b>	45	0.60	10	0.38-0.16	0/-18	C	42		
				<b>VE332MVHIPH</b>	62	0.75	10	0.51-0.22	0/-18	C	42		
RS	Elite	<b>VE240MVHRP</b>	62-61	0.85	10	0.55-0.23	0/-18	C	8				
3	120	IS	Apollo	<b>VE332120HIP</b>	60	0.60	20	0.50	0/-18	C	3		
				<b>VE332120HIPH</b>	80	0.75	10	0.67	0/-18	C	3		
				<b>VE432120HIP</b>	64	0.60	10	0.54	0/-18	C	43		
			Panther	<b>VE432120MIP</b>	65	0.60	150	1.00	0/-18	C	43	<b>X</b>	
	120-277	IS	Elite	<b>VE332MVHIP</b>	60	0.60	10	0.50-0.22	0/-18	C	3		
				<b>VE332MVHIPH</b>	80	0.75	10	0.67-0.29	0/-18	C	3		
				<b>VE332MVHIPL</b>	56	0.60	10	0.46-0.20	0/-18	C	3		
				<b>VE432MVHIP</b>	65	0.60	10	0.55-0.24	0/-18	C	43		
				<b>VE432MVHIPH</b>	84	0.75	10	0.71-0.31	0/-18	B	43		
4	120	IS	Apollo	<b>VE432120HIP</b>	78	0.60	10	0.66	0/-18	C	4		
			Panther	<b>VE432120MIP</b>	77	0.60	150	1.18	0/-18	C	4	<b>X</b>	
	120-277	IS	Elite	<b>VE432MVHIP</b>	77	0.60	10	0.65-0.28	0/-18	C	4		
				<b>VE432MVHIPH</b>	101	0.75	10	0.84-0.36	0/-18	B	4		

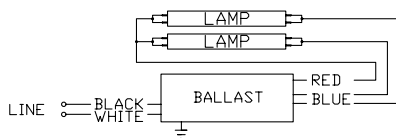


Diagram 2

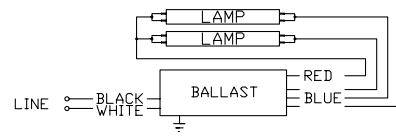


Diagram 42

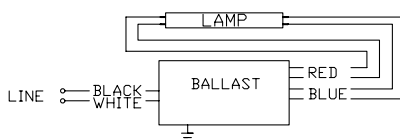


Diagram 36

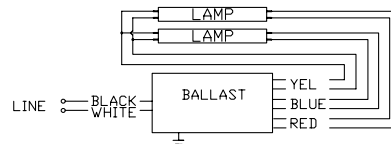


Diagram 8

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T12 Linear

# ELECTRONIC BALLASTS

For 40WT12 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

## F40T12 - 40W

1	120	IS	Apollo	VE232120HIP	33	0.65	31	0.30	0/-18	C	40	
			Panther	VE232120MIP	32	0.80	165	0.45	0/-18	C	40	X
				VE232120MIP(S)	32	0.80	165	0.45	0/-18	M	1	X
	120-277	IS	Apollo	VE140120HRP	40	1.00	20	0.31	0/-18	C	36	
			Elite	VE232MVHIP	31	0.65	10	0.26-0.11	0/-18	C	40	
2	120	IS	Apollo	VE232120HIP	48	0.65	25	0.41	0/-18	C	2	
				VE332120HIP	52	0.65	20	0.44	0/-18	C	42	
				VE332120HIPH	73	0.80	10	0.60	0/-18	C	42	
			Panther	VE232120MIP	49	0.65	150	0.68	0/-18	C	2	X
				VE232120MIP(S)	49	0.65	150	0.68	0/-18	M	41	X
	120-277	IS	Apollo	VE240120HRP	74	0.85	20	0.62	0/-18	C	8	
			Elite	VE232MVHIP	50	0.65	10	0.42-0.18	0/-18	C	2	
	120-277	IS	Elite	VE232MVHIPH	66	1.00	10	0.64-0.28	0/-18	C	2	
				VE332MVHIP	52	0.65	10	0.44-0.19	0/-18	C	42	
				VE332MVHIPH	73	0.80	10	0.61-0.26	0/-18	C	42	
				VE332MVHIPL	46	0.60	10	0.38-0.16	0/-18	C	42	
		RS	Elite	VE240MVHRP	72-70	0.85	10	0.62-0.26	0/-18	C	8	
				VE332MVHIP	69	0.65	10	0.58-0.25	0/-18	C	3	
				VE332MVHIPH	95	0.80	10	0.80-0.35	0/-18	C	3	
				VE332MVHIPL	62	0.60	10	0.50-0.22	0/-18	C	3	
3	120	IS	Apollo	VE332120HIP	69	0.65	20	0.58	0/-18	C	3	
				VE332120HIPH	95	0.80	10	0.80	0/-18	C	3	
				VE432120HIP	75	0.68	10	0.63	0/-18	C	43	
			Panther	VE432120MIP	78	0.70	150	1.20	0/-18	C	43	X
	120-277	IS	Elite	VE332MVHIP	69	0.65	10	0.58-0.25	0/-18	C	3	
				VE332MVHIPH	95	0.80	10	0.80-0.35	0/-18	C	3	
				VE332MVHIPL	62	0.60	10	0.50-0.22	0/-18	C	3	
4	120	IS	Apollo	VE432120HIP	92	0.65	10	0.78	0/-18	C	4	
			Panther	VE432120MIP	94	0.65	150	1.43	0/-18	C	4	X
	120-277	IS	Elite	VE432MVHIP	94	0.65	10	0.79-0.34	0/-18	C	4	
				VE432MVHIPH	124	0.85	10	1.04-0.45	0/-18	B	4	

Electronic Ballasts

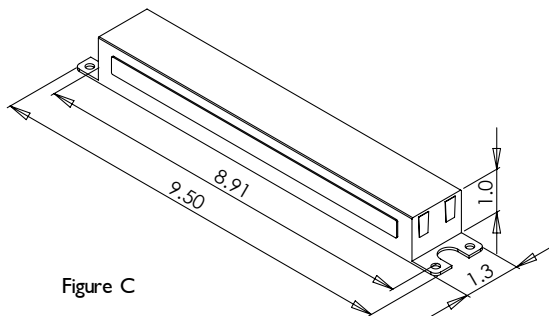


Figure C

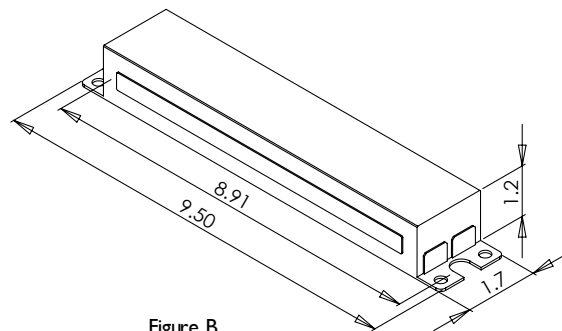
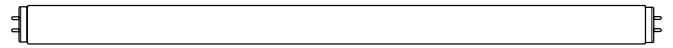


Figure B

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC BALLASTS

For 55W - 75W T12 Lamps



## T12 Slimline

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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### F72T12 - 55W

1	120	IS	Apollo	<b>VE275120HIP</b>	64	1.02	10	0.54	0/-18	B	46
	120/277	IS	Elite	<b>VE275MVHIP</b>	64-63	1.02	10	0.54-0.23	0/-18	B	46
2	120	IS	Apollo	<b>VE275120HIP</b>	106	0.90	10	0.85	0/-18	B	6
	120/277	IS	Elite	<b>VE275MVHIP</b>	106-104	0.90	10	0.85-0.37	0/-18	B	6

### F96T12/ES - 60W

1	120	IS	Apollo	<b>VE275120HIP</b>	64	1.00	10	0.54	50/10	B	46
	120-277	IS	Elite	<b>VE275MVHIP</b>	64	1.00	10	0.54-0.23	50/10	B	46
2	120	IS	Apollo	<b>VE275120HIP</b>	105	0.88	10	0.88	50/10	B	6
	120-277	IS	Elite	<b>VE275MVHIP</b>	105-104	0.88	10	0.88-0.38	50/10	B	6

### F96T12 - 75W

1	120	IS	Apollo	<b>VE275120HIP</b>	82	1.02	10	0.68	0/-18	B	46
	120-277	IS	Elite	<b>VE275MVHIP</b>	82-81	1.02	10	0.68-0.29	0/-18	B	46
2	120	IS	Apollo	<b>VE275120HIP</b>	135	0.88	10	1.13	0/-18	B	6
	120-277	IS	Elite	<b>VE275MVHIP</b>	135-133	0.88	10	1.13-0.49	0/-18	B	6

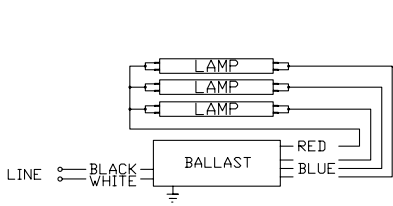


Diagram 3

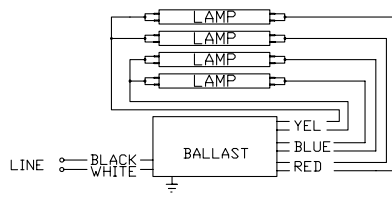


Diagram 4

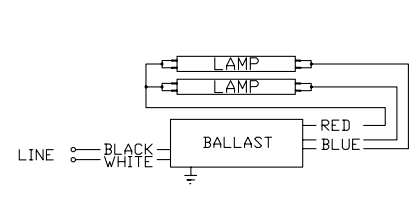


Diagram 2

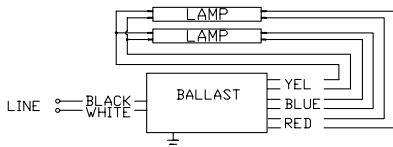


Diagram 8

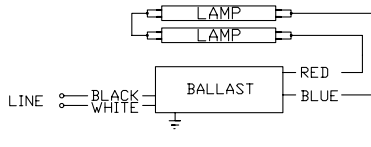


Diagram 41

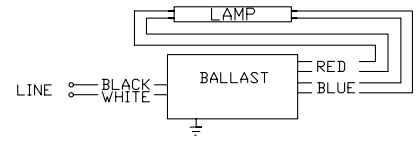


Diagram 36

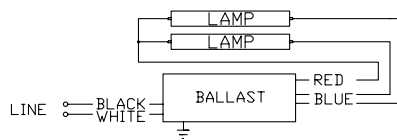


Diagram 6

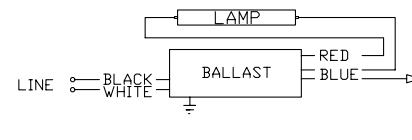


Diagram 46

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# T12/HO

# ELECTRONIC BALLASTS

For 40W T12 Lamps

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
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## F48T12/HO - 60W

1	120	RS	Apollo	VE2110120HRP	59	1.15	30	0.52	-20	A, D	37
2	120	RS	Apollo	VE2110120HRP	104	1.12	30	0.88	-20	A, D	8

## F60T12/HO - 75W

1	120	RS	Apollo	VE2110120HRP	69	1.05	30	0.59	-20	A, D	37
2	120	RS	Apollo	VE2110120HRP	124	1.00	30	1.05	-20	A, D	8

## F72T12/HO - 85W

1	120	RS	Apollo	VE2110120HRP	84	1.10	30	0.73	-20	A, D	37
2	120	RS	Apollo	VE2110120HRP	148	0.91	30	1.25	-20	A, D	8

## F96T12/HO/ES - 95W

1	120	RS	Apollo	VE2110120HRP	95	1.05	30	0.80	60	A, D	37
2	120	RS	Apollo	VE2110120HRP	170	0.89	20	1.44	60	A, D	8

## F96T12/HO - 110W

1	120	RS	Apollo	VE2110120HRP	109	0.90	30	0.92	-20	A, D	37
	120-277	IS	Elite	VE1110MVHIP	95-93	0.88	10	0.79-0.34	-20	C	1
2	120	RS	Apollo	VE2110120HRP	195	0.89	20	1.65	-20	A, D	8

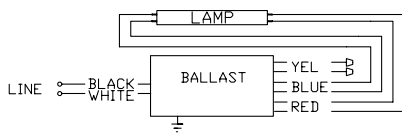


Diagram 37

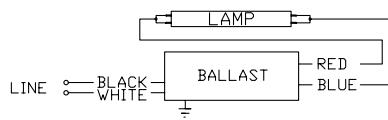


Diagram I

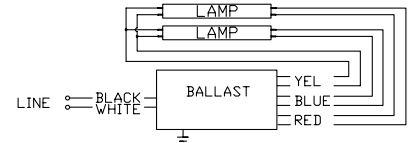


Diagram 8

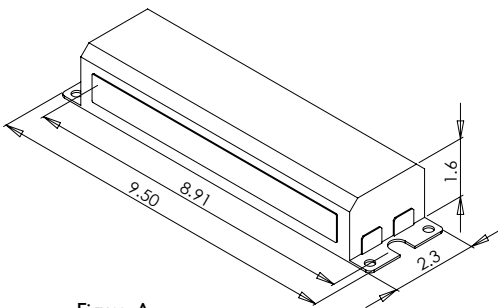


Figure A

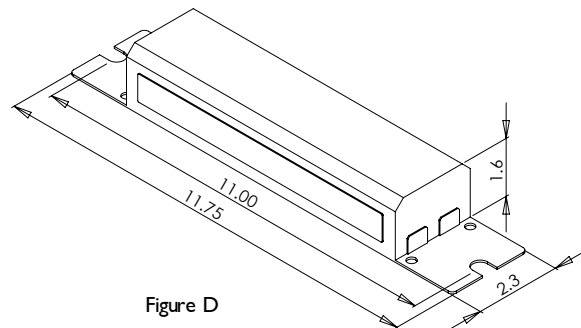
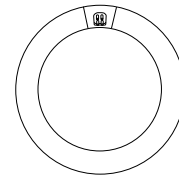


Figure D

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# ELECTRONIC BALLASTS

For 22W - 40W T9 Circular Lamps

## T9 Circular

Electronic Ballasts

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
--------------	-------------	--------------------	----------------	-----------	-------------	----------------	------------	---------------------	---------------------------	------	-------------	--------------------

### FC8T9 - 22W

1	120	RS	Stratus	<b>VEC22120MR</b>	20	0.88	150	0.31	0/-18	I	47	X •
		IS	Panther	<b>VE232120MIP</b>	20	0.90	165	0.29	0/-18	C	52	X
				<b>VE232120MIP(S)</b>	20	0.90	165	0.29	0/-18	M	54	X
2	120	IS	Panther	<b>VE232120MIP</b>	31	0.70	165	0.43	0/-18	C	51	X
				<b>VE232120MIP(S)</b>	31	0.70	165	0.43	0/-18	M	53	X
		RS	Stratus	<b>VEC54120MR</b>	44	0.90	135	0.73	0/-18	J	48	X •

### FC12T9 - 32W

1	120	RS	Stratus	<b>VEC32120MR</b>	31	1.00	150	0.50	0/-18	I	47	X •
		IS	Panther	<b>VE232120MIP</b>	28	0.90	165	0.39	0/-18	C	52	X
				<b>VE232120MIP(S)</b>	28	0.90	165	0.39	0/-18	M	54	X
2	120	IS	Panther	<b>VE232120MIP</b>	43	0.70	165	0.61	0/-18	C	51	X
				<b>VE232120MIP(S)</b>	43	0.70	165	0.61	0/-18	M	53	X
		RS	Stratus	<b>VEC72120MR</b>	60	0.90	135	0.80	0/-18	J	48	X •

### FC16T9 - 40W

1	120	RS	Stratus	<b>VEC40120MR</b>	39	1.00	135	0.58	0/-18	I	47	X •
---	-----	----	---------	-------------------	----	------	-----	------	-------	---	----	-----

### (I) FC8T9 - 22W & (I) FC12T9 - 32W

2	120	IS	Panther	<b>VE232120MIP</b>	37	0.70	165	0.52	0/-18	C	51	X
				<b>VE232120MIP(S)</b>	37	0.70	165	0.52	0/-18	M	53	X
		RS	Stratus	<b>VEC54120MR</b>	54	0.90	135	0.80	0/-18	J	48	X •

### (I) FC12T9 - 32W & (I) FC16T9 - 40W

1	120	RS	Stratus	<b>VEC40120MR</b>	38	1.00	135	0.58	0/-18	I	48	X •
2	120	RS	Stratus	<b>VEC72120MR</b>	68	0.90	135	0.73	0/-18	J	47	X •

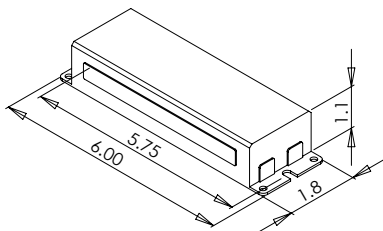


Figure J

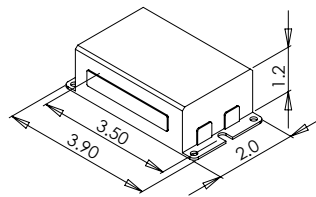


Figure I

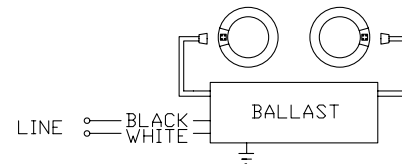


Diagram 48

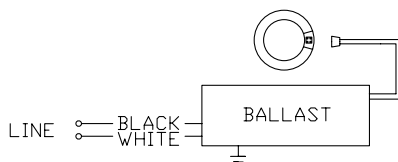


Diagram 47

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



## Symbols and Notes

- X** - Normal Power Factor
- ▲** - CEE HPT8/NEMA Premium
- - ENERGY STAR Platform Approved
- §** - Energy Efficiency Verification (Canada)

Refer to pages A-2 thru A-10 for wiring diagram index

Refer to pages B-2 thru B-7 for complete case dimensions index



Taking Energy Efficiency  
to a New Level



# Explore the Advantages of High Efficiency Dimming

Versatile, High Performance Ballasts

## T8 DIMMING

PAGE 3-3

- Reduced Energy Consumption
- Integrate with occupancy sensor for a smarter system
- Enhanced comfort and flexibility with continuous dimming
- Delivers up to 70% energy savings over standard fixed output T8 ballast
- Programmed Start provides extended lamp life for frequent starting

## CFL DIMMING

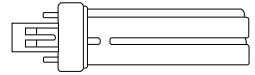
PAGE 3-2

- Meets Energy Star Platform Requirements
- Utilizes any incandescent dimmer for simplicity
- Available for 4-pin CFL Lamps
- Small Housing allows flexibility in design



**ELITE**  
DIMMING BALLAST

Improving  
**Comfort and Ambiance**



## T4 Lamps

# ELECTRONIC DIMMING BALLASTS

For 26W-42W Triple Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Max/Min		Full Light Output		Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
					Input Power	Ballast Factor	Max. THD %	Line Current (Amps)				

### CFQ18W/G24q - 18W CFL Quad Lamp

1	120	PS	Apollo	<b>VE118120HRPD</b>	22/8	0.88/0.08	15	0.19	50/10	G	12	•
---	-----	----	--------	---------------------	------	-----------	----	------	-------	---	----	---

### CFQ26W/G24q - 26W CFL Quad Lamp

1	120	PS	Apollo	<b>VE126120HRPD</b>	27/9	0.90/0.07	15	0.23	50/10	G	12	•
---	-----	----	--------	---------------------	------	-----------	----	------	-------	---	----	---

Dimming Electronic Ballasts

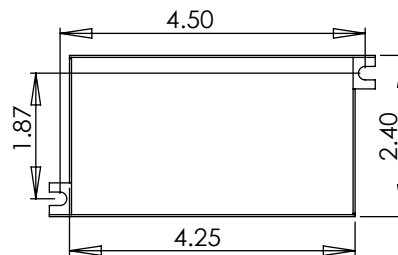
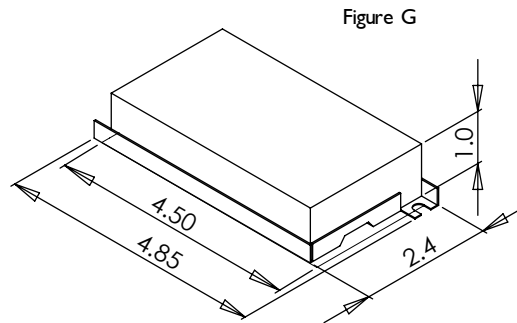
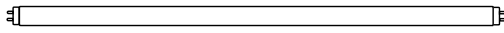


Figure G - Mounting



# T8 Linear

# ELECTRONIC DIMMING BALLASTS

For 32W T8 Lamps

No. of Lamps	Input Volts	Lamp Start Method	Ballast Family	Model No.	Max/Min		Full Light Output		Min. Start. Temp. (°F/°C)		Wiring Dia.	Symbols, Footnotes
					Input Power	Ballast Factor	Max. THD %	Line Current (Amps)	Dim.			

## F32T8 - 32W

2	120-277	PS	Elite	VE232MVHRPT3-AB	72/15	1.00/0.10	10	0.60-0.26	0/-18	B	50
				VE232MVHRPT2-SW	69/13	1.00/0.10	10	0.58-0.25	0/-18	B	55
				VE232MVHRPT2	68/14	1.00/0.10	10	0.57-0.25	0/-18	B	44
				VE232MVHRPD2	71/14	1.00/0.10	10	0.60-0.26	0/-18	B	49
3	120-277	PS	Elite	VE332MVHRPT3-AB	106/21	1.00/0.10	10	0.89-0.38	0/-18	B	57
				VE332MVHRPT2-SW	105/20	1.00/0.10	10	0.88-0.37	0/-18	B	58
				VE332MVHRPT2	105/20	1.00/0.10	10	0.88-0.37	0/-18	B	56
				VE332MVHRPD2	105/20	1.00/0.10	10	0.88-0.37	0/-18	B	56

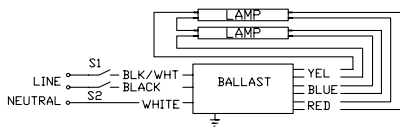


Diagram 50

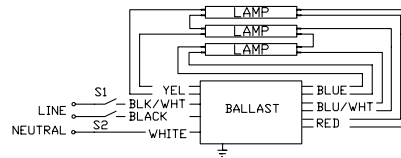


Diagram 57

Position	Output Power
0	0%
S1	20%
S2	50%
S1 S2	100%

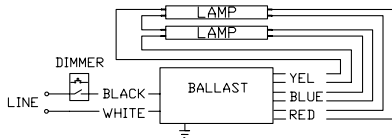


Diagram 55

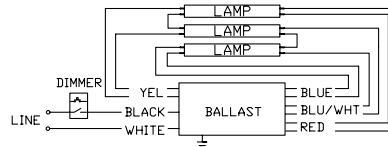


Diagram 58

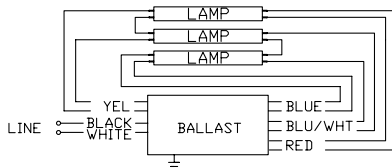


Diagram 44

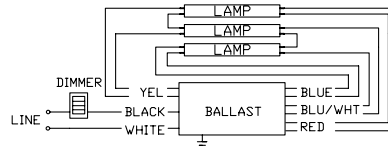


Diagram 56

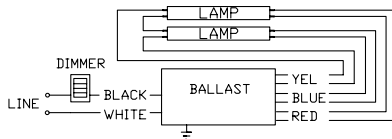


Diagram 49

Low Frequency

# Electronic HID Ballasts

For Metal Halide and High Pressure Sodium Lamps

<b>4-2 to 4-3</b>	<b>For Metal Halide</b>
4-2	20W through 70W
4-3	70W through 175W
4-4 to 4-5	Case Dimensions



UPGRADE TO ELECTRONIC HID SYSTEMS, EXPERIENCE:  
Higher Efficiency,  
Longer Lamp Life, and Enhanced Color

# ELECTRONIC HID BALLASTS

For 20W - 70W Lamps

## Metal Halide and High Pressure Sodium

No. of Lamps	Lamp Wattage	Input Volts	Model No.	Line Current (Amps)	Input Power	Max. Case Temp.	Wiring Dia.	Dim.	Max. Distance to Lamps (Ft.)	Symbols, Footnotes
--------------	--------------	-------------	-----------	---------------------	-------------	-----------------	-------------	------	------------------------------	--------------------

### 20 Watt Lamp, ANSI Code MI 75

1	20	120	MH120MV-BLS	0.21	24	80	67	AC	6	
		277		0.10	24	80	67	AC	6	
1	20	120	MH120MV-LF	0.21	24	80	67	AD	6	
		277		0.10	24	80	67	AD	6	
1	20	120	MH120MV-LFS	0.21	24	80	67	AD	6	
		277		0.10	24	80	67	AD	6	

### 39 Watt Lamp, ANSI Code MI 30

1	39	120	MH139MV-BLS	0.37	44	80	67	AC	5	
		277		0.17	44	80	67	AC	5	
1	39	120	MH139MV-LF	0.37	44	80	67	AD	5	
		277		0.17	44	80	67	AD	5	
1	39	120	MH139MV-LFS	0.37	44	80	67	AD	6	
		277		0.17	44	80	67	AD	6	

### 50 Watt Lamp, ANSI Code MI 10

1	50	120	MH150MV-BLS	0.49	58	80	67	AC	5	
		277		0.21	58	80	67	AC	5	
1	50	120	MH150MV-LF	0.49	58	80	67	AD	5	
		277		0.21	58	80	67	AD	5	
1	50	120	MH150MV-LFS	0.49	58	80	67	AD	5	
		277		0.21	58	80	67	AD	5	

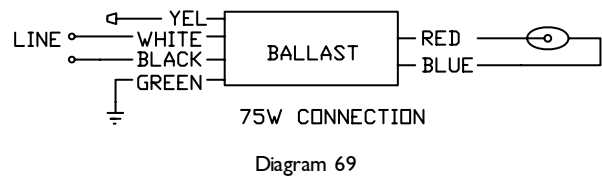
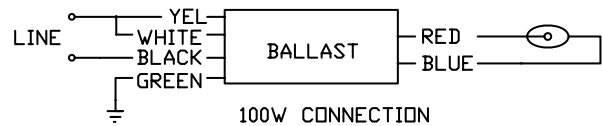
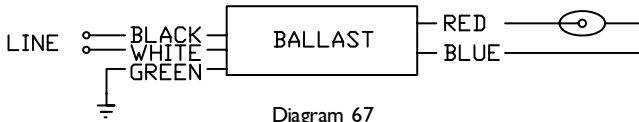
### 70 Watt Lamp, ANSI Code M98 or MI 43 or MI 39

1	70	120	MH1100AMV-BLS	0.67	78	80	70	AC	5	
		277		0.29	78	80	70	AC	5	
1	70	120	MH1100AMV-LF	0.67	78	80	69	AD	5	
		277		0.29	78	80	69	AD	5	
1	70	120	MH1100AMV-LFS	0.67	78	80	69	AD	5	
		277		0.29	78	80	69	AD	5	

See 4-4 to 4-5 for case dimensions

#### Ordering Information:

- BLS - Bottom exit leads with mounting studs
- LF - Side exit leads with mounting feet
- LFS - Side exit leads from same end with mounting feet



Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC HID BALLASTS

For 70W - 150W Lamps

## Metal Halide and High Pressure Sodium

No. of Lamps	Lamp Wattage	Input Volts	Model No.	Line Current (Amps)	Input Power	Max. Case Temp.	Wiring Dia.	Dim.	Max. Distance to Lamps (Ft.)	Symbols, Footnotes
--------------	--------------	-------------	-----------	---------------------	-------------	-----------------	-------------	------	------------------------------	--------------------

### 70 Watt Lamp, ANSI Code M98 or MI43 or MI39

1	70	120	MH170MV-BLS	0.67	78	80	67	AC	5	
		277		0.29	78	80	67	AC	5	
1	70	120	MH170MV-LF	0.67	78	80	67	AD	5	
		277		0.29	78	80	67	AD	5	
1	70	120	MH170MV-LFS	0.67	78	80	67	AD	5	
		277		0.29	78	80	67	AD	5	

### 100 Watt Lamp, ANSI Code M90 or MI40

1	100	120	MH1100AMV-BLS	0.94	111	80	70	AC	5	
		277		0.42	111	80	70	AC	5	
1	100	120	MH1100AMV-LF	0.94	111	80	69	AD	5	
		277		0.42	111	80	69	AD	5	
1	100	120	MH1100AMV-LFS	0.94	111	80	69	AD	5	
		277		0.42	111	80	69	AD	5	
1	100	120	MH1100MV-BLS	0.94	111	80	67	AC	5	
		277		0.42	111	80	67	AC	5	
1	100	120	MH1100MV-LF	0.94	111	80	67	AD	5	
		277		0.42	111	80	67	AD	5	
1	100	120	MH1100MV-LFS	0.94	111	80	67	AD	5	
		277		0.42	111	80	67	AD	5	

### 150 Watt Lamp, ANSI Code MI02 or MI42

1	150	120	MH1150MV-BLS	1.40	167	80	67	AB	5	
		277		0.61	167	80	67	AB	5	
1	150	120	MH1150MV-LF	1.40	167	80	67	AF	5	
		277		0.61	167	80	67	AF	5	
1	150	120	MH1150MV-LFS	1.40	167	80	67	AF	5	
		277		0.61	167	80	67	AF	5	

### 175 Watt Lamp, ANSI Code MI37 or MI52

1	175	120	MH1175MV-BLS	1.63	195	80	67	AB	5	
		277		0.71	195	80	67	AB	5	
1	175	120	MH1175MV-LF	1.63	195	80	67	AF	5	
		277		0.71	195	80	67	AF	5	
1	175	120	MH1175MV-LFS	1.63	195	80	67	AF	5	
		277		0.71	195	80	67	AF	5	

See 4-4 to 4-5 for case dimensions

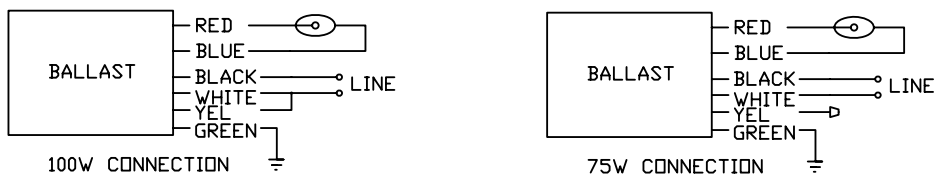


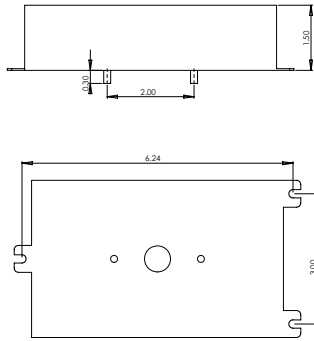
Diagram 70

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# ELECTRONIC HID BALLASTS

## Case Dimensions

FIGURE AB



Case Figure	Case Length	Case Width	Case Height	Mounting Length	Mounting Width
AB	5.80"	3.62"	1.50"	6.24"	3.00"

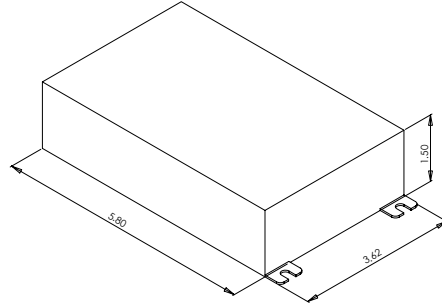
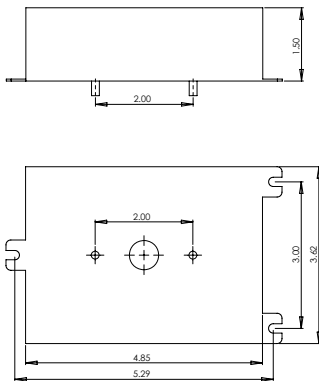


FIGURE AC



Case Figure	Case Length	Case Width	Case Height	Mounting Length	Mounting Width
AC	4.85"	3.62"	1.50"	5.29"	3.00"

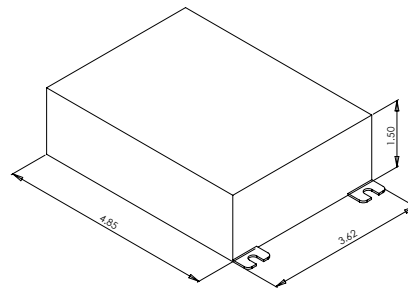
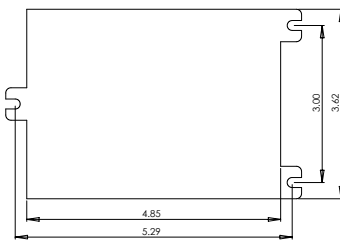
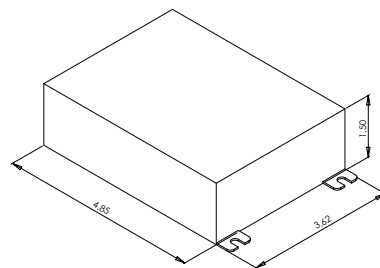


FIGURE AD



Case Figure	Case Length	Case Width	Case Height	Mounting Length	Mounting Width
AD	4.85"	3.62"	1.50"	5.29"	3.00"

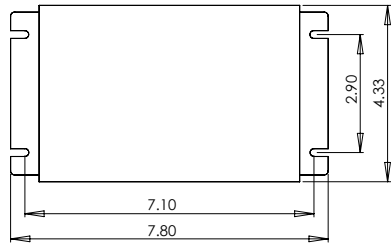




# ELECTRONIC HID BALLASTS

## Case Dimensions

FIGURE AE



Case Figure	Case Length	Case Width	Height	Mounting Length	Mounting Width	Overall Length
AE	6.40"	4.33"	2.67"	7.10"	2.90"	7.80"

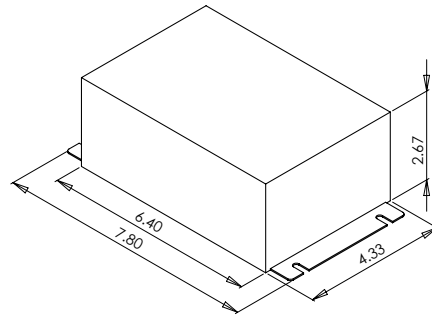
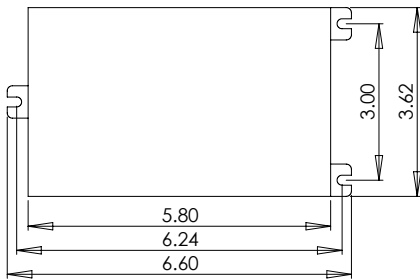
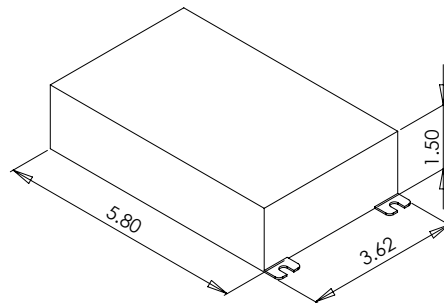


FIGURE AF



Case Figure	Case Length	Case Width	Height	Mounting Length	Mounting Width	Overall Length
AF	5.80"	3.62"	1.50"	6.24"	3.00"	6.60"



# ORDERING INFORMATION

## Espen Magnetic HID Ballast Part Number Guide

**VM MH 400 5T 001D PS**

### Lamp Starting Method

PS = Pulse Start

### Suffix Code

001DB = ballast replacement kit with  
dry capacitor and integral ignitor  
001D = ballast replacement kit with dry film capacitor  
001 = ballast replacement kit with oil filled capacitor

### Input Voltage

120 = 120V  
277 = 277V  
480 = 480V  
MV = 120V/277V  
3T = 120V/240V/277V  
3CT = 120V/277V/347V  
4T = 120V/208V/240V/277V  
4CT = 120V/240V/277V/247V  
5T = 120V/208V/240V/277V/480V

### Lamp Wattage

### Lamp Type

MH = Metal Halide  
HPS = High Pressure Sodium

### Espen Magnetic HID Prefix



High Intensity Discharge Core & Coil Ballast

# Magnetic HID Kits

For Metal Halide and High Pressure Sodium Lamps

5-2 to 5-5

For Metal Halide

5-6 to 5-8

For High Pressure Sodium

5-9

Additional Information

Versatile input voltage options  
offers convenient solutions for replacements

# HIGH INTENSITY DISCHARGE BALLASTS

## Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -20°F or -30°C)

## Metal Halide

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 50 Watt Metal Halide Lamp, ANSI Code MI 10 or MI 48

277	<b>VM-MH50-277</b>	R-NPF	62	0.57	277	2	Q1	M1	1.1	2.2	2	-	A
	<b>VM-MH50-277-001D</b>	R-HPF	62	0.20	277	2	Q1	M1	1.1	2.2	2	D	A
120/277	<b>VM-MH50-MV-001D</b>	HX-HPF	72	0.92/0.42	285	3/2	Q2	M2	1.0	2.1	5	D	A/A
120/ 277/347	<b>VM-MH50-3CT-001D</b>	HX-HPF	72	0.92/	285	3/	Q2	M2	1.0	2.1	5	D	A/
				0.42/0.34	285	2/2	Q2	M2	1.0	2.1	5	D	A/A

### 70 Watt Metal Halide Lamp, ANSI Code M98 (Medium Base) or MI 43

277	<b>VM-MH70-277-001D</b>	R-NPF	85	0.84	277	3	Q1	M1	1.5	2.9	10	-	A
		R-HPF	85	0.29	277	2	Q1	M1	1.5	2.9	10	D	A
120/208/ 240/277	<b>VM-MH70-4T-001D</b>	HX-HPF	90	0.83/0.49/	280	4/3/	Q2	M2	1.4	2.8	15	D	A/A
				0.42/0.38	280	2/2	Q2	M2	1.4	2.8	15	D	A/A
120/ 277/347	<b>VM-MH70-3CT-001D</b>	HX-HPF	90	0.83/	280	4/	Q2	M2	1.5	2.8	15	D	A/
				0.38/0.30	280	2/2	Q2	M2	1.5	2.8	15	D	A/A

### 100 Watt Metal Halide Lamp, ANSI Code M90 or MI 40

277	<b>VM-MH100-277-001D</b>	R-NPF	118	0.84	277	3	Q1	M1	1.6	2.9	10	-	A
		R-HPF	118	0.29	277	2	Q1	M1	1.6	2.9	10	D	A
120/208/ 240/277	<b>VM-MH100-4T-001D</b>	HX-HPF	129	1.10/0.65/	300	6/4/	Q2	M2	1.5	2.8	20	D	A/A
				0.58/0.48	300	3/3	Q2	M2	1.5	2.8	20	D	A/A
120/ 277/347	<b>VM-MH100-3CT-001D</b>	HX-HPF	129	1.10/	300	6/	Q2	M2	1.6	2.8	20	D	A/
				0.48/0.38	300	3/2	Q2	M2	1.6	2.8	20	D	A/A

HID Ballast

#### Ordering Information:

- 001DB = ballast replacement kit with dry capacitor and integral ignitor
- 001D = ballast replacement kit with dry film capacitor
- 001 = ballast replacement kit with oil filled capacitor

See 4-4 to 4-5 for case dimensions

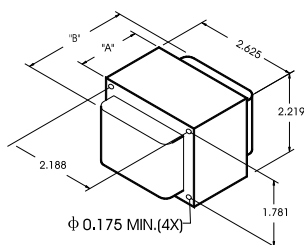


Fig. M1

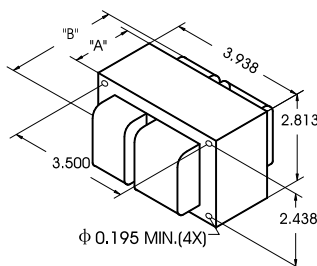
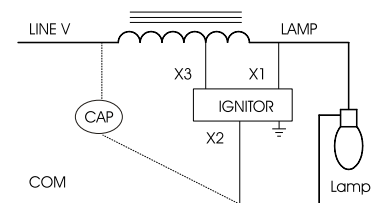
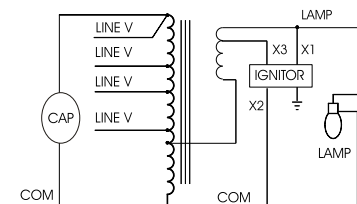


Fig. M2



Diag. Q1



Diag. Q2

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

## Metal Halide

### Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -20°F or -30°C)

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 150 Watt Metal Halide Lamp, ANSI Code MI02 or MI42

277	VM-MH150-277-001D	R-NPF	173	1.81	277	4	Q1	M1	2.5	3.8	15	-	A
		R-HPF	173	0.64	277	4	Q1	M1	2.5	3.8	15	D	A
120/208/240/277	VM-MH150-4T-001D	HX-HPF	185	1.60/1.00/	290	10/5	Q2	M2	2.3	3.9	10	D	A/A/
				0.80/0.70	290	5/4	Q2	M2	2.3	3.9	10	D	A/B
120/277/347	VM-MH150-3CT-001D	HX-HPF	185	1.60/	290	6/	Q2	M2	2.3	3.9	10	D	A/
				0.70/0.50	290	3/3	Q2	M2	2.3	3.9	10	D	A/B

### 175 Watt Metal Halide Lamp, ANSI Code M57 or H39

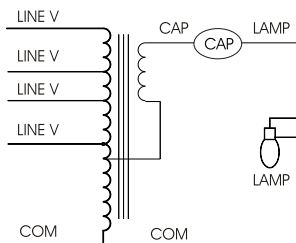
120/208/240/277	VM-MH175-4T-001D	CWA	210	1.90/1.10/	335	5/3/	Q4	M2	2.4	4.1	-	D	A/A/
				0.95/0.80	335	3/2	Q4	M2	2.4	4.1	-	D	A/A
120/240/277/347	VM-MH175-4CT-001D	CWA	210	1.80/1.10	335	5/3/	Q4	M2	2.4	3.7	-	D	A/A/
				0.80/0.70	335	2/2	Q4	M2	2.4	3.7	-	D	A/A
120/208/240/277/480	VM-MH175-5T-001D	CWA	210	1.90/1.10/	335	5/3/	Q4	M2	2.4	3.7	-	D	A/A/
				0.95/0.80	335	3/2/	Q4	M2	2.4	3.7	-	D	A/A/
				0.45	335	2	Q4	M2	2.4	3.7	-	D	A

### 250 Watt Metal Halide Lamp, ANSI Code M58 or H37

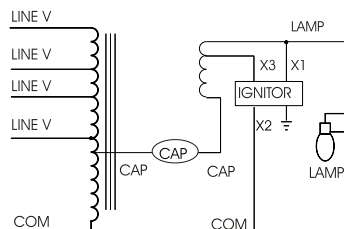
120/208/240/277	VM-MH250-4T-001D	CWA	295	2.70/1.60/	340	8/5/	Q4	M3	1.5	3.2	-	D	B/C/
				1.30/1.20	340	5/3	Q4	M3	1.5	3.2	-	D	B/B
120/240/277/347	VM-MH250-4CT-001D	CWA	295	2.50/1.30	345	8/5/	Q4	M3	1.7	3.1	-	D	A/A/
				1.10/0.90	345	3/3	Q4	M3	1.7	3.1	-	D	A/A
120/208/240/277/480	VM-MH250-5T-001D	CWA	290	2.70/1.60/	345	8/5/	Q4	M3	1.7	3.2	-	D	A/A/
				1.30/1.20	345	5/3/	Q4	M3	1.7	3.2	-	D	A/A/
				0.60	345	2	Q4	M3	1.7	3.2	-	D	A

### 250 Watt Metal Halide Lamp, ANSI Code MI38 or MI53 (Pulse Start)

120/208/240/277	VM-MH250-4T-001D-PS	CWA	291	2.50/1.40/	330	8/5/	Q3	M3	1.5	3.1	-	D	A/A/
				1.30/1.10	330	5/3	Q3	M3	1.5	3.1	-	D	A/A



Diag. Q4



Diag. Q3

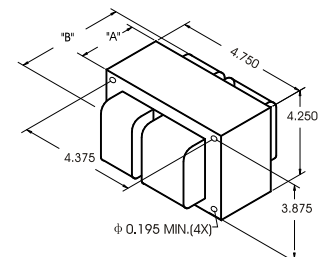


Fig. M3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

## Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -20°F or -30°C)

## Metal Halide

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 320 Watt Metal Halide Lamp, ANSI Code M138 or M153 (Pulse Start)

120/208/240/277	<b>VM-MH320-4T-001D-PS</b>	CWA	368	3.25/1.90/1.60/1.40	290	8/6/5/3	Q3	M3	1.7	3.7	2	D	C/B/B
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### 350 Watt Metal Halide Lamp, ANSI Code M131 (Pulse Start)

120/208/240/277	<b>VM-MH350-4T-001D-PS</b>	CWA	390	3.40/2.00/1.70/1.50	300	10/7/5/3	Q3	M3	1.8	3.7	2	D	D/A/A
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### 400 Watt Metal Halide Lamp, ANSI Code M59 or H33

120/208/240/277	<b>VM-MH400-4T-001D</b>	CWA	458	4.20/2.40/2.10/1.80	330	10/7/5/5	Q4	M3	2	4	-	D	A/B/A/B
120/240/277/347	<b>VM-MH400-4CT-001D</b>	CWA	460	4.00/2.00/1.70/1.40	330	10/7/5/4	Q4	M3	2.2	4.1	-	D	A/A/A/A
480	<b>VM-MH400-480-001D</b>	CWA	462	1.00	330	3	Q4	M3	2.2	4.1	-	D	B
120/208/240/277/480	<b>VM-MH400-5T-001D</b>	CWA	460	4.20/2.40/2.10/1.80/1.10	330	10/7/5/5/3	Q4	M3	2.2	4.1	-	D	A/A/A/A

### 400 Watt Metal Halide Lamp, ANSI Code M135 or M155 (Pulse Start)

120/208/240/277	<b>VM-MH400-4T-001-PS</b>	CWA	452	3.80/2.20/1.90/1.70	290	10/7/5/5	Q3	M3	1.8	3.7	10	O	B/B/C/C
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#### Ordering Information:

- 001DB = ballast replacement kit with dry capacitor and integral ignitor
- 001D = ballast replacement kit with dry film capacitor
- 001 = ballast replacement kit with oil filled capacitor

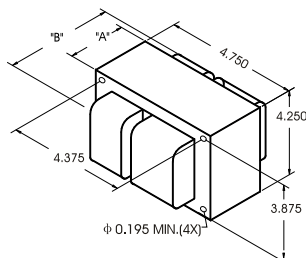


Fig. M3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

## Metal Halide

### Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -20°F or -30°C)

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 1000 Watt Metal Halide Lamp, ANSI Code M47 or H36

120/208/240/277	VM-MH1000-4T-001	CWA	1080	9.00/5.20/	440	20/15/	Q4	M4	2.8	4.8	-	O	D/D/
				4.50/4.00	440	10/10	Q4	M4	2.8	4.8	-	O	D/D
120/240/277/347	VM-MH1000-4CT-001	CWA	1080	9.00/4.50/	440	20/10/	Q4	M4	2.8	4.5	-	O	C/C/
				3.90/3.20	440	10/8	Q4	M4	2.8	4.5	-	O	C/C
120/208/240/277/480	VM-MH1000-5T-001	CWA	1080	9.30/5.50/	460	22/15/	Q4	M4	13	4.8	-	O	C/B/
				4.70/4.20/	460	12/10/	Q4	M4	13	4.8	-	O	C/D/
				2.50	460	6	Q4	M4	13	4.8	-	O	C

### 1500 Watt Metal Halide Lamp, ANSI Code M48

120/208/240/277	VM-MH1500-4T-001	CWA	1605	13.50/7.80/	444	30/25/	Q4	M4	4.1	6.1	-	O	D/D/
				6.80/5.90	444	20/15	Q4	M4	4.1	6.1	-	O	E/E

#### Ordering Information:

- 001DB = ballast replacement kit with dry capacitor and integral ignitor
- 001D = ballast replacement kit with dry film capacitor
- 001 = ballast replacement kit with oil filled capacitor

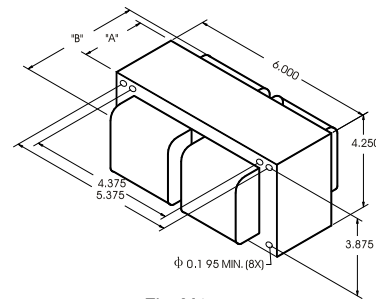
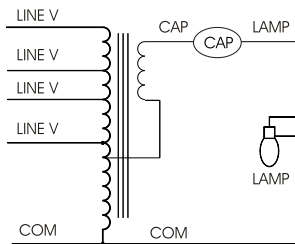
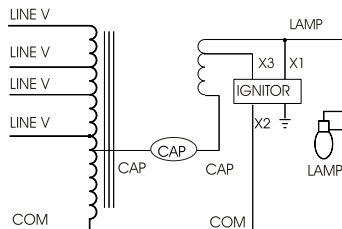


Fig. M4



Diag. Q4



Diag. Q3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

## Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -40°F or -40°C)

## High Pressure Sodium

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 35 Watt HPS Lamp, ANSI Code S76

120	VM-HPS35-120-001D	R-NPF	46	1.00	120	3	Q1	M1	0.6	1.8	2	-	A
		R-HPF	46	0.40	120	2	Q1	M1	0.6	1.8	2	D	A

### 50 Watt HPS Lamp, ANSI Code S68

120	VM-HPS50-120-001D	R-NPF	62	1.20	120	5	Q1	M1	0.8	2	2	-	A
		R-HPF	62	0.55	120	3	Q1	M1	0.8	2	2	D	A
120/277	VM-HPS50-MV-001D	HX-NPF	62	1.42/0.60	135	5/3	Q2	M2	1.0	2.2	2	D	A/A/
		HX-HPF	62	0.61/0.26	135	3/1	Q2	M2	1.0	2.2	2	D	A/A
120/ 277/347	VM-HPS50-3CT-001D	HX-HPF	66	0.61/	135	3/	Q2	M2	1.0	2.2	2	D	A/
			0.26/0.21	135	1/1	Q2	M2	1.0	2.2	2	D	A/A	

### 70 Watt HPS Lamp, ANSI Code S62

120	VM-HPS70-120-001D	R-NPF	86	1.65	120	8	Q1	M1	1.3	2.5	2	-	A
		R-HPF	86	0.70	120	3	Q1	M1	1.3	2.5	2	D	A
120/208/ 240/277	VM-HPS70-4T-001D	HX-HPF	91	0.80/0.48/	130	5/3/	Q2	M2	1.5	3.1	2	D	A/A/
			0.41/0.37	130	2/2	Q2	M2	1.5	3.1	2	D	A/A	
120/ 277/347	VM-HPS70-3CT-001D	HX-HPF	66	0.61/	130	5/	Q2	M2	1.5	3.1	2	D	A/
			0.26/0.21	130	2/2	Q2	M2	1.5	3.1	2	D	A/A	

### 100 Watt HPS Lamp, ANSI Code S54

120	VM-HPS100-120-001D	R-NPF	115	2.50	120	10	Q1	M1	1.5	2.8	2	-	A
		R-HPF	115	1.10	120	5	Q1	M1	1.5	2.8	2	D	A
120/208/ 240/277	VM-HPS100-4T-001D	HX-HPF	130	1.18/0.70/	130	7/5/	Q2	M2	2.0	3.6	2	D	B/C/
			0.60/0.50	130	3/3	Q2	M2	2.0	3.6	2	D	B/B	
120/ 277/347	VM-HPS100-3CT-001D	HX-HPF	130	1.18/	130	7/	Q2	M2	2.0	3.6	2	D	B/
			0.50/0.40	130	3/3	Q2	M2	2.0	3.6	2	D	B/B	

#### Ordering Information:

- 001DB = ballast replacement kit with dry capacitor and integral ignitor
- 001D = ballast replacement kit with dry film capacitor
- 001 = ballast replacement kit with oil filled capacitor

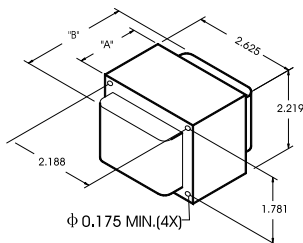


Fig. M1

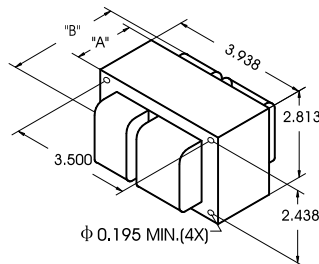


Fig. M2

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data



# High Pressure Sodium

# HIGH INTENSITY DISCHARGE BALLASTS

## Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -40°F or -40°C)

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 150 Watt HPS Lamp, ANSI Code S55 (55-Volt Arc Tube)

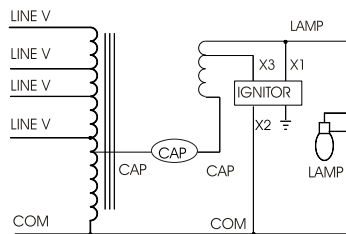
120	VM-HPS150-120-001D	R-NPF	170	2.60	120	15	Q1	M1	2.1	3.4	2	-	A
		R-HPF	170	1.40	120	8	Q1	M1	2.1	3.4	2	D	A
120/208/240/277	VM-HPS150-4T-001D	HX-HPF	188	1.60/0.95/	130	10/5/	Q2	M2	2.6	4.0	2	D	A/A/
				0.83/0.71	130	5/4	Q2	M2	2.6	4.0	2	D	A/A
120/277/347	VM-HPS150-3CT-001D	HX-HPF	188	1.60/	130	10/	Q2	M2	2.6	4.0	2	D	A/
				0.71/0.57	130	4/3	Q2	M2	2.6	4.0	2	D	A/A

### 200 Watt HPS Lamp, ANSI Code S66

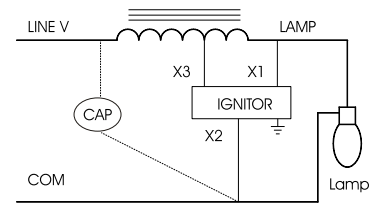
120/208/240/277	VM-HPS200-4T-001D	CWA	250	1.90/1.10/	250	6/4/	Q3	M3	1.2	3.0	2	D	C/C/
				0.95/0.85	250	3/3	Q3	M3	1.2	3.0	2	D	D/D

### 250 Watt HPS Lamp, ANSI Code S50

120/208/240/277	VM-HPS250-4T-001D	CWA	295	2.50/1.50/	220	7/4/	Q3	M3	1.8	3.6	2	D	C/D/
				1.30/1.10	220	4/3	Q3	M3	1.8	3.6	2	D	C/C
120/240/277/347	VM-HPS250-4CT-001D	CWA	295	2.70/1.30/	205	7/3/	Q3	M3	2.0	3.6	2	D	A/A/
				1.20/0.90	205	3/2	Q3	M3	2.0	3.6	2	D	A/A
120/208/240/277/480	VM-HPS250-5T-001D	CWA	300	2.50/1.50/	203	10/4/	Q3	M3	2.0	3.6	2	D	B/A/
				1.30/1.10/	203	4/3/	Q3	M3	2.0	3.6	2	D	A/A/
				0.70	203	2	Q3	M3	2.0	3.6	2	D	A



Diag. Q3



Diag. Q1

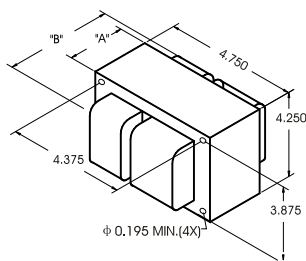
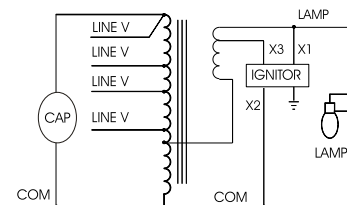


Fig. M3



Diag. Q2

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

## Core & Coil Ballasts

(60 Hz., Minimum Starting Temperature -40°F or -40°C)

## High Pressure Sodium

Input Volts	Model No.	Circuit Type	Input Watts	Max. Input Current	Nom. Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia.	Dim.			Max. Distance to Lamp (ft)	Dry or Oil	UL Bench Top Rise Code 1029
								Fig.	A	B			

### 400 Watt HPS Lamp, ANSI Code S5I

120/208/240/277	VM-HPS400-4T-001D	CWA	464	4.00/2.40/	240	10/8/	Q3	M3	2.3	4.4	2	D	D/D/
				2.10/1.70	240	5/5	Q3	M3	2.3	4.4	2	D	D/D
120/240/277/347	VM-HPS400-4CT-001D	CWA	464	3.80/1.90/	210	10/5/	Q3	M3	2.3	4.0	2	D	E/E/
				1.70/1.30	210	5/5	Q3	M3	2.3	4.0	2	D	E/E
480	VM-HPS400-480-001D	CWA	464	1.00	210	3	Q3	M3	3.0	2.6	2	D	F
120/208/240/277/480	VM-HPS400-5T-001D	CWA	465	4.00/2.40/	220	10/6/	Q3	M3	2.3	4.4	2	D	C/C/
				2.10/1.70/	220	5/5/	Q3	M3	2.3	4.4	2	D	C/D/
				1.10	220	3	Q3	M3	2.3	4.4	2	D	D

### 600 Watt HPS Lamp, ANSI Code S106

120/208/240/277	VM-HPS600-4T-001D	CWA	670	5.50/3.25/	220	15/9/	Q3	M4	3.2	5.4	2	D	D/D/
				2.85/2.30	220	8/8	Q3	M4	3.2	5.4	2	D	D/D

### 1000 Watt HPS Lamp, ANSI Code S52

120/208/240/277	VM-HPS1000-4T-001	CWA	1100	9.00/5.20/	440	25/15/	Q3	M4	3.7	5.9	-	O	D/D/
				4.50/4.00	440	10/10	Q3	M4	3.7	5.9	-	O	B/B
120/240/277/347	VM-HPS1000-4CT-001	CWA	1100	9.50/4.80/	485	25/10/	Q3	M4	3.9	6.0	-	O	E/E/
				4.20/3.30	485	15/10	Q3	M4	3.9	6.0	-	O	E/D
120/208/240/277/480	VM-HPS1000-5T-001	CWA	1100	9.50/5.30/	470	25/15/	Q3	M4	4.0	6.0	-	O	E/D/
				4.80/4.30/	470	12/10/	Q3	M4	4.0	6.0	-	O	D/E/
				2.50	470	6	Q3	M4	4.0	6.0	-	O	E

#### Ordering Information:

- 001DB = ballast replacement kit with dry capacitor and integral ignitor
- 001D = ballast replacement kit with dry film capacitor
- 001 = ballast replacement kit with oil filled capacitor

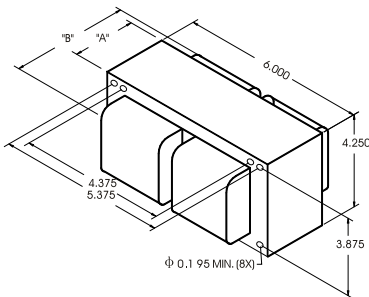


Fig. M4

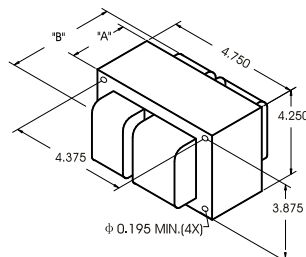
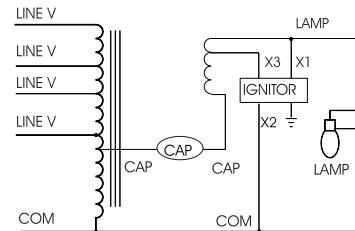


Fig. M3



Diag. Q3

Refer to pages A-2 through B-7 for case dimensions and wiring diagram data

# HIGH INTENSITY DISCHARGE BALLASTS

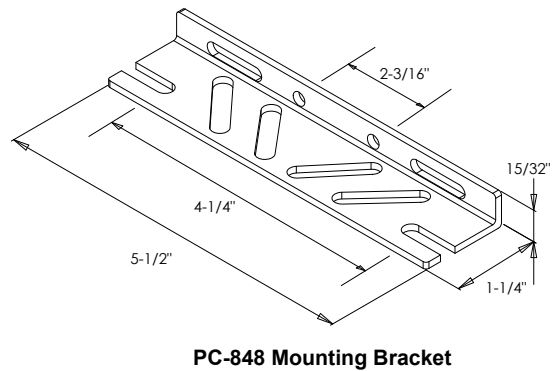
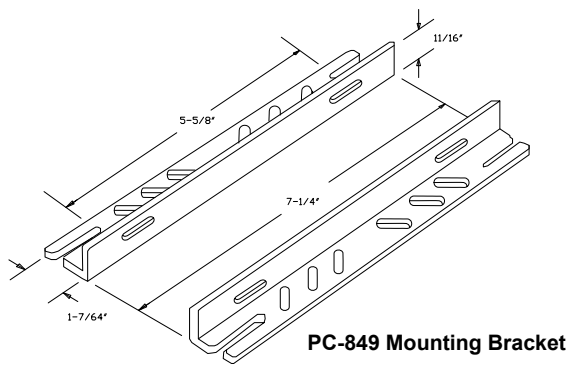
## ADDITIONAL INFORMATION

### UL Bench Top Rise Temperature Code

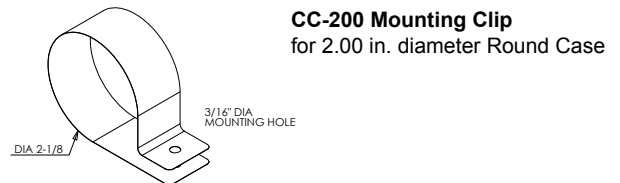
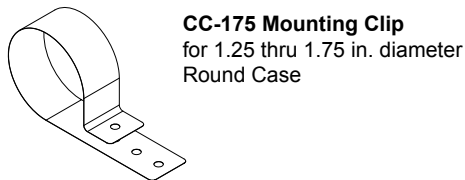
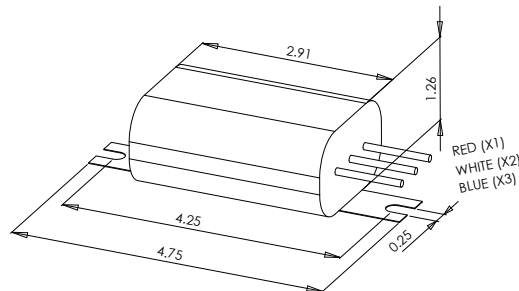
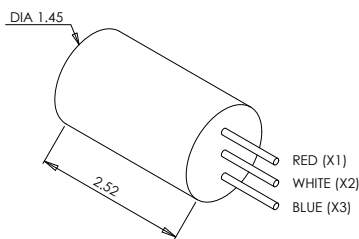
UL Bench Top Rise Letter Code	Temperature Range for Class H (180°C) Ballasts	Temperature Range for Class N (200°C) Ballasts
A	less than 75°C	less than 95°C
B	75°C < 80°C	95°C < 100°C
C	80°C < 85°C	100°C < 105°C
D	85°C < 90°C	105°C < 110°C
E	90°C < 95°C	110°C < 115°C
F	95°C < 100°C	115°C < 120°C
etc.	etc.	etc.

### Core & Coil Mounting Brackets

Included with Replacement Kits



### Ignitors





ENERGY EFFICIENT

# Fluorescent Lamps

Superior performance and lamp life

**6-2 to 6-4**

**T5 Lamps**

6-2

T5/HO Linear

6-2

T5/HO/ES Energy Edge (Reduced Wattage)

6-3

T5 Linear

6-4

T5 Circular

**6-5 to 6-6**

**Linear Fluorescent Lamps**

6-5

T8/HE (800 Series High Lumen)

6-5

T8 U-Bent

6-6

T8/ES Energy Edge (Reduced Wattage)

**6-7**

**T9 Circular**

# FLUORESCENT LAMPS

## High Output T5 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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### ELITE™ LONG LIFE T5 HIGH OUTPUT (HO) LAMPS



#### T5 Miniature Bipin

24	T5/HO	G5	F24T5HO/835	22	3500	85	24000	2000	1850
			F24T5HO/841	22	4100	85	24000	2000	1850
			F24T5HO/850	22	5000	82	24000	2000	1850
39	T5/HO	G5	F39T5HO/835	34	3500	85	24000	3500	3260
			F39T5HO/841	34	4100	85	24000	3500	3260
			F39T5HO/850	34	5000	82	24000	3500	3260
54	T5/HO	G5	F54T5HO/835	46	3500	85	24000	5000	4680
			F54T5HO/841	46	4100	85	24000	5000	4680
			F54T5HO/850	46	5000	82	24000	5000	4680
80	T5/HO	G5	F80T5HO/835	58	3500	85	24000	7000	6550
			F80T5HO/841	58	4100	85	24000	7000	6550
			F80T5HO/850	58	5000	82	24000	7000	6550

### ENERGY EDGE™ REDUCED WATTAGE T5 HIGH OUTPUT (HO) LAMPS

#### T5 Miniature Bipin

49	T5/HO	G5	F54T5HO/835/ES 49W	46	3500	85	24000	4900	4655
			F54T5HO/841/ES 49W	46	4100	85	24000	4900	4655
			F54T5HO/850/ES 49W	46	5000	82	24000	4800	4560

### High Output T5

Superior Life and Performance



# FLUORESCENT LAMPS

## T5 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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### APOLLO™ T5 LAMPS



#### T5 Miniature Bipin

14	T5	G5	F14T5/827	22	2700	85	20000	1350	1200
			F14T5/835	22	3500	85	20000	1350	1200
			F14T5/841	22	4100	85	20000	1350	1200
			F14T5/850	22	5000	82	20000	1350	1200
21	T5	G5	F21T5/827	34	2700	85	20000	2100	1950
			F21T5/835	34	3500	85	20000	2100	1950
			F21T5/841	34	4100	85	20000	2100	1950
			F21T5/850	34	5000	82	20000	2100	1950
28	T5	G5	F28T5/827	46	2700	85	20000	2900	2700
			F28T5/835	46	3500	85	20000	2900	2700
			F28T5/841	46	4100	85	20000	2900	2700
			F28T5/850	46	5000	82	20000	2900	2700
35	T5	G5	F35T5/827	58	2700	85	20000	3650	3400
			F35T5/835	58	3500	85	20000	3650	3400
			F35T5/841	58	4100	85	20000	3650	3400
			F35T5/850	58	5000	82	20000	3650	3400



# FLUORESCENT LAMPS

## T5 Circular Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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### STRATUS™ T5 4-PIN CIRCULAR FLUORESCENT



#### T5 4-Pin Circular Fluorescent Lamp

22	T5	G10q	FC22T5/827/G10q	7 OD	2700	82	10000	1750	1530
			FC22T5/835/G10q	7 OD	3500	82	10000	1750	1530
			FC22T5/841/G10q	7 OD	4100	82	10000	1750	1530
			FC22T5/850/G10q	7 OD	5000	82	10000	1750	1530
40	T5	G10q	FC40T5/827/G10q	11 OD	2700	82	10000	3200	2815
			FC40T5/835/G10q	11 OD	3500	82	10000	3200	2815
			FC40T5/841/G10q	11 OD	4100	82	10000	3200	2815
			FC40T5/850/G10q	11 OD	5000	82	10000	3200	2815

#### T5 2GX13 Base Circular Fluorescent Lamp

22	T5	2GX13	FC22T5/827/2GX13	9 OD	2700	82	10000	1900	1530
			FC22T5/835/2GX13	9 OD	3500	82	10000	1900	1530
			FC22T5/841/2GX13	9 OD	4100	82	10000	1900	1530
			FC22T5/850/2GX13	9 OD	5000	82	10000	1900	1530
40	T5	2GX13	FC40T5/827/2GX13	12 OD	2700	82	10000	3350	2800
			FC40T5/835/2GX13	12 OD	3500	82	10000	3350	2800
			FC40T5/841/2GX13	12 OD	4100	82	10000	3350	2800
			FC40T5/850/2GX13	12 OD	5000	82	10000	3350	2800
55	T5	2GX13	FC55T5/827/2GX13	12 OD	2700	82	10000	4500	3580
			FC55T5/835/2GX13	12 OD	3500	82	10000	4500	3580
			FC55T5/841/2GX13	12 OD	4100	82	10000	4500	3580
			FC55T5/850/2GX13	12 OD	5000	82	10000	4500	3580



# FLUORESCENT LAMPS

## 800 Series High Lumen T8 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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### ELITE™ HE: 800 SERIES HIGH LUMEN T8 FLUORESCENT LAMPS

#### T8 Medium Bipin

32	T8	G13	F32T8/827/HE	48	2700	85	24000	3100	2915
			F32T8/830/HE	48	3000	85	24000	3100	2915
			F32T8/835/HE	48	3500	85	24000	3100	2915
			F32T8/841/HE	48	4100	85	24000	3100	2915
			F32T8/850/HE	48	5000	82	24000	3100	2915
25	T8	G13	F25T8/827/HE	36	2700	85	24000	2400	2280
			F25T8/830/HE	36	3000	85	24000	2400	2280
			F25T8/835/HE	36	3500	85	24000	2400	2280
			F25T8/841/HE	36	4100	85	24000	2400	2280
			F25T8/850/HE	36	5000	82	24000	2400	2280
17	T8	G13	F17T8/827/HE	24	2700	85	24000	1700	1613
			F17T8/830/HE	24	3000	85	24000	1700	1613
			F17T8/835/HE	24	3500	85	24000	1700	1613
			F17T8/841/HE	24	4100	85	24000	1700	1613
			F17T8/850/HE	24	5000	82	24000	1700	1613

### ELITE™ HE: 800 SERIES HIGH LUMEN U-BENT T8 LAMPS

#### T8 Medium Bipin with 6" Wide Spacing

32	T8	G13	FB32T8/827/HE	22.5	2700	85	20000	2800	2535
			FB32T8/830/HE	22.5	3000	85	20000	2800	2535
			FB32T8/835/HE	22.5	3500	85	20000	2800	2535
			FB32T8/841/HE	22.5	4100	85	20000	2800	2535
			FB32T8/850/HE	22.5	5000	82	20000	2800	2535

#### T8 Medium Bipin with 1 5/8" Wide Spacing

31	T8	G13	FB31T8/827/HE	22.5	2700	85	20000	2750	2475
			FB31T8/830/HE	22.5	3000	85	20000	2750	2475
			FB31T8/835/HE	22.5	3500	85	20000	2750	2475
			FB31T8/841/HE	22.5	4100	85	20000	2750	2475
			FB31T8/850/HE	22.5	5000	82	20000	2750	2475



U-Bent T8 - 6" Spacing



# FLUORESCENT LAMPS

## 800 Series Reduced Wattage T8 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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### ENERGY EDGE™: REDUCED WATTAGE T8 25W FLUORESCENT LAMPS

#### T8 Medium Bipin

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
25	T8	G13	F32T8/827/ES 25W	48	2700	85	24000	2500	2425
			F32T8/830/ES 25W	48	3000	85	24000	2500	2425
			F32T8/835/ES 25W	48	3500	85	24000	2500	2425
			F32T8/841/ES 25W	48	4100	85	24000	2500	2425
			F32T8/850/ES 25W	48	5000	82	24000	2400	2330

### ENERGY EDGE™: REDUCED WATTAGE T8 28W FLUORESCENT LAMPS

#### T8 Medium Bipin

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
28	T8	G13	F32T8/827/ES 28W	48	2700	85	24000	2725	2560
			F32T8/830/ES 28W	48	3000	85	24000	2725	2560
			F32T8/835/ES 28W	48	3500	85	24000	2725	2560
			F32T8/841/ES 28W	48	4100	85	24000	2725	2560
			F32T8/850/ES 28W	48	5000	82	24000	2725	2560

### ENERGY EDGE™: REDUCED WATTAGE U-BENT T8 28W FLUORESCENT LAMPS

#### T8 Medium Bipin with 6" Wide Spacing

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
28	T8	G13	FB32T8/827/ES 28W	22.5	2700	85	20000	2600	2440
			FB32T8/830/ES 28W	22.5	3000	85	20000	2600	2440
			FB32T8/835/ES 28W	22.5	3500	85	20000	2600	2440
			FB32T8/841/ES 28W	22.5	4100	85	20000	2600	2440
			FB32T8/850/ES 28W	22.5	5000	82	20000	2600	2430

### ENERGY EDGE™: REDUCED WATTAGE U-BENT T8 25W FLUORESCENT LAMPS

#### T8 Medium Bipin

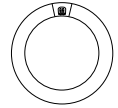
Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
25	T8	G13	FB32T8/827/ES 25W	22.5	2700	85	20000	2400	2330
			FB32T8/830/ES 25W	22.5	3000	85	20000	2400	2330
			FB32T8/835/ES 25W	22.5	3500	85	20000	2400	2330
			FB32T8/841/ES 25W	22.5	4100	85	20000	2400	2330
			FB32T8/850/ES 25W	22.5	5000	82	20000	2350	2280



# FLUORESCENT LAMPS

## T9 Circular

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.) (3 hrs/start)	Approx. Initial Lumens	Approx. Mean Lumens
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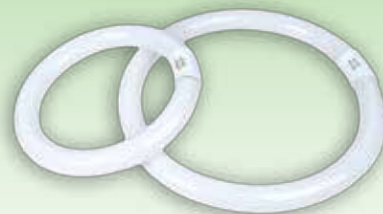


### STRATUS™ T9 4-PIN CIRCULAR LAMP

22	T9	G10q	FC8T9/827	8 OD	2700	>80	12000	1150	875
			FC8T9/830	8 OD	3000	>80	12000	1150	875
			FC8T9/835	8 OD	3500	>80	12000	1150	875
			FC8T9/841	8 OD	4100	>80	12000	1150	875
32	T9	G10q	FC12T9/827	12 OD	2700	>80	12000	1900	1600
			FC12T9/830	12 OD	3000	>80	12000	1900	1600
			FC12T9/835	12 OD	3500	>80	12000	1900	1600
			FC12T9/841	12 OD	4100	>80	12000	1900	1600
40	T9	G10q	FC16T9/827	16 OD	2700	>80	12000	2500	1975
			FC16T9/830	16 OD	3000	>80	12000	2500	1975
			FC16T9/835	16 OD	3500	>80	12000	2500	1975
			FC16T9/841	16 OD	4100	>80	12000	2500	1975

### ENERGY STAR® Qualified

Circular Lamp and Ballast Platform





A simple change to eco-friendly technology

# Compact Fluorescent Lamps

Energy Saving, Superb Quality of Light

7-2	Quad Tube Lamp (CFQ)
7-2	Triple Tube Lamp (CFT)
7-3	FT5 Lamp (Biax)
7-4	2-D (4-pin) Lamp
<b>7-5 to 7-7</b>	<b>Spiral and Globe CFL</b>
7-5	Mini-Spiral T2 CFL
7-6	Screw-in Base CFL
7-7	GU24 Base CFL



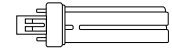
## SAVING ENERGY AND MONEY without compromising lighting quality

Today's compact fluorescent technology allows the same comfort and quality of light as incandescent light bulbs but consuming significantly less energy. The time for change is now.

# COMPACT FLUORESCENT LAMPS

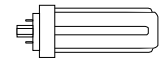
## Quad and Triple Tube Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
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### CFQ QUAD LAMP

13	CFQ	G24q-1	CFQ13W/827	5	2700	82	12000	900	775
			CFQ13W/830	5	3000	82	12000	900	775
			CFQ13W/835	5	3500	82	12000	900	775
			CFQ13W/841	5	4100	82	12000	900	775
18	CFQ	G24q-2	CFQ18W/827	5.6	2700	82	12000	1250	1075
			CFQ18W/830	5.6	3000	82	12000	1250	1075
			CFQ18W/835	5.6	3500	82	12000	1250	1075
			CFQ18W/841	5.6	4100	82	12000	1250	1075
26	CFQ	G24q-3	CFQ26W/827	6.4	2700	82	12000	1800	1550
			CFQ26W/830	6.4	3000	82	12000	1800	1550
			CFQ26W/835	6.4	3500	82	12000	1800	1550
			CFQ26W/841	6.4	4100	82	12000	1800	1550



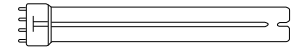
### CFT TRIPLE LAMP

18	CFT	GX24q-2	CFT18W/827	5.69	2700	82	12000	1250	1120
			CFT18W/830	5.69	3000	82	12000	1250	1120
			CFT18W/835	5.69	3500	82	12000	1250	1120
			CFT18W/841	5.69	4100	82	12000	1250	1120
26	CFT	GX24q-3	CFT26W/827	6.50	2700	82	12000	1780	1680
			CFT26W/830	6.50	3000	82	12000	1780	1680
			CFT26W/835	6.50	3500	82	12000	1780	1680
			CFT26W/841	6.50	4100	82	12000	1780	1680
32	CFT	GX24q-3	CFT32W/827	5.51	2700	82	12000	2400	2200
			CFT32W/830	5.51	3000	82	12000	2400	2200
			CFT32W/835	5.51	3500	82	12000	2400	2200
			CFT32W/841	5.51	4100	82	12000	2400	2200
42	CFT	GX24q-4	CFT42W/827	6.42	2700	82	12000	3100	2900
			CFT42W/830	6.42	3000	82	12000	3100	2900
			CFT42W/835	6.42	3500	82	12000	3100	2900
			CFT42W/841	6.42	4100	82	12000	3100	2900
57	CFT	GX24q-5	CFT57W/827	7.64	2700	82	12000	4250	4150
			CFT57W/830	7.64	3000	82	12000	4250	4150
			CFT57W/835	7.64	3500	82	12000	4250	4150
			CFT57W/841	7.64	4100	82	12000	4250	4150

# COMPACT FLUORESCENT LAMPS

## FT Compact Fluorescent

Watts	Bulb	Base	Order Code	MOL (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
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### FT (LONG) FLUROESCENT LAMPS

18	FT	2G11	FT18W/2G11/830	8.94	3000	82	12000	1200	1120
			FT18W/2G11/835	8.94	3500	82	12000	1200	1120
			FT18W/2G11/841	8.94	4100	82	12000	1200	1120
			FT18W/2G11/850	8.94	5000	82	12000	1200	1120
			FT18W/2G11/865	8.94	6500	82	12000	1200	1120
24	FT	2G11	FT24W/2G11/830	12.68	3000	82	12000	1800	1600
			FT24W/2G11/835	12.68	3500	82	12000	1800	1600
			FT24W/2G11/841	12.68	4100	82	12000	1800	1600
			FT24W/2G11/850	12.68	5000	82	12000	1800	1600
			FT24W/2G11/865	12.68	6500	82	12000	1800	1600
36	FT	2G11	FT36W/2G11/830	16.4	3000	82	12000	2900	2510
			FT36W/2G11/835	16.4	3500	82	12000	2900	2510
			FT36W/2G11/841	16.4	4100	82	12000	2900	2510
			FT36W/2G11/850	16.4	5000	82	12000	2900	2510
			FT36W/2G11/865	16.4	6500	82	12000	2900	2510
40	FT	2G11	FT40W/2G11/830	21.5	3000	82	12000	3500	2910
			FT40W/2G11/835	21.5	3500	82	12000	3500	2910
			FT40W/2G11/841	21.5	4100	82	12000	3500	2910
			FT40W/2G11/850	21.5	5000	82	12000	3500	2910
			FT40W/2G11/865	21.5	6500	82	12000	3500	2910
55	FT	2G11	FT55W/2G11/830	21.5	3000	82	12000	4800	3970
			FT55W/2G11/835	21.5	3500	82	12000	4800	3970
			FT55W/2G11/841	21.5	4100	82	12000	4800	3970
			FT55W/2G11/850	21.5	5000	82	12000	4800	3970
			FT55W/2G11/865	21.5	6500	82	12000	4800	3970



# COMPACT FLUORESCENT LAMPS

## 2D Fluorescent Lamps

Watts	Bulb	Base	Order Code	MOL (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
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### 4-PIN 2D COMPACT FLUORESCENT LAMP

10	2D	GR10q	F102D/827/GR10q	3.74	2700	82	10000	680	620
			F102D/830/GR10q	3.74	3000	82	10000	680	620
			F102D/835/GR10q	3.74	3500	82	10000	680	620
			F102D/841/GR10q	3.74	4100	82	10000	680	620
16	2D	GR10q	F162D/827/GR10q	5.55	2700	82	10000	1200	980
			F162D/830/GR10q	5.55	3000	82	10000	1200	980
			F162D/835/GR10q	5.55	3500	82	10000	1200	980
			F162D/841/GR10q	5.55	4100	82	10000	1200	980
21	2D	GR10q	F212D/827/GR10q	5.55	2700	82	10000	1400	1300
			F212D/830/GR10q	5.55	3000	82	10000	1400	1300
			F212D/835/GR10q	5.55	3500	82	10000	1400	1300
			F212D/841/GR10q	5.55	4100	82	10000	1400	1300
28	2D	GR10q	F282D/827/GR10q	8.15	2700	82	10000	2250	1800
			F282D/830/GR10q	8.15	3000	82	10000	2250	1800
			F282D/835/GR10q	8.15	3500	82	10000	2250	1800
			F282D/841/GR10q	8.15	4100	82	10000	2250	1800
38	2D	GR10q	F382D/827/GR10q	8.15	2700	82	10000	2800	2400
			F382D/830/GR10q	8.15	3000	82	10000	2800	2400
			F382D/835/GR10q	8.15	3500	82	10000	2800	2400
			F382D/841/GR10q	8.15	4100	82	10000	2800	2400
55	2D	GRY10q	F552D/827/GRY10q	8.15	2700	82	10000	3700	3300
			F552D/830/GRY10q	8.15	3000	82	10000	3700	3300
			F552D/835/GRY10q	8.15	3500	82	10000	3700	3300
			F552D/841/GRY10q	8.15	4100	82	10000	3700	3300



# COMPACT FLUORESCENT LAMPS

## GU24 Base Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Mean Lumens
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### Mini Spiral T2 CFL

5	T2	Med.	<b>CFS5W/827</b>	3.15	2700	>80	10,000	225
9	T2	Med.	<b>CFS9W/827</b>	3.59	2700	>80	10,000	520
			<b>CFS9W/841</b>	3.59	4100	>80	10,000	520
			<b>CFS9W/850</b>	3.59	5000	>80	10,000	520
11	T2	Med.	<b>CFS11W/827</b>	3.78	2700	>80	10,000	740
13	T2	Med.	<b>CFS13W/827</b>	4.02	2700	>80	15,000	900
			<b>CFS13W/841</b>	4.02	4100	>80	10,000	900
			<b>CFS13W/850</b>	4.02	5000	>80	10,000	900
19	T2	Med.	<b>CFS18W/827</b>	4.09	2700	>80	12,000	1200
23	T2	Med.	<b>CFS23W/827</b>	4.53	2700	>80	12,000	1600

# COMPACT FLUORESCENT LAMPS

## Screw-In Base Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Mean Lumens
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### Spiral T3 CFL

13	T3	Med.	<b>CFS13W/827-T3</b>	4.84	2700	>80	10,000	900
15	T3	Med.	<b>CFS15W/827-T3</b>	4.84	2700	>80	12,000	950
			<b>CFS15W/835-T3</b>	4.84	3500	>80	12,000	950
			<b>CFS15W/841-T3</b>	4.84	4100	>80	12,000	950
			<b>CFS15W/850-T3</b>	4.84	5000	>80	12,000	950
			<b>CFS15W/864-T3</b>	4.84	6400	>80	12,000	950
20	T3	Med.	<b>CFS20W/827-T3</b>	5.08	2700	>80	10,000	1200
			<b>CFS20W/835-T3</b>	5.08	3500	>80	10,000	1200
			<b>CFS20W/841-T3</b>	5.08	4100	>80	10,000	1200
			<b>CFS20W/850-T3</b>	5.08	5000	>80	10,000	1200
			<b>CFS20W/864-T3</b>	5.08	6400	>80	10,000	1200
23	T3	Med.	<b>CFS23W/827-T3</b>	5.28	2700	>80	10,000	1600
			<b>CFS23W/835-T3</b>	5.28	3500	>80	10,000	1600
			<b>CFS23W/841-T3</b>	5.28	4100	>80	10,000	1600
			<b>CFS23W/850-T3</b>	5.28	5000	>80	10,000	1600
			<b>CFS23W/864-T3</b>	5.28	6400	>80	10,000	1600
26	T3	Med.	<b>CFS26W/827-T3</b>	5.28	2700	>80	10,000	1750
			<b>CFS26W/841-T3</b>	5.28	4100	>80	10,000	1750
			<b>CFS26W/850-T3</b>	5.28	5000	>80	10,000	1750
			<b>CFS26W/864-T3</b>	5.28	6400	>80	10,000	1750
30	T3	Med.	<b>CFS30W/827-T3</b>	5.28	2700	>80	10,000	2000
			<b>CFS30W/841-T3</b>	5.28	4100	>80	10,000	2000
			<b>CFS30W/850-T3</b>	5.28	5000	>80	10,000	2000
			<b>CFS30W/864-T3</b>	5.28	6400	>80	10,000	2000
40	T3	Med.	<b>CFS40W/827-T3</b>	6.37	2700	>80	10,000	2650
			<b>CFS40W/850-T3</b>	6.37	5000	>80	10,000	2650

# COMPACT FLUORESCENT LAMPS

## GU24 Base Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Mean Lumens
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### GU24 Mini Spiral T2 CFL

11	T2	GU24	VE11SGU27	3.11	2700	>80	10,000	650
			VE11SGU30	3.11	3000	>80	10,000	650
			VE11SGU35	3.11	3500	>80	10,000	650
			VE11SGU41	3.11	4100	>80	10,000	650
			VE11SGU50	3.11	5000	>80	10,000	650
			VE11SGU64	3.11	6400	>80	10,000	650
13	T2	GU24	VE13SGU27	3.58	2700	>80	10,000	900
			VE13SGU30	3.58	3000	>80	10,000	900
			VE13SGU35	3.58	3500	>80	10,000	900
			VE13SGU41	3.58	4100	>80	10,000	900
			VE13SGU50	3.58	5000	>80	10,000	900
			VE13SGU64	3.58	6400	>80	10,000	900
18	T2	GU24	VE18SGU27	3.82	2700	>80	10,000	1200
			VE18SGU30	3.82	3000	>80	10,000	1200
			VE18SGU35	3.82	3500	>80	10,000	1200
			VE18SGU41	3.82	4100	>80	10,000	1200
			VE18SGU50	3.82	5000	>80	10,000	1200
			VE18SGU64	3.82	6400	>80	10,000	1200
26	T2	GU24	VE26SGU27	4.13	2700	>80	10,000	1600
			VE26SGU30	4.13	3000	>80	10,000	1600
			VE26SGU35	4.13	3500	>80	10,000	1600
			VE26SGU41	4.13	4100	>80	10,000	1600
			VE26SGU50	4.13	5000	>80	10,000	1600
			VE26SGU64	4.13	6400	>80	10,000	1600

### GU24 A-Shape CFL

11	A-Shape	GU24	VE11AGU27	3.94	2700	>80	10,000	520
			VE11AGU30	3.94	3000	>80	10,000	520
			VE11AGU35	3.94	3500	>80	10,000	520
			VE11AGU41	3.94	4100	>80	10,000	520
			VE11AGU50	3.94	5000	>80	10,000	520
			VE11AGU64	3.94	6400	>80	10,000	520
14	A-Shape	GU24	VE14AGU27	3.94	2700	>80	10,000	760
			VE14AGU30	3.94	3000	>80	10,000	760
			VE14AGU35	3.94	3500	>80	10,000	760
			VE14AGU41	3.94	4100	>80	10,000	760
			VE14AGU50	3.94	5000	>80	10,000	760
			VE14AGU64	3.94	6400	>80	10,000	760

Achieve longer life and low energy consumption

# Solid State Lighting

Promote Sustainable Design with High Performance LED Drivers

<b>8-2 to 8-3</b>	<b>Residential LED Drivers</b>
8-2	Constant Current
8-2	Constant Current (Plug-in)
8-3	Constant Voltage
<b>8-4</b>	<b>High Wattage LED Drivers</b>
8-4	Dimmable Constant Current
8-4	Constant Current
8-4	Constant Voltage
<b>8-4</b>	<b>RGB Controllers</b>
8-5 to 8-6	Case Dimensions





# SOLID STATE LIGHTING

## LED Driver

Output Voltage (V)	Output Current (Amps)	Max. Output Power (W)	Input Voltage	Input Frequency	Order Code	No. of LED	Indiv. LED Wattage (W)	Dim.	Wiring Dia.
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### Constant Current

12	0.35	3.5	100-255	50-60	VEL3350MV	1-3	1	N	59
36	0.35	8	100-255	50-60	VEL8350MV	1-8	1	N	59
12	0.70	6.5	100-255	50-60	VEL2700MV	1-2	3	N	59
21	0.70	9	100-255	50-60	VEL3700MV	1-3	3	N	59
12	0.35	3.5	100-255	50-60	VEL3350MV-1	1-3	1	O	59
12	0.70	6.5	100-255	50-60	VEL2700MV-1	1-2	3	O	59
12	0.35	3.5	100-255	50-60	VEL3350MV-2	1-3	1	P	59
36	0.35	8	100-255	50-60	VEL8350MV-2	1-8	1	P	59
12	0.70	6.5	100-255	50-60	VEL2700MV-2	1-2	3	P	59
21	0.70	9	100-255	50-60	VEL3700MV-2	1-3	3	P	59
3.5 - 10.5	0.70	7.5	120	50-60	LD-C307033-09	1-3	3	K	61
3.5 - 21	0.70	2.5 - 15	120	50-60	LD-C307033-07	1-6	3	L	61

### Constant Current - Plug In

12	0.35	3.5	100-255	50-60	VEL3350MVP	1-3	1	Q	60
36	0.35	8	100-255	50-60	VEL8350MVP	1-8	1	Q	60
12	0.70	6.5	100-255	50-60	VEL2700MVP	1-2	3	Q	60
21	0.70	9	100-255	50-60	VEL3700MVP	1-3	3	Q	60

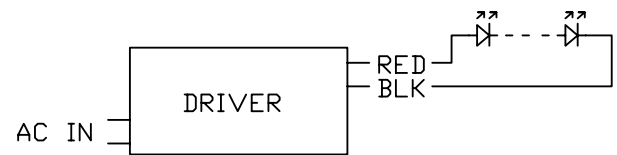


Diagram 61

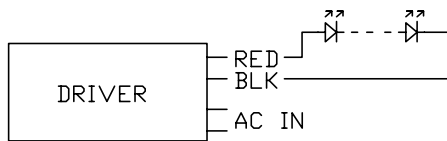


Diagram 59

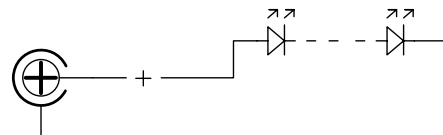


Diagram 60

# SOLID STATE LIGHTING

## LED Driver

Output Voltage (V)	Output Current (Amps)	Max. Output Power (W)	Input Voltage	Input Frequency	Order Code	No. of LED	Indiv. LED Wattage (W)	Dim.	Wiring Dia.
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### Constant Voltage

12	0.25	3	100-240	50-60	VEV2512MV	-	-	N	-
12	0.50	6	100-240	50-60	VEV5012MV	-	-	N	-
12	0.83	10	100-240	50-60	VDV8312MV	-	-	N	-
24	0.13	3	100-240	50-60	VEV1221MV	-	-	N	-
24	0.25	6	100-240	50-60	VEV2524MV	-	-	N	-
24	0.41	10	100-240	50-60	VEV4124MV	-	-	N	-
12	0.25	3	100-240	50-60	VEV2512MV-1	-	-	O	-
12	0.5	6	100-240	50-60	VEV5012MV-1	-	-	O	-
24	0.13	3	100-240	50-60	VEV1224MV-1	-	-	O	-
24	0.25	6	100-240	50-60	VEV2524MV-1	-	-	O	-
12	0.25	3	100-240	50-60	VEV2512MV-2	-	-	P	-
12	0.50	6	100-240	50-60	VEV5012MV-2	-	-	P	-
12	0.53	10	100-240	50-60	VEV8312MV-2	-	-	P	-
24	0.13	3	100-240	50-60	VEV1224MV-2	-	-	P	-
24	0.25	6	100-240	50-60	VEV2524MV-2	-	-	P	-
24	0.41	10	100-240	50-60	VEV4124MV-2	-	-	P	-

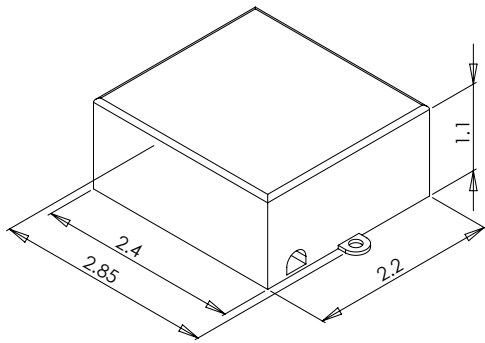


Figure L

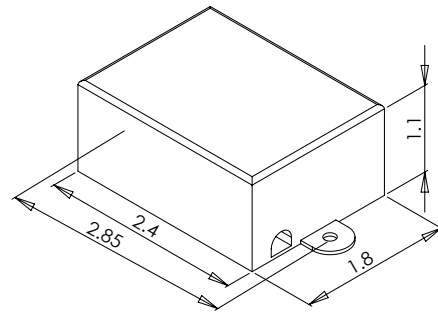


Figure K

# SOLID STATE LIGHTING

## LED Driver

No. of LED	Max. Output Power	Min. Output Power	Output Voltage (V)	Output Current (Amps)	Min./Max. Ambient Temp. (°C)	Input Voltage	Order Code	Power Factor	Dim.	Wiring	Env. Rating	Symbols, Notes
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### Dimmable Constant Current **NEW**

1 - 6	18	3	20 - 30	0.70	-20°C / 40°C	120	LD-C307030-07D	0.9	L	65	Dry	◆
1 - 3	9	3	8 - 12	0.70	-20°C / 40°C	120	LD-C307012-09D	0.9	K	65	Dry	◆
1 - 6	7.2	1.2	3 - 22	0.35	-20°C / 40°C	100-240	VEL6350MVD10	0.9	R	62	Dry	‡
1 - 6	7.2	1.2	3 - 22	0.35	-20°C / 40°C	100-240	VEL6350MVDP	0.9	R	62	Dry	†
1 - 10	12	1.2	9 - 36	0.35	-20°C / 40°C	100-240	VEL10350MVDP	0.9	S	63	Dry	‡†
1 - 10	9	3	3 - 12	0.70	-20°C / 40°C	100-240	VEL3700MVDP	0.9	S	63	Dry	‡†

### Constant Current - High Power Factor **NEW**

1 - 10	12	1	3 - 36	0.35	-20°C / 50°C	100-240	VEL10350MV-5	0.9	U	59	Damp, Wet	
1 - 4	12	3	3 - 17	0.70	-20°C / 50°C	100-240	VEL4700MV-5	0.9	U	59	Damp, Wet	
3 - 16	16	3	3 - 54	0.35	-20°C / 50°C	100-240	VEL16350MV-15	0.9	Z	59	Damp, Wet	
1 - 6	18	3	3 - 26	0.70	-20°C / 50°C	100-240	VEL6700MV-16	0.9	Z	59	Damp, Wet	

### Constant Voltage - High Power Factor **NEW**

-	12	-	12	1.00	-20°C / 50°C	100-240	VEV10012MV-5	0.9	U	-	Damp, Wet	
-	12	-	24	0.50	-20°C / 50°C	100-240	VEV5024MV-5	0.9	U	-	Damp, Wet	
-	60	-	12	5.00	-20°C / 50°C	100-240	VEV50012-19	0.9	AA	-	Damp, Wet	
-	60	-	24	2.50	-20°C / 50°C	100-240	VEV25024-19	0.9	AA	-	Damp, Wet	

### RGB Controller for High Power LEDs: 1W / 0.35A **NEW**

1 - 3	-	-	12	0.35	-20°C / 50°C	-	RGB350DC	0.9	64	-	Dry	*
1 - 6	-	-	24	0.35	-20°C / 50°C	-	RGB350DC	0.9	64	-	Dry	*
1 - 9	-	-	36	0.35	-20°C / 50°C	-	RGB350DC	0.9	64	-	Dry	*



#### Symbols and Notes:

- ◆ - Wall Dimming (Phase Control)
- ‡ - PWM (for LED)
- † - 0-10V or 1-10V Potentialmeter
- \* - Equal number of LED(s) on each branch



# SOLID STATE LIGHTING

## Case Dimensions

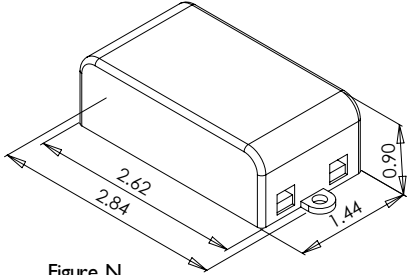


Figure N

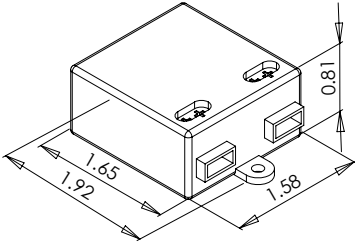


Figure O

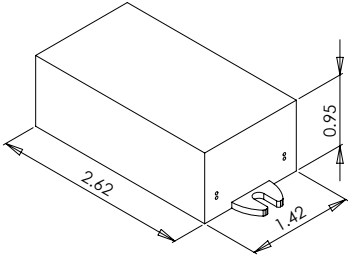


Figure P

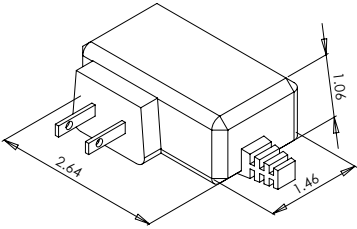


Figure Q

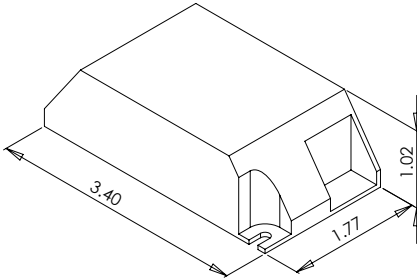


Figure R

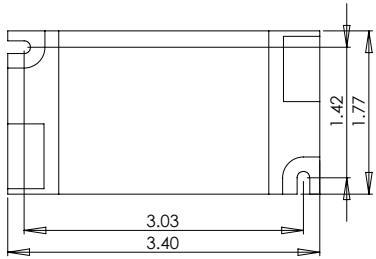


Figure R - Mounting View

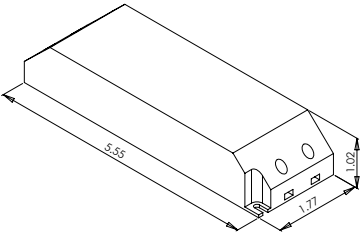


Figure S

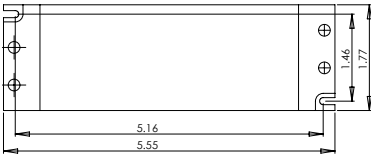


Figure S - Mounting View

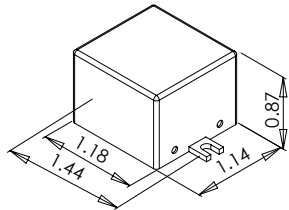


Figure V

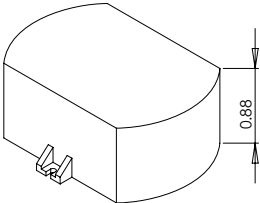


Figure U

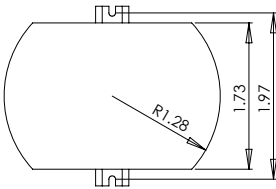


Figure U - Mounting View

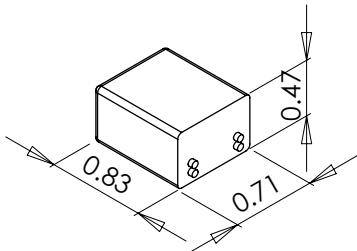


Figure W

# SOLID STATE LIGHTING

## Case Dimensions

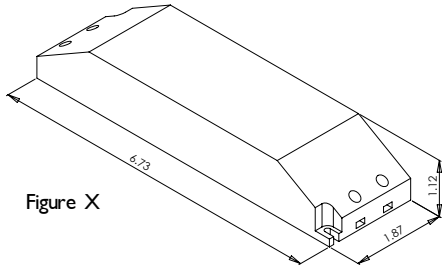


Figure X

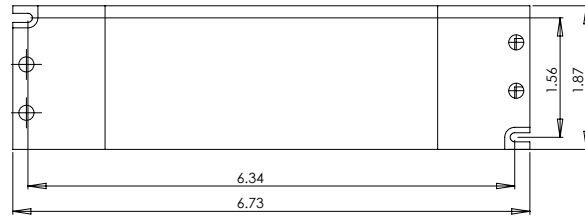


Figure X - Mounting View

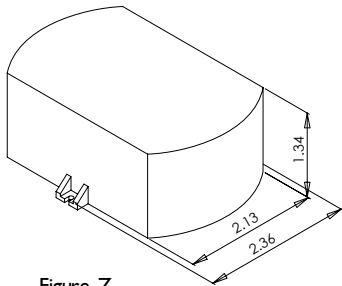


Figure Z

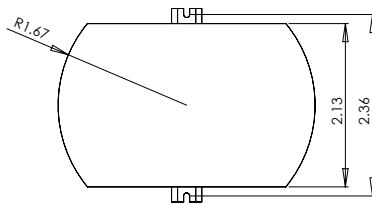


Figure Z - Mounting View

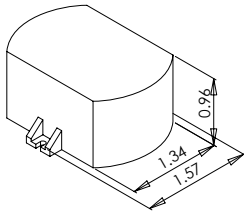


Figure Y

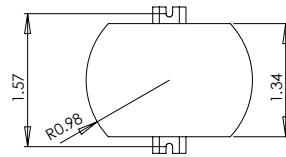


Figure Y - Mounting View

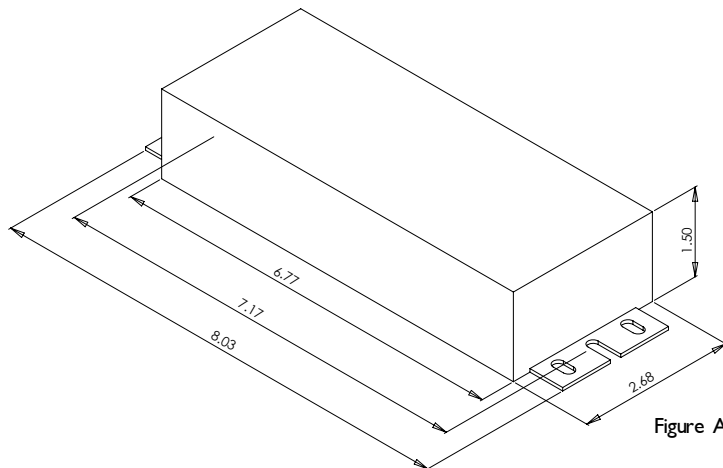


Figure AA

# ADDITIONAL INFORMATION

## **A-2 to A-9**

A-2

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A-4

A-5

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A-7

A-8

A-9

A-10

## **Wiring Diagram Index**

Diagram 1 to 9

Diagram 10 to 18

Diagram 19 to 27

Diagram 28 to 34

Diagram 35 to 43

Diagram 44 to 53

Diagram 54 to 63

Diagram 64 to 70

Diagram Q1 to Q4

## **B-2 to B-6**

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Figure F to M

Figure N to W

Figure X to AA

Figure AB to AF

Figure M1 to M4

## **C-1 to C-3**

## **Model Number Index**

# ADDITIONAL INFORMATION

## Wiring Diagram Index

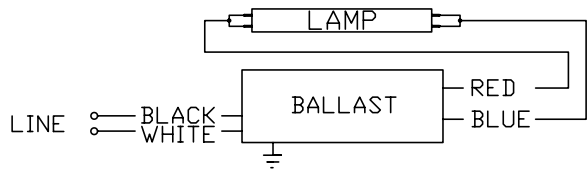


Diagram 1

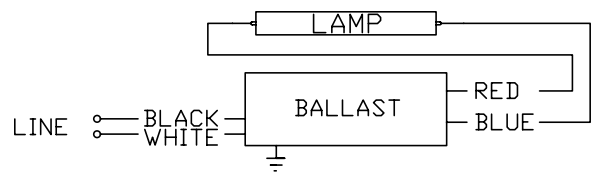


Diagram 5

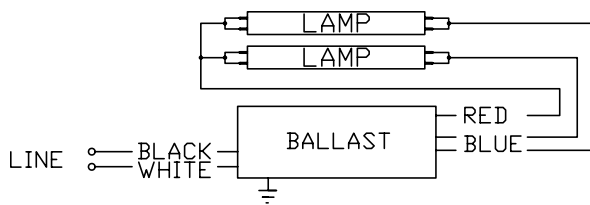


Diagram 2

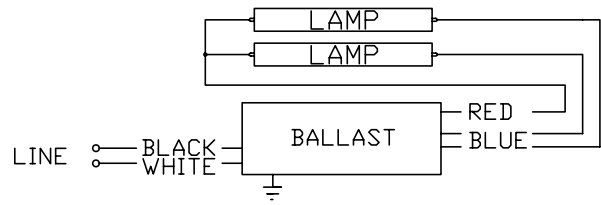


Diagram 6

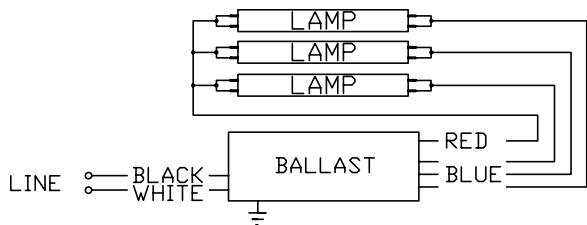


Diagram 3

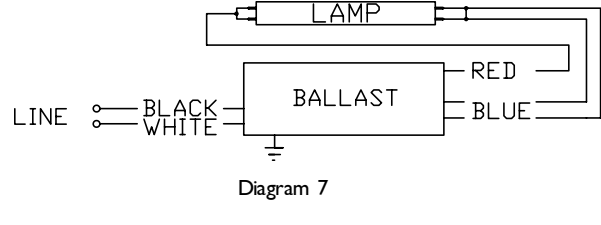


Diagram 7

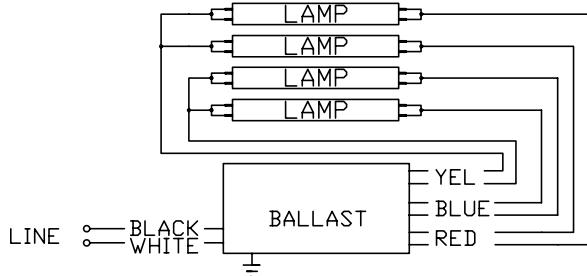


Diagram 4

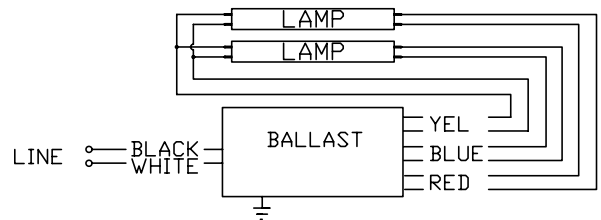


Diagram 8

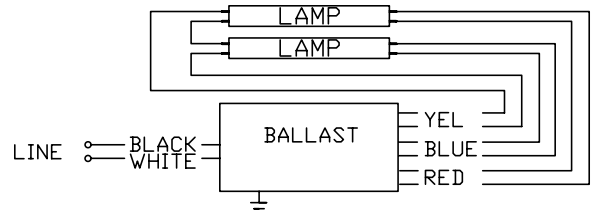


Diagram 9

# ADDITIONAL INFORMATION

## Wiring Diagram Index

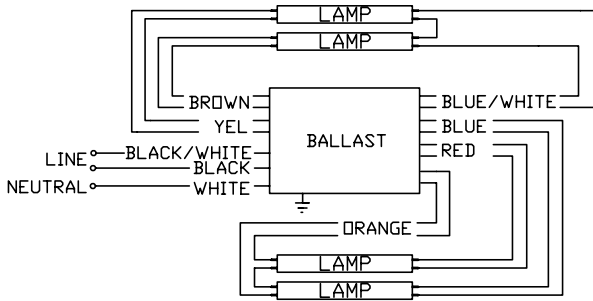


Diagram 10

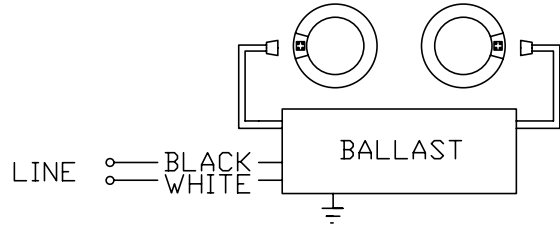


Diagram 14

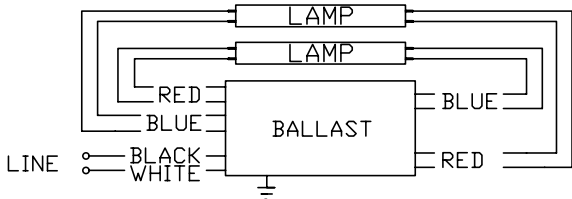


Diagram 11

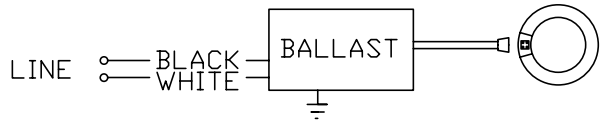


Diagram 15

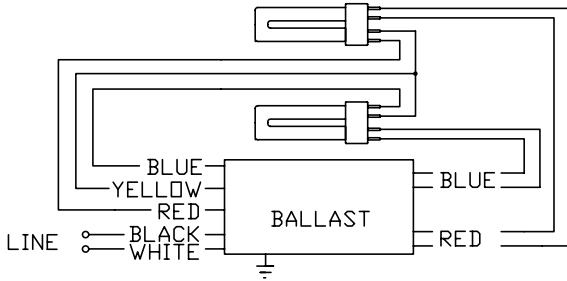


Diagram 12

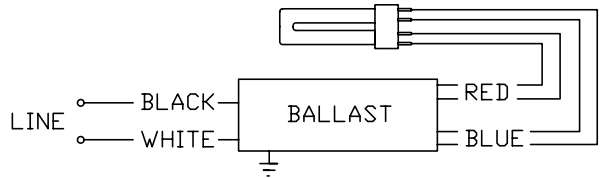


Diagram 16

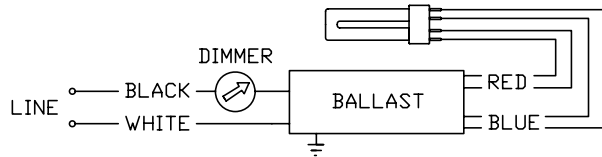


Diagram 17

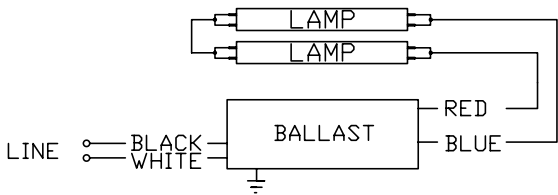


Diagram 13

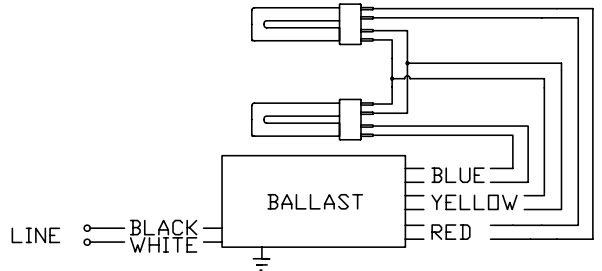


Diagram 18

# ADDITIONAL INFORMATION

## Wiring Diagram Index

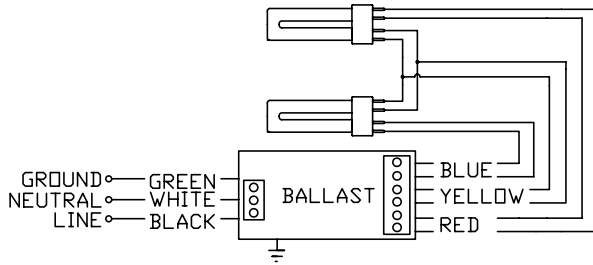


Diagram 19

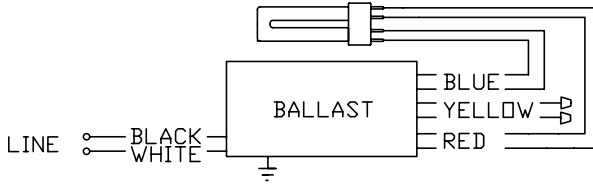


Diagram 20

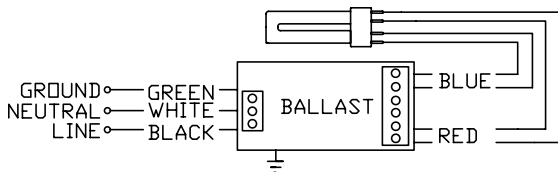


Diagram 21

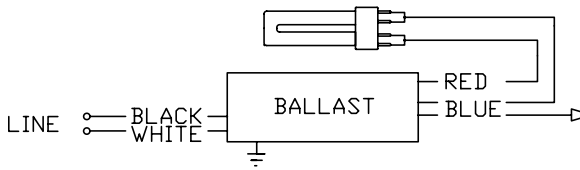


Diagram 22

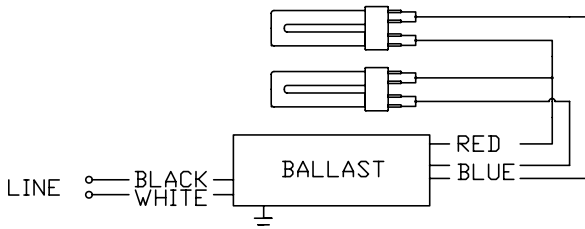


Diagram 23

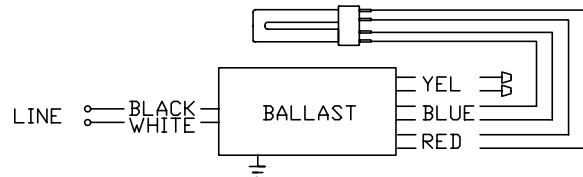


Diagram 24

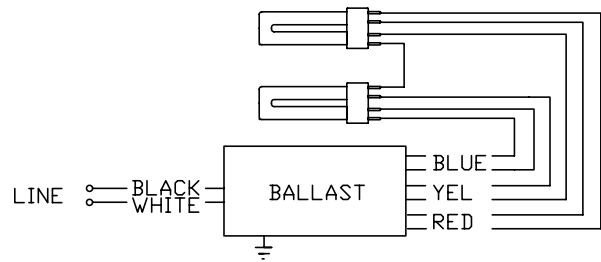


Diagram 25

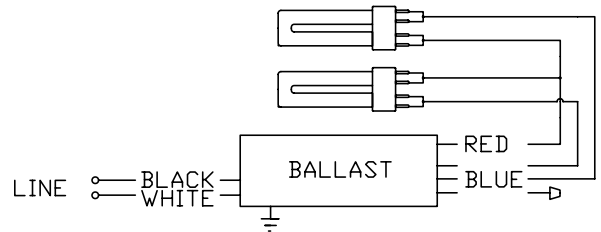


Diagram 26

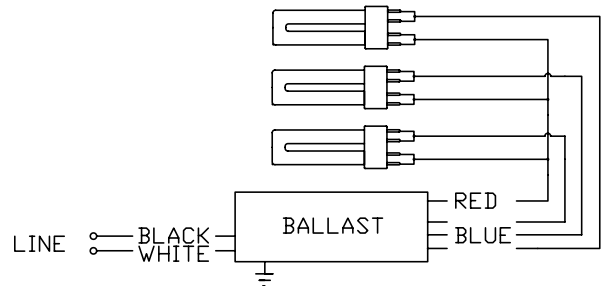


Diagram 27

# ADDITIONAL INFORMATION

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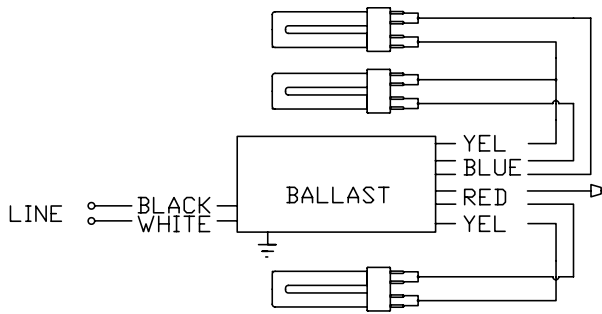


Diagram 28

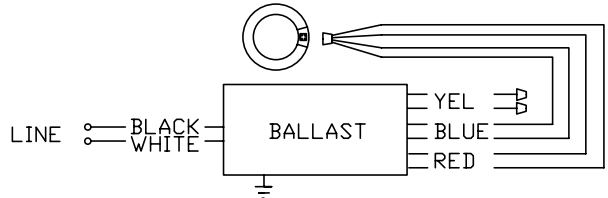


Diagram 32

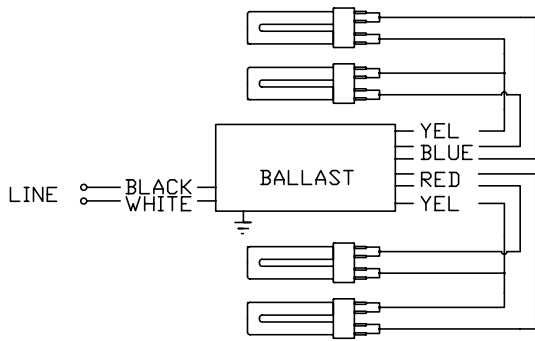


Diagram 29

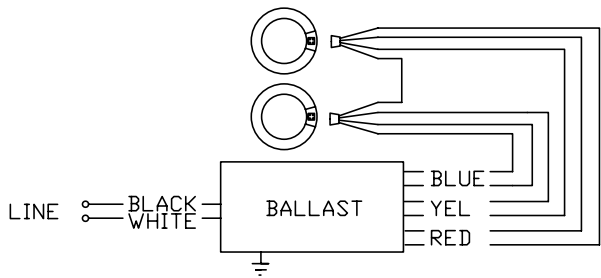


Diagram 33

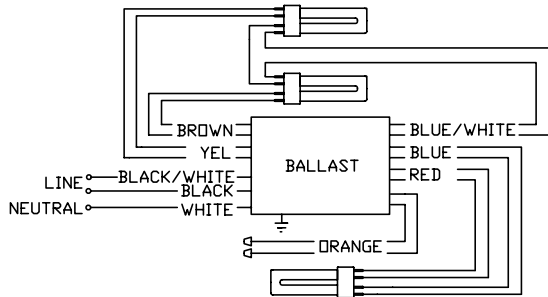


Diagram 30

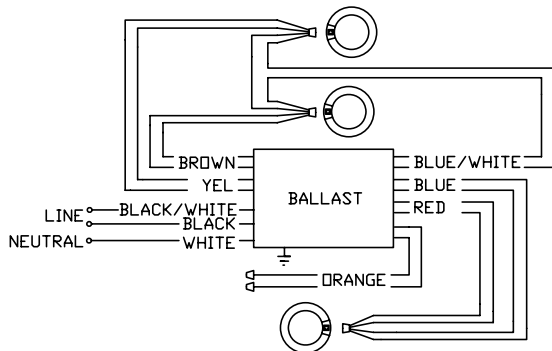


Diagram 34

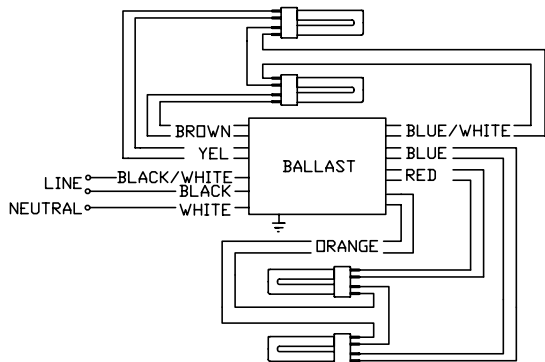


Diagram 31

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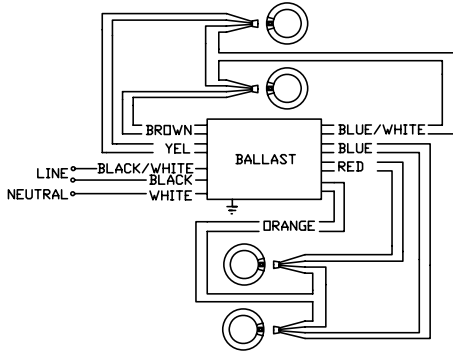


Diagram 35

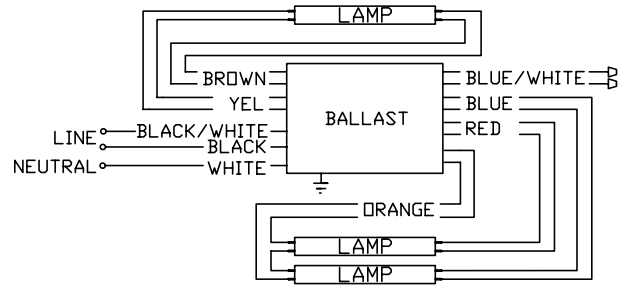


Diagram 39

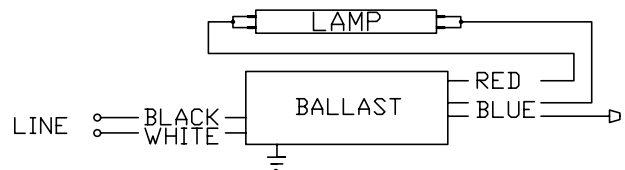


Diagram 40

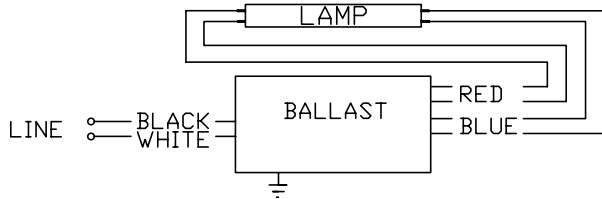


Diagram 36

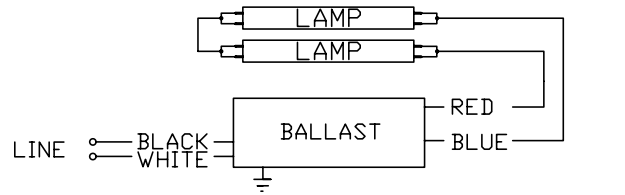


Diagram 41

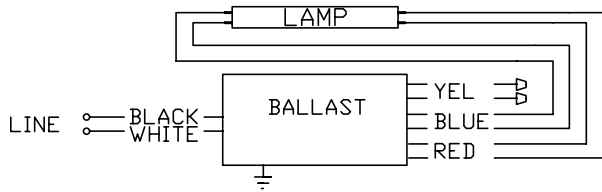


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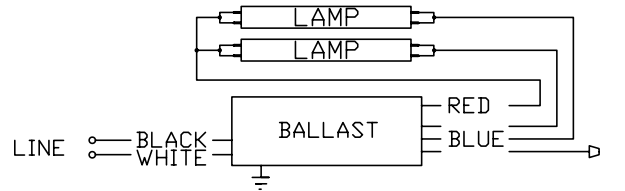


Diagram 42

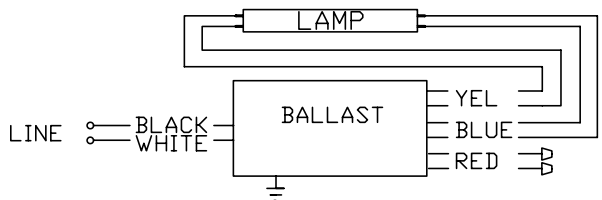


Diagram 38

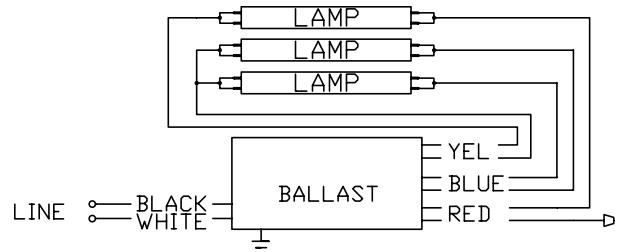


Diagram 43



# ADDITIONAL INFORMATION

## Wiring Diagram Index

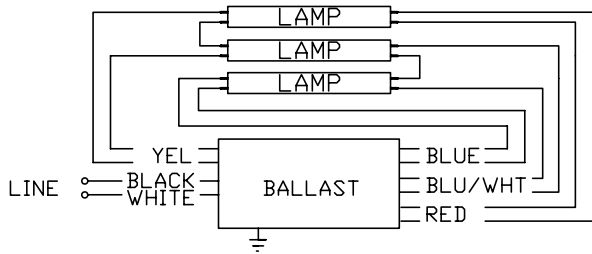


Diagram 44

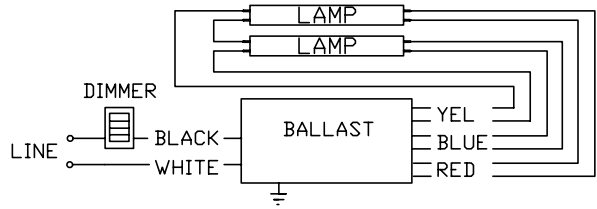


Diagram 49

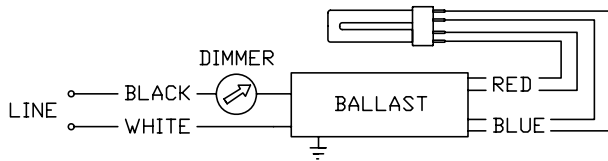


Diagram 45

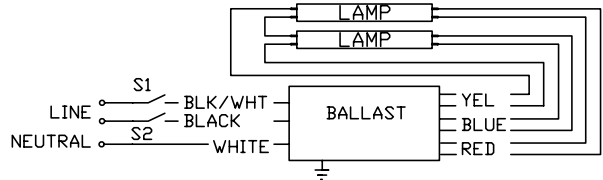


Diagram 50

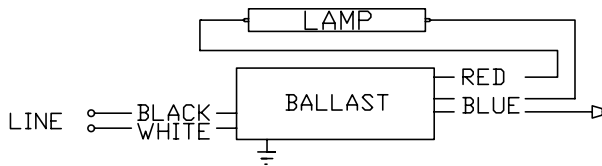


Diagram 46

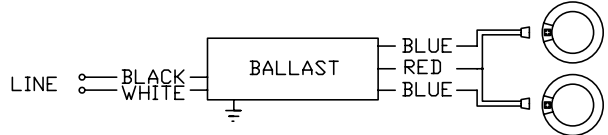


Diagram 51

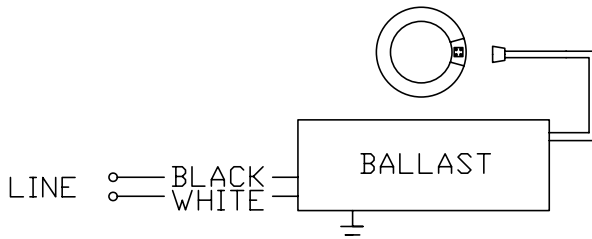


Diagram 47



Diagram 52

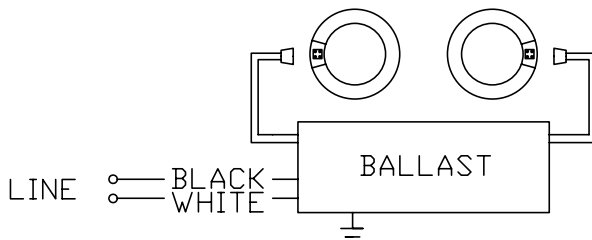


Diagram 48



Diagram 53

# ADDITIONAL INFORMATION

## Wiring Diagram Index



Diagram 54

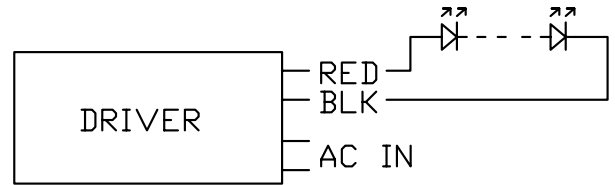


Diagram 59

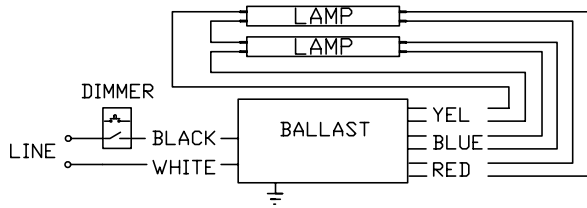


Diagram 55

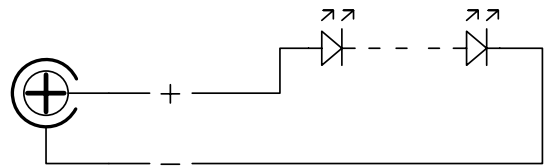


Diagram 60

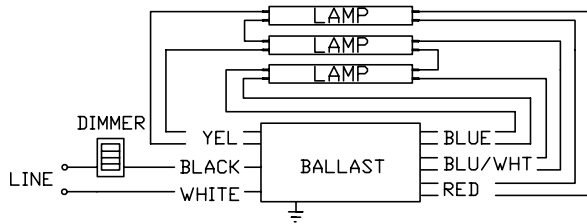


Diagram 56

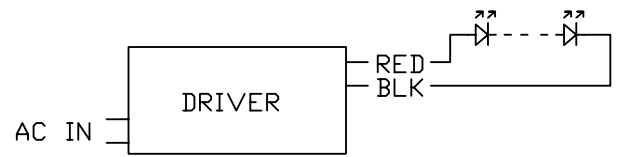


Diagram 61

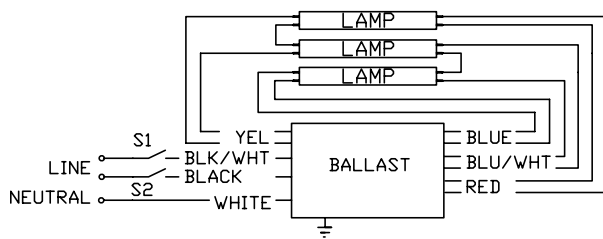


Diagram 57

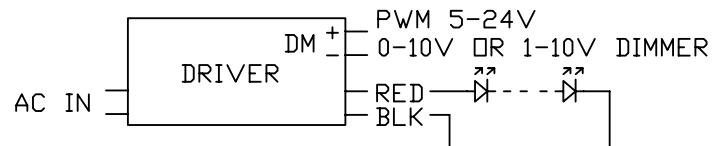


Diagram 62

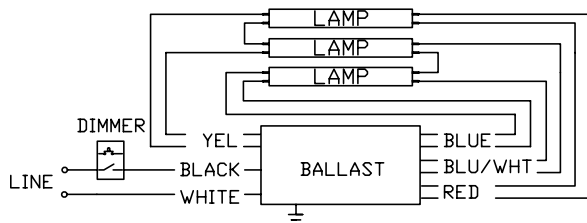


Diagram 58

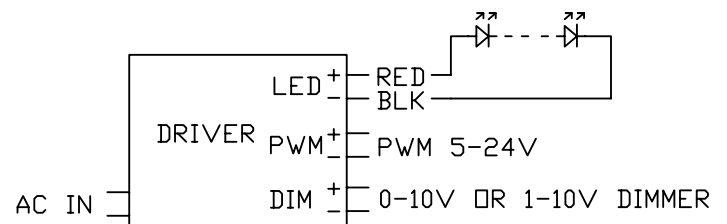


Diagram 63

# ADDITIONAL INFORMATION

## Wiring Diagram Index

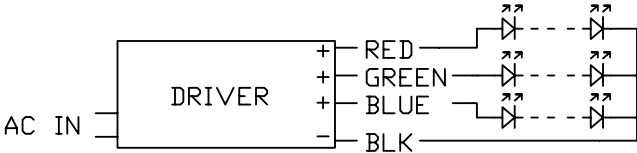


Diagram 64

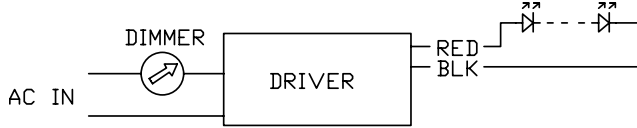


Diagram 65

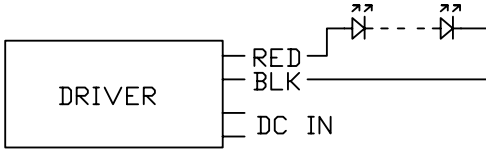
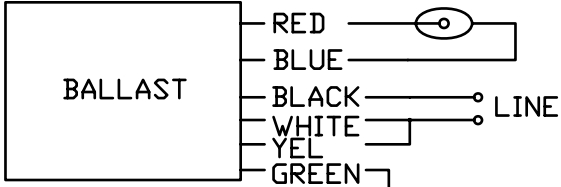
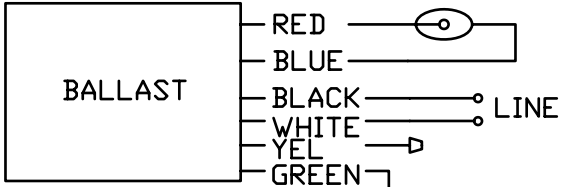


Diagram 66



100W CONNECTION



75W CONNECTION

Diagram 70

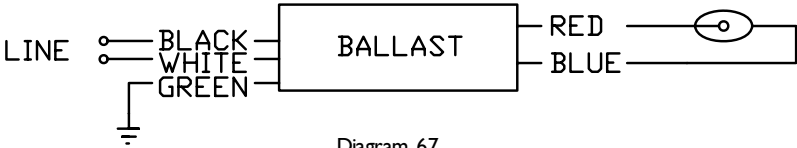
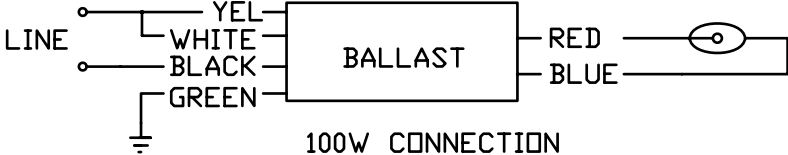
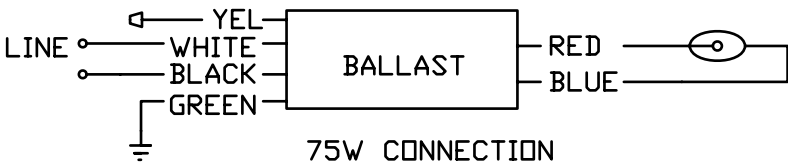


Diagram 67



100W CONNECTION

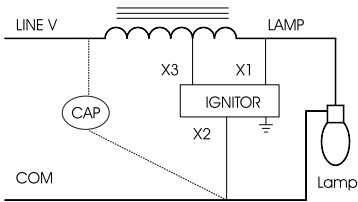


75W CONNECTION

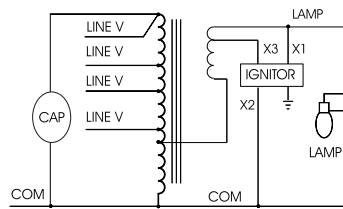
Diagram 69

# ADDITIONAL INFORMATION

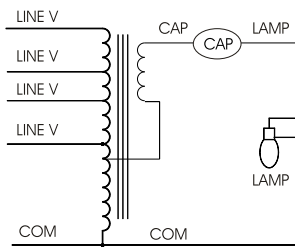
## Wiring Diagram Index



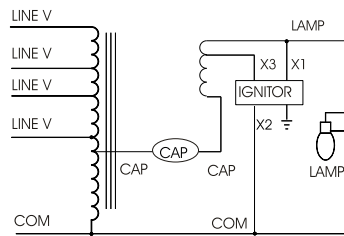
Diag. Q1



Diag. Q2



Diag. Q4

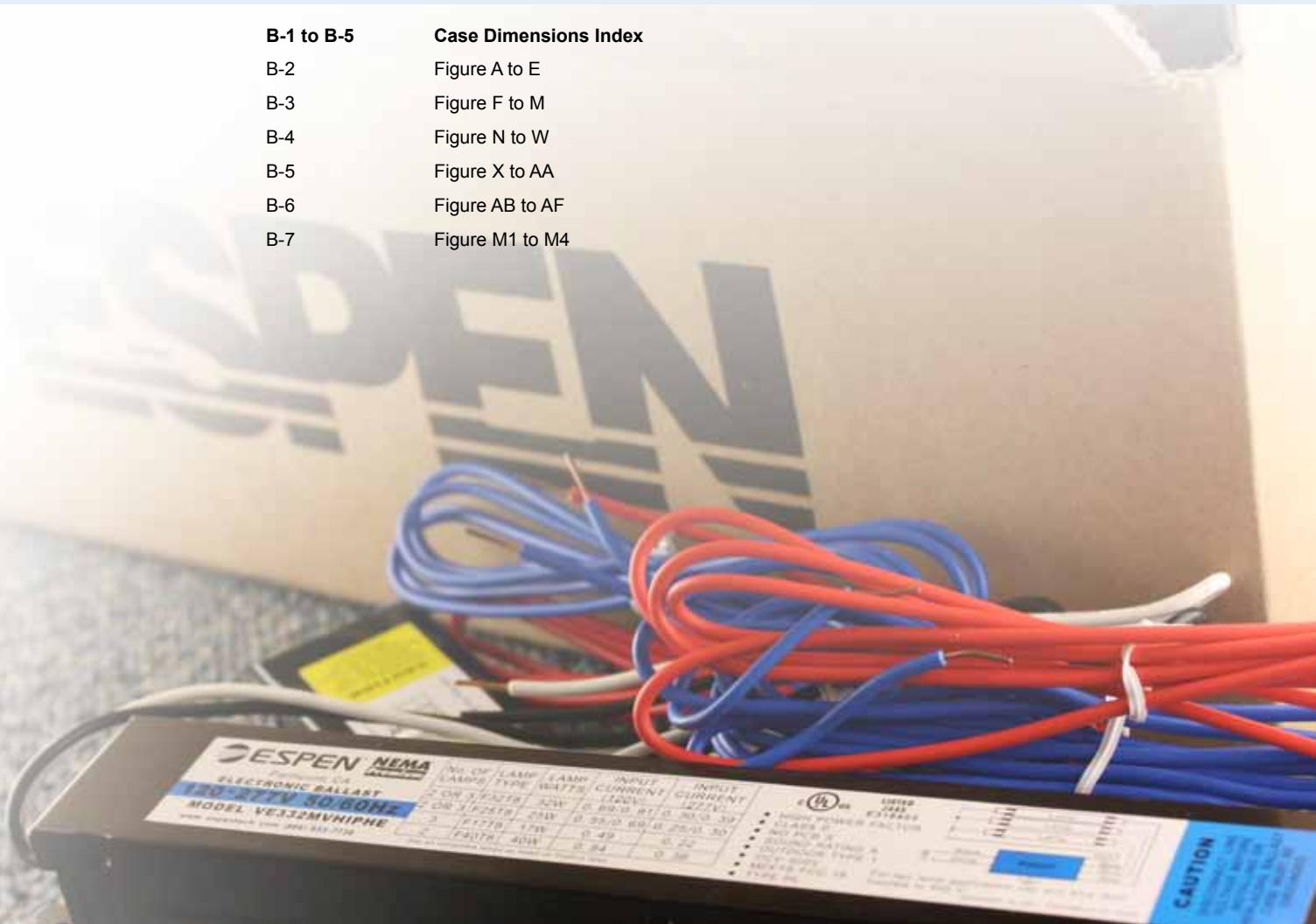


Diag. Q3

# ADDITIONAL INFORMATION

## Case Dimensions

<b>B-1 to B-5</b>	<b>Case Dimensions Index</b>
B-2	Figure A to E
B-3	Figure F to M
B-4	Figure N to W
B-5	Figure X to AA
B-6	Figure AB to AF
B-7	Figure M1 to M4



# ADDITIONAL INFORMATION

## Case Dimension Index

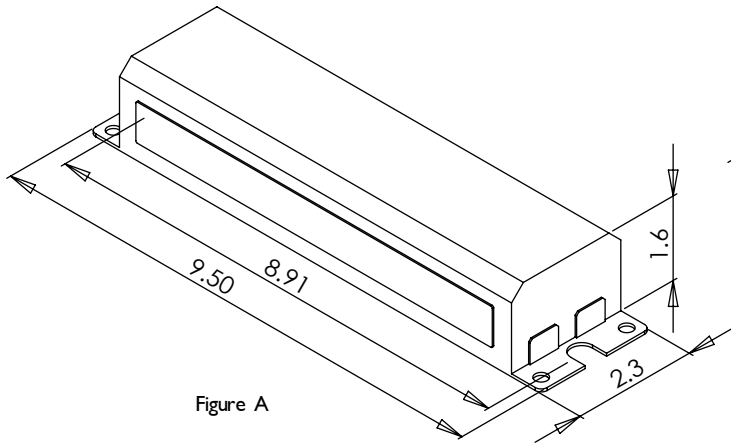


Figure A

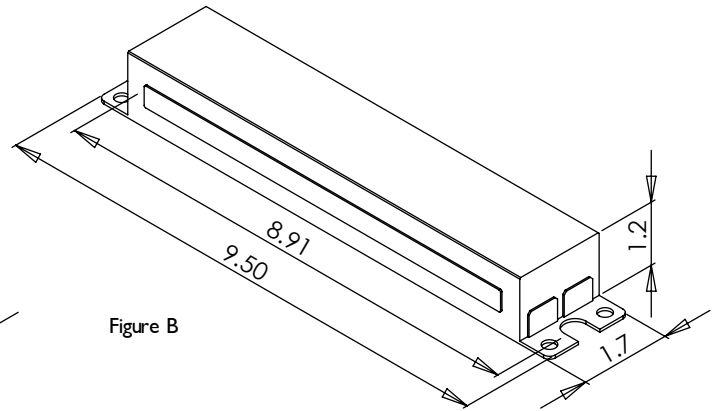


Figure B

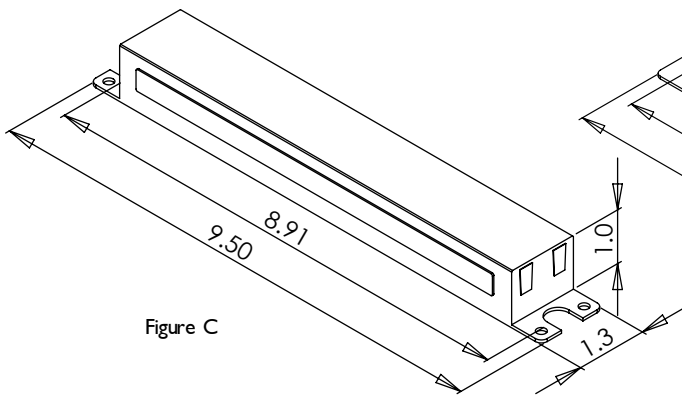


Figure C

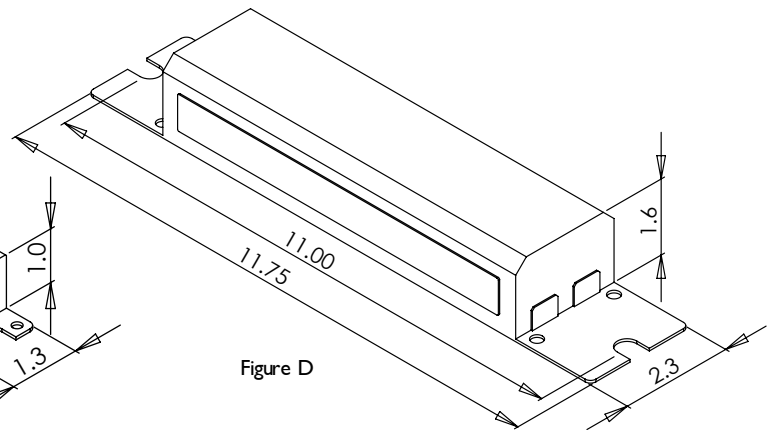


Figure D

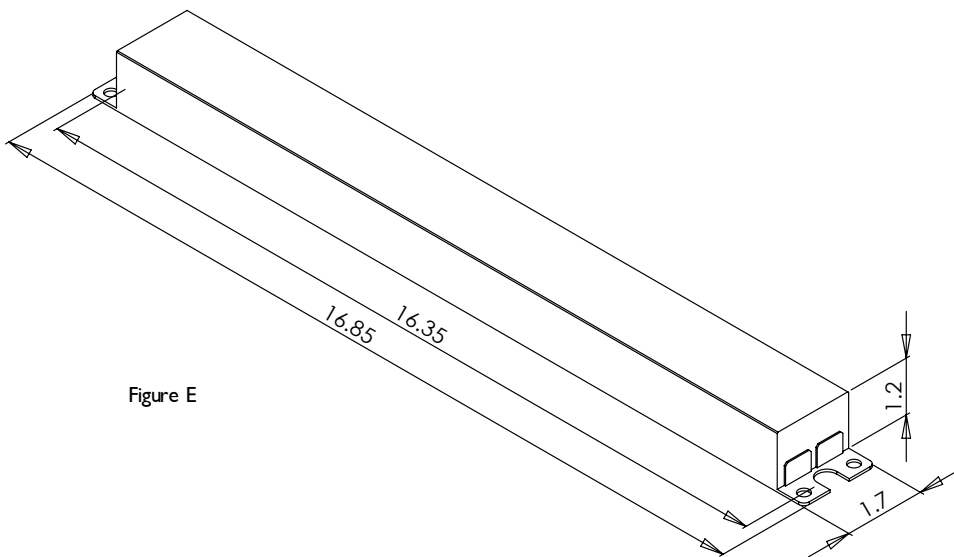


Figure E

# ADDITIONAL INFORMATION

## Case Dimension Index

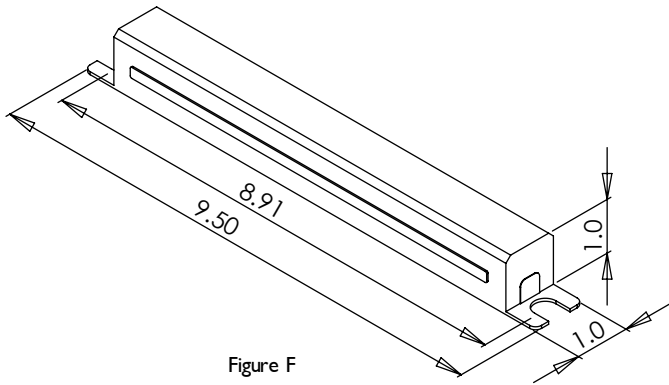


Figure F

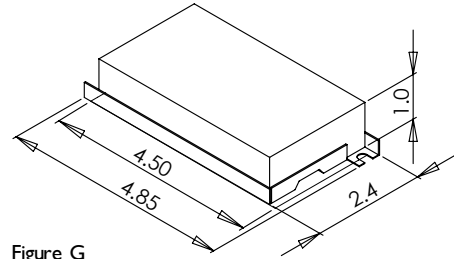


Figure G

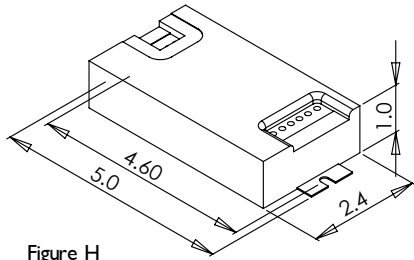


Figure H

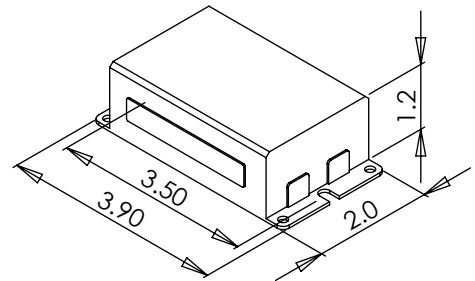


Figure I

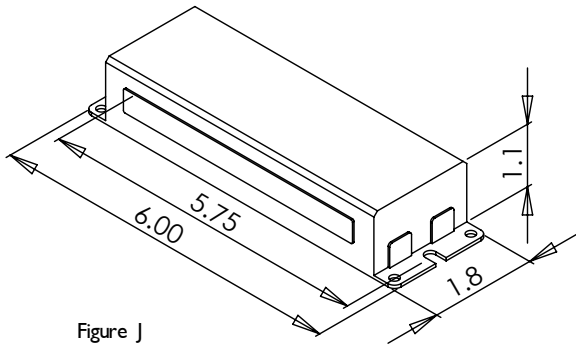


Figure J

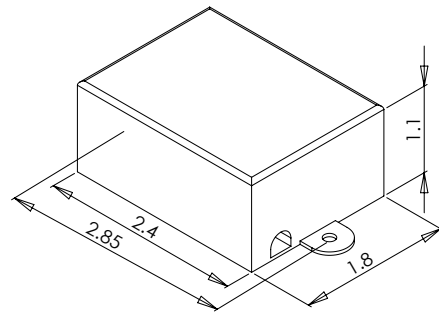


Figure K

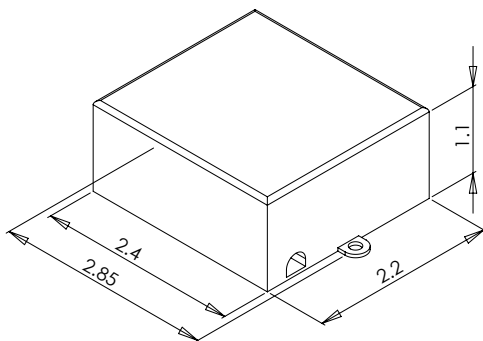


Figure L

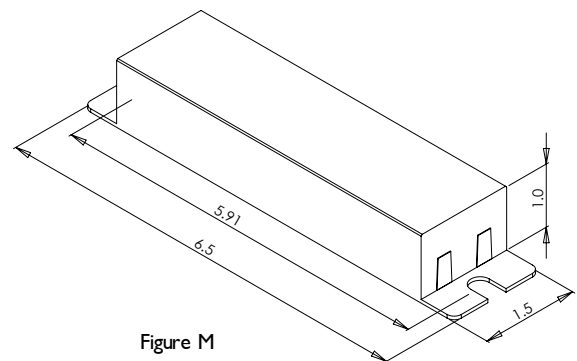


Figure M

# ADDITIONAL INFORMATION

## Case Dimension Index

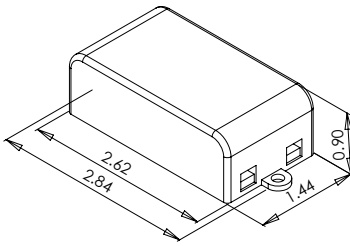


Figure N

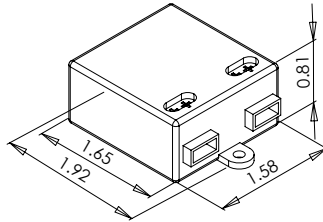


Figure O

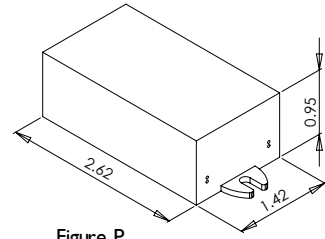


Figure P

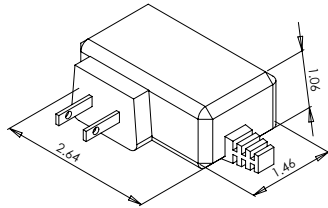


Figure Q

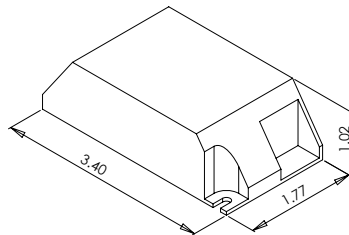


Figure R

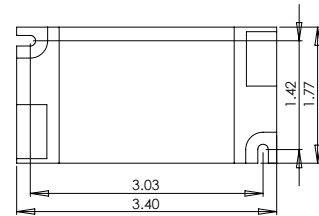


Figure R - Mounting View

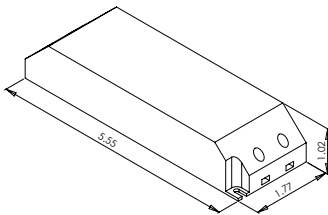


Figure S

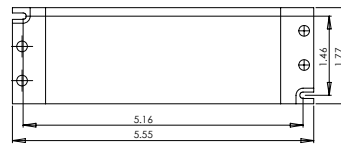


Figure S - Mounting View

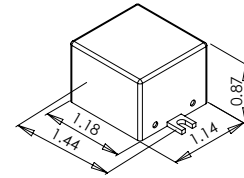


Figure V

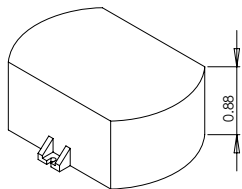


Figure U

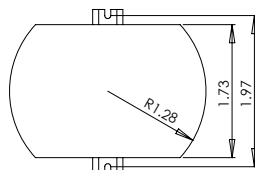


Figure U - Mounting View

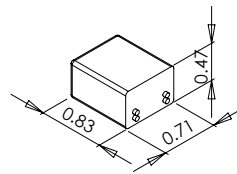


Figure W



# ADDITIONAL INFORMATION

## Case Dimension Index

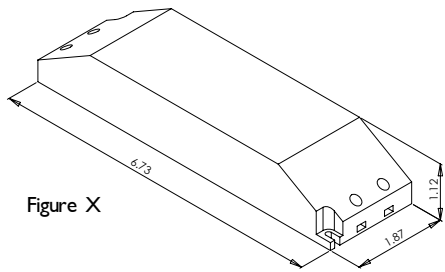


Figure X

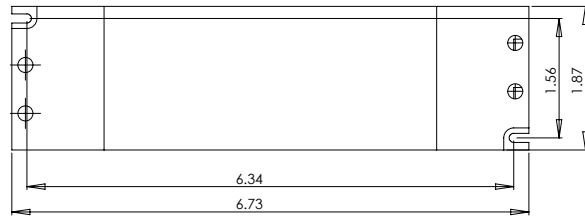


Figure X - Mounting View

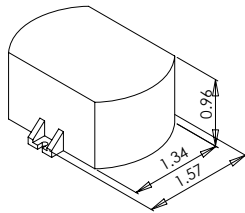


Figure Y

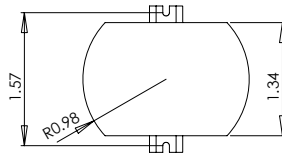


Figure Y - Mounting View

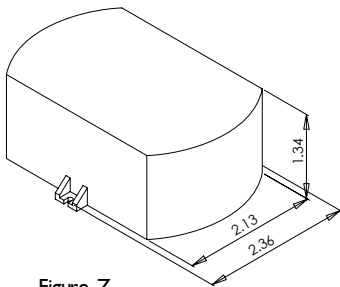


Figure Z

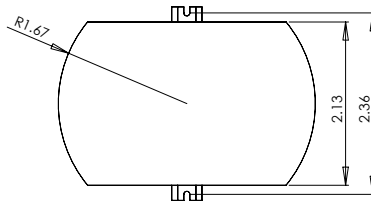


Figure Z - Mounting View

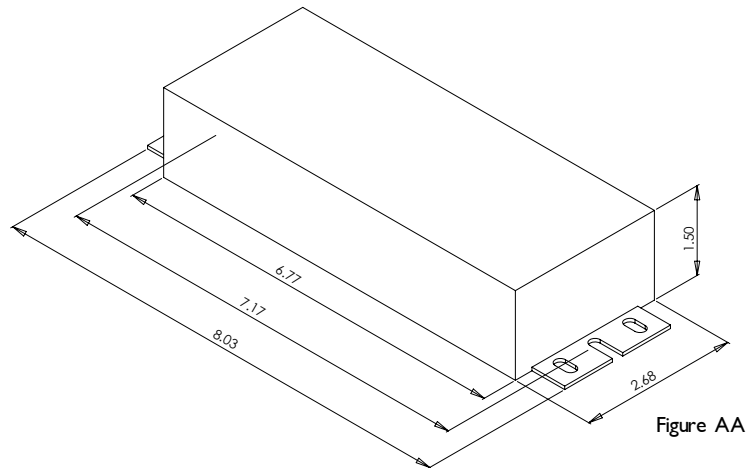


Figure AA

# ADDITIONAL INFORMATION

## Case Dimension Index

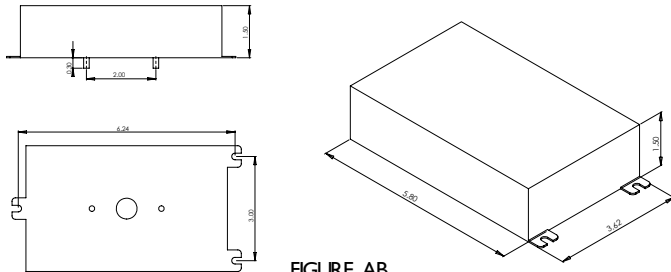


FIGURE AB

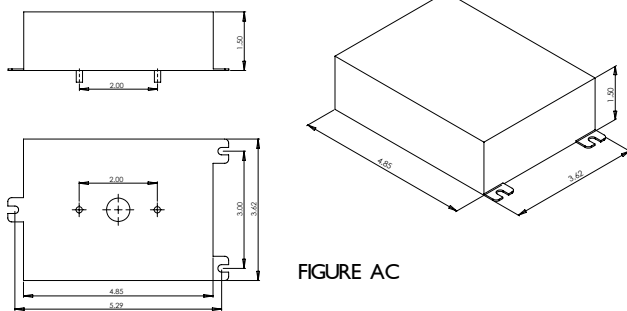


FIGURE AC

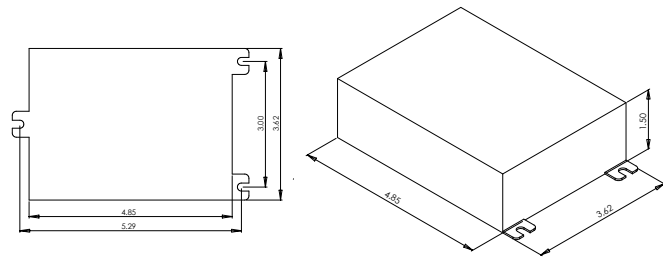


FIGURE AD

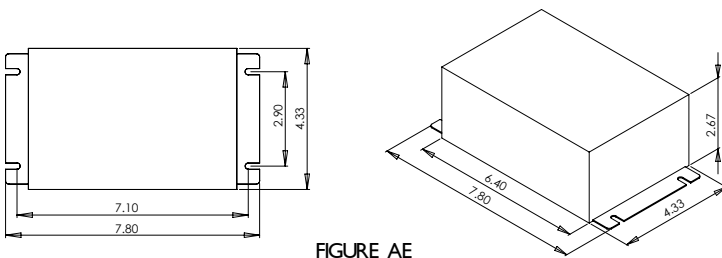


FIGURE AE

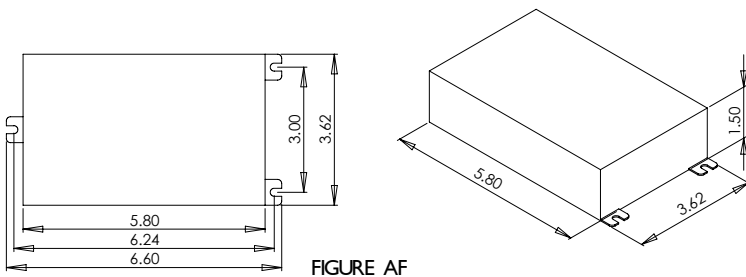


FIGURE AF

# ADDITIONAL INFORMATION

## Case Dimension Index

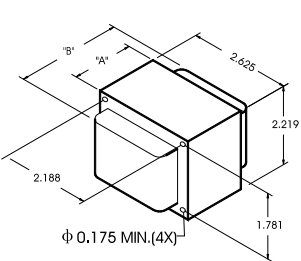


Fig. M1

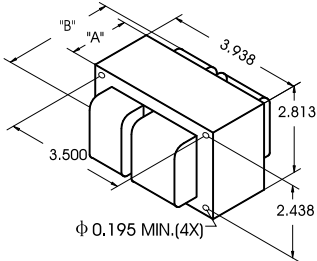


Fig. M2

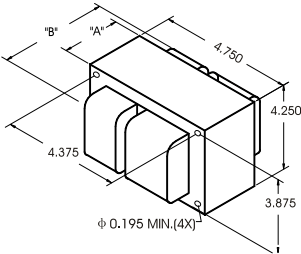


Fig. M3

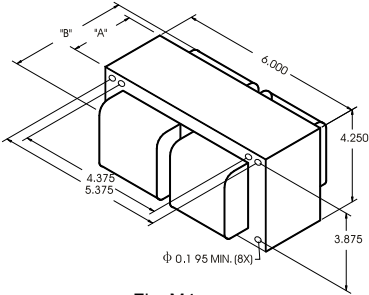


Fig. M4

NOTES

Lined area for notes with horizontal lines.





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VE432MVHIPL	2-11, 2-14, 2-15, 2-17, 2-20, 2-22, 2-25, 2-26, 2-28
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## ESPEN Technology® Ballast Limited Warranty

### PERIOD OF WARRANTY AND COVERAGE

Espen Technology, Inc. ("Espen Technology"), 12257 Florence Ave., Santa Fe Springs, CA 90670, (562) 529-2938, warrants that its ballasts will be free of defects from material and workmanship from the date of manufacture, as indicated by the date code on each product, for the following periods.

Product	Warranty Period
High Power Factor Ballasts (case temperature 75°C or less)	5 Years
High Power Factor Ballasts (case temperature 85°C or less)	3 Years
High Power Factor Ballasts (case temperature 90°C or less)	2 Years
Medium Power Factor Ballasts	2 Years

### CONDITIONS

This express limited warranty is extended by Espen Technology only to the original or first end-user purchaser.

This warranty is conditional upon proper storage, installation, usage and maintenance.

Espen Technology is not responsible for any supplemental equipment not supplied by Espen Technology, which is used in connection with the ballast. Damage to all such supplemental equipment is expressly excluded from this warranty. Espen Technology is not responsible for any damage to the ballast resulting from the use of supplemental equipment not supplied by Espen Technology.

This warranty is not applicable to any ballast which is not installed and operated in accordance with the current edition of the Standards for Safety of Underwriter's Laboratory, Inc. (UL), The National Electric Code (NEC), the Standards for the American National Standards Institute (ANSI), applicable federal, state, and local codes, and with Espen Technology's most recent instructions and application guidelines for ballast installation.

This warranty is not applicable to any Espen Technology manufactured ballast that has been subject to abnormal or excessive stresses and operating conditions.

### WARRANTY CLAIM AND SERVICE

If it appears within the specified warranty period that any Espen Technology ballast does not meet the warranty specified above, Espen Technology, at its sole discretion, will replace or repair the defective ballast.

In order to make a claim under the warranty, the customer must notify Espen Technology in writing, seeking return authorization, and provide the defective product to Espen Technology for evaluation at which time Espen Technology shall determine applicability of warranty. If the product is found to be defective under this warranty, Espen Technology, at its own option, will replace or repair the ballast. Espen Technology may pay a maximum of US\$10 to apply to labor charges at Espen Technology's discretion.

The conditions of any tests concerning ballasts which are alleged to be defective under this warranty shall be mutually agreed upon in writing and Espen Technology shall be notified of and represented at any such tests.

### Returned Goods Authorizations (RGA)

Claimants should contact Espen Technology directly at (562) 529-2938 or 12257 Florence Ave., Santa Fe Springs, CA 90670 for RGAs.

### NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY BEYOND THE AFOREMENTIONED WARRANTY PERIOD.

This warranty is exclusive of all other statutory, written or oral warranties, and no other warranties of any sort, statutory or otherwise, are provided or herein expressed. All Espen Technology's responsibilities regarding the ballast and the claimant's exclusive remedy are set forth by this warranty.

### LIMITATION OF LIABILITY

Under no circumstances will Espen Technology be liable for any consequential, incidental, special or exemplary damages including but not limited to, loss of profits or revenues, loss of use of ballast or any other goods or associated equipment or damage to any associated equipment, cost of capital, cost of substitute products, facilities of services, down time cost, or claims of claimant's customers as a result of breach of contract, breach of warranty, tort, strict liability.

This warranty gives the claimant specific legal rights. The claimant may also possess other rights that vary from state to state.



## ESPEN Technology® T8 Fluorescent System Limited Warranty

*Subject to change without notice*

Espen Technology, Inc. ("Espen") is pleased to offer the following limited warranty covering the Espen T8 fluorescent lamps listed below and Espen linear fluorescent electronic ballasts.

This warranty only applies when Espen lamps are operated with Espen linear electronic ballasts that have been correctly wired and installed; are operated within the electrical values publicized on the ballast specifications; used in lighting equipment designed and approved for the application and in environmental conditions within the normal specified operating range of the system.

### Lamp Remedy:

If an Espen lamp mentioned below fails due to defect in materials or workmanship within the periods/hours of operation indicated below then Espen agrees to supply replacement lamps at no charge. This warranty applies to lamps that are operated on a burning cycle of 10 hours per start or more; operated on Espen linear fluorescent electronic ballasts that have been correctly wired and installed; are operated within the electrical values publicized on the ballast specifications; operated in lighting equipment designed and approved for the application and in environmental conditions (temperature, humidity and air movement) within the normal specified operating range of the system.

F32T8/XX/HE	36 months after date of purchase, or 12,000 hours of operation, whichever comes first
F32T8/XX/ES 28W	30 months after date of purchase, or 10,500 hours of operation, whichever comes first
F32T8/XX/ES 25W	30 months after date of purchase, or 10,500 hours of operation, whichever comes first
F32T8/XX/XHL	36 months after date of purchase, or 12,000 hours of operation, whichever comes first

### Ballast Remedy:

If an Espen linear fluorescent electronic ballast fails due to defects in materials or workmanship within five (5) years after the date of manufacture, then Espen, at its option, will at no charge either (1) replace the defective ballast, including paying a labor allowance that is pre-approved by Espen, or (2) refund the purchase price of the ballast. This warranty applies only to Espen Elite linear fluorescent electronic ballasts that are operating Espen lamps referenced above; have been properly wired and installed; are operated within the electrical values publicized on the ballast specifications; operated in lighting equipment designed and approved for the application and in environmental conditions (temperature, humidity and air movement) within the normal specified operating range of the system.

### Terms and Conditions:

Operation of this lamp/ballast system in frequently-switched applications (5 or more cycles per day) or in conjunction with automated controls (such as, but not limited to, occupancy sensors) will void this warranty. The lamp and ballast warranties do not apply to failures caused by acts of God or as a result of any abuse, misuse, abnormal use, or use in violation of any applicable standard, code or instructions for use in installations including, but not limited to, those contained in the National Electrical Code (NEC), the Standards for Safety of Underwriters Laboratory, Inc. (UL), Standards for the American National Standards Institute (ANSI) or, in Canada, the Canadian Standards Association (CSA). Espen reserves the right to inspect failed lamps and/or ballasts to determine the cause of failure and patterns of usage. The date of purchase and lamp installation date must be verified to validate the elapsed operating hours if a warranty claim is made. If the lamp life is not validated, the lamp date code will be used to establish elapsed burning time based on estimated usage.

The foregoing warranties shall constitute the sole and exclusive remedy of the purchaser and the sole liability of Espen for lamp and ballast warranties. **NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE OR IS TO BE IMPLIED.** In no event shall Espen be liable for any other costs or damages including lost profits, incidental, special or consequential damages.

To Make a Warranty Claim: Retain the failed products and contact Espen within thirty (30) days of the failure. This warranty extends only to the purchaser; however, Espen will honor, under the terms of this limited warranty, valid warranty claims made by the purchaser for the remedy set forth above as a result of warranty claims made to the purchaser by its customers and/or indirect customers.

#### **Headquarters**

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