

Controllable Lighting

Fluorescent Energy Management / Dimming Ballasts and Controls

The effective dimming of fluorescent lights delivers a wide range of benefits: greater control of workspace lighting, ability to create a mood, energy savings, and more.

Universal Lighting Technologies (“Universal”) line of electronic dimming ballasts and controls lets you accomplish these goals with a variety of products to suit your dimming needs. From light level switching and analog dimming to digital dimming and controls, Universal has the products and technologies to meet today’s dimming requirements for energy savings and controllable lighting.

Product Overview

Universal offers three different families of dimming products that can be used for today's dimming requirements for architectural lighting control and energy management applications:

Ballastar: Light Level Switching

SuperDim: Analog (0 to 10 volt) dimming

DaliPro: Digital Dimming with the DALI protocol

Ballastar® Light Level Switching (S30 & S50)

Our Ballastar® line offers two options of light level switching (either 100/50% or 100/60/30%). That makes Ballastar® a cost-effective solution for both new construction and retrofits.

Universal Ballastar® ballasts are designed to ensure optimum lamp performance. Their Lamp Current Crest Factors are well below the maximum 1.7 ANSI standard — and they start the lamps according to ANSI recommendations at all dimming levels. Both of these important design parameters ensure optimum lamp performance. In addition, Ballastar® ballasts actually increase cathode heating when dimming to maintain the cathode's proper temperature, which enhances lamp life and performance stability.

- 1, 2, & 3 lamp models for 120 & 277 volt
- Switches to preset light levels, keeping all lamps illuminated
- Eliminates the dark spots associated with inboard/outboard configurations
- Connects with two line voltage power leads
 - Wires the same as an inboard/outboard fixture
 - No special controls required; uses two wall switches
- Meets all ASHRAE 90.1 and California Title 24 requirements for lighting control
- THD <10%
- Lower installed costs; less wiring and equipment required



Ballastar® Light Level Switching for ultimate control.

Product Overview

SuperDim® Analog Dimming Ballasts

Universal Lighting's new SuperDim® analog dimming ballasts are the most cost-effective choice for large scale dimming applications. SuperDim® ballasts are designed for T8 and T5 linear fluorescent lamps and T4 4-pin quad and triple compact fluorescent lamps.

SuperDim® ballasts are compatible with a wide range of 0 – 10 volt controls and can be connected to photocells for daylight harvesting. The resulting energy savings makes it easy to adhere to even the strictest energy requirements, including California Title 24 and ASHRAE 90.1.

These versatile ballasts offer programmed rapid start technology for longer lamp life. They also incorporate end-of-lamp-life shutdown circuits, low profile designs and < 10% THD at full bright.

Features and Benefits

- Ideal for T8 and T5 linear fluorescent lamps and T4 4-pin quad and triple compact fluorescent lamps
- Compatible with most 0 – 10 volt manufactured controls
- Daylight harvesting options with photocells for maximum energy savings
- Programmed rapid start technology maximizes lamp life
- Low profile design for fixture design flexibility
- End-of-lamp-life shutdown circuitry ensures safe operation
- < 10% THD at full bright
- Universal input voltage (120–277 volts) for installation flexibility

Notes

Product Overview

DaliPro Digital Dimming Ballasts for DALI

New DaliPro™ ballasts from Universal Lighting let you take full advantage of the Digital Addressable Lighting Interface (DALI) standard...and that means greater flexibility, greater savings.

The DALI Advantage

The DALI protocol uses a 2-wire control loop to communicate with up to 64 ballasts. Broadcast, group and individual addressing is used to control light levels, recall scenes and poll ballast status.

Many DALI-compatible controls are now available from established manufacturers; and new varieties are being developed daily.

DaliPro Features and Benefits

- Available for T8, T5, T5HO and compact fluorescent lamps
- Provides dimming down to 1% for linear lamps and 3% for compact fluorescent lamps
- Lets you adapt instantly to additions or changes in lighting design without ballast or fixture rewiring
- Offers status/performance data, including lamp status and system faults
- Low profile designs for easy installation in a wide variety of fixtures
- Universal input voltage (120– 277 volts)
 - Installer-friendly; ensures you have the right ballast every time
 - Reduces inventory costs and requirements
- End-of-Lamp Life Shutdown with auto reset circuitry for safe operation
- Programmed Rapid Start for long lamp life



Application And Operating Information

Dimming ballasts follow the same guidelines as electronic ballasts in regard to the application and operating information. In addition to the section for electronic ballasts, the following applies specifically to dimming electronic ballasts.

SAFETY

Analog dimming ballasts are controlled by using a low voltage 10-0vDC control circuit. Care should be taken to insure that the line voltage (AC) wires are not connected to the low voltage DC wires. SuperDim® Electronic dimming ballasts have a protection circuit that will sense if the ballast has been connected in this manner and not harm the ballast or the installer. If connected in this mode, the lamps will dim to the 30% level.

New Lamp Installation

When new lamps are installed, they must operate at a full bright level for a minimum of 100 hours prior to dimming. Failure to do this will effect lamp life and cause the lamps to not dim properly. Consult your lamp manufacturer for further lamp information.

Light Level Switching Installation Note

The two power leads for the light level switching ballasts must be connected to the same power circuit. The leads should connect to separate switches or relays for control of the light level switching operation. Connection of the input leads to separate power circuits can damage the ballasts.

Note:

Do not connect any other ballast to the load side of the switches controlling the switched dimming ballast.

Compatible Dimming Controls

For a listing of compatible controls for universal analog ballasts, please consult catalog page 3-7, or call 1-800-BALLAST or check out the Dimming and Controls section of our home page at www.unvlt.com.

Fusing

Class P ballasts do not require fusing. Fusing can be used when a single circuit has a large number of fixtures/ballasts. For a comprehensive list of appropriate fuses, contact our Technical Engineering Services (TES) Department at 1-800-BALLAST.

Detailed Operating Instructions

For additional information on all of Universal's dimming products, consult our website at www.unvlt.com. Application notes, dimming brochures and online training is available

Controls For Analog Dimming Ballasts

Manual Controls: Wall Stations & Hand-Held Remotes

Manufacturer	Website	Telephone
Architectural Lighting Management	www.almsys.com	(888) 446-9137
Douglas Lighting Controls, Inc.	www.douglaslightingcontrols.com	(604) 873-2797
Electronics Diversified, Inc.	www.edionline.com	(800) 547-2690
Genlyte Controls	www.lolcontrols.com	(800) 526-2731
HUNT Dimming	www.huntdimming.com	(970) 484-9048
Lehigh Electric Products Co.	www.lehighdim.com	(610) 395-3386
Leviton	www.leviton.com	(800) 323-8902
Lutron	www.lutron.com/universal	(888) LUTRON1 - Sales (800) 523-9466 - Technical Support
NexLight	www.nexlight.com	(218) 828-3700
PLC-Multipoint	www.plcmultipoint.com	(425) 353-7552
Sensor Switch, Inc.	www.sensorswitch.com	(800) 727-7483
The Watt Stopper, Inc.	www.wattstopper.com	(800) 879-8585

Occupancy Sensors & Controls

Manufacturer	Website	Telephone
Electronics Diversified, Inc.	www.edionline.com	(800) 547-2690
Lehigh Electric Products Co.	www.lehighdim.com	(610) 395-3386
Leviton	www.leviton.com	(800) 323-8902
Lutron	www.lutron.com/universal	(888) LUTRON1 - Sales (800) 523-9466 - Technical Support
Marlin Controls, Inc.	www.marlincontrols.com	(800) 788-5750
NexLight	www.nexlight.com	(218) 828-3700
Novitas	www.novitas.com	(310) 218-5360
The Watt Stopper, Inc.	www.wattstopper.com	(800) 879-8585

Photodetectors & Daylight Controls

Manufacturer	Website	Telephone
Douglas Lighting Controls, Inc.	www.douglaslightingcontrols.com	(604) 873-2797
Electronics Diversified, Inc.	www.edionline.com	(800) 547-2690
Hubbell Building Automation, Inc.	www.hubbell-automation.com	(888) 698-3242
Lehigh Electric Products Co.	www.lehighdim.com	(610) 395-3386
Leviton	www.leviton.com	(800) 323-8902
Lutron	www.lutron.com/universal	(888) LUTRON1 - Sales (800) 523-9466 - Technical Support
Marlin Controls, Inc.	www.marlincontrols.com	(800) 788-5750
NexLight	www.nexlight.com	(218) 828-3700
Novitas	www.novitas.com	(310) 218-5360
PLC-Multipoint	www.plcmultipoint.com	(425) 353-7552
Sensor Switch, Inc.	www.sensorswitch.com	(800) 727-7483
The Watt Stopper, Inc.	www.wattstopper.com	(800) 879-8585

Systems: Control Panels, Building Management Systems, etc.

Manufacturer	Website	Telephone
Architectural Lighting Management	www.almsys.com	(888) 446-9137
Douglas Lighting Controls, Inc.	www.douglaslightingcontrols.com	(604) 873-2797
Electronics Diversified, Inc.	www.edionline.com	(800) 547-2690
Genlyte Controls	www.lolcontrols.com	(800) 526-2731
HUNT Dimming	www.huntdimming.com	(970) 484-9048
Lehigh Electric Products Co.	www.lehighdim.com	(610) 395-3386
Leviton	www.leviton.com	(800) 323-8902
Lutron	www.lutron.com/universal	(888) LUTRON1 - Sales (800) 523-9466 - Technical Support
Marlin Controls, Inc.	www.marlincontrols.com	(800) 788-5750
NexLight	www.nexlight.com	(218) 828-3700
PLC-Multipoint	www.plcmultipoint.com	(425) 353-7552
Touch-Plate Lighting Controls	www.touchplate.com	(800) 227-5154
The Watt Stopper, Inc.	www.wattstopper.com	(800) 879-8585

Universal Lighting Technologies Analog Dimming Ballasts

SuperDim[®]
A Triad[®] Brand

BallaSTAR[®]

The information listed above is provided by Universal Lighting Technologies to facilitate development of dimming systems. All information has been provided by the controls manufacturers, and Universal Lighting Technologies makes no guarantee regarding its accuracy. The reader is advised to contact these, and other manufacturers of analog dimming systems, to obtain application advice, to determine availability of the controls listed above, and to learn about other controls that may be offered.

Data is subject to change without notice.

Lamp Qty.	Starting Method	Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
F32T8												
1	PRS	120 277	B132PUNVDV1●	0.31 0.13	37 36	> .98	1.00	2.70 2.78	<10	0/-18	7	DP1
2	PRS	120 277	B232PUNVDV1●	0.61 0.26	73 70	> .98	1.00	1.37 1.43	<10	0/-18	8	DP1
F14T5												
1	PRS	120 277	B114PUNVDV1	0.15 0.07	18	> .98	1.00	5.56	<10	50/10	7	DP1
2	PRS	120 277	B214PUNVDV1	0.28 0.13	18	> .98	1.00	2.86	<10	50/10	8	DP1
F28T5												
1	PRS	120 277	B128PUNVDV1	0.27 0.11	32 31	> .98	1.00	3.13 3.23	<10	50/10	7	DP1
2	PRS	120 277	B228PUNVDV1	0.55 0.23	66 63	> .98	1.00	1.52 1.59	<10	50/10	8	DP1
F54T5HO												
1	PRS	120 277	B154PUNVDV1	0.52 0.22	62 60	> .98	1.00	1.61 1.67	<10	50/10	7	DP1
2	PRS	120 277	B254PUNVDV1	1.05 0.44	126 121	> .98	1.00	0.79 0.83	<10	50/10	8	DP1
CFQ18W/Gx24q												
1	PRS	120 277	C118PUNVDV3◆●	0.19 0.10	21 20	> .95	1.00	4.76 5.00	<10	0/-18	9	DP2
2	PRS	120 277	C218PUNVDV3◆■	0.34 0.16	39 38	> .95	1.00	2.56 2.63	<10	0/-18	10	DP2
CFQ26W/Gx24q												
1	PRS	120 277	C126PUNVDV3◆◇	0.28 0.12	28 27	> .95	1.00	3.57 3.70	<10	0/-18	9	DP2
2	PRS	120 277	C226PUNVDV3◆□	0.50 0.23	54 53	> .95	1.00	1.85 1.89	<10	0/-18	10	DP2
CFTR32W/Gx24q												
1	PRS	120 277	C132PUNVDV3◆	0.34 0.15	38 37	> .95	1.00	2.63 2.70	<10	0/-18	9	DP2
2	PRS	120 277	C232PUNVDV3◆	0.58 0.26	71 70	> .95	1.00	1.41 1.43	<10	0/-18	10	DP2
CFM42W/Gx24q												
1	PRS	120 277	C142PUNVDV3◆	0.43 0.19	47 45	> .95	1.00	2.13 2.22	<10	0/-18	9	DP2
2	PRS	120 277	C242PUNVDV3◆	0.82 0.36	92 91	> .95	1.00	1.09 1.10	<10	0/-18	10	DP2
FT40W/2G11												
1	PRS	120 277	C140PUNVDV3◆	0.37 0.16	45 44	> .95	1.00	2.22 2.27	<10	0/-18	9	DP1
2	PRS	120 277	C240PUNVDV3◆	0.83 0.37	97 94	> .95	1.00	1.03 1.06	<10	0/-18	10	DP1

All models are cULus Listed

See page 3-20 for Dimensions and Wiring Diagrams

- Minimum Dimming Temperature is 50°F / 10°C
- ◆ Minimum Dimming Temperature is 32°F / 0°C
- Also operates (1) CFTR18W/Gx24q
- Also operates (2) CFTR18W/Gx24q
- ◇ Also operates (1) CFTR26W/Gx24q
- Also operates (2) CFTR26W/Gx24q

STARTING METHOD LEGEND

- IS = Instant Start
- PRS = Programmed Rapid Start
- RS = Rapid Start
- PAR-IS = Parallel Instant Start
- PAR-PRS = Parallel Programmed Rapid Start
- PAR-RS = Parallel Rapid Start
- SER-RS = Series Rapid Start

SuperDim® DIMMING BALLASTS

SuperDim®

Please visit www.unvlt.com for the most up to date status and recent changes to the SuperDim product family.

Lamp Qty.	Starting Method	Line Volts	Catalog Number	Description	Certification		Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
					UL	SF									
F17T8															
1	PRS	120 277	ES5833B	ES-1-T8-17-UNV-B-DIM-10	•	•	0.17 0.08	20 21	> .99 > .95	0.87	4.35 4.20	<10	32/0	1	ESB
1	PRS	120 277	ES5818K	ES-1-T8-17-UNV-K-DIM-10	•	•	0.17 0.08	20 21	> .99 > .95	0.87	4.35 4.20	<10	32/0	1	ESK
2	PRS	120 277	ES5834B	ES-2-T8-17-UNV-B-DIM-10	•	•	0.29 0.13	35	> .99 > .98	0.87	2.51 2.47	<10	32/0	2	ESB
2	PRS	120 277	ES5817K	ES-2-T8-17-UNV-K-DIM-10	•	•	0.29 0.13	35	> .99 > .98	0.87	2.51 2.47	<10	32/0	2	ESK
F25T8															
1	PRS	120 277	ES5821B	ES-1-T8-32/25-UNV-B-DIM-10	•	•	0.21 0.10	26	> .99 > .90	0.87	3.41 3.36	<10	32/0	1	ESB
1	PRS	120 277	ES5835K	ES-1-T8-32/25-UNV-K-DIM-10	•	•	0.21 0.10	26	> .99 > .90	0.87	3.40 3.31	<10	32/0	1	ESK
2	PRS	120 277	ES5822B	ES-2-T8-32/25-UNV-B-DIM-10	•	•	0.41 0.18	48	> .99 > .95	0.87	1.80 1.82	<10	32/0	1	ESB
2	PRS	120 277	ES5836K	ES-2-T8-32/25-UNV-K-DIM-10	•	•	0.41 0.18	48	> .99 > .95	0.87	1.80 1.82	<10	32/0	1	ESK
F32T8															
1	PRS	120 277	ES5821B	ES-1-T8-32/25-UNV-B-DIM-10	•	•	0.29 0.13	34	> .99 > .95	0.87	2.60 2.57	<10	32/0	1	ESB
1	PRS	120 277	ES5835K	ES-1-T8-32/25-UNV-K-DIM-10	•	•	0.27 0.13	33 34	> .99 > .95	0.87	2.63 2.60	<10	32/0	1	ESK
2	PRS	120 277	ES5822B	ES-2-T8-32/25-UNV-B-DIM-10	•	•	0.56 0.23	65 64	> .99 > .98	0.87	1.33 1.37	<10	32/0	2	ESB
2	PRS	120 277	ES5836K	ES-2-T8-32/25-UNV-K-DIM-10	•	•	0.56 0.23	65 64	> .99 > .95	0.87	1.33 1.37	<10	32/0	2	ESK
F14T5															
1	PRS	120 277	ES5849K	ES-1-T5-14-UNV-K-DIM-10	•	•	0.16 0.07	20	> .99 > .98	1.00	5.13 4.95	<10	32/0	1	ESK
2	PRS	120 277	ES5851K	ES-2-T5-14-UNV-K-DIM-10	•	•	0.28 0.13	34	> .99 > .95	1.00	2.94	<10	32/0	2	ESK
F21T5															
1	PRS	120 277	ES5839K	ES-1-T5-21-UNV-K-DIM-10	•	•	0.23 0.16	28	> .99 > .98	1.00	3.64	<10	32/0	1	ESK
2	PRS	120 277	ES5861K	ES-2-T5-21-UNV-K-DIM-10	•	•	0.40 0.17	48	> .99 > .98	1.00	2.08	<10	32/0	2	ESK
F28T5															
1	PRS	120 277	ES5846K	ES-1-T5-28-UNV-K-DIM-10	•	•	0.30 0.14	37	> .99 > .95	1.00	2.67 2.71	<10	32/0	1	ESK
2	PRS	120 277	ES5847K	ES-2-T5-28-UNV-K-DIM-10	•	•	0.56 0.25	67	> .99 > .98	1.00	1.49 1.50	<10	32/0	2	ESK
F35T5															
1	PRS	120 277	ES5853K	ES-1-T5-35-UNV-K-DIM-10	•	•	0.34 0.15	40 41	> .99 > .98	1.00	2.50 2.44	<10	32/0	1	ESK
CFQ/H13W															
2	PRS	120 277	ES5011GT/HT❖	ES-2/1-CFQ-13-UNV-GT/HT-DIM-10	•	•	0.25 0.11	30 29	> .99 > .95	1.00	3.38 3.41	<10	32/0	3	GT/HT
CFQ/H18W															
2	PRS	120 277	ES5012GT/HT❖	ES-2/1-CFQ-18-UNV-GT/HT-DIM-10	•	•	0.31 0.14	38	> .99 > .95	1.00	2.66	<10	32/0	3	GT/HT
CFQ/H26W															
2	PRS	120 277	ES5013GT/HT❖	ES-2/1-CFQ-26-UNV-GT/HT-DIM-10	•	•	0.46 0.19	54 52	> .99 > .95	1.00	1.85 1.94	<10	32/0	3	GT/HT
CFH42W															
1	PRS	120 277	ES5010GT/HT❖	ES-1-CFH-42/36/26-UNV-GT/HT-DIM-10	•	•	0.34 0.15	46	> .99 > .95	1.00	2.41 2.20	<10	32/0	4	GT/HT
FT40W/2G11															
1	PRS	120 277	ES5006BM❖	ES-1-CFT-40-UNV-BM-DIM-10	•	•	0.35 0.16	44 43	> .99 > .98	1.09	2.48 2.53	<10	32/0	5	ESBM
2	PRS	120 277	ES5007BMT❖	ES-2-CFT-40-UNV-BMT-DIM-10	•	•	0.73 0.31	88 87	> .99	1.09	1.24 1.25	<10	32/0	6	ESBMT

Fluorescent Dimming

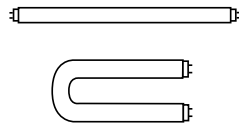
- ❖ Also operates (1) CFQ/H13W
- Also operates (1) CFQ/H18W
- ❖ Also operates (1) CFQ/H26W
- Also operates (1) CFH32W and (1) FQ/H26W

- ❖ HT suffix—Lead entry is bottom feed
- ❖ GT suffix—Lead entry is end feed
- ❖ Incorporates lead wires

STARTING METHOD LEGEND
PRS = Programmed Rapid Start

See page 3-20 for Dimensions and Wiring Diagrams

BALLASTAR® 0-10V DIMMING



- Analog Dimming
- Rapid Start
- 1, 2, 3 & 4 Lamp Applications

BALLASTAR® 0-10 VOLT DIMMING BALLASTS

FOR (1), (2), (3) & (4) T8 LAMPS

Please visit www.unvlt.com for the most up to date status and recent changes to the Ballastar 0-10V product family.

Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F25T8 - One Lamp Applications												
1	RS	120	B132R120V5 @ 100%	0.22	26	> .99	0.90	3.46	< 10	50/10	13	ST
			B132R120V5 @ 5%	0.06	7	> .90	0.05	0.71	< 15	50/10	13	ST
		277	B132R277V5 @ 100%	0.10	26	> .99	0.90	3.46	< 10	50/10	13	ST
			B132R277V5 @ 5%	0.03	7	> .90	0.05	0.71	< 20	50/10	13	ST
		347	B132R347V5 @ 100%	0.08	26	> .99	0.90	3.46	< 10	50/10	13	ST
			B132R347V5 @ 5%	0.02	7	> .90	0.05	0.71	< 30	50/10	13	ST
F25T8 - Two Lamp Applications												
2	RS	347	B232SR347V5 @ 100%	0.14	47	> .99	0.93	1.98	< 10	50/10	15	-E
			B232SR347V5 @ 5%	0.04	12	> .90	0.05	0.42	< 15	50/10	15	-E
F25T8 - Four Lamp Applications												
4	PAR-PRS	277	B432P277V5-E @ 100%	0.33	90	> .98	0.88	0.98	< 10	50/10	14	-E
			B432P277V5-E @ 5%	0.09	22	> .90	0.05	0.23	< 15	0/10	14	-E
F32T8 - One Lamp Applications												
1	RS	120	B132R120V5 @ 100%	0.27	32	> .99	0.88	2.75	< 10	50/10	13	ST
			B132R120V5 @ 5%	0.07	8	> .90	0.05	0.63	< 10	50/10	13	ST
		277	B132R277V5 @ 100%	0.12	32	> .99	0.88	2.75	< 10	50/10	13	ST
			B132R277V5 @ 5%	0.03	8	> .90	0.05	0.63	< 15	50/10	13	ST
		347	B132R347V5 @ 100%	0.09	32	> .99	0.88	2.75	< 10	50/10	13	ST
			B132R347V5 @ 5%	0.02	8	> .90	0.05	0.63	< 20	50/10	13	ST
F32T8 - Two Lamp Applications												
2	SER-RS	120	B232SR120V5 @ 100%	0.52	62	> .99	0.88	1.42	< 10	50/10	15	ST
			B232SR120V5 @ 5%	0.12	13	> .90	0.05	0.38	< 10	50/10	15	ST
		277	B232SR277V5 @ 100%	0.23	62	> .99	0.88	1.42	< 10	50/10	15	ST
			B232SR277V5 @ 5%	0.05	13	> .90	0.05	0.38	< 15	50/10	15	ST
		347	B232SR347V5 @ 100%	0.18	62	> .99	0.88	1.42	< 10	50/10	15	ST
			B232SR347V5 @ 5%	0.04	13	> .90	0.05	0.38	< 15	50/10	15	ST
2	RS	347	B232SR347V5 @ 100%	0.18	62	> .99	0.88	1.42	< 10	50/10	15	-E
			B232SR347V5 @ 5%	0.04	13	> .90	0.05	0.38	< 15	50/10	15	-E
F32T8 - Three Lamp Applications												
3	SER-RS	120	B332SR120V5 @ 100%	0.77	92	> .99	0.88	0.96	< 10	50/10	17	ST
			B332SR120V5 @ 5%	0.17	20	> .90	0.05	0.25	< 10	50/10	17	ST
		277	B332SR277V5 @ 100%	0.33	92	> .99	0.88	0.96	< 10	50/10	17	ST
			B332SR277V5 @ 5%	0.07	20	> .90	0.05	0.25	< 15	50/10	17	ST
F32T8 - Four Lamp Applications												
4	SER/PAR-RS	277	B432SR277V5 @ 100%	0.42	117	> .99	0.88	0.79	< 10	50/10	18	-ZZ
			B432SR277V5 @ 5%	0.11	27	> .90	0.05	0.19	< 15	50/10	18	-ZZ
4	SER-PRS	277	B432P277V5-E @ 100%	0.42	115	> .99	0.88	0.77	< 10	50/10	14	-E
			B432P277V5-E @ 5%	0.10	24	> .90	0.05	0.21	< 15	50/10	14	-E
4	SER-PRS	277	B432P277V5H-E @ 100%	0.55	150	> .99	1.18	0.79	< 10	50/10	14	-E
			B432P277V5H-E @ 5%	0.12	28	> .90	0.06	0.22	< 15	50/10	14	-E

All models except B232SR347V5 are cULus Listed
B232SR347V5 is CSA Certified

See page 3-20 for Dimensions
and Wiring Diagrams

STARTING METHOD LEGEND

IS = Instant Start
PRS = Programmed Rapid Start
RS = Rapid Start

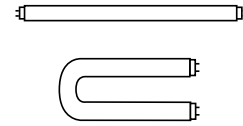
PAR-IS = Parallel Instant Start
PAR-PRS = Parallel Programmed Rapid Start

PAR-RS = Parallel Rapid Start
SER-RS = Series Rapid Start

BALLASTAR® STEP DIMMING BALLASTS

FOR (1), (2) & (3) T8 LAMPS

- Step Dimming
- Rapid Start
- 1-3 Lamp Applications



**BALLASTAR
LIGHT LEVEL
SWITCHING**

Lamp Qty.	Starting Method	Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
F17T8 - One Lamp Applications												
1	PRS	120	B232PUS50-A @ 100%	0.14	16	> .95	0.88	5.50	< 15	32/0	12a	-A
			B232PUS50-A @ 50%	0.08	9	> .95	0.29	3.22	< 15	32/0	12a	-A
		277	B232PUS50-A @ 100%	0.08	16	> .70	0.88	5.50	< 15	32/0	12a	-A
			B232PUS50-A @ 50%	0.05	9	> .70	0.29	3.22	< 15	32/0	12a	-A
F17T8 - Two Lamp Applications												
2	PRS	120	B232PUS50-A @ 100%	0.25	30	> .99	0.87	2.90	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.14	16	> .98	0.30	1.88	< 15	32/0	12	-A
		277	B232PUS50-A @ 100%	0.12	30	> .88	0.87	2.90	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.07	16	> .85	0.30	1.88	< 15	32/0	12	-A
F25T8 - One Lamp Applications												
1	RS	120	B232PUS50-A @ 100%	0.21	24	> .95	0.85	3.54	< 10	32/0	12a	-A
			B232PUS50-A @ 50%	0.10	12	> .90	0.28	2.33	< 10	32/0	12a	-A
		277	B232PUS50-A @ 100%	0.11	24	> .80	0.85	3.54	< 10	32/0	12a	-A
			B232PUS50-A @ 50%	0.06	12	> .80	0.28	2.33	< 10	32/0	12a	-A
F25T8 - Two Lamp Applications												
2	SER-RS	120	B232PUS50-A @ 100%	0.39	46	> .98	0.84	1.83	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.20	24	> .95	0.28	1.17	< 10	32/0	12	-A
		277	B232PUS50-A @ 100%	0.18	46	> .98	0.84	1.83	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.09	24	> .90	0.28	1.17	< 10	32/0	12	-A
F32T8 - One Lamp Applications												
1	RS	120	B132R120S30 @ 100%	0.27	32	> .99	0.89	2.78	< 10	50/10	11	ST
			B132R120S30 @ 60%	0.19	23	> .99	0.60	2.61	< 10	50/10	11	ST
			B132R120S30 @ 30%	0.12	14	> .98	0.28	2.00	< 10	50/10	11	ST
			B132R277S30 @ 100%	0.13	33	> .99	0.89	2.70	< 10	50/10	11	ST
			B132R277S30 @ 60%	0.09	25	> .98	0.63	2.52	< 15	50/10	11	ST
			B132R277S30 @ 30%	0.06	15	> .95	0.28	1.87	< 20	50/10	11	ST
		277	B232PUS50-A @ 100%	0.25	29	> .99	0.88	3.03	< 10	32/0	12a	ST
			B232PUS50-A @ 50%	0.12	14	> .98	0.29	2.07	< 10	32/0	12a	ST
			B232PUS50-A @ 100%	0.12	29	> .85	0.88	3.03	< 10	32/0	12a	ST
			B232PUS50-A @ 50%	0.06	14	> .80	0.29	2.07	< 20	32/0	12a	ST
F32T8 - Two Lamp Applications												
2	SER-RS	120	B232SR120S30 @ 100%	0.52	62	> .99	0.88	1.42	< 10	50/10	12	ST
			B232SR120S30 @ 60%	0.38	45	> .95	0.58	1.29	< 10	50/10	12	ST
			B232SR120S30 @ 30%	0.24	28	> .95	0.27	0.96	< 10	50/10	12	ST
			B232SR277S30 @ 100%	0.23	62	> .99	0.88	1.42	< 10	50/10	12	ST
			B232SR277S30 @ 60%	0.17	45	> .95	0.58	1.29	< 10	50/10	12	ST
			B232SR277S30 @ 30%	0.11	28	> .95	0.27	0.96	< 10	50/10	12	ST
		277	B232PUS50-A @ 100%	0.48	57	> .99	0.88	1.54	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.24	28	> .99	0.30	1.07	< 10	32/0	12	-A
			B232PUS50-A @ 100%	0.21	56	> .95	0.88	1.57	< 10	32/0	12	-A
			B232PUS50-A @ 50%	0.11	28	> .90	0.30	1.07	< 10	32/0	12	-A
F32T8 - Three Lamp Applications												
3	SER-RS	120	B332SR120S30 @ 100%	0.78	93	> .99	0.88	0.95	< 10	50/10	16	ST
			B332SR120S30 @ 60%	0.61	69	> .95	0.60	0.87	< 10	50/10	16	ST
			B332SR120S30 @ 30%	0.40	43	> .95	0.30	0.70	< 10	50/10	16	ST
			B332SR277S30 @ 100%	0.34	94	> .99	0.88	0.94	< 10	50/10	16	ST
			B332SR277S30 @ 60%	0.26	69	> .95	0.60	0.87	< 10	50/10	16	ST
			B332SR277S30 @ 30%	0.16	43	> .95	0.30	0.70	< 10	50/10	16	ST

All models are cULus Listed

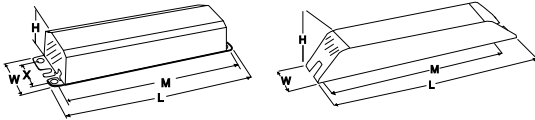
See page 3-20 for Dimensions and Wiring Diagrams

Fluorescent Dimming

T8 DIMMING

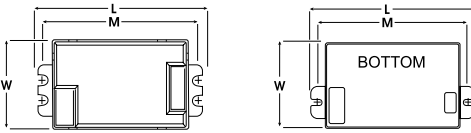
DIMENSIONS AND WIRING DIAGRAMS

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-E	16.88"	1.74"	1.18"	16.28"	—
-ZZ	16.40"	2.40"	1.50"	15.88"	1.69"
ESB	9.50"	2.38"	1.00"	8.88"	—
ESK	16.65"	1.24"	1.00"	16.30"	—
GT/HT	4.95"	3.00"	1.18"	4.63"	—
ESBM	9.50"	2.38"	1.00"	8.88"	—
ESBMT	9.50"	2.38"	1.20"	8.88"	—
DP1	18.00"	1.18"	1.18"	17.70"	—
DP2	4.95"	2.93"	1.38"	4.57"	—



ST, -ZZ

-E, ESB, ESK, ESBM, ESBMT, DP1



GT

HT, DP2

WIRING DIAGRAMS

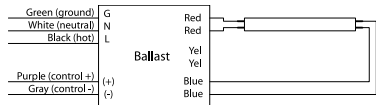


DIAGRAM 1

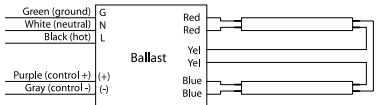


DIAGRAM 2

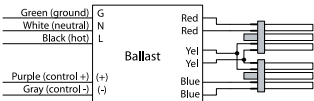


DIAGRAM 3

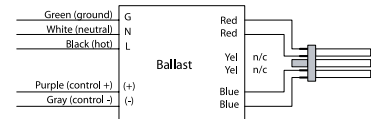


DIAGRAM 4

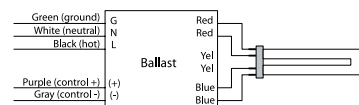


DIAGRAM 5

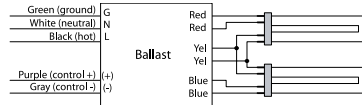


DIAGRAM 6

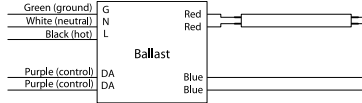


DIAGRAM 7

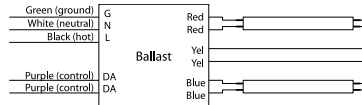


DIAGRAM 8

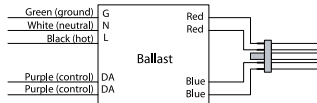


DIAGRAM 9

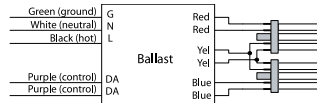


DIAGRAM 10

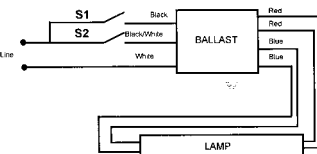


DIAGRAM 11

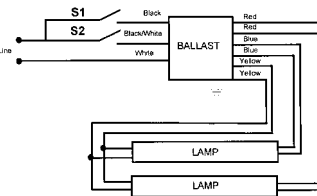


DIAGRAM 12

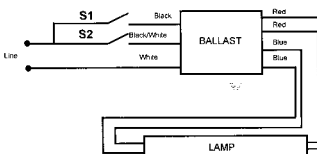


DIAGRAM 12a

INDIVIDUALLY CAP YELLOW LEADS

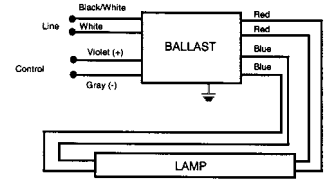


DIAGRAM 13

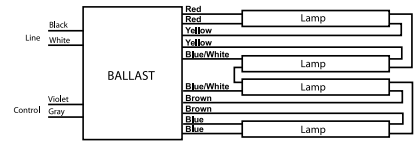


DIAGRAM 14

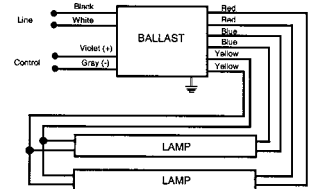


DIAGRAM 15

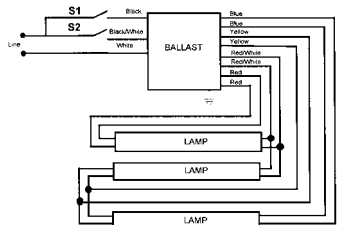


DIAGRAM 16

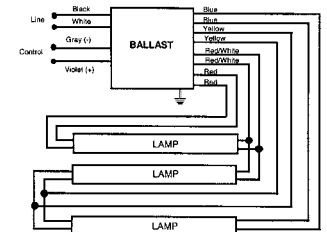


DIAGRAM 17

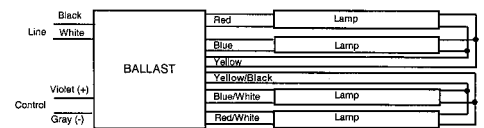
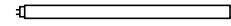


DIAGRAM 18

BALLASTAR® STEP DIMMING BALLASTS FOR T5 LAMPS

- Step Dimming
- Programmed Rapid Start
- 2 Lamp Applications



**BALLASTAR
LIGHT LEVEL
SWITCHING**

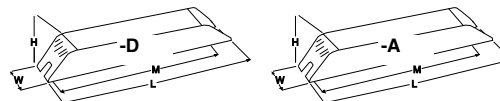
Lamp Qty.	Starting Method	Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.	
F14T5 - One Lamp Applications													
1	PRS	120	B214PU115S50A @ 100%	0.17	21	> .95	1.19	5.90	< 15	50/10	12a	-A	
			B214PU115S50A @ 50%	0.09	10	> .95	0.40	3.74	< 15	50/10	12a	-A	
		277	B214PU115S50A @ 100%	0.09	21	> .75	1.19	5.80	< 15	50/10	12a	-A	
			B214PU115S50A @ 50%	0.05	10	> .75	0.40	3.50	< 15	50/10	12a	-A	
F14T5 - Two Lamp Applications													
2	PRS	120	B214PU115S50A @ 100%	0.33	37.5	> .95	1.15	3.10	< 10	50/10	12	-A	
			B214PU115S50A @ 50%	0.15	18	> .95	0.40	2.19	< 15	50/10	12	-A	
			277	B214PU115S50A @ 100%	0.15	37	> .90	1.15	3.11	< 10	50/10	12	-A
				B214PU115S50A @ 50%	0.08	19	> .85	0.40	2.14	< 15	50/10	12	-A
		120	B228PU95S50D @ 100%	0.29	35	> .95	1.00	2.86	< 10	50/10	19	-D	
			B228PU95S50D @ 50%	0.13	16	> .95	0.37	2.30	< 10	50/10	19	-D	
			277	B228PU95S50D @ 100%	0.13	35	> .95	1.00	2.86	< 10	50/10	19	-D
				B228PU95S50D @ 50%	0.06	16	> .90	0.37	2.29	< 10	50/10	19	-D
F21T5 - One Lamp Applications													
1	PRS	120	B214PU115S50A @ 100%	0.24	29	> .95	1.18	4.09	< 10	50/10	12a	-A	
			B214PU115S50A @ 50%	0.12	14	> .95	0.39	2.84	< 15	50/10	12a	-A	
		277	B214PU115S50A @ 100%	0.12	29	> .85	1.18	4.06	< 15	50/10	12a	-A	
			B214PU115S50A @ 50%	0.62	14	> .85	0.40	2.75	< 15	50/10	12a	-A	
2	PRS	120	B228PU95S50D @ 100%	0.40	48	> .95	0.99	2.06	< 10	50/10	19	-D	
			B228PU95S50D @ 50%	0.18	21	> .95	0.36	1.73	< 10	50/10	19	-D	
		277	B228PU95S50D @ 100%	0.17	47	> .95	0.99	2.10	< 10	50/10	19	-D	
			B228PU95S50D @ 50%	0.08	22	> .95	0.36	1.65	< 10	50/10	19	-D	
F28T5 - Two Lamp Applications													
2	PRS	120	B228PU95S50D @100%	0.50	58	> .99	0.95	1.64	< 10	50/10	19	-D	
			B228PU95S50D @50%	0.23	28	> .99	0.35	1.25	< 20	50/10	19	-D	
		277	B228PU95S50D @100%	0.21	57	> .98	0.95	1.67	< 10	50/10	19	-D	
			B228PU95S50D @50%	0.10	28	> .95	0.35	1.25	< 20	50/10	19	-D	
2	PRS	120	B228PU115S50D @100%	0.59	71	> .99	1.15	1.62	< 10	50/10	19	-D	
			B228PU115S50D @50%	0.29	34	> .99	0.45	1.32	< 10	50/10	19	-D	
		277	B228PU115S50D @100%	0.25	69	> .98	1.15	1.67	< 10	50/10	19	-D	
			B228PU115S50D @50%	0.12	34	> .95	0.45	1.32	< 15	50/10	19	-D	

° Preliminary Data
All models are cULus Listed

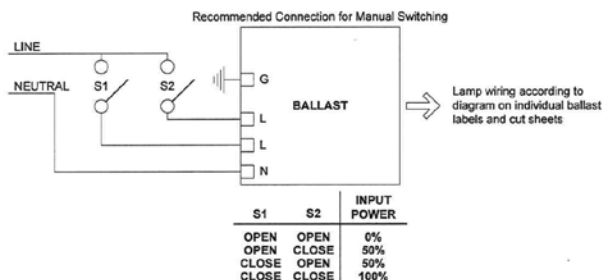
Fluorescent Dimming

- STARTING METHOD LEGEND**
- IS = Instant Start
 - PRS = Programmed Rapid Start
 - RS = Rapid Start
 - PAR-IS = Parallel Instant Start
 - PAR-PRS = Parallel Programmed Rapid Start
 - PAR-RS = Parallel Rapid Start
 - SER-RS = Series Rapid Start

Overall Dimensions			Mounting Dimensions		
Draw #	L	W	H	M	X
-D	16.88"	1.18"	1.00"	16.20"	—
-A	9.50"	1.70"	1.18"	8.89"	—



WIRING DIAGRAMS



Notes
