Lighting Catalog

Ballast, Lamp, LED Specification Guide 2009-2010

Sustainable Lighting Solutions

ESPEN™ TECHNOLOGY

Headquarters
Espen Technology, Inc.
7621 Somerset Blvd.
Paramount, CA 90723

Sales/Customer Service
Toll Free Tel.: (866) 933-7736
Toll Free Fax: (888)503-7736
Tel.: (562) 529-2938
Fax: (562) 529-2978

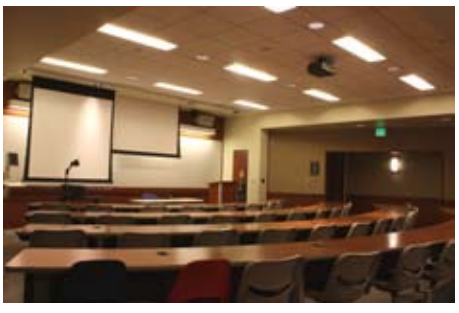
Website
www.espentech.com

Email
info@espentech.com

ESPEN™ TECHNOLOGY

Content

4-15	**Introduction**
4-5	About Espen Technology
14	Ballast Ordering Information
16-57	**Electronic Ballasts**
54-57	Dimming Ballasts
58-61	**Fluorescent Lamps**
62-65	**Compact Fluorescent Lamps**
66-67	**Solid State Lighting**
68-76	**Index**
68-74	Wiring Diagram Index
74-76	Case Dimensions Index
77	**Warranty**



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 the 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

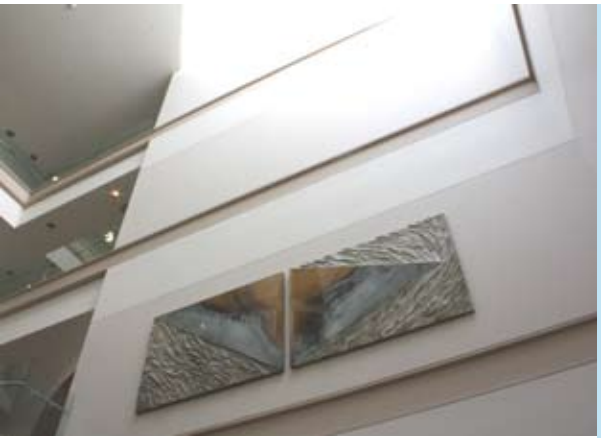
Espen's product line has a strong bias towards energy-efficient products. This commitment is part of a broader effort to proliferate sustainable technology and promote enduring growth.

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, designer, 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.



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.

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.

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.

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

High Efficiency Designation

Blank = Standard Efficiency
E = High Efficiency
(BEF meeting CEE HPT8 standards)

Ballast Factor

Blank = Normal Ballast Factor
H = High Ballast Factor
L = Low Ballast Factor

Additional Description

P = Potted

Lamp Starting Method

I = Instant Start
R = Rapid Start or Programmed Start

Power Factor

H = High Power Factor
M = Normal Power Factor

Input Voltage

120 = 120V
MV = Universal Input (120V through 277V)

Lamp Watts (Primary Lamp)

Maximum Number of Lamps

Espen Manufacturer Prefix

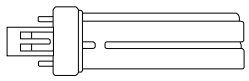
ADDITIONAL INFORMATION

Electronic Ballast - Symbols and Footnotes

X - Normal Power Factor

ELECTRONIC BALLASTS

For 13W - 26W Quad Lamps



T4 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
CFQ13W/G24q - 13W CFL Quad Lamp												
1	120	PS	Stratus	**VE113120MR**	14	0.92	150	0.21	0/-18	I	16	X
	120-277	PS	Elite	**VE213MVHRP-C**	18	1.00	10	0.15-0.07	0/-18	H	21	
				VE213MVHRP-W	18	1.00	10	0.15-0.07	0/-18	G	20	
2	120	PS	Stratus	**VE213120MR**	27	0.92	150	0.43	0/-18	J	12	X
	120-277	PS	Elite	**VE213MVHRP-C**	30	1.00	10	0.26-0.11	0/-18	H	19	
				VE213MVHRP-W	30	1.00	10	0.26-0.11	0/-18	G	18	
CFQ18W/G24q - 18W CFL Quad Lamp												
1	120	PS	Stratus	**VE118120MR**	17	0.88	150	0.27	0/-18	I	16	X
	120-277	PS	Elite	**VE218MVHRP-C**	21	1.00	10	0.17-0.08	0/-18	H	21	
				VE218MVHRP-W	21	1.00	10	0.17-0.08	0/-18	G	20	
2	120	PS	Stratus	**VE218120MR**	35	0.88	135	0.57	0/-18	J	12	X
	120-277	PS	Elite	**VE218MVHRP-C**	40-39	0.95	10	0.33-0.15	0/-18	H	19	
				VE218MVHRP-W	40-39	0.95	10	0.33-0.15	0/-18	G	18	
CFQ26W/G24q - 26W CFL Quad Lamp												
1	120	PS	Stratus	**VE126120MR**	26	0.92	150	0.50	0/-18	I	16	X
	120-277	PS	Elite	**VE226MVHRP-C**	30	1.00	10	0.25-0.11	0/-18	H	21	
				VE226MVHRP-W	30	1.00	10	0.25-0.11	0/-18	G	20	
2	120	PS	Stratus	**VE226120MR**	45	0.88	150	0.68	0/-18	J	12	X
	120-277	PS	Elite	**VE226MVHRP-C**	58-56	0.97	10	0.48-0.21	0/-18	H	19	
				VE226MVHRP-W	58-56	0.97	10	0.48-0.21	0/-18	G	18	

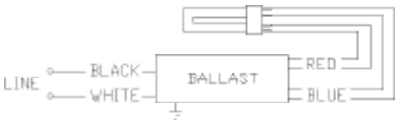


Diagram 16

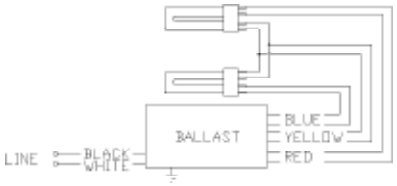


Diagram 18

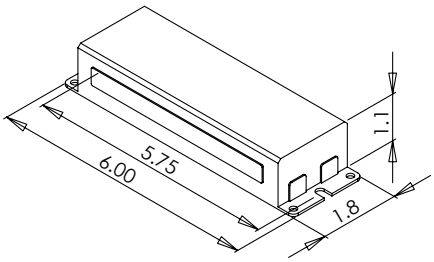


Figure J

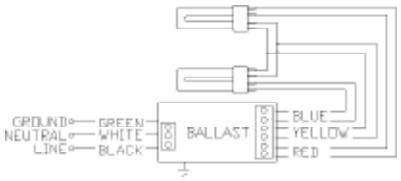


Diagram 19

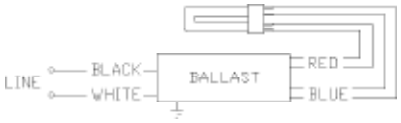
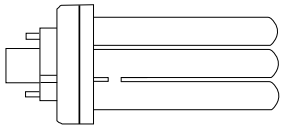


Diagram 16



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
CFTR13W/GX24q - 13W CFL Triple Tube												
1	120	PS	Stratus	**VE113120MR**	14	0.92	150	0.21	0/-18	I	16	X
	120-277	PS	Elite	**VE213MVHRP-C**	18	1.00	10	0.15-0.07	0/-18	H	21	
				VE213MVHRP-W	18	1.00	10	0.15-0.07	0/-18	G	20	
2	120	PS	Stratus	**VE213120MR**	27	0.92	150	0.43	0/-18	J	12	X
	120-277	PS	Elite	**VE213MVHRP-C**	30	1.00	10	0.26-0.11	0/-18	H	19	
				VE213MVHRP-W	30	1.00	10	0.26-0.11	0/-18	G	18	
CFTR18W/GX24q - 18W CFL Triple Tube												
1	120	PS	Stratus	**VE118120MR**	19	0.88	150	0.27	0/-18	I	16	X
	120-277	PS	Elite	**VE218MVHRP-C**	21	1.00	10	0.17-0.08	0/-18	H	21	
				VE218MVHRP-W	21	1.00	10	0.17-0.08	0/-18	G	20	
2	120	PS	Stratus	**VE218120MR**	35	0.88	135	0.57	0/-18	J	12	X
	120-277	PS	Elite	**VE218MVHRP-C**	40-39	0.95	10	0.33-0.15	0/-18	H	19	
				VE218MVHRP-W	40-39	0.95	10	0.33-0.15	0/-18	G	18	

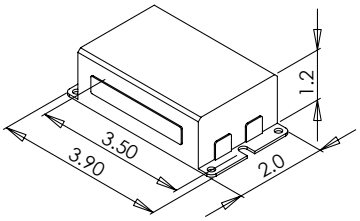


Figure I

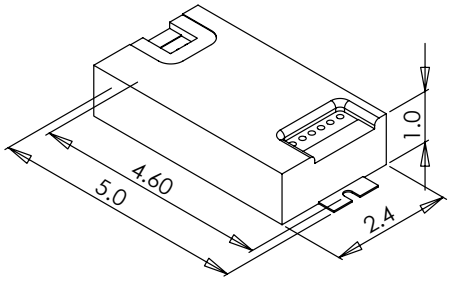


Figure H

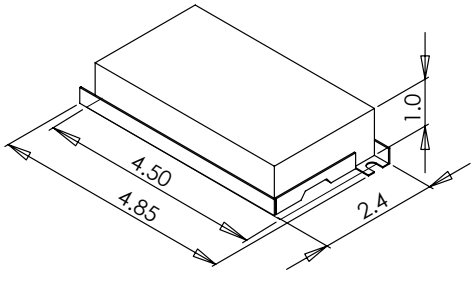


Figure G

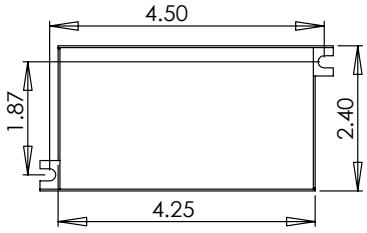
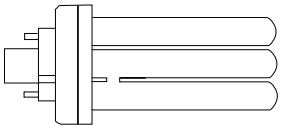


Figure G - Mounting



ELECTRONIC BALLASTS

For 26W-42W Triple Lamps

T4 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
CFTR26W/GX24q - 26W CFL Triple Tube												
1	120	PS	Stratus	**VE126120MR**	26	0.92	150	0.50	0/-18	I	16	**X**
	120-277	PS	Elite	**VE226MVHRP-C**	30	1.00	10	0.25-0.11	0/-18	H	21	
				VE226MVHRP-W	30	1.00	10	0.25-0.11	0/-18	G	20	
2	120	PS	Stratus	**VE226120MR**	45	0.88	150	0.68	0/-18	J	12	**X**
	120-277	PS	Elite	**VE226MVHRP-C**	58-56	0.97	10	0.48-0.21	0/-18	H	21	
				VE226MVHRP-W	58-56	0.97	10	0.48-0.21	0/-18	G	20	
CFTR32W/GX24q - 32W CFL Triple Tube												
1	120-277	PS	Elite	**VE226MVHRP-C**	36	0.98	10	0.31-0.13	0/-18	H	21	
				VE226MVHRP-W	36	0.98	10	0.31-0.13	0/-18	G	20	
CFTR42W/GX24q - 42W CFL Triple Tube												
1	120-277	PS	Elite	**VE226MVHRP-C**	46	0.98	10	0.38-0.17	0/-18	H	21	
				VE226MVHRP-W	46	0.98	10	0.38-0.17	0/-18	]G	20	

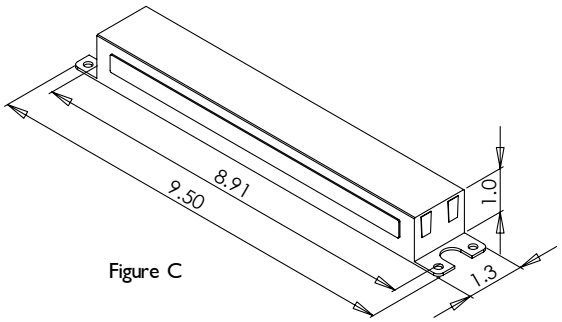


Figure C

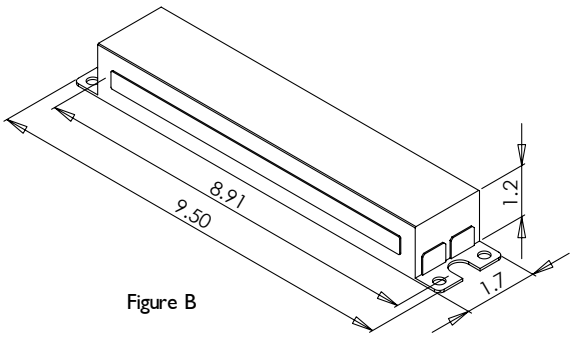
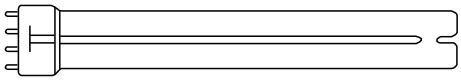


Figure B



FT5 Lamps

ELECTRONIC BALLASTS

For 36W/39W 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
FT36W/2G11 - 36/39W												
1	120	IS	Apollo	**VE232120HIP**	32	0.80	30	0.30	0/-18	C	22	
	120-277	IS	Elite	**VE232MVHIP**	32	0.80	20	0.29	0/-18	C	22	
				VE232MVHIPH	39	1.00	10	0.33-0.14	0/-18	C	22	
		PS	Elite	**VE254MVHRP**	46	1.20	20	0.38-0.18	0/-18	C	24	
2	120	IS	Apollo	**VE232120HIP**	49	0.70	25	0.42	0/-18	C	23	
				VE332120HIP	50	0.70	20	0.43	0/-18	C	23	
				VE332120HIPH	67	0.88	10	0.56	0/-18	C	26	
	120-277	IS	Elite	**VE332MVHIP**	64	0.85	10	0.53-0.23	0/-18	C	26	
				VE232MVHIPH	52	0.72	10	0.44-0.19	0/-18	C	23	
				VE332MVHIPH	67	0.88	10	0.56-0.24	0/-18	C	26	
		PS	Elite	**VE254MVHRP**	89-87	1.18	15	0.71-0.31	0/-18	C	25	
3	120	IS	Apollo	**VE332120HIP**	74	0.68	20	0.62	0/-18	C	27	
				VE332120HIPH	91	0.83	20	0.75	0/-18	C	27	
				VE432120HIP	76	0.68	10	0.64	0/-18	C	28	
	120-277	IS	Elite	**VE332MVHIP**	71	0.68	10	0.59-0.26	0/-18	C	27	
				VE332MVHIPH	91	0.82	10	0.75-0.32	0/-18	C	27	
				VE432MVHIP	77	0.68	10	0.65-0.28	0/-18	C	28	
				VE432MVHIPH	97	0.88	10	0.82-0.36	0/-18	B	28	
		PS	Elite	**VE454MVHRP**	135-133	1.20	20	1.09-0.49	0/-18	E	30	
4	120	IS	Apollo	**VE432120HIP**	94	0.65	10	0.79	0/-18	C	29	
	120-277	IS	Elite	**VE432MVHIP**	95	0.65	10	0.80-0.35	0/-18	C	29	
				VE432MVHIPH	118	0.82	10	0.99-0.43	0/-18	B	29	
		PS	Elite	**VE454MVHRP**	178-174	1.18	15	1.42-0.62	0/-18	E	31	

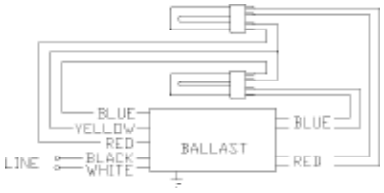


Diagram 12

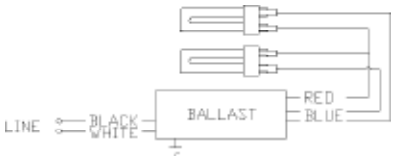


Diagram 23

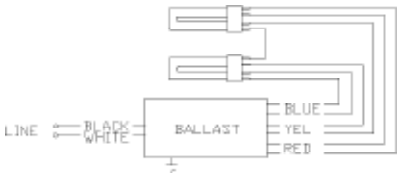


Diagram 25

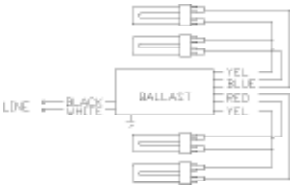


Diagram 29

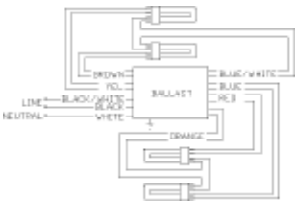
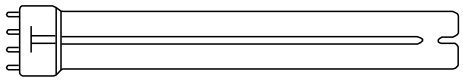


Diagram 31

ELECTRONIC BALLASTS

For 40W-55W 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
FT40W/2G11 - 40W												
1	120	IS	Apollo	**VE232120HIP**	43	0.98	30	0.37	0/-18	C	22	
	120-277	IS	Elite	**VE232MVHIP**	39	0.90	10	0.33-0.14	0/-18	C	22	
				VE232MVHIPH	51	1.25	10	0.42-.018	0/-18	C	22	
2	120	IS	Apollo	**VE332120HIP**	70	0.98	10	0.59	0/-18	C	26	
				VE332120HIPH	92	1.10	10	0.77		C	26	
	120-277	IS	Elite	**VE332MVHIP**	70	0.98	10	0.59-0.26	0/-18	C	26	
				VE332MVHIPH	92	1.10	10	0.77-0.33	0/-18	C	26	
				VE332MVHIPL	60	0.82	10	0.50-0.22	0/-18	C	26	
3	120	IS	Apollo	**VE432120HIP**	103	0.88	10	0.86	0/-18	C	28	
	120-277	IS	Elite	**VE432MVHIP**	104	0.88	10	0.87-0.38	0/-18	C	28	
				VE432MVHIPH	130	1.10	10	1.08-0.47	0/-18	B	28	
FT50W/2G11 - 50W												
1	120-277	PS	Elite	**VE254MVHRP**	61-60	1.20	10	0.51-0.22	0/-18	C	24	
2	120-277	PS	Elite	**VE254MVHRP**	118-115	1.12	10	0.99-0.42	0/-18	C	25	
3	120-277	PS	Elite	**VE454MVHRP**	179-176	1.15	10	1.51-0.65	0/-18	E	30	
4	120-277	PS	Elite	**VE454MVHRP**	236-230	1.12	10	1.98-0.84	0/-18	E	31	
FT55W/2G11 - 55W												
1	120-277	PS	Elite	**VE254MVHRP**	58	0.93	20	0.51-0.22	0/-18	C	24	
2	120-277	PS	Elite	**VE254MVHRP**	112-109	0.91	10	0.94-0.40	0/-18	C	25	
3	120-277	PS	Elite	**VE454MVHRP**	170-167	0.93	10	1.45-0.62	0/-18	E	30	
4	120-277	PS	Elite	**VE454MVHRP**	224-218	0.91	10	1.88-0.80	0/-18	E	31	

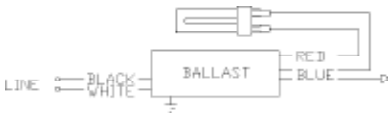


Diagram 22

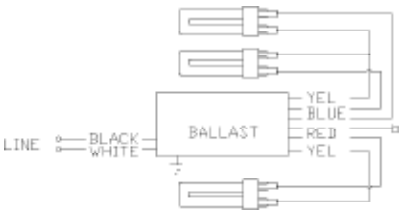


Diagram 28

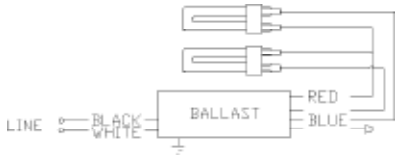


Diagram 26

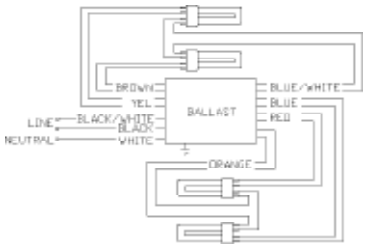
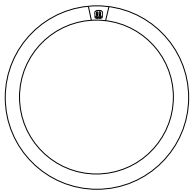


Diagram 31



T5/HO Circular

ELECTRONIC BALLASTS

For 55W T5/HO Circular 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
FC12T5/HO - 55W												
1	120-277	PS	Elite	**VE254MVHRP**	55	0.88	20	0.45-0.20	0/-18	C	32	
2	120-277	PS	Elite	**VE254MVHRP**	106-103	0.86	10	0.87-0.37	0/-18	C	33	
3	120-277	PS	Elite	**VE454MVHRP**	161-158	0.88	20	1.32-0.57	0/-18	E	34	
4	120-277	PS	Elite	**VE454MVHRP**	212-206	0.86	10	1.74-0.74	0/-18	E	35	

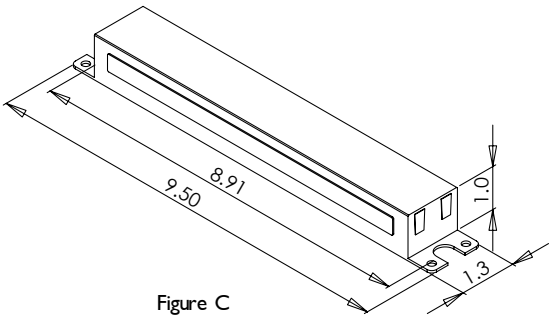


Figure C

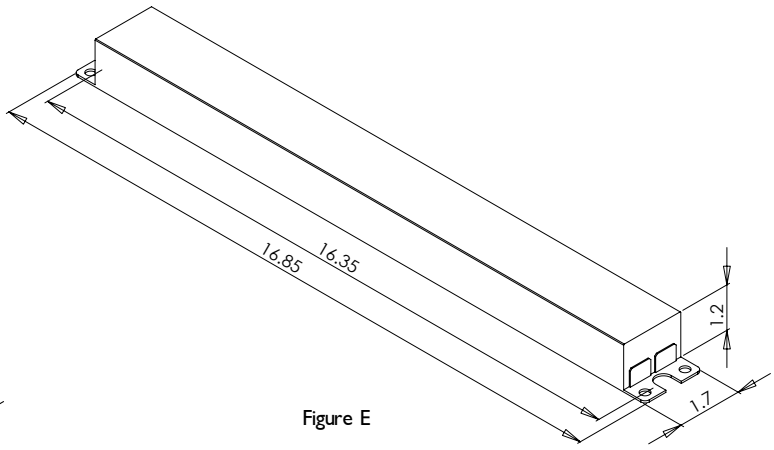


Figure E

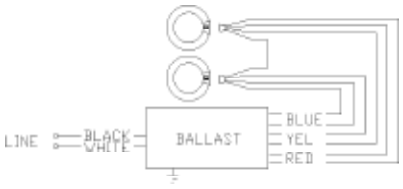


Diagram 33

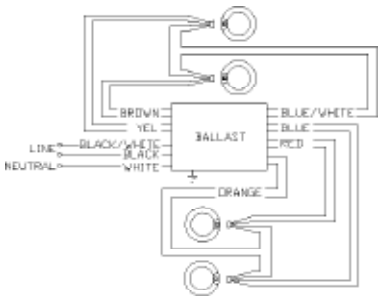


Diagram 35

ELECTRONIC BALLASTS

For 8W - 28W T5 Lamps

T5 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
F8T5 - 8W												
1	120	PS	Panther	**VE114120MRP**	10	1.30	135	0.16	0/-18	F	36	**X**
2	120	PS	Panther	**VE214120MRP**	18	1.20	135	0.28	0/-18	C	8	**X**
(1) F8T5 & (1) F13T5 - 8W & 13W												
2	120	PS	Panther	**VE214120MRP**	22	1.05	135	0.35	0/-18	C	8	**X**
F13T5 - 13W												
1	120	PS	Panther	**VE114120MRP**	14	1.00	135	0.21	0/-18	F	36	**X**
2	120	PS	Panther	**VE214120MRP**	26	0.92	135	0.40	0/-18	C	8	**X**
F14T5 - 14W												
1	120	PS	Panther	**VE114120MRP**	14	0.95	135	0.21	0/-18	F	36	**X**
2	120	PS	Panther	**VE214120MRP**	26	0.88	135	0.40	0/-18	C	8	**X**
F21T5 - 21W												
1	120	PS	Panther	**VE128120MRP**	21	0.92	135	0.35	0/-18	F	36	**X**
				VE228120MRP	21	0.88	135	0.26	0/-18	C	37	**X**
2	120	PS	Panther	**VE228120MRP**	40	0.88	135	0.67	0/-18	C	8	**X**
F28T5 - 28W												
1	120	PS	Panther	**VE128120MRP**	28	0.92	135	0.47	0/-18	F	36	**X**
				VE228120MRP	28	0.88	135	0.49	0/-18	C	37	**X**
2	120	PS	Panther	**VE228120MRP**	54	0.88	135	0.90	0/-18	C	8	**X**

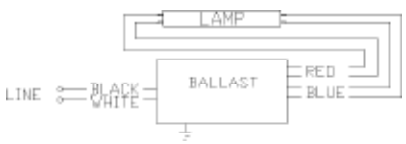


Diagram 36

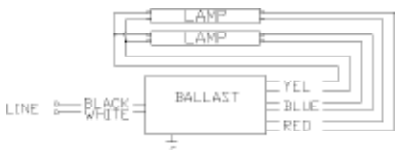


Diagram 8

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
F54T5/HO - 54W												
1	120-277	PS	Elite	**VE254MVHRP**	62	1.03	10	0.52-0.23	0/-18	C	37	
2	120-277	PS	Elite	**VE254MVHRP**	120-117	1.00	10	1.00-0.43	0/-18	C	9	
3	120-277	PS	Elite	**VE454MVHRP**	182-179	1.03	10	1.52-0.66	0/-18	E	39	
4	120-277	PS	Elite	**VE454MVHRP**	240-234	1.00	10	2.00-0.86	0/-18	E	10	

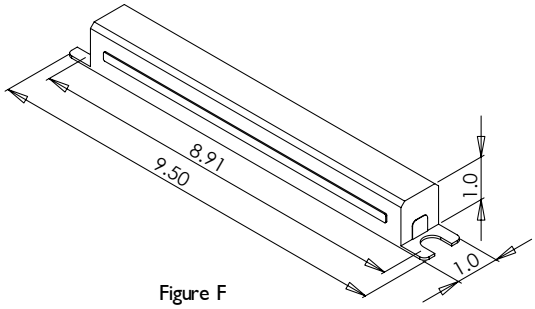


Figure F

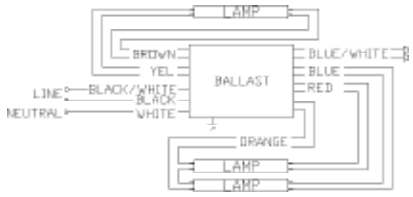


Diagram 39

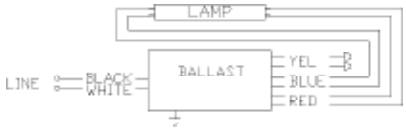


Diagram 37

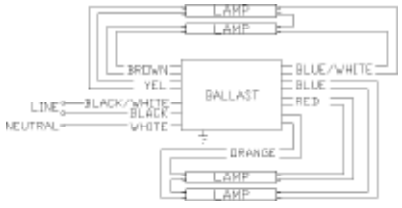


Diagram 10

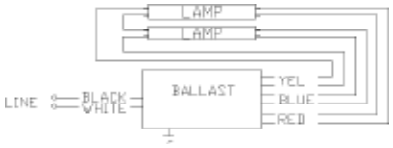


Diagram 9

ELECTRONIC BALLASTS

For 15W - 17W T8 Lamps

T8 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
F15T8 - 15W												
1	120	RS	Stratus	**VE118120MR**	15	0.88	150	0.24	0/-18	I	36	**X**
		IS	Panther	**VE232120MIP**	17	1.10	165	0.26	0/-18	C	40	**X**
				VE232120MIP(S)	17	1.10	165	0.26	0/-18	M	1	**X**
2	120	IS	Panther	**VE232120MIP**	26	0.90	165	0.37	0/-18	C	2	**X**
				VE232120MIP(S)	26	0.90	165	0.37	0/-18	M	41	**X**
F17T8 - 17W												
1	120	IS	Apollo	**VE132120HIP**	18	0.94	30	0.17	0/-18	C	1	
				VE232120HIP	21	1.15	35	0.20	0/-18	C	40	
			Panther	**VE232120MIP**	19	1.05	165	0.27	0/-18	C	40	**X**
				VE232120MIP(S)	19	1.05	165	0.27	0/-18	M	1	**X**
		RS	Stratus	**VE118120MR**	17	0.88	150	0.27	0/-18	I	36	**X**
	120-277	IS	Elite	**VE132MVHIP**	17	0.93	10	0.15-0.07	0/-18	C	1	
				VE232MVHIP	22	1.10	10	0.18-0.08	0/-18	C	40	
				VE232MVHIPH	25	1.42	20	0.22-0.11	0/-18	C	40	
				VE232MVHIPL	19	0.90	20	0.16-0.07	0/-18	C	40	
				VE232MVHIPE	19	1.06	15	0.17-0.08	0/-18	C	40	
				VE232MVHIPHE	23	1.41	20	0.21-0.10	0/-18	C	40	
				VE232MVHIPLE	18	0.90	20	0.15-0.07	0/-18	C	40	
		PS	Elite	**VE232MVHRPE**	17	0.97	15	0.14-0.07	0/-18	C	40	

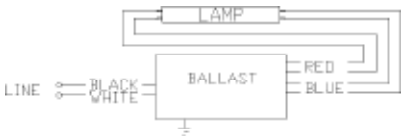


Diagram 36

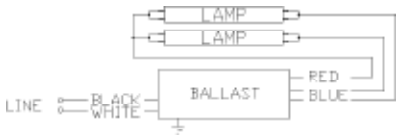


Diagram 2

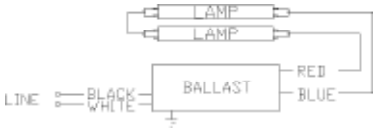


Diagram 41

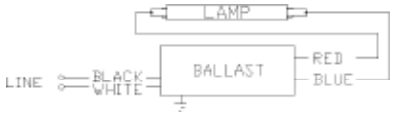


Diagram 1

T8 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
F17T8 - 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	C	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	
				VE232MVHIPLE	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	
				VE332MVHIPLE	32	0.90	20	0.27-0.13	0/-18	C	42	
		PS	Elite	**VE232MVHRPE**	29	0.90	10	0.24-0.11	0/-18	C	9	

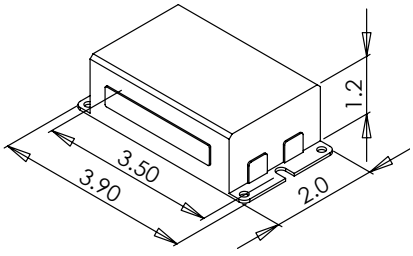


Figure I

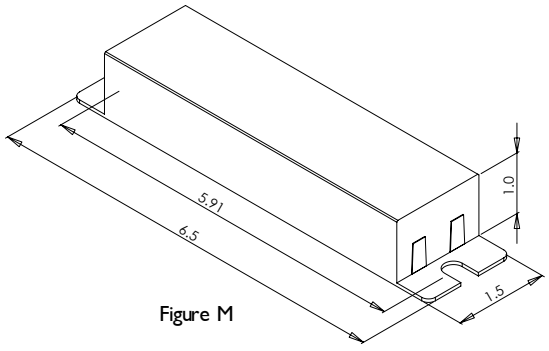


Figure M

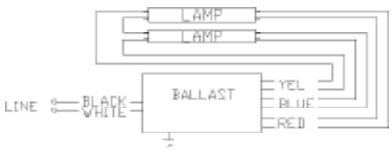


Diagram 9

ELECTRONIC BALLASTS

For 17W T8 Lamps

T8 Linear

F17T8 - 17W

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
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	
				VE332MVHIPLE	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	
				VE432MVHIPLE	44	0.87	20	0.37-0.18	0/-18	C	43	
		PS		**VE332MVHRPE**	43	0.88	10	0.36-0.16	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	
				VE432MVHIPLE	54-52	0.81	10	0.46-0.19	0/-18	C	4	

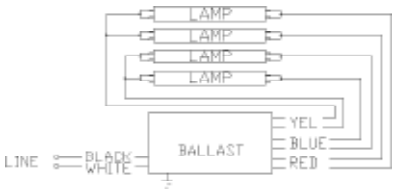


Diagram 4

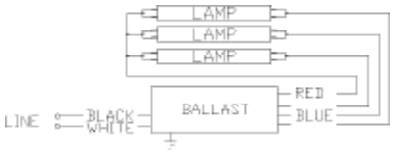
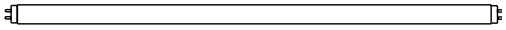


Diagram 3



T8 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
F18T8 - 18W												
1	120	PS	Stratus	**VE118120MR**	18	1.00	150	0.28	0/-18	I	36	**X**
		IS	Panther	**VE232120MIP**	18	1.00	150	0.26	0/-18	C	40	**X**
				VE232120MIP(S)	18	1.00	150	0.26	0/-18	M	1	**X**
2	120	IS	Panther	**VE232120MIP**	27	0.75	150	0.38	0/-18	C	2	**X**
				VE232120MIP(S)	27	0.75	150	0.38	0/-18	M	41	**X**

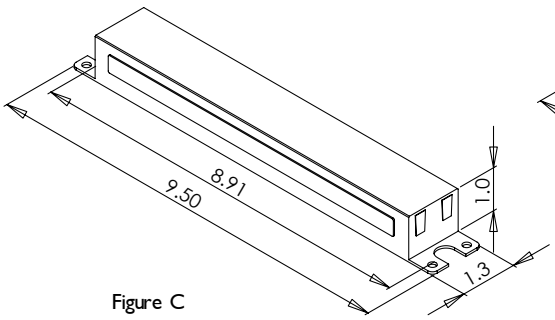


Figure C

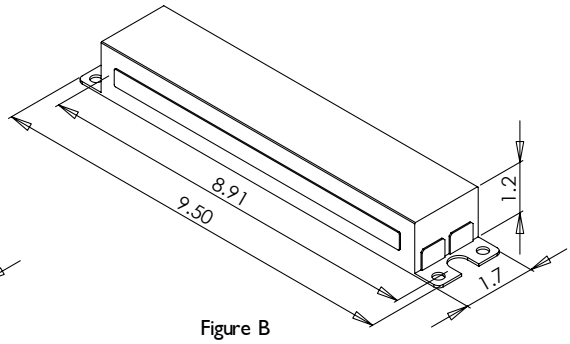


Figure B

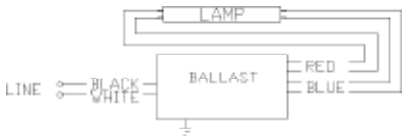


Diagram 36

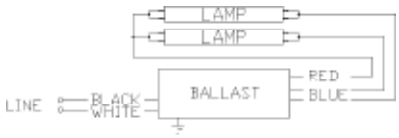


Diagram 2

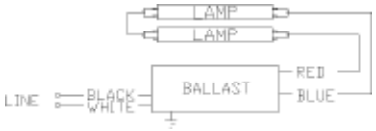


Diagram 41

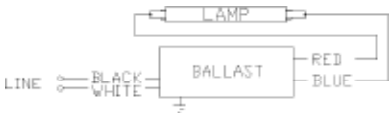
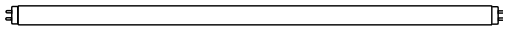


Diagram 1

ELECTRONIC BALLASTS

For 25W - 36" T8 Lamps



T8 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
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	
				VE232MVHIPLE	24	0.90	10	0.20-0.09	0/-18	C	40	
		PS	Elite	**VE232MVHRPE**	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	
			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
	120-277	IS	Elite	**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	
				VE232MVHIPLE	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	
				VE332MVHIPLE	44	0.87	10	0.37-0.17	0/-18	C	42	
		PS	Elite	**VE232MVHRPE**	43	0.89	10	0.36-0.16	0/-18	C	9	
				VE232MVHRPHE	57	1.20	10	0.48-0.21	0/-18	C	9	

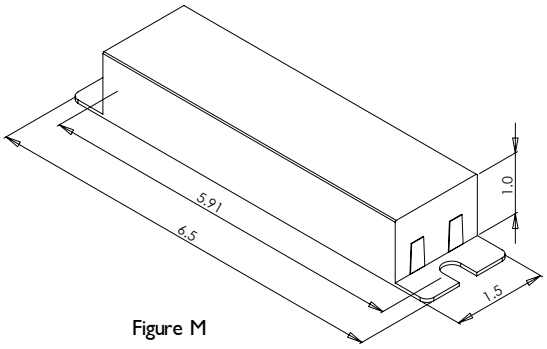
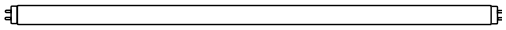


Figure M



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
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	
				VE332120MIPH	85	1.06	135	1.36	0/-18	A	3	
				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	
				VE332MVHIPLE	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	
				VE432MVHIPLE	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	

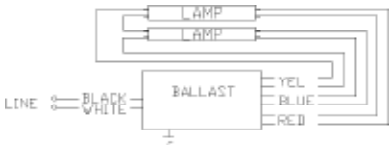


Diagram 9

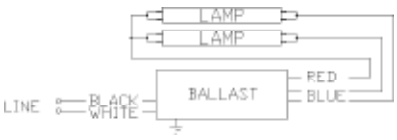


Diagram 2

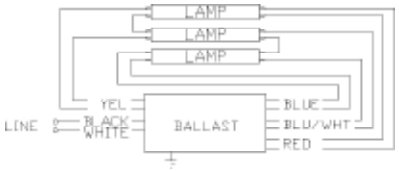


Diagram 44

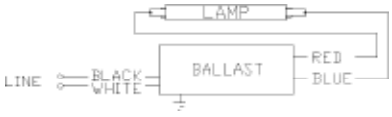


Diagram 1

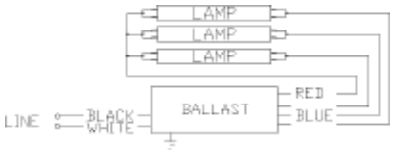
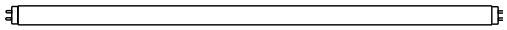


Diagram 3

ELECTRONIC BALLASTS

For 25W - 36" T8 Lamps



T8 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
F25T8 - 25W												
4	120	IS	Apollo	**VE432120HIP**	89	0.94	20	0.74	0/-18	C	4	
			Panther	**VE432120MIP**	79	0.82	135	1.30	0/-18	C	4	**X**
	120-277	IS	Elite	**VE432MVHIP**	87-85	0.89	10	0.72-0.32	0/-18	C	4	
				VE432MVHIPH	110-108	1.18	10	0.92-0.40	0/-18	B	4	
				VE432MVHIPL	76-74	0.78	10	0.64-0.27	0/-18	C	4	
				VE432MVHIPE	86	0.89	10	0.73-0.32	0/-18	C	4	
				VE432MVHIPHE	109-109	1.17	10	0.92-0.40	0/-18	B	4	
				VE432MVHIPLE	76-74	0.78	10	0.64-0.27	0/-18	C	4	

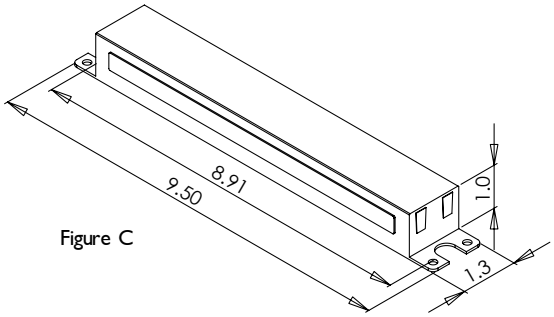


Figure C

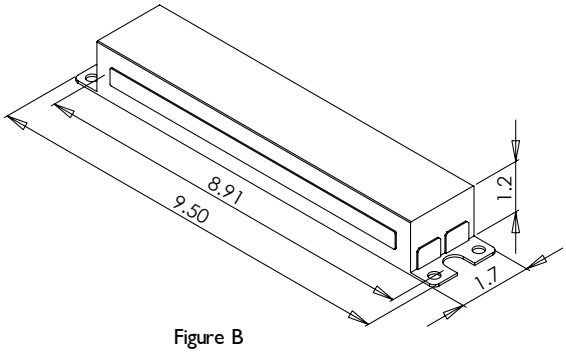


Figure B

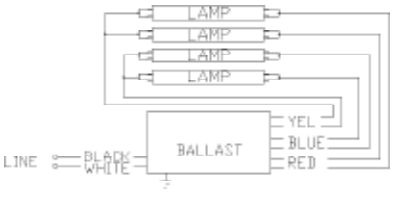


Diagram 4

T8/ES 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
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	
				VE232MVHIPLE	24	0.90	10	0.20-0.09	0/-18	C	40	
		PS	Elite	**VE232MVHRPE**	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	
				VE232MVHIPLE	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	
				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	
				VE332MVHIPLE	44	0.87	10	0.37-0.17	0/-18	C	42	
		PS	Elite	**VE232MVHRPE**	50-49	0.98	10	0.42-0.18	0/-18	C	9	
				VE232MVHRPHE	60	1.19	10	0.51-0.22	0/-18	C	9	

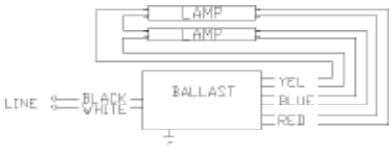


Diagram 9

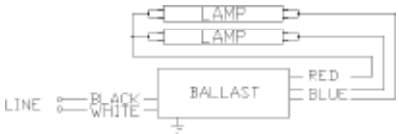


Diagram 2

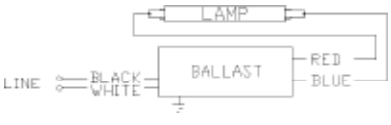
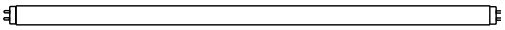


Diagram 1

ELECTRONIC BALLASTS

For 25W - 48" T8 Lamps



T8/ES 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
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	
				VE332MVHIPLE	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	
				VE432MVHIPLE	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	4	
			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	
				VE432MVHIPLE	76	0.77	10	0.65-0.28	50/10	C	4	

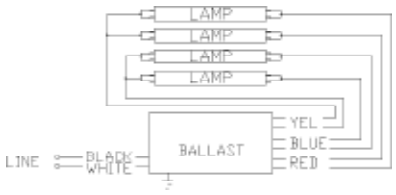


Diagram 4

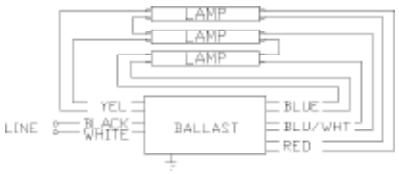
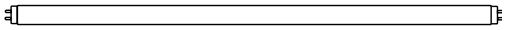


Diagram 44



T8/ES Linear

F32T8/ES - 28W

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
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	
				VE232MVHIPLE	26	0.90	10	0.22-0.10	0/-18	C	40	
		PS	Elite	**VE232MVHRPE**	27	0.90	10	0.22-0.10	0/-18	C	37	

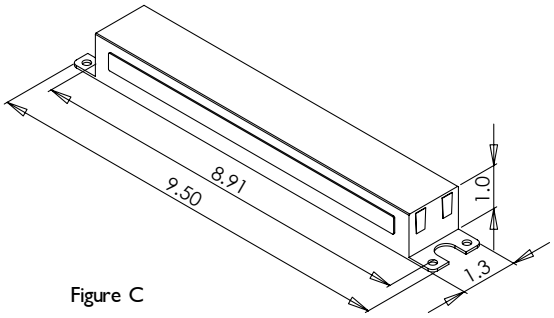


Figure C

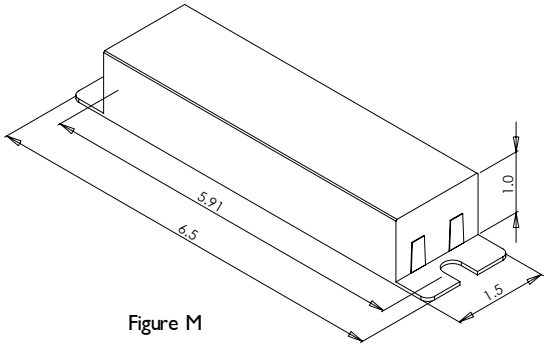


Figure M

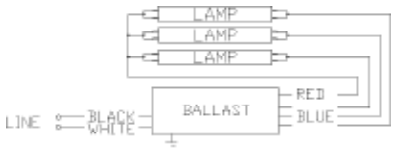


Diagram 3

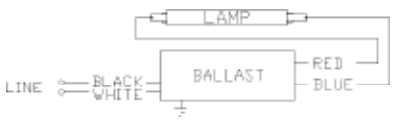
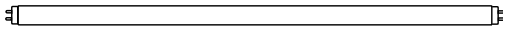


Diagram 1

ELECTRONIC BALLASTS

For 28W - 48" T8 Lamps



T8/ES 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
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	
				VE232MVHIPLE	26	0.90	10	0.22-0.10	0/-18	C	2	
				VE232MVHIPLE	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	
				VE332MVHIPLE	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	

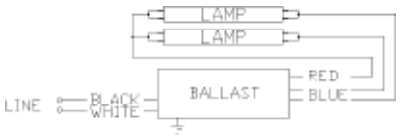


Diagram 2

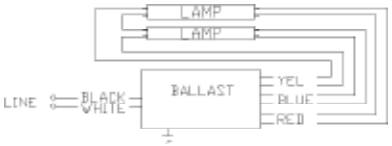


Diagram 9

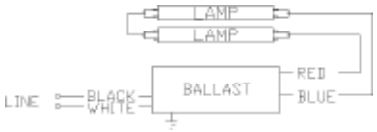


Diagram 41

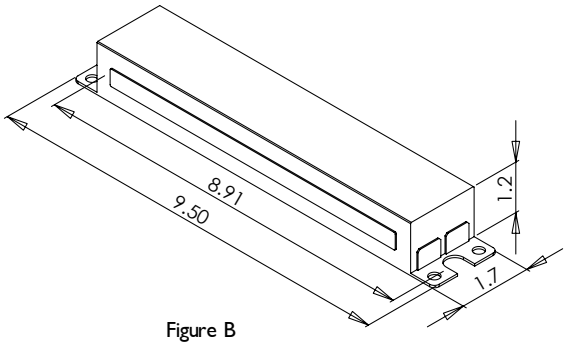


Figure B

T8/ES Linear

F32T8/ES - 28W

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
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	
				VE332MVHIPLE	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	
				VE432MVHIPLE	69-68	0.85	10	0.57-0.25	0/-18	C	43	
		PS	Elite	**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	
				VE432MVHIPLE	84-82	0.77	10	0.71-0.30	50/10	C	4	

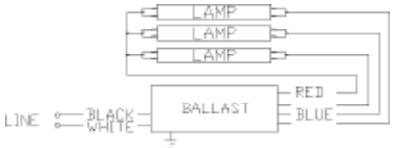


Diagram 3

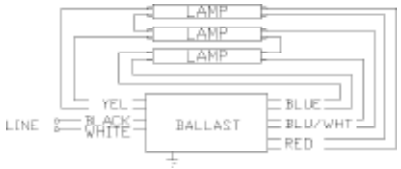


Diagram 44

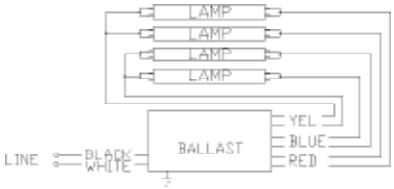
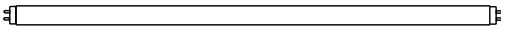


Diagram 4

ELECTRONIC BALLASTS

For 30W - 48" T8 Lamps



T8/ES Linear

F32T8/ES - 30W

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
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	
				VE232MVHIPLE	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	
				VE232MVHIPLE	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	
				VE332MVHIPL	52	0.85	10	0.45/0.20	50/10	C	42	
				VE332MVHIPLE	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	

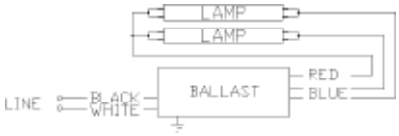


Diagram 2

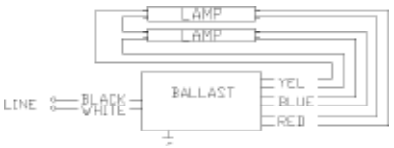


Diagram 9

T8/ES Linear

F32T8/ES - 30W

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
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	
				VE332MVHIPLE	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	
				VE432MVHIPLE	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	
				VE432MVHIPLE	90-88	0.77	10	0.76-0.32	0/-18	C	4	

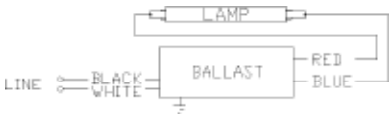


Diagram 1

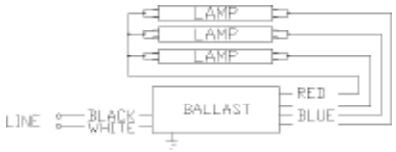


Diagram 3

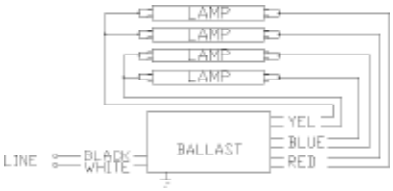


Diagram 4

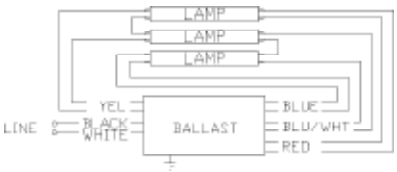
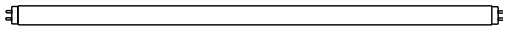


Diagram 44

ELECTRONIC BALLASTS

For 32W T8 Lamps



T8 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
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	

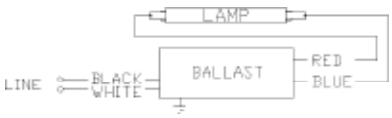


Diagram 1

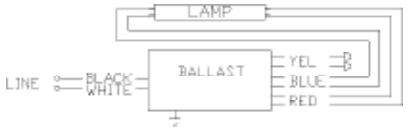


Diagram 37

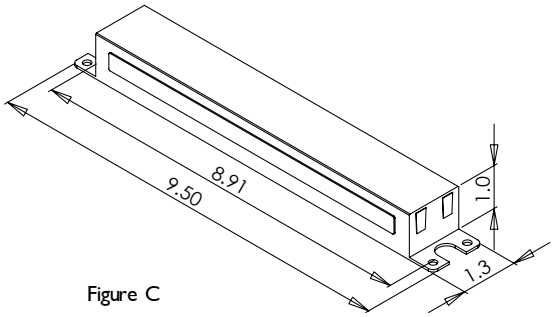
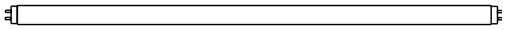


Figure C



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
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	
				VE232MVHIPLE	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	
				VE332MVHIPLE	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	

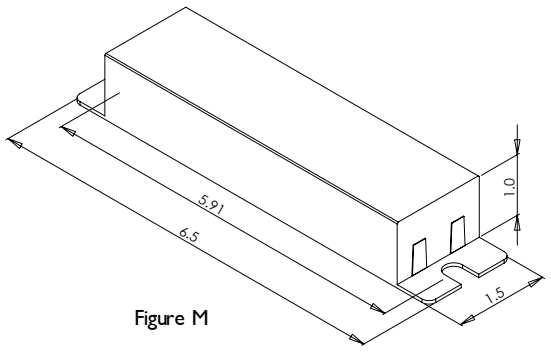


Figure M

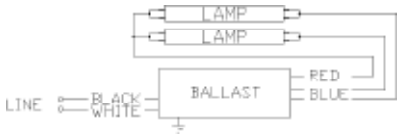


Diagram 2

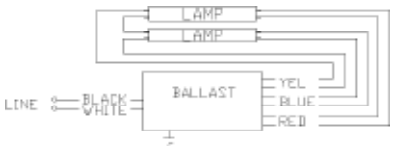


Diagram 9

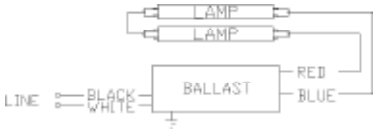
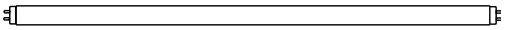


Diagram 41

ELECTRONIC BALLASTS

For 32W T8 Lamps



T8 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
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	

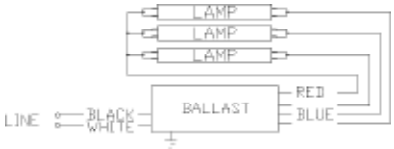


Diagram 3

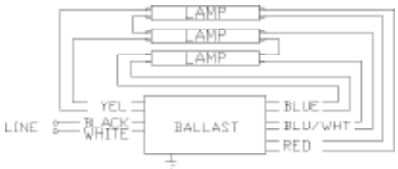
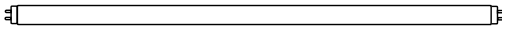


Diagram 44



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
F32T8 - 32W												
4	120	IS	Apollo	**VE432120HIP**	112	0.88	20	0.93	0/-18	C	4	
			Panther	**VE432120MIP**	106	0.82	145	1.57	0/-18	C	4	**X**
	120-277	IS	Elite	**VE432MVHIP**	112-108	0.88	10	0.93-0.40	0/-18	C	4	
				VE432MVHIPH	145	1.16	10	1.24-0.53	0/-18	B	4	
				VE432MVHIPL	98-96	0.77	10	0.82-0.35	0/-18	C	4	
				VE432MVHIPE	110-108	0.88	10	0.94-0.40	0/-18	C	4	
				VE432MVHIPHE	145-144	1.16	10	1.24-0.53	0/-18	B	4	
				VE432MVHIPLE	98-96	0.77	10	0.82-0.35	0/-18	C	4	

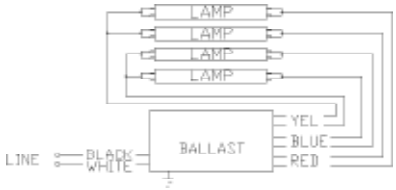


Diagram 4

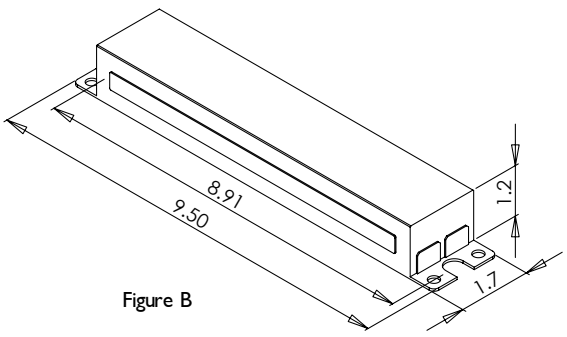


Figure B

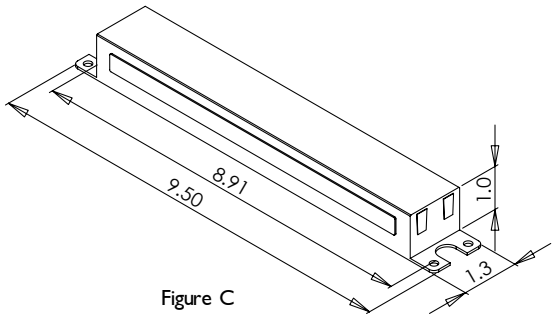
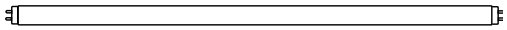


Figure C

ELECTRONIC BALLASTS

For 40W T8 Lamps



T8 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
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**
				VE232120MIPH	49	1.14	170	0.84	0/-18	C	40	**X**
	120-277	IS	Elite	**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	
				VE232MVHIPLE	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	

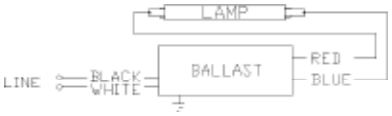


Diagram 1

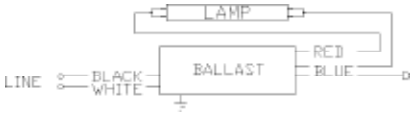


Diagram 40

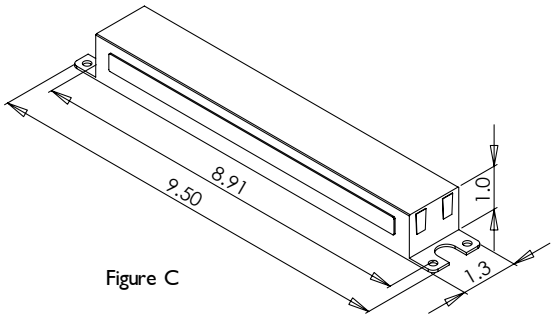


Figure C

T8 Linear

F40T8 - 40W

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
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	
				VE332MVHIPHE	102	1.30	10	0.86-0.37	32/0	C	42	
				VE332MVHIPLE	68	0.87	10	0.50-0.26	32/0	C	42	
3	120	IS	Apollo	**VE432120HIP**	112	0.88	20	0.93	0/-18	C	43	
	120-277	IS	Elite	**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	
				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	
				VE432MVHIPLE	98-96	0.84	10	0.82-0.35	32/0	C	43	

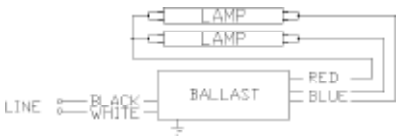


Diagram 2

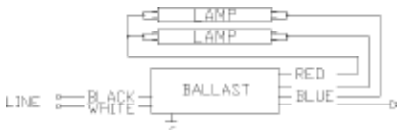


Diagram 42

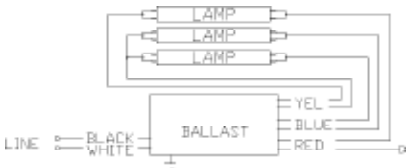


Diagram 43

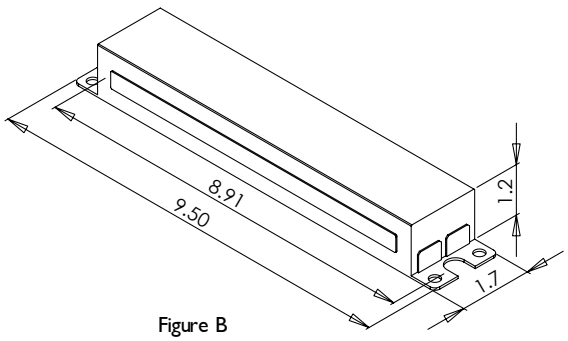


Figure B

ELECTRONIC BALLASTS

For 46W - 59W T8 Lamps

T8 Slimline

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	**VE259120HIP**	52	1.20	10	0.44	32/0	C	46	
	120-277	IS	Elite	**VE259MVHIP**	58	1.20	10	0.48-0.21	32/0	C	46	
2	120	IS	Apollo	**VE259120HIP**	88	1.05	10	0.74	32/0	C	6	
	120-277	IS	Elite	**VE259MVHIP**	90	1.15	10	0.75-0.32	32/0	C	6	
F96T8/ES - 51W												
1	120	IS	Apollo	**VE259120HIP**	59	1.10	20	0.49	32/0	C	46	
	120-277	IS	Elite	**VE259MVHIP**	59	1.10	10	0.49-0.22	32/0	C	46	
2	120	IS	Apollo	**VE259120HIP**	96	1.00	20	0.81	32/0	C	6	
	120-277	IS	Elite	**VE259MVHIP**	96-95	1.00	10	0.81-0.35	32/0	C	6	
F96T8/ES - 54W												
1	120	IS	Apollo	**VE259120HIP**	57	1.05	20	0.47	32/0	C	46	
	120-277	IS	Elite	**VE259MVHIP**	57	1.05	10	0.47-0.21	32/0	C	46	
2	120	IS	Apollo	**VE259120HIP**	93	0.87	10	0.77	32/0	C	6	
	120-277	IS	Elite	**VE259MVHIP**	93	0.87	10	0.77-0.33	32/0	C	6	
F96T8/ES - 57W												
1	120	IS	Apollo	**VE259120HIP**	68	1.10	10	0.60	32/0	C	46	
	120-277	IS	Elite	**VE259MVHIP**	63	1.09	10	0.53-0.23	32/0	C	46	
2	120	IS	Apollo	**VE259120HIP**	106	0.90	10	0.90	32/0	C	6	
	120-277	IS	Elite	**VE259MVHIP**	104	0.90	10	0.86-0.37	32/0	C	6	
F96T8 - 59W												
1	120	IS	Apollo	**VE259120HIP**	68	1.09	10	0.57	32/0	C	46	
	120-277	IS	Elite	**VE259MVHIP**	68-67	1.09	10	0.57-0.25	32/0	C	46	
2	120	IS	Apollo	**VE259120HIP**	110	0.88	10	0.93	32/0	C	6	
	120-277	IS	Elite	**VE259MVHIP**	108-106	0.88	10	0.92-0.40	32/0	C	6	

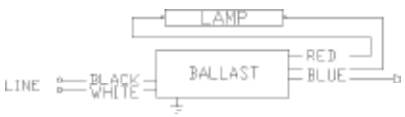


Diagram 46

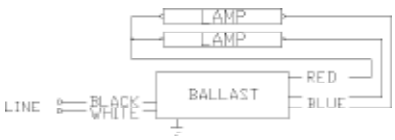
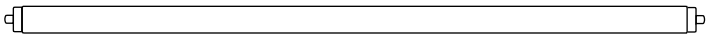


Diagram 6



T8/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
F96T8/HO - 86W												
1	120	IS	Apollo	**VE259120HIP**	92	1.05	10	0.77	32/0	C	7	
	120-277	IS	Elite	**VE259MVHIP**	92-91	1.05	10	0.77-0.33	32/0	C	7	

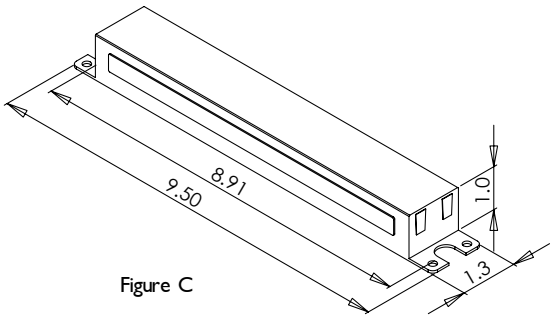


Figure C

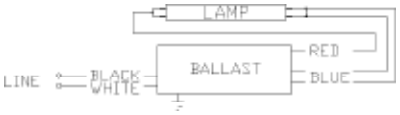


Diagram 7

ELECTRONIC BALLASTS

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

T10 and T12 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
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
2	120	RS	Apollo	**VE240120HRP**	62	0.85	25	0.50	0/-18	C	8	
		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	

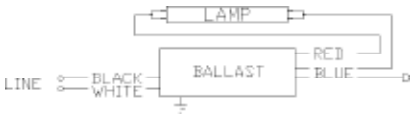


Diagram 40

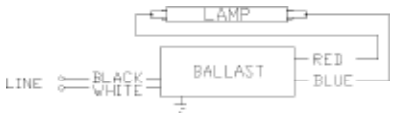


Diagram 1

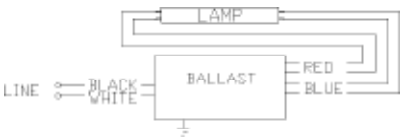


Diagram 36

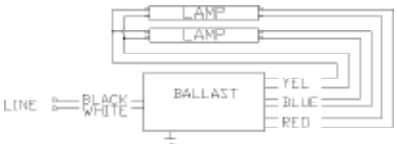
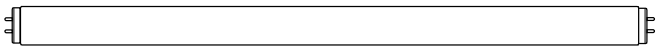


Diagram 8



T12 Linear

ELECTRONIC BALLASTS

For 34 - 40W 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")												
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	

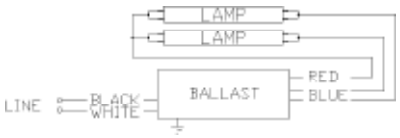


Diagram 2

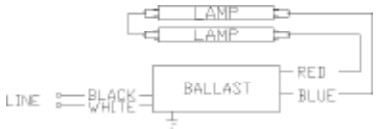


Diagram 41

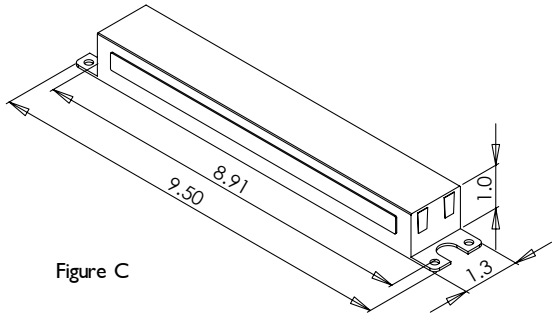


Figure C

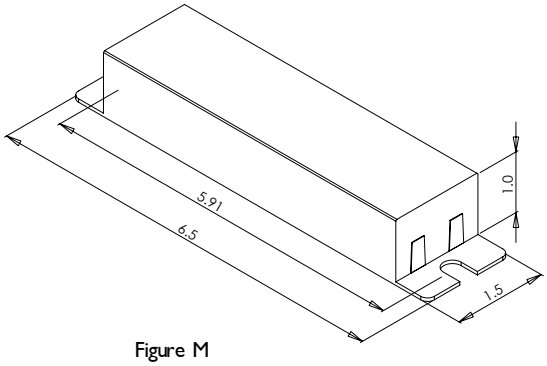


Figure M

ELECTRONIC BALLASTS

For 25W T12 Lamps

T12 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
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	
			Panther	**VE432120MIP**	77	1.00	150	1.16	0/-18	C	43	X
	120-277	IS	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	
				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	

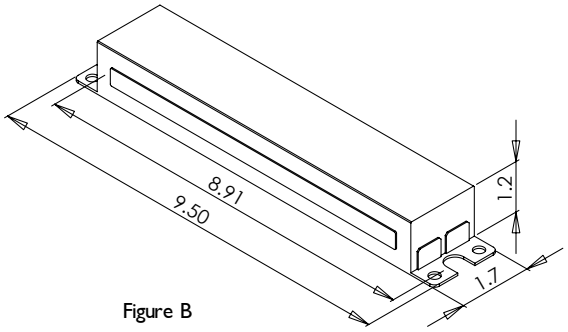


Figure B

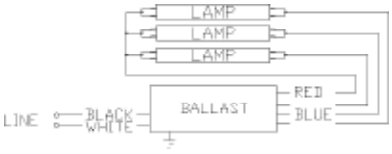


Diagram 3

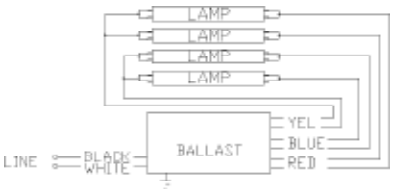


Diagram 4

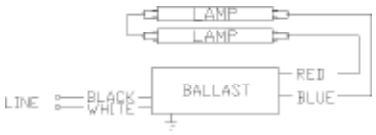
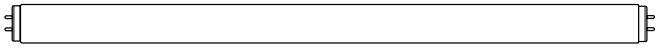


Diagram 41



T12 Linear

ELECTRONIC BALLASTS

For 34-40W 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 - 34W (48")												
1	120	IS	Apollo	**VE232120HIP**	29	0.65	32	0.28	0/-18	C	2	
			Panther	**VE232120MIP**	27	0.80	165	0.39	0/-18	C	40	X
				VE232120MIP(S)	27	0.80	165	0.39	0/-18	M	1	X
		PS	Apollo	**VE140120HRP**	35	1.00	20	0.29	0/-18	C	36	
	120-277	IS	Elite	**VE232MVHIP**	26	0.60	10	0.22-0.10	0/-18	C	40	
				VE232MVHIPH	34	0.95	10	0.28-0.12	0/-18	C	40	
2	120	IS	Apollo	**VE232120HIP**	43	0.70	25	0.37	0/-18	C	2	
				VE332120HIP	45	0.70	20	0.38	0/-18	C	42	
				VE332120HIPH	62	0.75	10	0.50	0/-18	C	42	
			Panther	**VE232120MIP**	42	0.65	165	0.58	0/-18	C	2	X
				VE232120MIP(S)	42	0.65	165	0.58	0/-18	M	41	X
		RS	Apollo	**VE240120HRP**	62	0.85	25	0.53	0/-18	C	8	
	120-277	IS	Elite	**VE232MVHIP**	41	0.60	10	0.35-0.15	0/-18	C	2	
				VE232MVHIPH	53	0.82	10	0.44-0.19	0/-18	C	2	
				VE332MVHIP	45	0.60	10	0.38-0.16	0/-18	C	42	
				VE332MVHIPH	62	0.75	10	0.51-0.22	0/-18	C	42	
				VE332MVHIPL	42	0.60	10	0.34-0.15	0/-18	C	42	
		RS	Elite	**VE240MVHRP**	62-61	0.85	10	0.55-0.23	0/-18	C	8	
3	120	IS	Apollo	**VE332120HIP**	60	0.60	20	0.50	0/-18	C	3	
				VE332120HIPH	80	0.75	10	0.67	0/-18	C	3	
				VE432120HIP	64	0.60	10	0.54	0/-18	C	43	
			Panther	**VE432120MIP**	65	0.60	150	1.00	0/-18	C	43	X
	120-277	IS	Elite	**VE332MVHIP**	60	0.60	10	0.50-0.22	0/-18	C	3	
				VE332MVHIPH	80	0.75	10	0.67-0.29	0/-18	C	3	
				VE332MVHIPL	56	0.60	10	0.46-0.20	0/-18	C	3	
				VE432MVHIP	65	0.60	10	0.55-0.24	0/-18	C	43	
				VE432MVHIPH	84	0.75	10	0.71-0.31	0/-18	B	43	
4	120	IS	Apollo	**VE432120HIP**	78	0.60	10	0.66	0/-18	C	4	
			Panther	**VE432120MIP**	77	0.60	150	1.18	0/-18	C	4	X
	120-277	IS	Elite	**VE432MVHIP**	77	0.60	10	0.65-0.28	0/-18	C	4	
				VE432MVHIPH	101	0.75	10	0.84-0.36	0/-18	B	4	

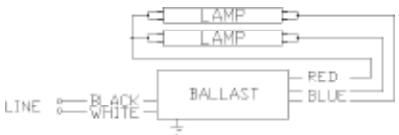


Diagram 2

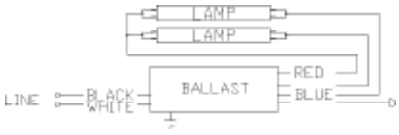


Diagram 42

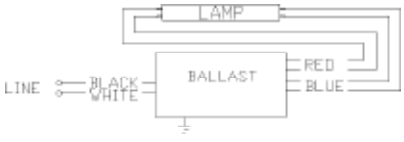


Diagram 36

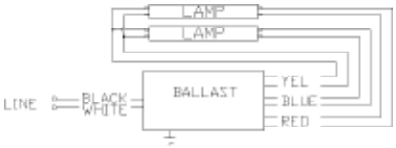


Diagram 8

ELECTRONIC BALLASTS

For 40W T12 Lamps

T12 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
F48T12 - 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
		RS	Apollo	**VE140120HRP**	40	1.00	20	0.31	0/-18	C	36	
	120-277	IS	Elite	**VE232MVHIP**	31	0.65	10	0.26-0.11	0/-18	C	40	
				VE232MVHIPH	41	1.10	10	0.35-0.15	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
		RS	Apollo	**VE240120HRP**	74	0.85	20	0.62	0/-18	C	8	
	120-277	IS	Elite	**VE232MVHIP**	50	0.65	10	0.42-0.18	0/-18	C	2	
				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	
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	
				VE432MVHIP	78	0.72	10	0.66-0.29	0/-18	C	43	
				VE432MVHIPH	101	0.72	10	0.84-0.36	0/-18	B	43	
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	

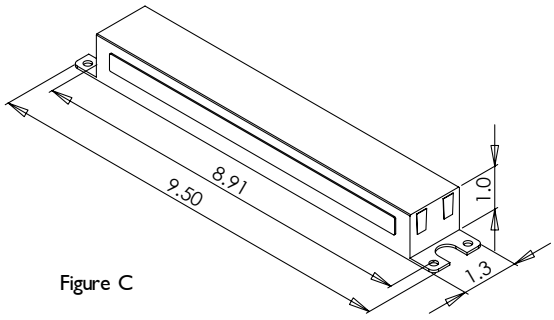


Figure C

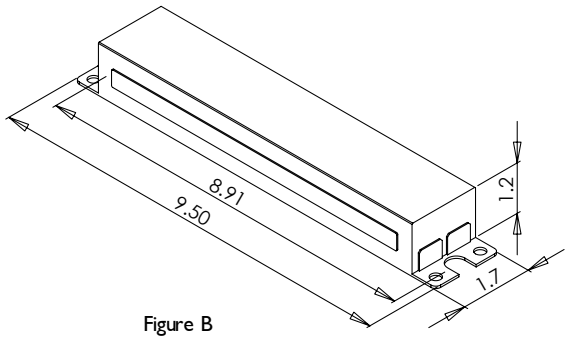
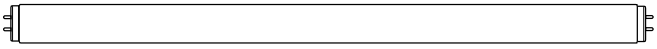


Figure B



T12 Slimline

ELECTRONIC BALLASTS

For 55W - 75W 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
F72T12 - 55W												
1	120	IS	Apollo	**VE275120HIP**	64	1.02	10	0.54	0/-18	B	46	
	120/277	IS	Elite	**VE275MVHIP**	64-63	1.02	10	0.54-0.23	0/-18	B	46	
2	120	IS	Apollo	**VE275120HIP**	106	0.90	10	0.85	0/-18	B	6	
	120/277	IS	Elite	**VE275MVHIP**	106-104	0.90	10	0.85-0.37	0/-18	B	6	
F96T12/ES - 60W												
1	120	IS	Apollo	**VE275120HIP**	64	1.00	10	0.54	50/10	B	46	
	120-277	IS	Elite	**VE275MVHIP**	64	1.00	10	0.54-0.23	50/10	B	46	
2	120	IS	Apollo	**VE275120HIP**	105	0.88	10	0.88	50/10	B	6	
	120-277	IS	Elite	**VE275MVHIP**	105-104	0.88	10	0.88-0.38	50/10	B	6	
F96T12 - 75W												
1	120	IS	Apollo	**VE275120HIP**	82	1.02	10	0.68	0/-18	B	46	
	120-277	IS	Elite	**VE275MVHIP**	82-81	1.02	10	0.68-0.29	0/-18	B	46	
2	120	IS	Apollo	**VE275120HIP**	135	0.88	10	1.13	0/-18	B	6	
	120-277	IS	Elite	**VE275MVHIP**	135-133	0.88	10	1.13-0.49	0/-18	B	6	

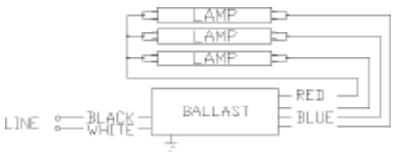


Diagram 3

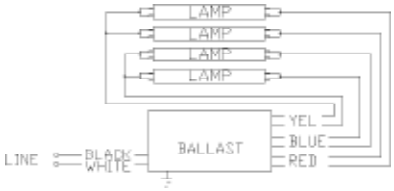


Diagram 4

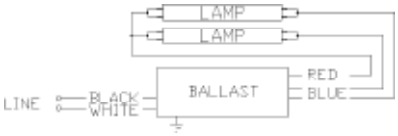


Diagram 2

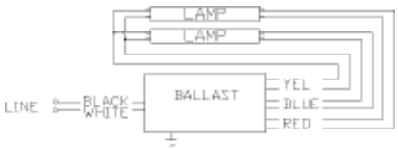


Diagram 8

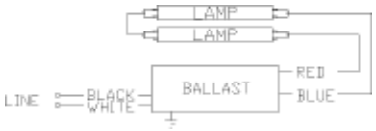


Diagram 41

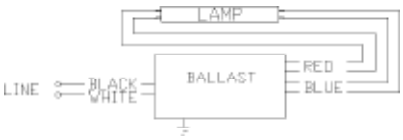


Diagram 36

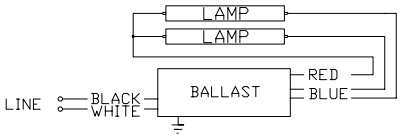


Diagram 6

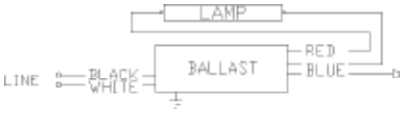


Diagram 46

ELECTRONIC BALLASTS

For 40W T12 Lamps

T12/HO

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/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	

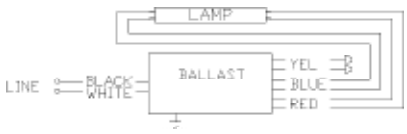


Diagram 37

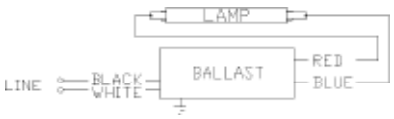


Diagram 1

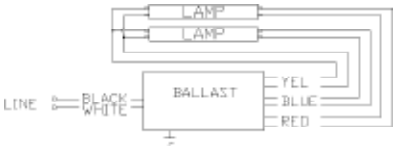


Diagram 8

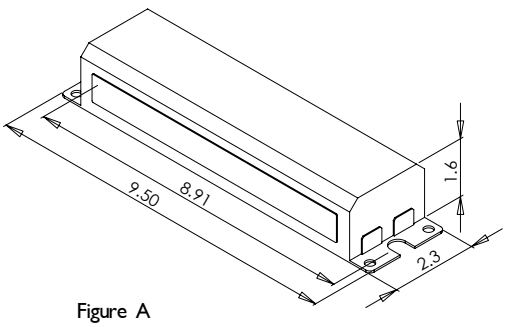


Figure A

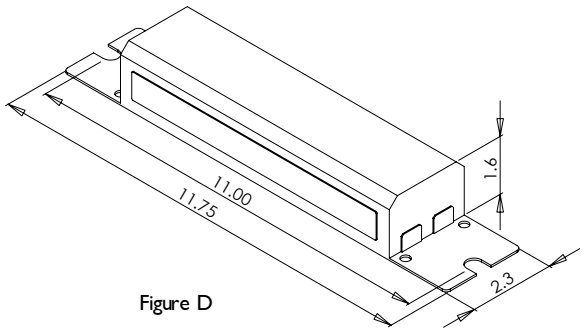
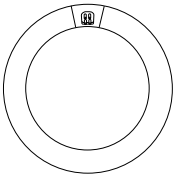


Figure D



T9 Circular

ELECTRONIC BALLASTS

For 55W - 75W 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
FC8T9 - 22W												
1	120	RS	Stratus	**VE126120MR**	20	0.88	150	0.31	0/-18	I	47	X
		IS	Panther	**VE232120MIP**	20	0.90	165	0.29	0/-18	C	52	X
				VE232120MIP(S)	20	0.90	165	0.29	0/-18	M	54	X
2	120	IS	Panther	**VE232120MIP**	31	0.70	165	0.43	0/-18	C	51	X
				VE232120MIP(S)	31	0.70	165	0.43	0/-18	M	53	X
		RS	Stratus	**VEC54120MR**	44	0.90	135	0.73	0/-18	J	48	X
FC12T9 - 32W												
1	120	RS	Stratus	**VEC40120MR**	31	1.00	150	0.50	0/-18	I	47	X
		IS	Panther	**VE232120MIP**	28	0.90	165	0.39	0/-18	C	52	X
				VE232120MIP(S)	28	0.90	165	0.39	0/-18	M	54	X
2	120	IS	Panther	**VE232120MIP**	43	0.70	165	0.61	0/-18	C	51	X
				VE232120MIP(S)	43	0.70	165	0.61	0/-18	M	53	X
		RS	Stratus	**VEC72120MR**	60	0.90	135	0.80	0/-18	J	48	X
(1) FC8T9 - 22W & (1) FC12T9 - 32W												
2	120	IS	Panther	**VE232120MIP**	37	0.70	165	0.52	0/-18	C	51	X
				VE232120MIP(S)	37	0.70	165	0.52	0/-18	M	53	X
		RS	Stratus	**VEC54120MR**	54	0.90	135	0.80	0/-18	J	48	X
(1) FC12T9 - 32W & (1) FC16T9 - 40W												
1	120	RS	Stratus	**VEC40120MR**	38	1.00	135	0.58	0/-18	I	48	X
2	120	RS	Stratus	**VEC72120MR**	68	0.90	135	0.73	0/-18	J	47	X

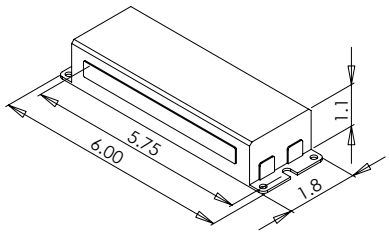


Figure J

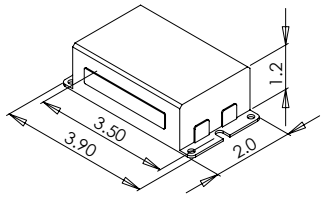


Figure I

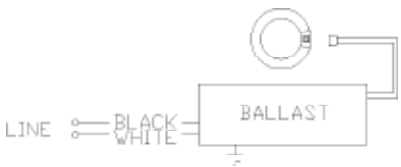


Diagram 47

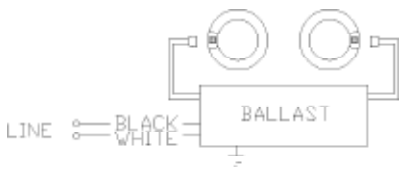
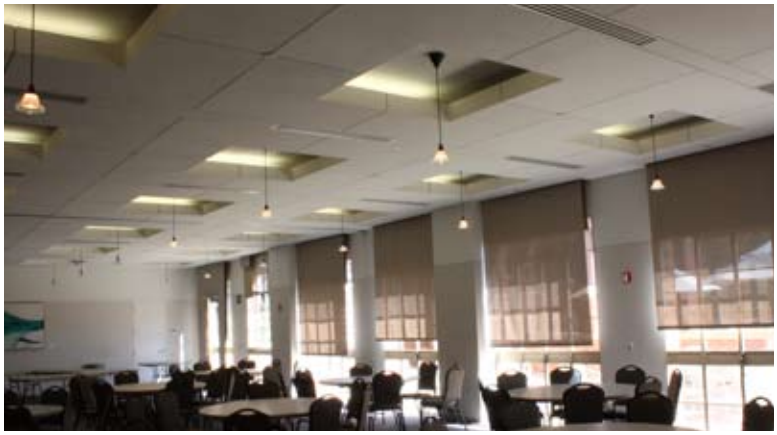


Diagram 48

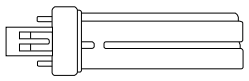
ELITE

DIMMING BALLAST



ELECTRONIC DIMMING BALLASTS

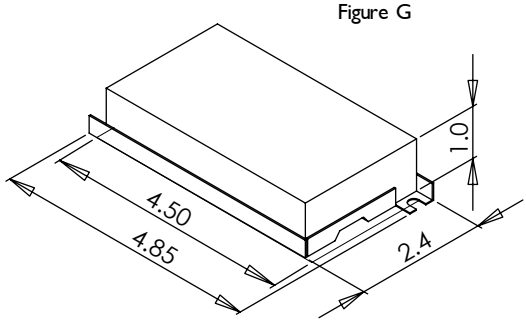
For 26W-42W Triple Lamps



T4 Lamps

No. of Lamps	Input Volts	Lamp Start. Method	Ballast Family	Model No.	Max/Min Input Power	Max/Min Ballast Factor	Full Light Output Max. THD %	Full Light Output Line Current (Amps)	Min. Start. Temp. (°F/°C)	Dim.	Wiring Dia.	Symbols, Footnotes
CFQ18W/G24q - 18W CFL Quad Lamp												
1	120	PS	Apollo	**VE118120HRPD**	22/8	0.88/0.08	15	0.19	50/10	G	12	
CFQ26W/G24q - 26W CFL Quad Lamp												
1	120	PS	Apollo	**VE126120HRPD**	27/9	0.90/0.07	15	0.23	50/10	G	12	

Figure G



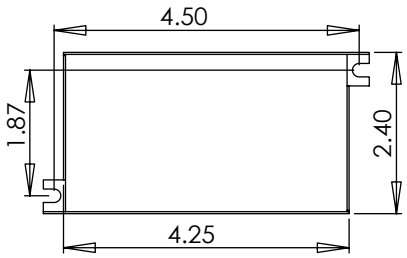
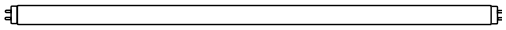


Figure G - Mounting



T8 Linear

ELECTRONIC DIMMING BALLASTS

For 32W T8 Lamps

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

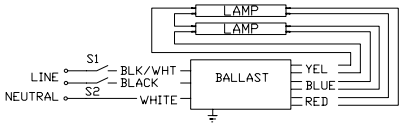


Diagram 50

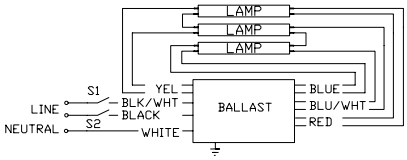


Diagram 57

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

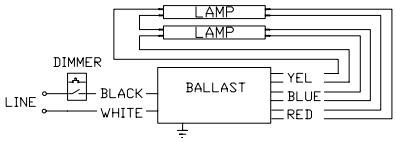


Diagram 55

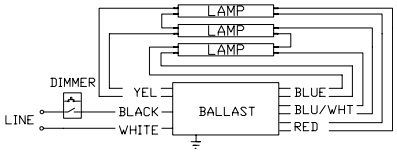


Diagram 58

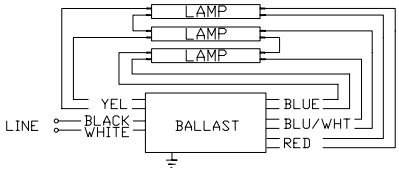


Diagram 44

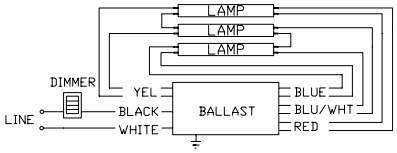


Diagram 56

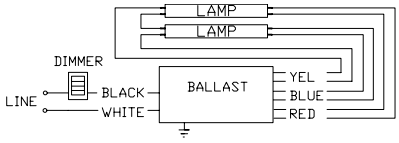


Diagram 49

FLUORESCENT LAMPS

High Output T5 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
T5/HO - 24W									
24	T5/HO	G5	**F24T5HO/827**	21.6	2700	82	24000	2000	1850
			F24T5HO/835	21.6	3500	82	24000	2000	1850
			F24T5HO/841	21.6	4100	82	24000	2000	1850
			F24T5HO/850	21.6	5000	82	24000	2000	1850
T5/HO - 39W									
39	T5/HO	G5	**F39T5HO/827**	33.4	2700	82	24000	3500	3260
			F39T5HO/835	33.4	3500	82	24000	3500	3260
			F39T5HO/841	33.4	4100	82	24000	3500	3260
			F39T5HO/850	33.4	5000	82	24000	3500	3260
T5/HO - 54W									
54	T5/HO	G5	**F54T5HO/827**	45.2	2700	82	24000	5000	4680
			F54T5HO/835	45.2	3500	82	24000	5000	4680
			F54T5HO/841	45.2	4100	82	24000	5000	4680
			F54T5HO/850	45.2	5000	82	24000	5000	4680
T5/HO - 80W									
80	T5/HO	G5	**F80T5HO/827**	57	2700	82	24000	7000	6550
			F80T5HO/835	57	3500	82	24000	7000	6550
			F80T5HO/841	57	4100	82	24000	7000	6550
			F80T5HO/850	57	5000	82	24000	7000	6550

FLUORESCENT LAMPS

T5 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
T5 - 14W									
14	T5	G5	**F14T5/827**	21.6	2700	82	20000	1350	1200
			F14T5/835	21.6	3500	82	20000	1350	1200
			F14T5/841	21.6	4100	82	20000	1350	1200
			F14T5/850	21.6	5000	82	20000	1350	1200
T5 - 21W									
21	T5	G5	**F21T5/827**	33.4	2700	82	20000	2100	1950
			F21T5/835	33.4	3500	82	20000	2100	1950
			F21T5/841	33.4	4100	82	20000	2100	1950
			F21T5/850	33.4	5000	82	20000	2100	1950
T5 - 28W									
28	T5	G5	**F28T5/827**	45.2	2700	82	20000	2900	2700
			F28T5/835	45.2	3500	82	20000	2900	2700
			F28T5/841	45.2	4100	82	20000	2900	2700
			F28T5/850	45.2	5000	82	20000	2900	2700
T5 - 35W									
35	T5	G5	**F35T5/827**	57	2700	82	20000	3650	3400
			F35T5/835	57	3500	82	20000	3650	3400
			F35T5/841	57	4100	82	20000	3650	3400
			F35T5/850	57	5000	82	20000	3650	3400

FLUORESCENT LAMPS

High Lumen T8 Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
F32T8 - 32W									
32	T8	G13	**F32T8/827**	48	2700	82	24000	3100	2915
			F32T8/830	48	3000	82	24000	3100	2915
			F32T8/835	48	3500	82	24000	3100	2915
			F32T8/841	48	4100	82	24000	3100	2915
			F32T8/850	48	5000	82	24000	3100	2915
F25T8 - 25W									
25	T8	G13	**F25T8/827**	36	2700	82	24000	2400	2280
			F25T8/830	36	3000	82	24000	2400	2280
			F25T8/835	36	3500	82	24000	2400	2280
			F25T8/841	36	4100	82	24000	2400	2280
			F25T8/850	36	5000	82	24000	2400	2280
F17T8 - 17W									
17	T8	G13	**F17T8/827**	24	2700	82	24000	1700	1613
			F17T8/830	24	3000	82	24000	1700	1613
			F17T8/835	24	3500	82	24000	1700	1613
			F17T8/841	24	4100	82	24000	1700	1613
			F17T8/850	24	5000	82	24000	1700	1613

COMPACT FLUORESCENT LAMPS

Quad Lamps

Watts	Bulb	Base	Order Code	Nominal Length (In.)	Color Temp. (Kelvin)	CRI	Rated Avg. Life (Hrs.)	Approx. Initial Lumens	Approx. Mean Lumens
CFQ13W/G24q-1 - 13W Quad Lamp									
13	CFQ	G24q-1	**CFQ13W/827**	5.19	2700	82	12000	900	775
			CFQ13W/830	5.19	3000	82	12000	900	775
			CFQ13W/835	5.19	3500	82	12000	900	775
			CFQ13W/841	5.19	4100	82	12000	900	775
CFQ18W/G24q-2 - 18W Quad Lamp									
18	CFQ	G24q-2	**CFQ18W/827**	5.69	2700	82	12000	1250	1075
			CFQ18W/830	5.69	3000	82	12000	1250	1075
			CFQ18W/835	5.69	3500	82	12000	1250	1075
			CFQ18W/841	5.69	4100	82	12000	1250	1075
CFQ26W/G24q-3 - 26W Quad Lamp									
26	CFQ	G24q-3	**CFQ26W/827**	6.50	2700	82	12000	1800	1550
			CFQ26W/830	6.50	3000	82	12000	1800	1550
			CFQ26W/835	6.50	3500	82	12000	1800	1550
			CFQ26W/841	6.50	4100	82	12000	1800	1550

COMPACT FLUORESCENT LAMPS

Circular Lamps

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

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
Mini Spiral T2 CFL								
5	T2	Med.	**CFS5W/827**	3.15	2700	>80	10,000	225
9	T2	Med.	**CFS9W/827**	3.59	2700	>80	10,000	520
			CFS9W/841	3.59	4100	>80	10,000	520
			CFS9W/850	3.59	5000	>80	10,000	520
11	T2	Med.	**CFS11W/827**	3.78	2700	>80	10,000	740
13	T2	Med.	**CFS13W/827**	4.02	2700	>80	15,000	900
			CFS13W/841	4.02	4100	>80	10,000	900
			CFS13W/850	4.02	5000	>80	10,000	900
19	T2	Med.	**CFS18W/827**	4.09	2700	>80	12,000	1200
23	T2	Med.	**CFS23W/827**	4.53	2700	>80	12,000	1600
Spiral T3 CFL								
13	T3	Med.	**CFS13W/827-T3**	4.84	2700	>80	10,000	900
15	T3	Med.	**CFS15W/827-T3**	4.84	2700	>80	12,000	950
			CFS15W/835-T3	4.84	3500	>80	12,000	950
			CFS15W/841-T3	4.84	4100	>80	12,000	950
			CFS15W/850-T3	4.84	5000	>80	12,000	950
			CFS15W/864-T3	4.84	6400	>80	12,000	950
20	T3	Med.	**CFS20W/827-T3**	5.08	2700	>80	10,000	1200
			CFS20W/835-T3	5.08	3500	>80	10,000	1200
			CFS20W/841-T3	5.08	4100	>80	10,000	1200
			CFS20W/850-T3	5.08	5000	>80	10,000	1200
			CFS20W/864-T3	5.08	6400	>80	10,000	1200
23	T3	Med.	**CFS23W/827-T3**	5.28	2700	>80	10,000	1600
			CFS23W/835-T3	5.28	3500	>80	10,000	1600
			CFS23W/841-T3	5.28	4100	>80	10,000	1600
			CFS23W/850-T3	5.28	5000	>80	10,000	1600
			CFS23W/864-T3	5.28	6400	>80	10,000	1600
26	T3	Med.	**CFS26W/827-T3**	5.28	2700	>80	10,000	1750
			CFS26W/841-T3	5.28	4100	>80	10,000	1750
			CFS26W/850-T3	5.28	5000	>80	10,000	1750
			CFS26W/864-T3	5.28	6400	>80	10,000	1750
30	T3	Med.	**CFS30W/827-T3**	5.28	2700	>80	10,000	2000
			CFS30W/841-T3	5.28	4100	>80	10,000	2000
			CFS30W/850-T3	5.28	5000	>80	10,000	2000
			CFS30W/864-T3	5.28	6400	>80	10,000	2000
40	T3	Med.	**CFS40W/827-T3**	6.37	2700	>80	10,000	2650
			CFS40W/850-T3	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
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

SOLID STATE LIGHTING

LED Driver

Output Voltage (V)	Output Current (Amps)	Max. Output Power	Input Voltage	Input Frequency	Order Code	No. of LED	LED Wattage (W)	Dim.
Constant Current								
12	0.35	3.5	100-255	50-60	**VEL3350MV**	1-3	1	2.56"L x 1.38"W x 0.91"H
36	0.35	8	100-255	50-60	**VEL8350MV**	1-8	1	2.56"L x 1.38"W x 0.91"H
12	0.70	6.5	100-255	50-60	**VEL2700MV**	1-2	3	2.56"L x 1.38"W x 0.91"H
21	0.70	9	100-255	50-60	**VEL3700MV**	1-3	3	2.56"L x 1.38"W x 0.91"H
Constant Current - Plug In								
12	0.35	3.5	100-255	50-60	**VEL3350MVP**	1-3	1	2.64"L x 1.46"W x 1.06"H
36	0.35	8	100-255	50-60	**VEL8350MVP**	1-8	1	2.64"L x 1.46"W x 1.06"H
12	0.70	6.5	100-255	50-60	**VEL2700MVP**	1-2	3	2.64"L x 1.46"W x 1.06"H
21	0.70	9	100-255	50-60	**VEL3700MVP**	1-3	3	2.64"L x 1.46"W x 1.06"H
12	0.35	3.5	100-255	50-60	**VEL3350MV-1**	1-3	1	1.65"L x 1.58"W x 0.82" H
12	0.70	6.5	100-255	50-60	**VEL2700MV-1**	1-2	3	1.65"L x 1.58"W x 0.82" H
12	0.35	3.5	100-255	50-60	**VEL3350MV-2**	1-3	1	2.56"L x 1.38"W x 0.91"H
36	0.35	8	100-255	50-60	**VEL8350MV-2**	1-8	1	2.56"L x 1.38"W x 0.91"H
12	0.70	6.5	100-255	50-60	**VEL2700MV-2**	1-2	3	2.56"L x 1.38"W x 0.91"H
21	0.70	9	100-255	50-60	**VEL3700MV-2**	1-3	3	2.56"L x 1.38"W x 0.91"H
Constant Voltage								
12	0.25	3	100-240	50-60	**VEV2512MV**			
12	0.50	6	100-240	50-60	**VEV5012MV**			
12	0.83	10	100-240	50-60	**VDV8312MV**			
24	0.13	3	100-240	50-60	**VEV1221MV**			
24	0.25	6	100-240	50-60	**VEV2524MV**			
24	0.41	10	100-240	50-60	**VEV4124MV**			
12	0.25	3	100-240	50-60	**VEV2512MV-1**			
12	0.5	6	100-240	50-60	**VEV5012MV-1**			
24	0.13	3	100-240	50-60	**VEV1224MV-1**			
24	0.25	6	100-240	50-60	**VEV2524MV-1**			
12	0.25	3	100-240	50-60	**VEV2512MV-2**			
12	0.50	6	100-240	50-60	**VEV5012MV-2**			
12	0.53	10	100-240	50-60	**VEV8312MV-2**			
24	0.13	3	100-240	50-60	**VEV1224MV-2**			
24	0.25	6	100-240	50-60	**VEV2524MV-2**			
24	0.41	10	100-240	50-60	**VEV4124MV-2**			

Output Voltage (V)	Output Current (Amps)	Max. Output Power (W)	Input Voltage	Input Frequency	Order Code	No. of LED	LED Wattage (W)	Dim.
Constant Current								
3.5 - 10.5	0.70	7.5	120	50-60	**LD-C307033-09**	1-3	3	K
3.5 - 21	0.70	2.5 - 15	120	50-60	**LD-C307033-07**	1-6	3	L

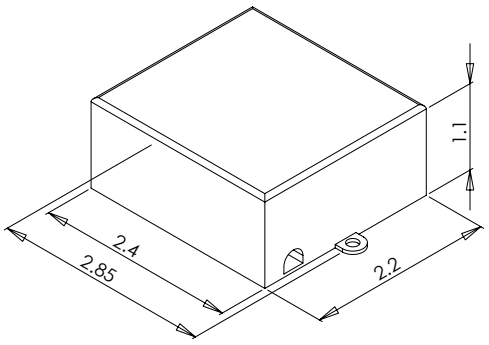


Figure L

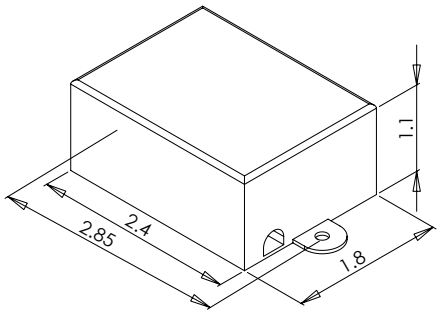


Figure K

ADDITIONAL INFORMATION

Electronic Ballast Wiring Diagram Index

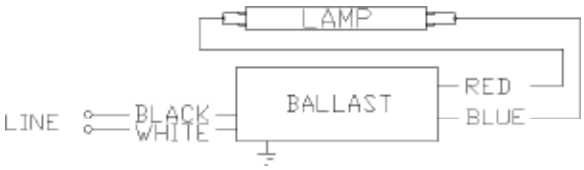


Diagram 1

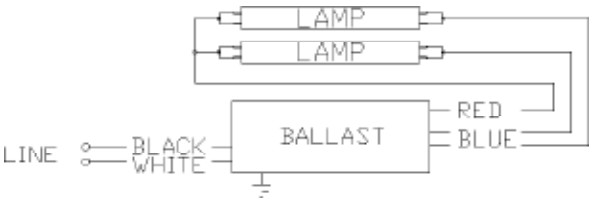


Diagram 2

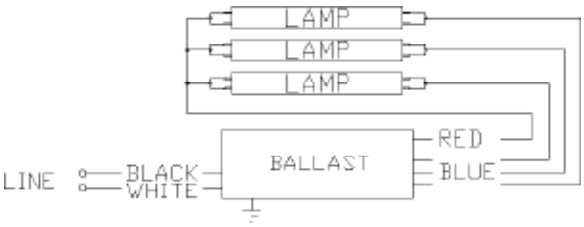


Diagram 3

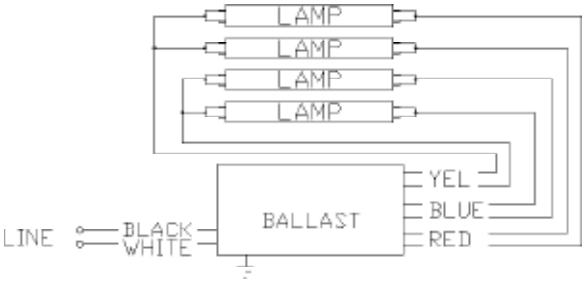


Diagram 4

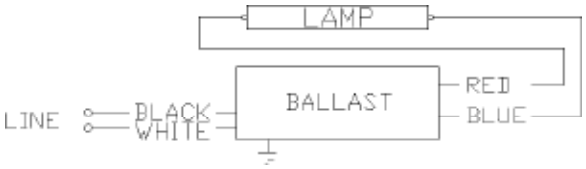


Diagram 5

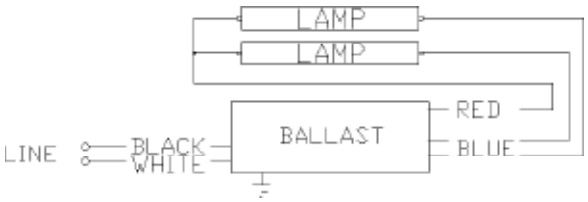


Diagram 6

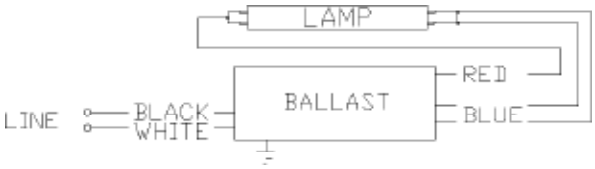


Diagram 7

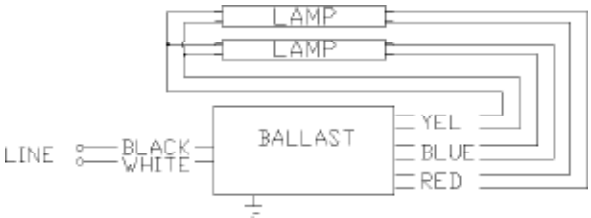


Diagram 8

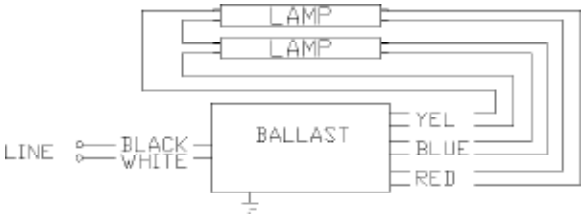


Diagram 9

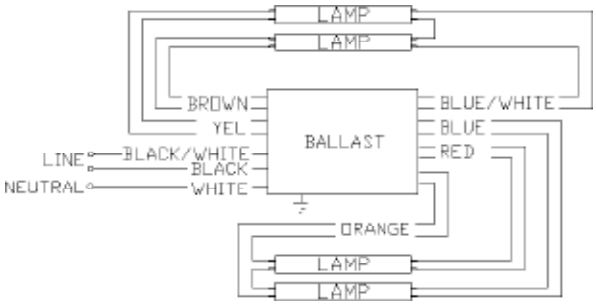


Diagram 10

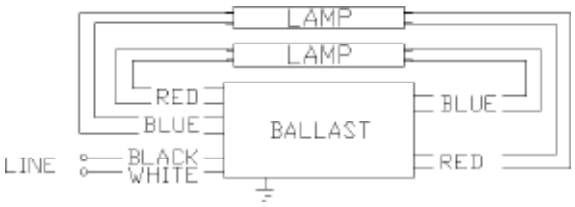


Diagram 11

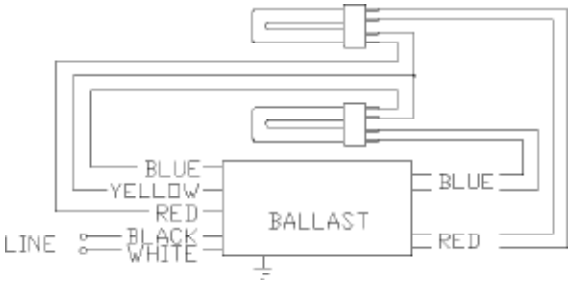


Diagram 12

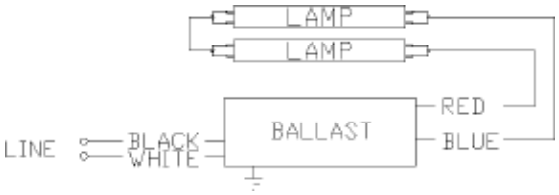


Diagram 13

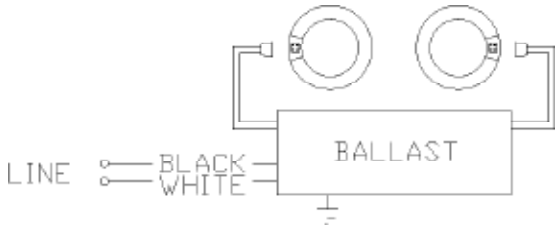


Diagram 14

Diagram 15

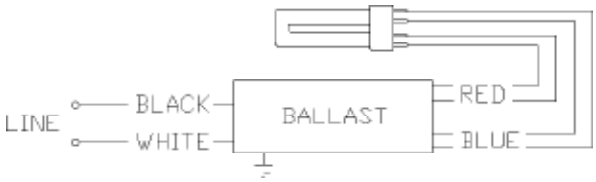


Diagram 16

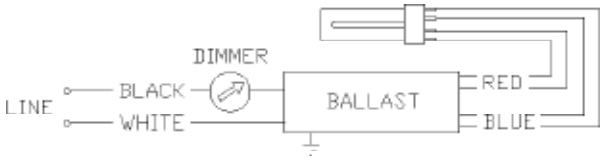


Diagram 17

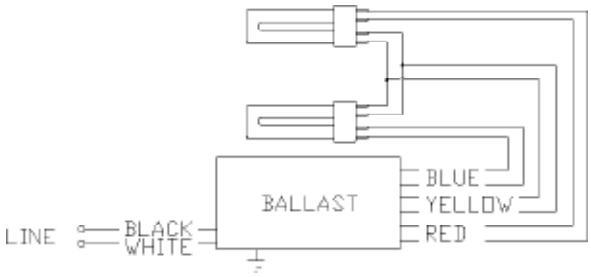


Diagram 18

ADDITIONAL INFORMATION

Electronic Ballast Wiring Diagram Index

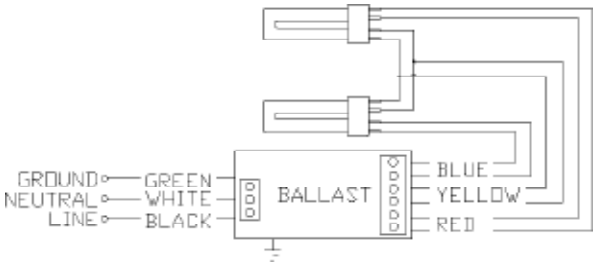


Diagram 19

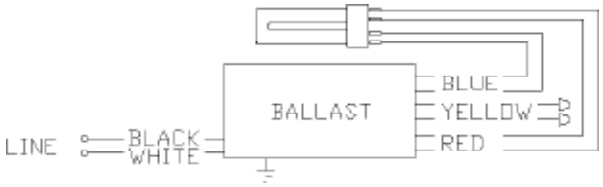


Diagram 20

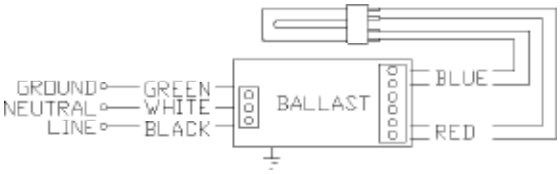


Diagram 21

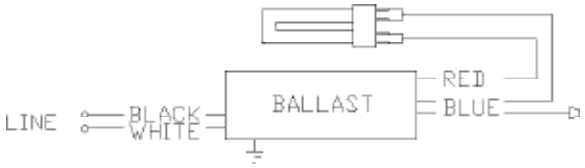


Diagram 22

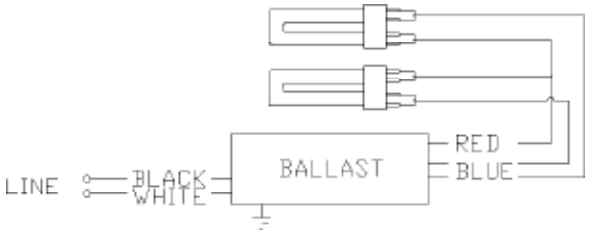


Diagram 23

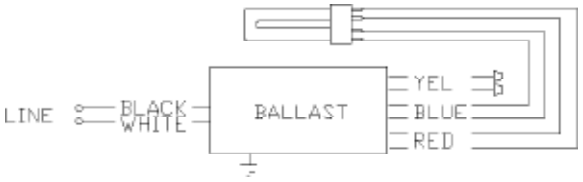


Diagram 24

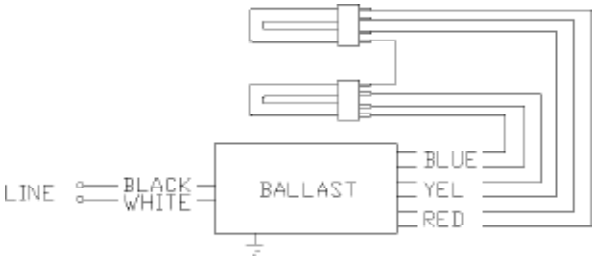


Diagram 25

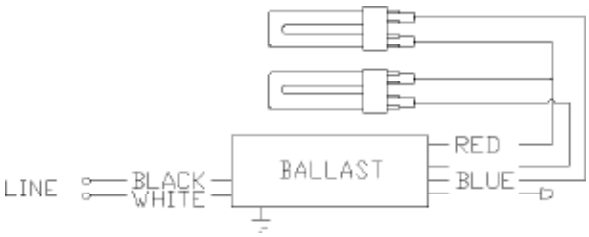


Diagram 26

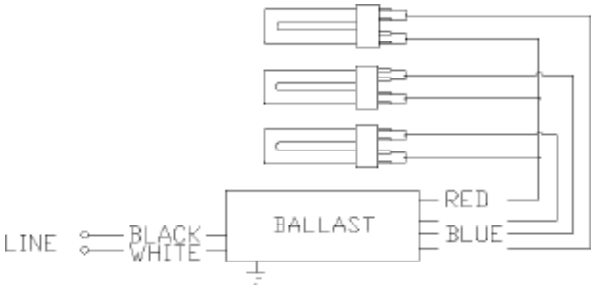


Diagram 27

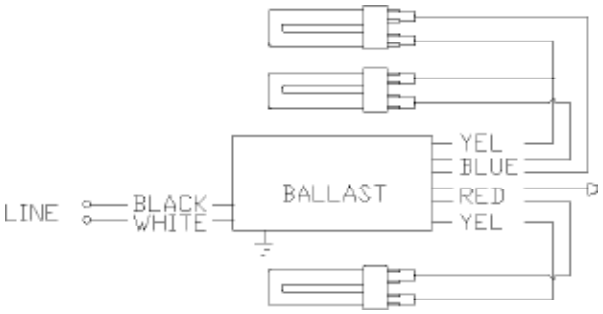


Diagram 28

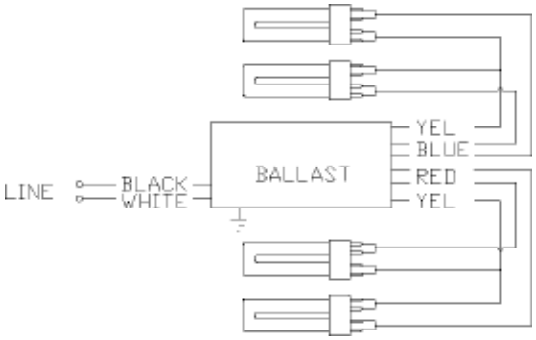


Diagram 29

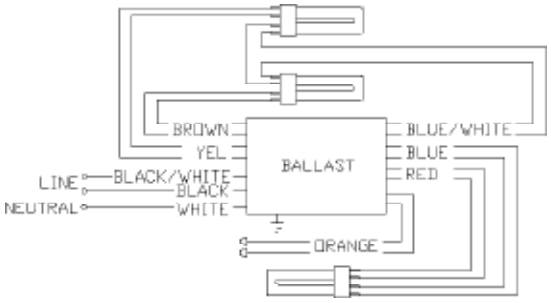


Diagram 30

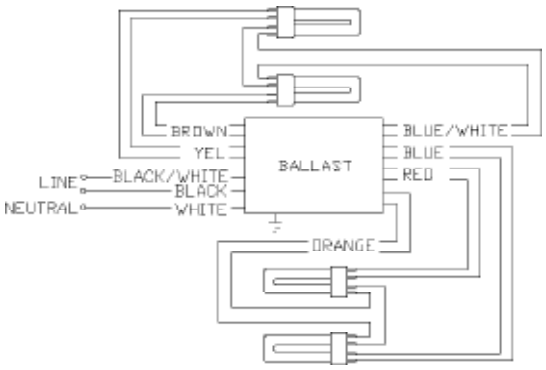


Diagram 31

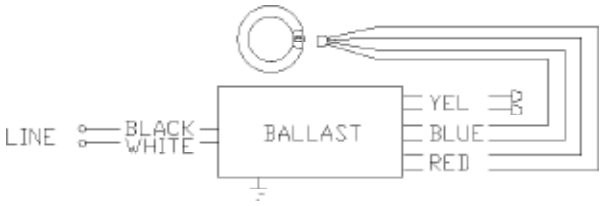


Diagram 32

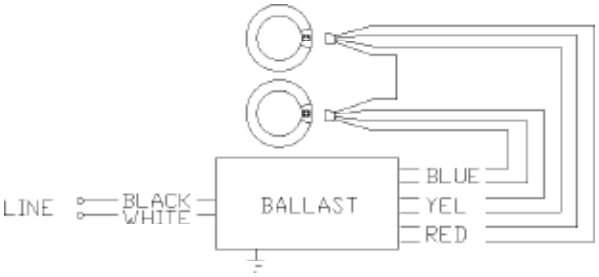


Diagram 33

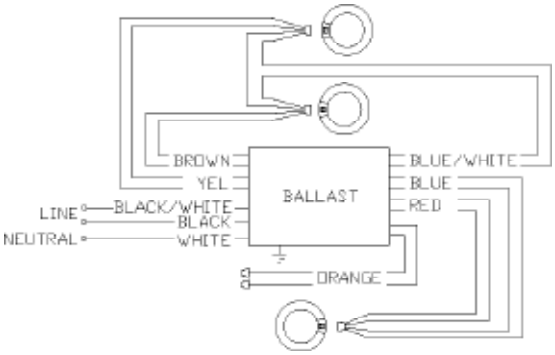


Diagram 34

ADDITIONAL INFORMATION

Electronic Ballast Wiring Diagram Index

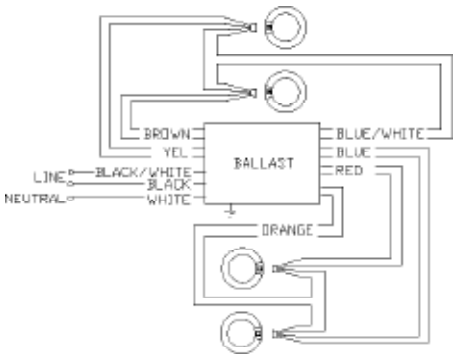


Diagram 35

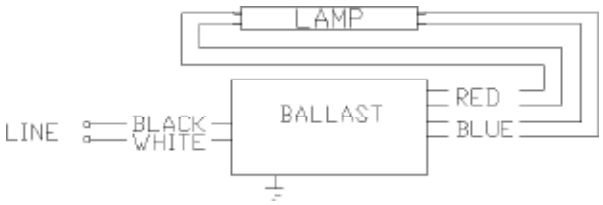


Diagram 36

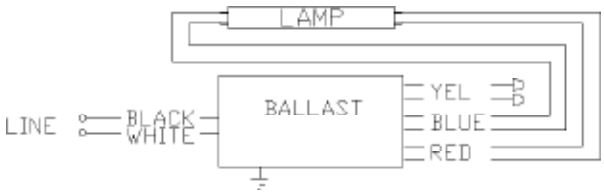


Diagram 37

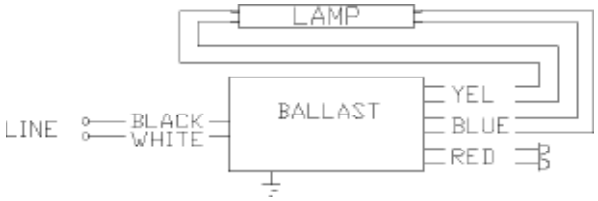


Diagram 38

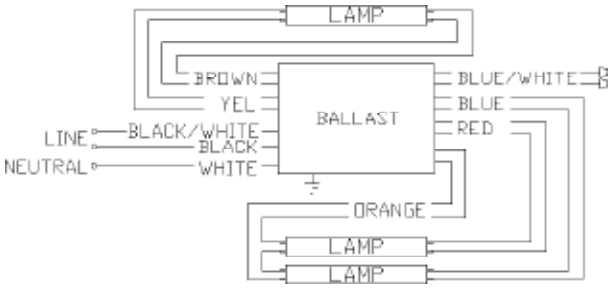


Diagram 39

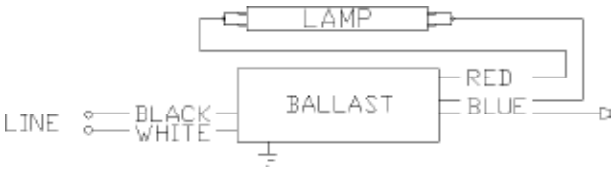


Diagram 40

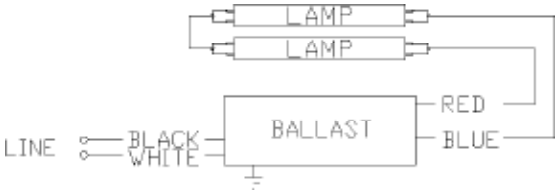


Diagram 41

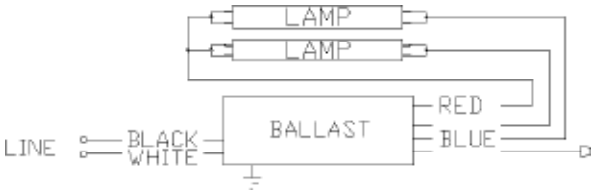


Diagram 42

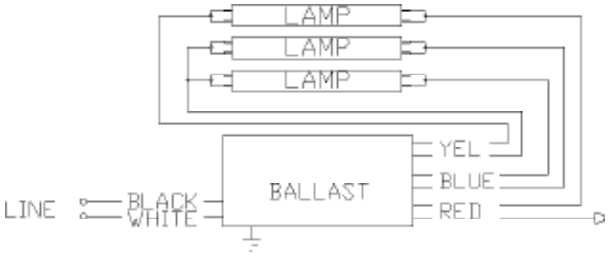


Diagram 43

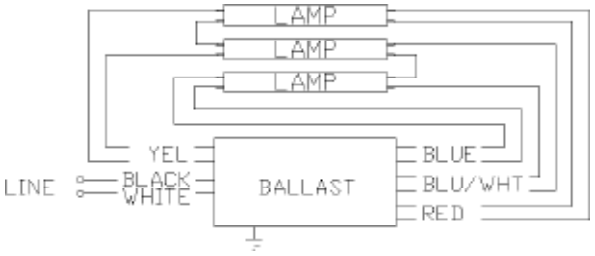


Diagram 44

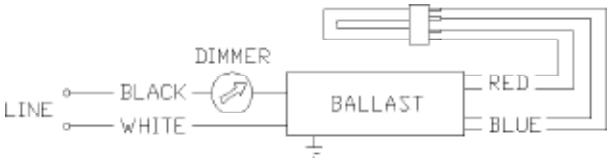


Diagram 45

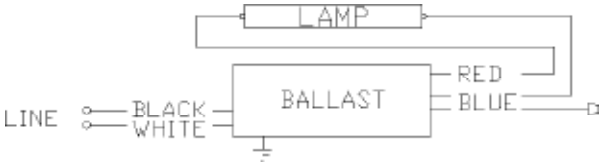


Diagram 46

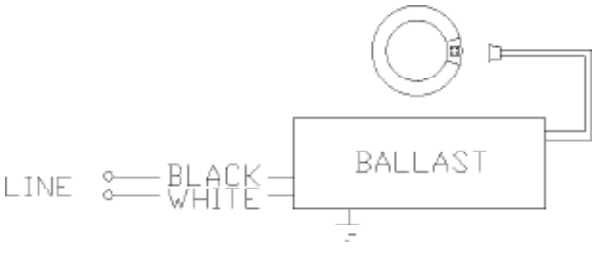


Diagram 47

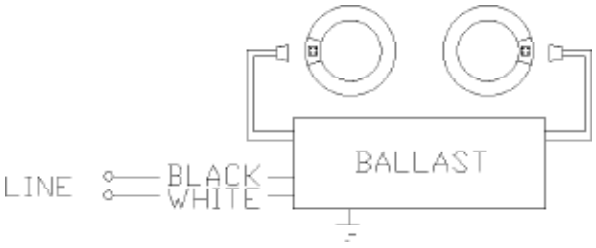


Diagram 48

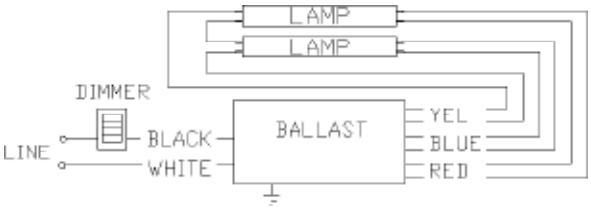


Diagram 49

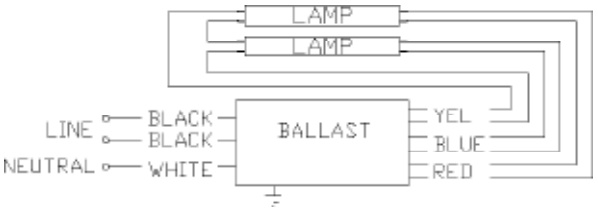


Diagram 50

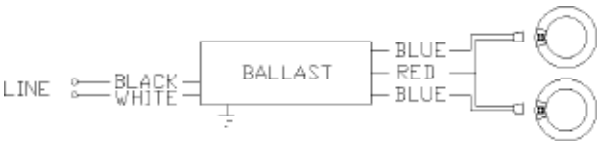


Diagram 51

Diagram 52

Diagram 53

ADDITIONAL INFORMATION

Electronic Ballast Wiring Diagram Index

Diagram 54

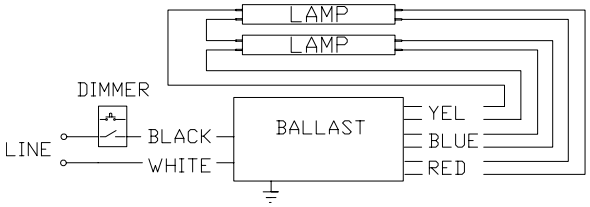


Diagram 55

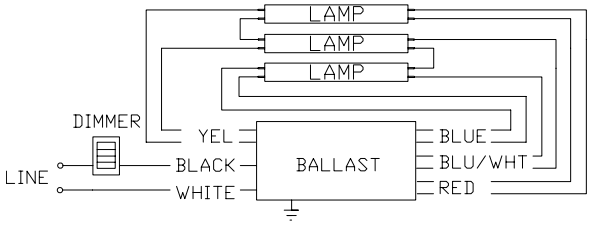


Diagram 56

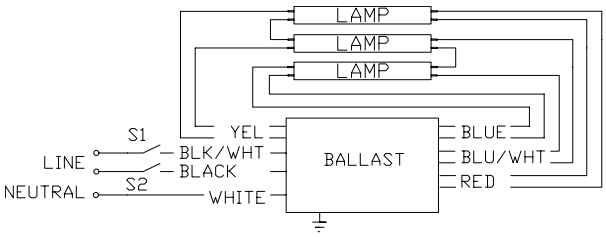


Diagram 57

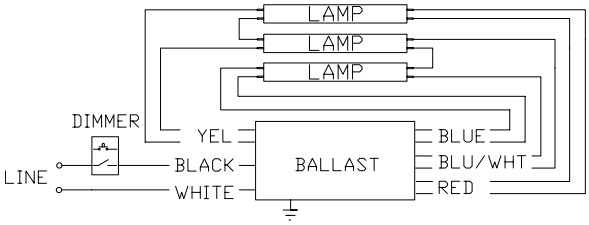


Diagram 58

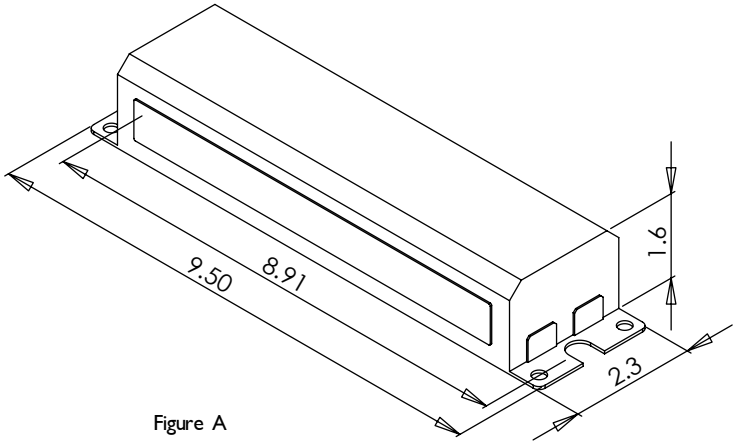


Figure A

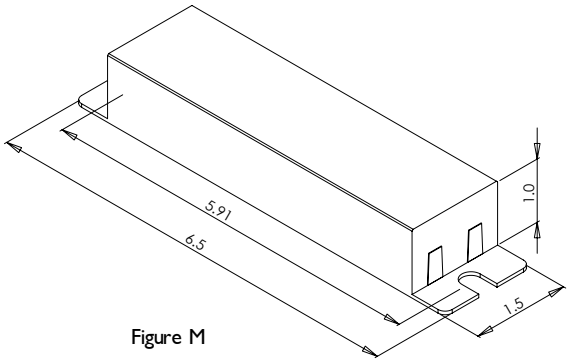


Figure M

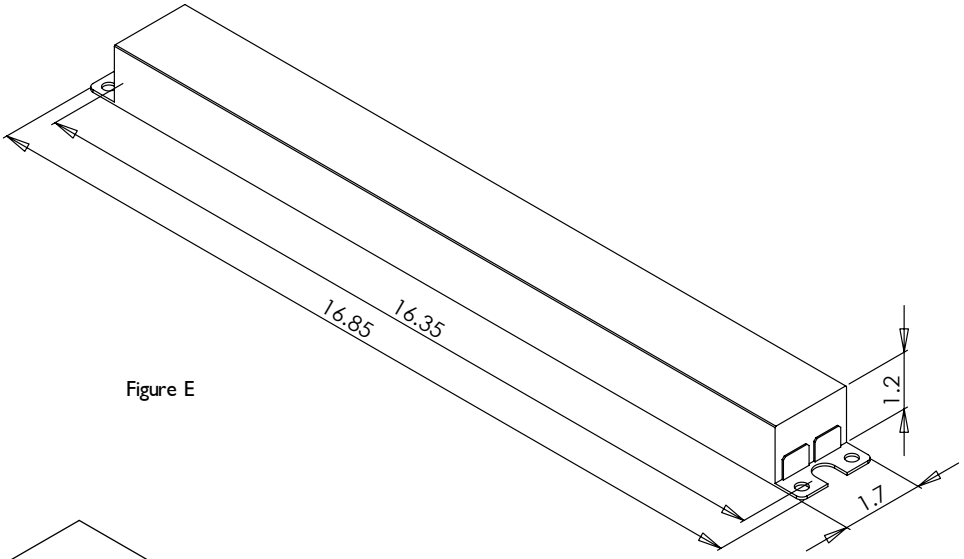


Figure E

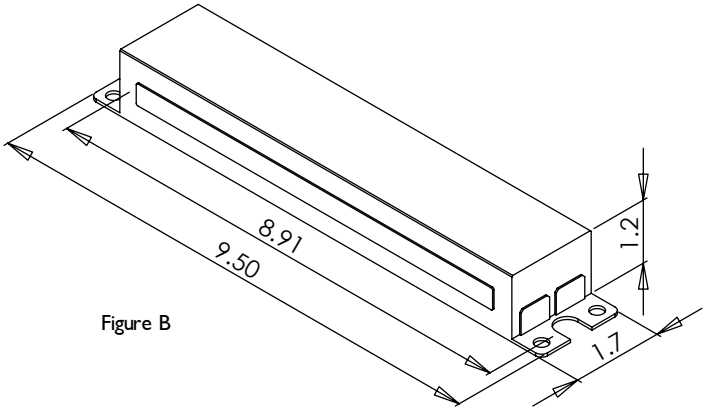


Figure B

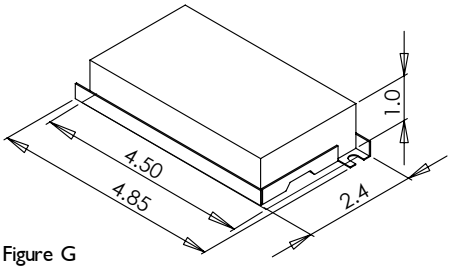


Figure G

ADDITIONAL INFORMATION

Electronic Ballast Case Dimension ndex

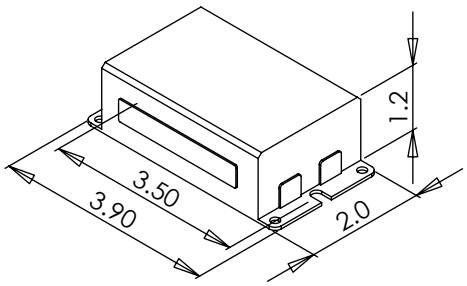


Figure I

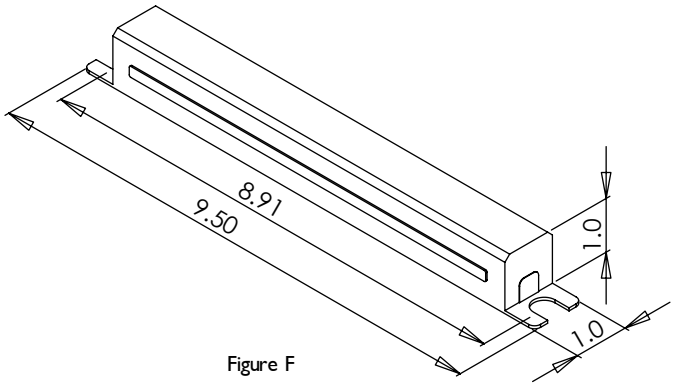


Figure F

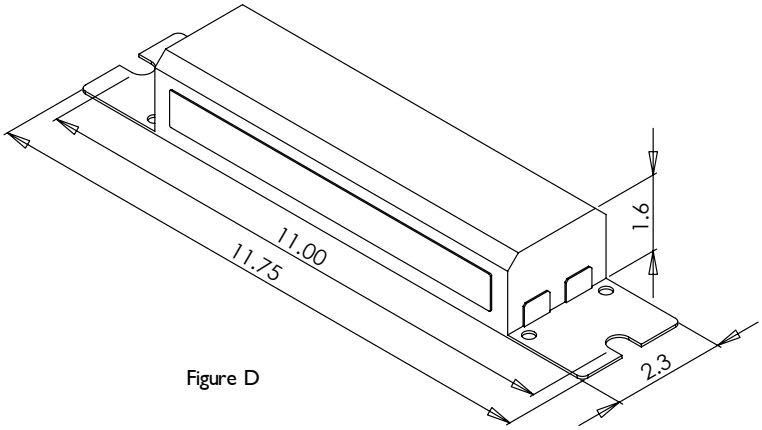


Figure D

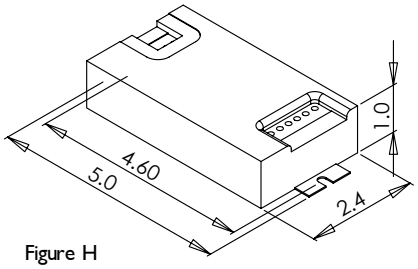


Figure H

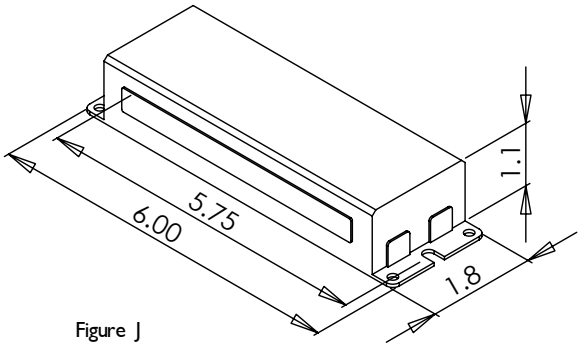


Figure J

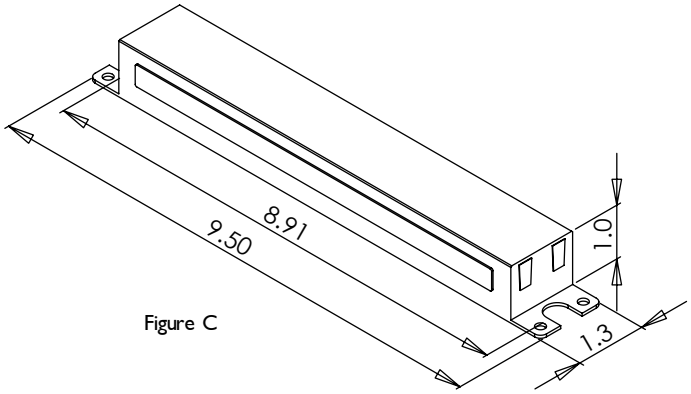


Figure C

ESPEN Technology® Ballast Limited Warranty

PERIOD OF WARRANTY AND COVERAGE
Espen Technology, Inc. ("Espen Technology"), 7621 Somerset Blvd., Paramount, CA 90723, (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 7621 Somerset Blvd, Paramount, CA 90723 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.

Headquarters
Espen Technology, Inc.
7621 Somerset Blvd.
Paramount, CA 90723

Sales/Customer Service
Toll Free Tel.: (866) 933-7736
Toll Free Fax: (888)503-7736
Tel.: (562) 529-2938
Fax: (562) 529-2978

Website
www.espentech.com

Email
info@espentech.com

© 2009 Espen Technololgy, Inc.
All rights reserved. Reproduction in whole or part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without noice. No liability will be accepted by the publisher for any consequence of its use.