

Electronic Fluorescent Ballasts

A Complete Range of Solutions — From The Name You Trust

For more than 30 years, the lighting industry has relied on our TRIAD® brand for the most specified, most installed, most reliable electronic ballasts in the business.

The TRIAD® line offers advantages like installer-friendly universal input voltage, which ensures that you have the right voltage ballast every time. We're also the industry leader in low profile design - lightweight, space-saving ballasts that offer the same footprint and wiring as conventional ballasts. And our AccuStart™ ballasts feature programmed rapid start technology that dramatically enhances lamp life.



Universal is the leader in energy saving electronic ballasts.

Product Overview

Setting The Pace In T8 Technology

Universal Lighting keeps pushing the frontier of T8 technology with innovative products that deliver dramatic energy savings, greater fixture design flexibility, longer lamp life and installation ease. You can count on Universal for some of the industry's smallest, lightest and most hassle-free T8 ballasts.

Universal Voltage Low Profile High Performance (HP-A and HP-B)

Our low profile High Performance ballasts with THD<10% offer the convenience of universal input voltage (108 - 305 volts) as a standard feature. Universal input is "installer-friendly" - ensuring that you have the right voltage ballast every time. Our low profile models also feature a remarkably small package and cross section (1.0"H x 1.5"W) for greater flexibility in fixture design. Since the mounting and wiring footprints are the same as a standard size ballast, our low profile HP models will easily retrofit into any T12 or T8 fixture.

High Efficiency Lamp/Ballast System

The High Efficiency Lamp/Ballast System is the most significant advancement in linear fluorescent energy savings in more than a quarter century. The system delivers up to 40% energy savings compared to conventional magnetic T12 energy-saving systems and up to 11% versus standard electronic T8 systems. Our High Efficiency ballast is designed to operate any lamp manufacturer's F32T8/ES energy-saving lamp or standard F32T8 lamp. There are two options:

- EL suffix denotes .77 ballast factor (.71 for Program Start)
- HE suffix denotes .87 ballast factor
- HEH suffix denotes 1.18 ballast factor

AccuStart®

AccuStart® ballasts are ideal for frequently switched applications or as a rapid start alternative. They incorporate programmed rapid start technology to properly heat the lamp filaments, which yields an increase in lamp life up to 50%. The 1-4 lamp models offer universal input voltage - an industry exclusive.

T8 Super Low Profile

Our T8 super low profile models offer maximum fixture flexibility. They're ideal for pendant mount and other specialty lighting applications. They feature a small cross section (1.0"H x 1.18"W) and low profile dimensions for indirect/direct fixtures, plus installer-friendly universal input voltage (108 - 305 volts).

Low Power (L-A)



Family of Low Profile Ballasts.



AccuStart® ballasts for frequently switched applications.

Product Overview

Low Power (L-A)

The L-A Series ballasts offer the option of a .78 ballast factor for maximum energy savings. They feature space-saving low profile design. The 2- to 4-lamp models are ideal for retrofitting energy-saving T12 lamps - and offer parallel lamp operation and THD<20%.

Low Profile Reduced Harmonic (RH-A)

Our low profile RH ballasts are over 45% smaller and 30% lighter. They feature a space-saving package and cross section (1.18" H x 1.7"W) for greater flexibility in fixture design. The 1- to 4-lamp model features parallel lamp operation, with standard mounting footprint and wiring for ease of replacement. They offer high efficiency performance with THD<20%.

Reduced Harmonic High Output (RHH and RHH-A)

These ballasts deliver the maximum light output by operating lamps at their rated current of 265mA without compromising lamp life. They feature a 1.18 ballast factor versus the industry standard .88 to provide lighting design flexibility.

T5 Ballasts For Indirect And High-End Architectural Applications

T5 systems are gaining greater popularity for high-end architectural applications. Universal Lighting gives you a wide range of T5 solutions, from 14 to 54 watts. Our T5 ballasts operate multiple (1 or 2) F35T5, F28T5, F21T5 and F14T5 lamps. Additionally, our T5HO ballasts operate multiple (1 or 2) F54T5HO, F39T5HO and F24T5HO lamps. Moreover, they make your life easier with standard features that include universal input voltage (108 - 305 volts), programmed rapid start technology for longer lamp life and end of lamp life shutdown circuit with auto-reset.

T5 Standard Output

Our standard output T5 ballasts support multiple lamp operation (including 14-, 21-, 28-, and 35-watt lamps). They're ideal for indirect pendant mount, surface mount, cove, undercabinet or task lighting. With a small cross section (1.0"H x 1.18"W), our T5 models give you more options for slim fixture design. Standard features include universal input voltage, end-of-lamp-life shutdown circuit and programmed rapid start technology.

T5 High Output

Universal's high output T5 ballasts support 24-, 39- and 54-watt lamps. They offer the same standard features and compact dimensions as our T5 standard output line - and they're also well-suited to applications where space is at a premium, including slim pendant mounted fixtures, cove and task lighting.



Family of Universal HP Ballasts.



Flexible Fixture design options for T5 and T5HO lamps.

Application And Operating Information

SAFETY

NEC & UL Requirements

Ballast installation presents the possibility of exposure to potentially hazardous voltages and should be performed only by qualified personnel. All installation, inspection and maintenance should be performed only with power to the fixture turned off. Additionally, all fixtures and ballasts must be installed and operated in compliance with the National Electrical Code, Underwriters Laboratories Inc. (UL) requirements, and all local applicable codes and regulations.

Polarity

Polarity refers to the proper connection of ballast lead wires to line wires. To aid you in making a correct installation, Universal ballast leads are color-coded for easy identification. The WHITE ballast lead is to be connected to the neutral (grounded) and the BLACK (or black with white tracer) lead always to the phase ("hot") line wire. Systems where neither of the line wires are at ground potential require specially designed ballasts. A change in polarity may result in the voltage from the lead to the ground exceeding UL-specified limits. In some types of ballasts, a change in polarity may decrease voltage from the lead to the ground, thereby impeding the starting dependability of the ballast.

Grounding

Ballast cases and fixtures must always be grounded. The ballast case may be grounded to the fixture or otherwise grounded. It could be hazardous to make contact with an ungrounded fixture or ballast when in operation. Neglecting to properly ground the ballast and fixture combination may also result in failure of certain lamps to start or for unacceptable levels of electromagnetic noise to be conducted onto the power lines.

Operating Line Voltage Limits

To receive the full benefits of rated lamp output and to prolong ballast life, it is essential that voltage supplied to an installation be maintained within limits prescribed for each circuit. These limits are listed below:

Nominal Voltage	VOLTAGE RANGE	
	Minimum	Maximum
120	108	132
220	198	242
277	249	305
347	312	382
120-277 (UNV)	108	305
347-480 (HRV)	312	528

Subjecting a ballast to excessive voltage for an extended period results in the deterioration of the insulation. This insulation breakdown will cause early ballast failure.

Low voltage has no damaging effect on the ballast. However, lamps may not start reliably, and early lamp failure could result.

Internal Ballast Protection

Class P Classification - Since January 1, 1984, the National Electrical Code requires that "where Fluorescent fixtures are installed indoors, the ballast shall have thermal protection integral within the ballast except for simple reactance ballasts." This ruling applies to replacement ballasts as well as to those contained within new fixtures.

In compliance with the National Electrical Code, UL has established a Class P ballast classification for fluorescent light fixtures.

A Class P ballast must employ internal thermal protection limiting its operating temperature.

Universal UL-approved Class P ballasts comply with the National Electrical Code requirement and are equipped with an automatic resetting thermal protector, built-in and adjacent to the transformer coils. The resetting thermal protector functions as a thermostat which will open and temporarily deactivate the ballast when it exceeds the permissible temperature. It will reset when the ballast cools to a safe operating temperature. The ballast will continue to cycle until the cause of overheating is eliminated. If the ballast is defective, it must be replaced. If the cause is external, a Class P ballast will resume normal operation after abnormal conditions are eliminated.

Application And Operating Information

SAFETY

Dimming Ballasts - Ballastar® Dimming Ballasts are controlled by using 10-0vDC. Care should be taken to insure that the line voltage (AC) wires are not connected to the low voltage DC wires. Ballastar® Electronic Dimming Ballasts have protection (safety) circuitry, that will sense the error so as not to harm the installer or the ballast. Dimming ballasts manufactured after May 1999 have the protection circuit. Dimming ballasts manufactured before this date do not have low voltage circuit protection.

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 or check out our TES home page at www.unvlt.com.

Grounding - ANSI C82.1 recommends all fixtures and ballasts be grounded. Universal requires all electronic ballasts be grounded.

Thermal Protection - All Universal electronic ballasts meet UL 935 Standard for thermal protection. These ballasts are designated Class P. A Class P ballast will disconnect the ballast from input power in the event of internal over-temperature.

PERFORMANCE

Lamp Connections

Fluorescent ballasts are designed to generate voltages in excess of 300 volts. It is imperative that proper connection to quality Lampholders be assured in accordance with wiring diagrams on each page of the catalog and on product labels. Some applications may not require the use of all of the ballast output leads. If any leads are not to be connected, each should be individually capped and insulated to at least 600 volts.

Application Versatility

Many Universal models are designed to allow for applications with different types or quantities of lamps. Lamp applications not listed on label cannot be warranted.

Audible Noise (Sound)

Electrical equipment, including most fluorescent lamp ballasts, produces some noise. Care must be taken to select a ballast with the proper sound rating for a particular lighting installation. Secure mounting can reduce the potential for audible noise.

EMI/RFI

Electronic ballasts operate at high frequency and, therefore, may produce radio frequency interference (RFI) or electromagnetic interference (EMI). Some sensitive electrical equipment such as televisions, radios, or some medical equipment can be adversely affected by this RFI or EMI interference. Currently the electronic frequencies from 450 kilohertz (kHz) to 300 megahertz (MHz) are regulated by the FCC. For electronic ballasts, the limits and regulations are listed in the Code of Federal Regulations, Title 47, Part 18, Subpart C titled RF Lighting Devices. ULT provides ballasts compliant with non-consumer limits for commercial applications, as well as several models in compliance with consumer limits for residential use.

See the Data Sheets for the electronic ballast of interest to determine which FCC requirement, consumer or non-consumer the particular product meets.

Remote Mounting

Excessive hot or cold temperatures, audible noise requirements, or a desire to operate lamps in more than one fixture with the same ballast (tandem), may make it desirable to mount the ballast remotely. Care must be taken to allow for ballast heat dissipation and proper grounding.

In any application, the wire used to extend leads must be at least as large as the wire supplied on the ballast (18 AWG) with an insulation rating of 1000 VAC at 90°C.

Lead lengths in excess of those noted cause loading effects that can dramatically impact ballast performance and void the warranty.

See individual data sheets to determine all wiring options.

Application And Operating Information

PERFORMANCE

- **Lamp Starting Dependability**

Fluorescent lamps are inherently more difficult to start at low temperatures. All ballasts have limitations as to their ability to start lamps at low ambient temperatures. In this catalog, the low starting point for each lamp/ballast combination appears in the column marked "Minimum Starting Temperature."

Universal four lamp instant start ballasts can operate at a minimum starting temperature down to -18°C (0°F) under the following conditions:

1. Lead lengths to the lamps are those supplied, by Universal, with the ballast or shorter.
2. The distance from the lamp to the ground plane is no greater than 3/4".
3. The line voltage supplied to the ballast is no less than rated nominal.
4. The ballast or lamps are not remotely mounted.
5. The lamps have been burned in per lamp manufacturer requirements (typically 100 hours).

The lamp manufacturer should be contacted for lamp operating characteristics and requirements below 15°C (50°F).

- **Light Output**

Optimum light output from fluorescent lamps is achieved when the lamp wall is at 100-110°F. Any substantial excursion (either colder or warmer) will result in a reduction in light output.

- **Ballast Life**

A fluorescent lamp ballast, like any other electrical device, generates heat during its normal operation. Ballast temperatures should be kept as low as possible. Maximum dissipation of heat through fixture design and proper ballast installation will help. Although excessive temperature may not cause the ballast to fail immediately, it can shorten ballast life. To assure maximum life, the ballast case temperature should not exceed 75°C, in a maximum ambient (fixture cavity) of 40°C.

Causes of ballast overheating:

- Incorrect line voltage or frequency
- Incorrect size, type or number of lamps
- Incorrect wiring
- Poor heat dissipation due to surrounding insulation
- Sealed (Vapor Tight) Fixtures - Unusual heat build-up due to lack of ventilation in fixtures may cause thermal (on/off) cycling of certain ballasts. Consult Universal for specific recommendations.

RECOMMENDATIONS...

- Selection of a proper ballast to match the requirements of the lamp, fixture, voltage and installation.
 - Mounting of ballast within the fixture with as much surface contact as possible between the ballast and metal portions of the fixture. Secure mounting will aid in proper heat dissipation and can minimize the potential for ballast hum.
 - The use of heat-conducting dissipators (radiators), if necessary, which increase surface contact between the ballast and fixture.
 - If necessary, locate the ballast in a remote, cooler area outside the fixture.
 - Consult Universal for remote mounting recommendations.
- **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

Specifications

TYPICAL SPECIFICATIONS FOR INSTANT START BALLASTS FOR:

- **RH** (Reduced Harmonic)
- **L** (Low Wattage)
- **RHH and RHH-A** (Reduced Harmonic High Output)

1. Ballasts (1-4 lamp) shall operate as a Parallel Circuit, allowing remaining lamp(s) to maintain full light output if one or more lamps fail.
2. Ballasts shall operate from 60 Hz input source of 120, 277 Volts, and sustained variations of $\pm 10\%$ (Voltage & Frequency) with no damage to the ballasts.
3. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 20 kHz.
4. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
5. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
6. Ballasts shall provide transient immunity as recommended by ANSI C62.41-1991, Location A2.
7. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
8. Ballasts shall tolerate sustained open circuit and short circuit output conditions without damage.
9. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
10. Ballast shall have a Ballast Factor greater than .85 per ANSI C82.11-1993.
- Ballast Factor for Low Power (L-A) models shall be greater than .77.
11. Input current Total Harmonic Distortion shall not exceed 20% for the primary lamp applications
12. Ballasts shall have a Power Factor greater than .95 for primary lamp applications.
13. The ballasts do not contain any PCB's.
14. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for five years from date of manufacture.
15. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
16. Ballast shall be manufactured in an ISO 9001 Certified Facility
17. Ballasts shall provide instant starting sequence consistent with ANSI standard C82.11-1993.
18. Universal model _____ (or approved equal).

Specifications

TYPICAL SPECIFICATIONS FOR INSTANT START BALLASTS FOR:

Universal Voltage

•HP (High Performance)

1. Ballasts (1-4 lamp) shall operate as a Parallel Circuit, allowing remaining lamp(s) to maintain full light output if one or more lamps fail.
2. Ballasts shall operate from 50/60 Hz input source of 120 through 277 Volts, and sustained variations of $\pm 10\%$ (Voltage & Frequency) with no damage to the ballasts.
3. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 42 kHz to minimize interference with infrared control systems.
4. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
5. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
6. Ballasts shall provide transient immunity as recommended by ANSI C62.41-1991, Location A2.
7. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
8. Ballasts shall tolerate sustained open circuit and short circuit output conditions without damage.
9. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
10. Ballast shall have a Ballast Factor greater than .85 per ANSI C82.11-1993.
11. Input current Total Harmonic Distortion shall not exceed 10% for the primary lamp.
12. Ballasts shall have a Power Factor greater than .98 for primary lamp.
13. The ballasts shall not have any PCB's.
14. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for five years from date of manufacture.
15. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
16. Ballast shall be manufactured in an ISO 9001 Certified Facility.
17. Ballasts shall provide instant starting sequence consistent with ANSI standard C82.11-1993.
18. Ballast shall be Universal Lighting Technologies Bx32IUNVHP-B (x=1 or 2) or Bx32IUNVHP-A (x=3 or 4) depending upon the quantity of lamps per fixture.
19. Universal model _____ (or approved equal).

Specifications

TYPICAL SPECIFICATIONS FOR INSTANT START BALLASTS FOR:

- HP (High Performance)
 - HPL (High Performance Low Power)
 - HPH (High Performance High Light)
1. Ballasts (1-4 lamp) shall operate as a Parallel Circuit, allowing remaining lamp(s) to maintain full light output if one or more lamps fail (except T12 High Output).
 2. Ballasts shall operate from 50/60 Hz input source of 120, 277, and 347 Volts, and sustained variations of $\pm 10\%$ (Voltage & Frequency) with no damage to the ballasts.
 3. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 20 kHz.
 4. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
 5. Ballasts shall provide transient immunity as recommended by ANSI C62.41-1991, Location A2.
 6. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
 7. Ballasts shall tolerate sustained open circuit and short circuit output conditions without damage.
 8. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
 9. Ballast shall have a Ballast Factor greater than .85 per ANSI C82.11-1993.
 - Ballast Factor for Low Power (L) models shall be greater than .77.
 10. Input current Total Harmonic Distortion shall not exceed 10% for the primary lamp.
 11. Ballasts shall have a Power Factor greater than .98 for primary lamp.
 12. The ballasts do not contain any PCB's.
 13. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for five years from date of manufacture.
 14. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
 15. Ballast shall be manufactured in an ISO 9001 Certified Facility
 16. Ballasts shall provide instant starting sequence consistent with ANSI standard C82.11-1993.
 17. Universal model _____ (or approved equal).

Specifications

TYPICAL SPECIFICATIONS FOR RAPID START BALLASTS

1. Ballasts (1-4 lamp) shall operate as a Parallel Circuit, allowing remaining lamps(s) to maintain full light output if one or more lamps fail (except T12 High Output).
2. Ballasts shall operate from 60 Hz input source of 120, 277 Volts, and sustained variations of $\pm 10\%$ (Voltage & Frequency) with no damage to the ballasts.
3. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 20 kHz.
4. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
5. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
6. Ballasts shall provide transient immunity as recommended by ANSI C62.41-1991, Location A2.
7. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
8. Ballasts shall tolerate sustained open circuit and short circuit output conditions without damage.
9. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, CSA Certified where applicable.
10. Ballast shall have a Ballast factor greater than .85, per ANSI C82.11-1993.
11. Input current Total Harmonic Distortion shall not exceed 10% for primary lamp applications.
12. Ballast shall be manufactured in an ISO 9001 Certified Facility
13. Ballasts shall have a Power Factor greater than 0.98 primary applications.
14. The ballasts do not contain any PCB's.
15. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for five years from date of manufacture.
16. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
17. Ballasts shall provide rapid starting sequence consistent with ANSI standard C82.11-1993.
18. Universal model _____ (or approved equal).

Specifications

TYPICAL SPECIFICATIONS FOR PROGRAMMED RAPID START BALLASTS:

1. Ballasts shall have a minimum start temperature of 0°F.
2. Ballasts shall operate from a 50/60 Hz input source of 120 through 277 Volts, and sustained variations of $\pm 10\%$ (Voltage & Frequency) with no damage to the ballasts.
3. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 42 kHz to minimize interference with infrared control systems.
4. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
5. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
6. Ballasts shall provide transient immunity as recommended by ANSI C62.41-1991, Location A2.
7. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
8. Ballasts shall tolerate sustained open circuit and short circuit output conditions without damage.
9. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
10. Ballast shall have a Ballast factor greater than .85, per ANSI C82.11-1993.
11. Input current Total Harmonic Distortion shall not exceed 10%.
12. Ballasts shall have a Power Factor greater than 0.98, for primary application.
13. The ballasts shall not have any PCB's.
14. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for five years from date of manufacture.
15. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
16. Ballast shall be manufactured in an ISO 9001 Certified Facility.
17. Ballast shall be manufactured in North America.
18. Ballast shall be Universal Lighting Technologies AccuStart HP Product Bx32PUNVHP-A (x=1,2,3. or 4).
19. Universal model _____ (or approved equal).

Specifications

TYPICAL SPECIFICATIONS FOR INSTANT START T5 AND T5 HIGH OUTPUT (HO) BALLASTS :

1. Ballast shall be Instant Start.
2. Ballast shall incorporate lamp shutdown circuitry for end of lamp life protection.
3. Ballast shall allow for re-lamping without the need to cycle power.
4. Ballasts shall operate from 50/60 Hz input source from 108-305 Volts with no damage to the ballasts.
5. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 20 kHz.
6. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
7. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
8. Ballasts shall provide transient immunity recommended by ANSI C62.41-1991, Location A2.
9. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
10. Ballasts shall tolerate sustained open and short circuit output conditions without damage.
11. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
12. Ballast shall have a Ballast Factor greater than 0.95 per ANSI C82.11-1993.
13. Input current Total Harmonic Distortion shall not exceed 10% for the primary lamp.
14. Ballasts shall have a Power Factor greater than .98.
15. The ballasts do not contain any PCB's.
16. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for up to five years from date of manufacture.
17. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
18. Ballast shall be manufactured in an ISO 9001 Certified Facility.
19. Universal model _____ (or approved equal).

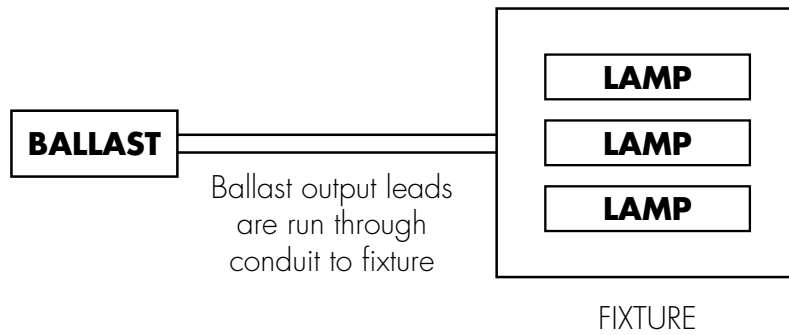
Specifications

TYPICAL SPECIFICATIONS FOR PROGRAMMED RAPID START T5 AND T5 HIGH OUTPUT (HO) BALLASTS :

1. Ballast shall be Programmed Rapid Start.
2. Ballast shall incorporate lamp shutdown circuitry for end of lamp life protection.
3. Ballast shall allow for re-lamping without the need to cycle power.
4. Ballasts shall operate from 50/60 Hz input source from 108-305 Volts with no damage to the ballasts.
5. Ballasts shall be a high frequency electronic type, and operate lamps at a frequency above 20 kHz.
6. Lamp Current Crest Factor (ratio of peak to RMS current) shall be 1.7 or less in accordance with lamp manufacturer recommendation and ANSI C82.11-1993.
7. Ballasts shall comply with FCC Part 18 Non-Consumer Equipment for EMI (power line conducted) and RFI (Radiated).
8. Ballasts shall provide transient immunity recommended by ANSI C62.41-1991, Location A2.
9. Ballasts shall operate lamps with no visible flicker (<3% flicker index).
10. Ballasts shall tolerate sustained open and short circuit output conditions without damage.
11. Ballasts shall be Underwriters Laboratory (UL 935) listed, Class P, Type 1 Outdoor, and CSA certified where applicable.
12. Ballast shall have a Ballast Factor greater than 0.95 per ANSI C82.11-1993.
13. Input current Total Harmonic Distortion shall not exceed 10% for the primary lamp.
14. Ballasts shall have a Power Factor greater than .98.
15. The ballasts do not contain any PCB's.
16. The manufacturer shall provide written warranty against defects in material or workmanship, including replacement, for up to five years from date of manufacture.
17. Manufacturer shall have been manufacturing electronic ballasts for at least fifteen years.
18. Ballast shall be manufactured in an ISO 9001 Certified Facility.
19. Universal model _____ (or approved equal).

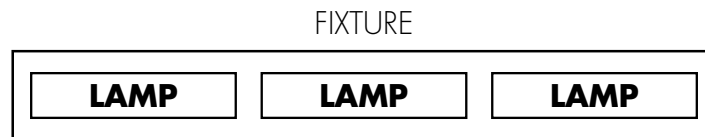
Electronic Ballast Applications

Remote Mounting



Configuration is applicable to 1, 2 and 4-lamp fixtures as well.

Through Wiring

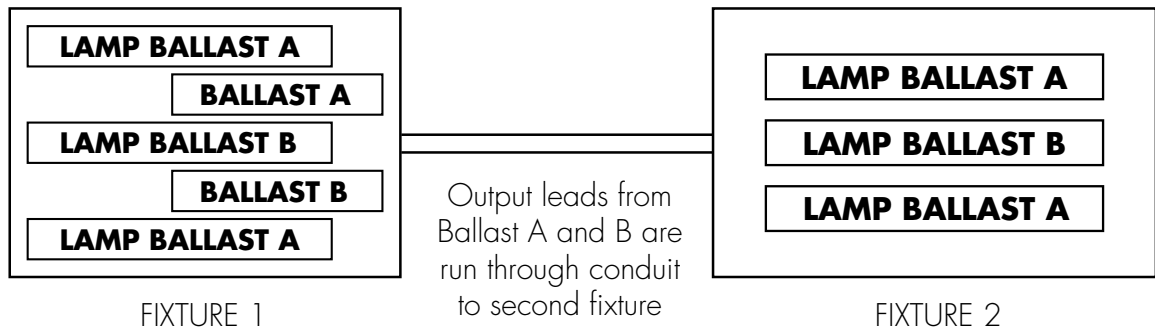


Ballast output leads are run through the fixture to each lamp, NOT through conduit. Minimize lead lengths by mounting ballast at the center of the fixture when possible.

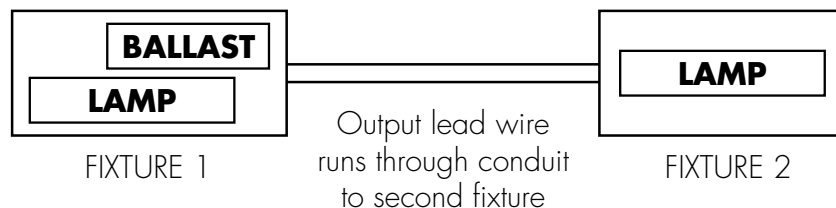
Configuration is applicable to 2 and 3-lamp fixtures as well.

Tandem Wiring

2-Ballast Configuration



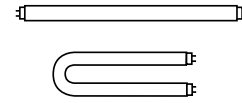
1-Ballast Configuration



TRIAD® ELECTRONIC BALLASTS

FOR (1) & (2) F17T8 LAMP

- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 1-2 Lamp Applications



F17T8

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													
F17T8 - One Lamp Application														
1	IS	120	B132I120RH-A	0.17	19	> .90	0.93	4.89	< 32	0/-18	1	-A		
		120	B132IUNVHP-B	0.14	17	>.95	0.89	5.24	< 10	0/-18	1	-B		
		277		0.07					< 15					
		347	B132I347HP	0.05	18	> .95	0.92	5.11	< 15	0/-18	1	ST		
		120	B232I120RES-A*	0.35	21	> .50	1.08	5.14	< 150	0/-18	3a	-A		
		120	B232I120RES-G*	0.34	22	> .50	1.08	4.91	< 150	0/-18	3a	-G		
		120	B232IUNV-C	0.17	20	> .98	1.04	5.20	< 10	0/-18	21a	-C		
		277		0.08		> .95								
		120	B132IUNVEL-A	0.12	14	> .98	0.78	5.57	< 15	0/-18	1	-A		
		277		0.06		> .90								
120	B132IUNVHE-A	0.13	16	> .98	0.90	5.63	< 10	0/-18	1	-A				
277		0.07		> .90										
120	ES1608A	0.14	16	> .97	0.87	5.44	< 10	0/-18	39a	ESA				
277		0.07	17			5.12								
1	PRS	120	B132PUNVHP-A ²	0.15	17	> .99	0.91	5.35	< 10	0/-18	2	-A		
		277		0.07		> .96			< 15					
		347	ES1510A	0.05	18	> .97	0.87	4.83	< 10	0/-18	40	ESA		
F17T8 - Two Lamp Applications														
2	PAR-IS	347	B232I347L-A	0.09	29	> .98	0.80	2.76	< 20	0/-18	3	-A		
		120	B232I120RES-G*	0.49	33	> .50	0.94	2.85	< 140	0/-18	3	-G		
		120	B232I120RES-A*	0.49	32	> .50	0.94	2.94	< 140	0/-18	3	-A		
		120	B232I120RH-A	0.31	34	> .90	0.95	2.79	< 32	0/-18	3	-A		
		277	B232I277RH-A	0.13	34	> .90	0.95	2.79	< 32	0/-18	3	-A		
		347	B232I347RH-A	0.09	32	> .95	0.92	2.88	< 20	0/-18	3	-A		
		347	B232I347HPL	0.09	29	> .98	0.79	2.72	< 10	0/-18	3	ST		
		120	B232IUNVHP-B	0.26	32	> .99	0.91	2.84	< 10	0/-18	3	-B		
		277		0.12		> .98								
		347	B232I347HP-A	0.09	32	> .95	0.92	2.88	< 10	0/-18	3	-A		
		120	B232IUNV-C	0.27	31	> .99	0.91	2.94	< 10	0/-18	21	-C		
		277		0.12		> .98			< 10					
		120	B232IUNVEL-A	0.21	25	> .95	0.80	3.20	< 10	0/-18	3	-A		
		277		0.10	26			3.08						
		120	B232IUNVHE-A	0.24	30	> .95	0.90	3.00	< 10	0/-18	3	-A		
		277		0.12										
		120	B232IUNVHEH-A	0.33	41	> .95	1.18	2.88	< 10	0/-18	3	-A		
		277		0.15	40			2.95						
		2	SER-IS	120	ES1608A	0.24	29	> .97	0.87	3.00	< 10	0/-18	39	ESA
				277		0.11	30			2.90				
120	B232PUNVEL-A			0.22	26	> .90	0.72	2.77	< 10	0/-18	30	-A		
277				0.10	26			2.77						
2	SER-PRS	120	B232PUNVHE-A	0.24	29	> .90	0.84	2.90	< 10	0/-18	30	-A		
		277		0.11	28			3.00						
		120	ES4800A	0.29	35	> .97	0.95	2.71	< 10	0/-18	37	ESA		
		277		0.13	36			2.64						
		120	B232PUNVHP-A	0.28	34	> .99	0.95	2.79	< 10	0/-18	30	-A		
277		0.13		> .95			< 15							
347	ES1329 A	0.11	36	> .97	0.87	2.42	< 10	0/-18	37	ESA				

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STARTING METHOD LEGEND

IS = Instant Start

RS = Rapid Start

PAR-PRS = Parallel Programmed Rapid Start

PAR-RS = Parallel Rapid Start

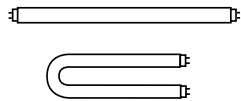
SER-IS = Series Instant Start

PRS = Programmed Rapid Start

PAR-IS = Parallel Instant Start

SER-PRS = Series Programmed Rapid Start

SER-RS = Series Rapid Start



- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 3-4 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (3) & (4) F17T8 LAMPS

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											
F17T8 - Two Lamp Applications												
2	PAR-PRS	120	B232PUNVHE-B ¹	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-B
		277		TBD	TBD	> .97						
		120	B232PUNVEL-B ¹	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-B
		277		TBD	TBD	> .92						
F17T8 - Three Lamp Applications												
3	PAR-IS	120	B332I120RH-A	0.47	52	> .90	0.99	1.90	< 32	0/-18	6	-A
		347	B332I347RH	0.14	47	> .95	0.90	1.91	< 20	0/-18	6	ST
		347	B332I347HPL	0.12	43	> .99	0.80	1.85	< 10	0/-18	6	ST
		120	B332IUNVHP-A	0.38	45	> .99	0.92	2.04	< 10	0/-18	6	-A
		277		0.18	45	> .90						
		347	B332I347HP	0.14	48	> .98	0.92	1.92	< 10	0/-18	6	ST
		120	B332IUNVEL-A	0.35	42	> .99	0.82	1.95	< 10	0/-18	6	-A
		277		0.15	41	> .95		2.00				
		120	B332IUNVHE-A	0.39	46	> .99	0.92	2.00	< 10	0/-18	6	-A
		277		0.17	46	> .97						
		120	B332IUNVHEH-A	0.49	60	> .95	1.19	1.98	< 10	0/-18	6	-A
		277		0.22	58			2.05				
		120	B432I120RES-A*	0.72	51	> .50	1.00	1.96	< 135	0/-18	7a	-A
		120	B432IUNV-D	0.41	49	> .98	0.99	1.98	< 10	0/-18	24	-D
		277		0.18	48	> .95		2.02		< 12		
		120	ES1720B	0.39	46	> .97	0.87	1.89	< 10	0/-18	38a	ESB
277		0.18	47			1.85						
3	SER-PRS	120	B332PUNVHP-A	0.41	49	> .99	0.93	1.90	< 10	0/-18	23	-A
		277		0.19	48	> .90		1.94				
3	PAR-PRS	120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	TBD
		277		TBD	TBD	> .97						
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	TBD
		277		TBD	TBD	> .96						
F17T8 - Four Lamp Applications												
4	PAR-IS	120	B432I120RES-A*	0.84	61	> .50	0.92	1.51	< 130	0/-18	7a	-A
		120	B432I120RH-A	0.54	63	> .95	0.92	1.46	< 20	0/-18	7a	-A
		347	B432I347RH	0.19	64	> .95	0.92	1.44	< 20	0/-18	7a	ST
		347	B432I347HPL	0.17	56	> .97	0.82	1.46	< 10	0/-18	7	ST
		120	B432IUNVHP-A	0.49	59	> .98	0.90	1.53	< 10	0/-18	7a	-A
		277		0.22	58	> .90		1.55				
		347	B432I347HP	0.19	62	> .98	0.92	1.48	< 10	0/-18	7a	ST
		120	B432IUNV-D	0.49	59	> .98	0.91	1.51	< 10	0/-18	25	-D
		277		0.22	58	> .95		1.56		< 12		
		120	B432IUNVEL-A	0.44	53	> .98	0.79	1.49	< 10	0/-18	7a	-A
		277		0.20	52	> .95		1.52				
		120	B432IUNVHE-A	0.49	59	> .98	0.90	1.53	< 10	0/-18	7a	-A
		277		0.22	58	> .95		1.55				
		277	B432I277HEH	0.28	77	> .99	1.20	1.56	< 10	0/-18	7a	ST

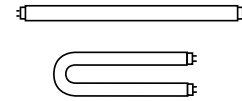
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See page 2-19 for Dimensions and Wiring Diagrams

TRIAD® ELECTRONIC BALLASTS

FOR (1) & (2) F25T8 LAMP

- Standard & Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 1-2 Lamp Applications



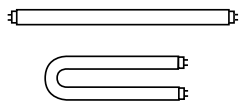
F17T8- F25T8

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											
F17T8 - Four Lamp Applications												
4	SER-PRS	120	B432PUNVHP-A	0.53	63	> .99	0.91	1.44	< 10	0/-18	8	-A
		277		0.24	62	> .90		1.47				
4	PAR-PRS	120	B432PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-A
		277		TBD	TBD	> .96		TBD				
		120	B432PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-A
		277		TBD	TBD	> .95		TBD				
F25T8 - One Lamp Applications												
1	IS	120	B132I120RH-A	0.22	26	> .97	0.92	3.54	< 25	0/-18	1	-A
		120	B132IUNVHP-B	0.21	24	> .95	0.88	3.67	< 10	0/-18	1	-B
		277		0.09								
		347	B132I347HP	0.07	25	> .95	0.90	3.60	< 10	0/-18	1	ST
		120	B132IUNVEL-A	0.18	19	> .98	0.78	4.11	< 10	0/-18	1	-A
		277		0.09		> .90						
		120	B132IUNVHE-A	0.18	22	> .98	0.89	4.05	< 10	0/-18	1	-A
		277		0.10		> .95						
1	PRS	120	B132PUNVHP-A	0.20	24	> .99	0.91	3.79	< 10	0/-18	2	-A
		277		0.09		> .98						
1	IS	347	ES1510A	0.07	24	> .97	0.87	2.81	< 10	0/-18	40	ESA
		347	B232I347HPL	0.08	26	> .98	0.88	3.38	< 10	0/-18	3	ST
		120	B232I120RES-A*	0.43	28	> .50	1.08	3.86	< 150	0/-18	3a	-A
		120	B232I120RES-G*	0.43	28	> .50	1.08	3.86	< 150	0/-18	3a	-G
		120	B232IUNV-C	0.24	28	> .98	1.02	3.64	< 10	0/-18	21	-C
		277		0.11								
		120	ES1608A	0.19	23	> .97	0.87	3.78	< 10	0/-18	39a	ESA
		277		0.09	24			3.63				
1	PRS	120	ES4800A	0.22	25	> .97	1.02	3.92	< 10	0/-18	37	ESA
		277		0.09	26			4.08				
F25T8 - Two Lamp Applications												
2	PAR-IS	347	B232I347L-A	0.12	39	> .98	0.79	2.03	< 20	0/-18	3	-A
		120	B232I120RES-A*	0.64	46	> .50	0.92	2.00	< 130	0/-18	3	-A
		120	B232I120RES-G*	0.64	46	> .50	0.92	2.00	< 140	0/-18	3	-G
		120	B232I120RH-A	0.41	48	> .95	0.93	1.94	< 20	0/-18	3	-A
		277	B232I277RH-A	0.18	48	> .95	0.93	1.94	< 20	0/-18	3	-A
		347	B232I347RH-A	0.13	46	> .95	0.89	1.93	< 20	0/-18	3	-A
		347	B232I347HPL	0.12	41	> .98	0.75	1.83	< 10	0/-18	3	ST
		120	B232IUNVHP-B	0.37	45	> .99	0.90	2.00	< 10	0/-18	3	-B
		277		0.16	44	> .98		2.05				
		347	B232I347HP-A	0.13	46	> .95	0.89	1.93	< 10	0/-18	3	-A
		120	B232IUNV-C	0.37	45	> .98	0.90	2.00	< 10	0/-18	21	-C
		277		0.16	44			2.05				
		120	B232IUNVEL-A	0.30	36	> .95	0.79	2.19	< 10	0/-18	3	-A
		277		0.14	37		0.80	2.18				
		120	B232IUNVHE-A	0.36	44	> .95	0.88	2.00	< 10	0/-18	3	-A
		277		0.16								
		120	B232IUNVHEH-A	0.51	61	> .95	1.18	1.93	< 10	0/-18	3	-A
		277		0.22	60			1.97				

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² Consult Universal for Availability

See page 2-19 for Dimensions and Wiring Diagrams



- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 3-4 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (3) & (4) F25T8 LAMPS

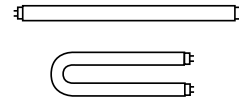
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F25T8 - Two Lamp Applications												
2	SER-IS	120	ES1608A	0.36	43	> .97	0.87	2.02	< 10	0/-18	39	ESA
		277		0.16								
		120	B232PUNVEL-A	0.31	37	> .90	0.71	1.92	<10	0/-18	30	-A
		277		0.14	36			2.00				
		120	B232PUNVHE-A	0.35	42	> .90	0.83	1.98	<10	0/-18	30	-A
		277		0.15	41			2.02				
2	SER-PRS	120	B232PUNVHP-A	0.40	47	> .99	0.94	2.00	<10	0/-18	30	-A
		277		0.17	46	> .97		2.04				
		347	ES1329A	0.14	49	> .97	0.87	1.78	<10	0/-18	37	ESA
		120	ES4800A	0.40	47	> .97	0.94	2.00	< 10	0/-18	37	ESA
		277		0.17	46			2.04				
		120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	30	-B
		277		TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	30	-B
		277		TBD	TBD	> .95						
		F25T8 - Three Lamp Applications										
	PAR-IS	120	B332I120RH-A	0.60	70	> .95	0.93	1.33	< 20	0/-18	6	-A
		347	B332I347RH	0.20	68	> .95	0.90	1.32	< 20	0/-18	6	ST
		347	B332I347HPL	0.17	60	> .99	0.76	1.26	< 10	0/-18	6	ST
		120	B332IUNVHP-A	0.55	66	> .99	0.92	1.36	<10	0/-18	6	-A
		277		0.25	65	> .98		1.38				
		347	B332I347HP	0.20	68	> .99	0.91	1.34	< 10	0/-18	6	ST
		120	B332IUNVEL-A	0.49	59	> .99	0.80	1.36	< 10	0/-18	6	-A
		277		0.22	58	> .97		1.38				
		120	B332IUNVHE-A	0.56	67	> .99	0.90	1.34	< 10	0/-18	6	-A
		277		0.24	66	> .98		1.36				
		120	B332IUNVHEH-A	0.69	83	> .95	1.16	1.40	< 10	0/-18	6	-A
		277		0.30	81			1.43				
3	SER-PRS	120	B332PUNVHP-A	0.58	70	> .99	0.92	1.31	< 10	0/-18	23	-A
		277		0.26		> .95						
		120	B432I120RES-A*	0.96	71	> .50	0.98	1.38	< 130	0/-18	7a	-A
		120	B432IUNV-D	0.62	74	> .98	0.98	1.32	< 10	0/-18	24	-D
		277		0.26	72			1.36				
		120	ES1720B	0.52	63	> .97	0.87	1.38	< 10	0/-18	38a	ESB
		277		0.24	64			1.36				
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .98						
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .95						
		F25T8 - Four Lamp Applications										
	PAR-IS	120	B432I120RES-A*	1.13	85	> .50	0.90	1.06	< 130	0/-18	7a	-A
		120	B432I120RH-A	0.74	87	> .95	0.91	1.05	< 20	0/-18	7a	-A
		347	B432I347RH	0.26	90	> .95	0.90	1.00	< 20	0/-18	7a	ST
		347	B432I347HPL	0.24	83	> .98	0.78	0.94	< 10	0/-18	7	ST
4	PAR-IS	120	B432IUNVHP-A	0.74	87	> .99	0.89	1.02	< 10	0/-18	7a	-A
		277		0.32	85	> .95		1.05				

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TRIAD® ELECTRONIC BALLASTS

FOR (3) & (4) F25T8 LAMPS

- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 3-4 Lamp Applications



F25T8

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 - Four Lamp Applications												
4	PAR-IS	347	B432I347HP	0.26	90	> .98	0.90	1.00	< 10	0/-18	7a	ST
		120	B432IUNV-D	0.73	87	> .98	0.90	1.03	< 10	0/-18	25	-D
		277		0.31	85							
		120	B432IUNVEL-A	0.65	78	> .98	0.78	1.00	< 10	0/-18	7a	-A
		277		0.28	76							
		120	B432IUNVHE-A	0.72	87	> .99	0.89	1.02	< 10	0/-18	7a	-A
		277		0.31	85							
		277	B432I277HEH	0.41	114	> .99	1.19	1.04	< 10	0/-18	7a	ST
120	ES1720B	0.69	83	> .97	0.87	1.05	< 10	0/-18	38	ESB		
277		0.31										
4	SER-PRS	120	B432PUNVHP-A	0.77	92	> .99	0.89	0.97	< 10	0/-18	8	-A
		277		0.33	89	> .95						
4	PAR-PRS	120	B432PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97						
		120	B432PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97						

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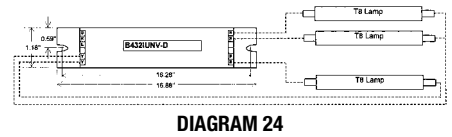
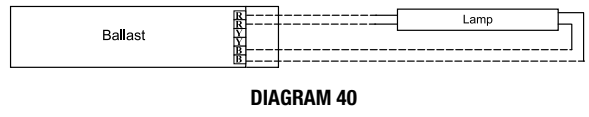
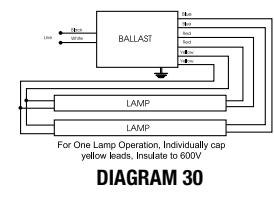
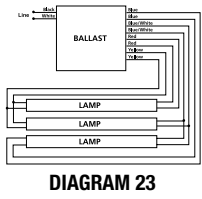
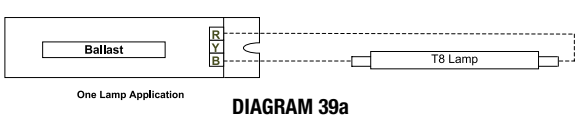
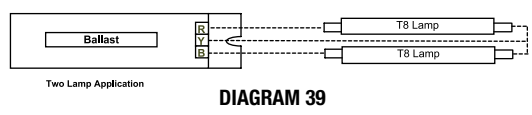
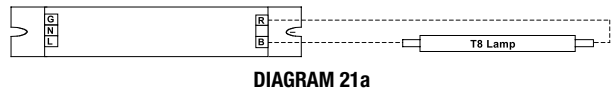
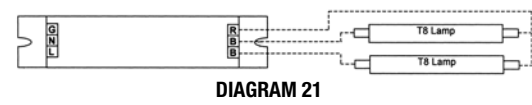
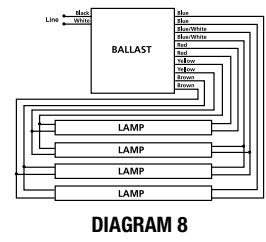
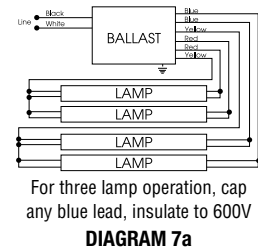
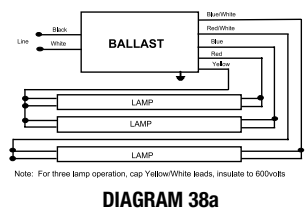
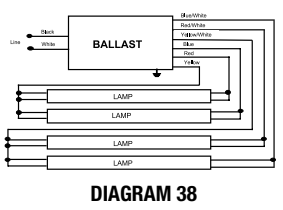
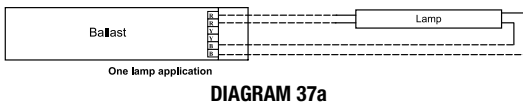
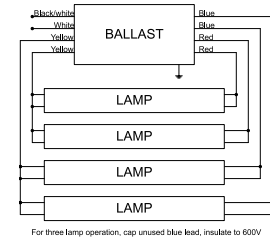
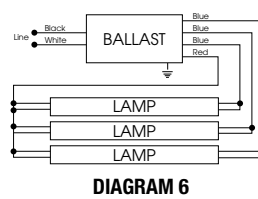
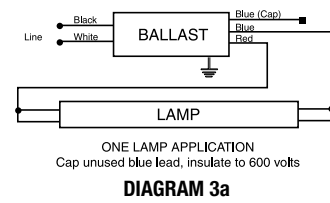
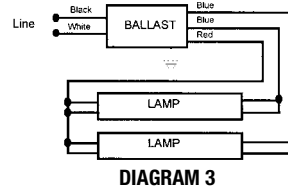
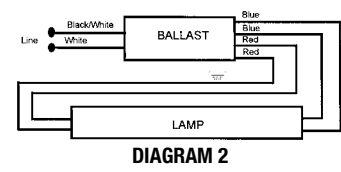
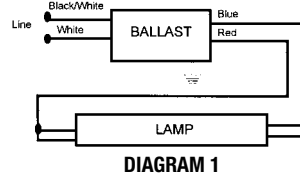
² Consult Universal for Availability

See page 2-19 for Dimensions and Wiring Diagrams

Fluorescent-Electronic

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"
-B	9.50"	1.50"	1.00"	8.89"	0.88"
-C	14.25"	1.18"	1.00"	13.75"	---
-D	16.88"	1.18"	1.00"	16.20"	---
-G	9.50"	1.18"	1.00"	8.89"	---
ESA	9.50"	1.56"	1.00"	8.88"	0.78"
ESB	9.50"	2.38"	1.00"	8.88"	---

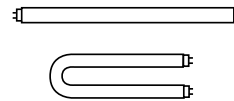
WIRING DIAGRAMS



TRIAD® ELECTRONIC BALLASTS

FOR (1) F32T8 LAMP

- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 1 Lamp Applications



F32T8

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											
F32T8 - One Lamp Applications												
1	IS	120	B132I120RH-A	0.26	31	> .98	0.88	2.84	< 20	0/-18	1	-A
		277	B132IUNVHP-B	0.12	29	> .95	0.88	2.93	< 10	0/-18	1	-B
		347	B132I347HP	0.09	31	> .98	0.88	2.84	< 10	0/-18	1	ST
		120	B132IUNVEL-A	0.22	25	> .98	0.77	3.08	< 10	0/-18	1	-A
		277	B132IUNVEL-A	0.11	25	> .95	0.77	3.08	< 10	0/-18	1	-A
		120	B132IUNVHE-A	0.24	28	> .98	0.87	3.11	< 10	0/-18	1	-A
		277	B132IUNVHE-A	0.12	28	> .95	0.87	3.11	< 10	0/-18	1	-A
		347	B232I347L-A	0.10	33	> .98	0.96	2.91	< 20	0/-18	3a	-A
		120	B232I120RES-A*	0.53	35	> .50	1.06	3.03	< 135	0/-18	3a	-A
		120	B232I120RES-G*	0.53	36	> .50	1.06	2.94	< 150	0/-18	3a	-G
		120	B232I120RH-A	0.31	38	> .90	1.09	2.87	< 25	0/-18	3a	-A
		277	B232I277RH-A	0.14	38	> .90	1.09	2.87	< 25	0/-18	3a	-A
		347	B232I347RH-A	0.11	36	> .95	1.05	2.92	< 20	0/-18	3a	-A
		347	B232I347HPL	0.09	32	> .98	0.91	2.84	< 10	0/-18	3a	ST
		120	B232IUNVHP-B	0.29	35	> .99	1.05	3.00	< 10	0/-18	3a	-B
		277	B232IUNVHP-B	0.13	35	> .98	1.05	3.00	< 10	0/-18	3a	-B
		347	B232I347HP-A	0.11	36	> .95	1.05	2.92	< 10	0/-18	3a	-A
		120	B232IUNV-C	0.29	35	> .98	1.02	3.19	< 10	0/-18	22	-C
		277	B232IUNV-C	0.13	35	> .98	1.02	3.19	< 10	0/-18	22	-C
		120	B232IUNVEL-A	0.24	30	> .95	0.95	3.17	< 10	0/-18	3a	-A
		277	B232IUNVEL-A	0.11	30	> .95	0.95	3.17	< 10	0/-18	3a	-A
		120	B232IUNVHE-A	0.28	33	> .95	1.05	3.18	< 10	0/-18	3a	-A
		277	B232IUNVHE-A	0.13	33	> .95	1.05	3.18	< 10	0/-18	3a	-A
		120	B232IUNVHEH-A ¹	0.39	47	> .95	1.38	2.94	< 10	0/-18	3a	-A
		277	B232IUNVHEH-A ¹	0.18	46	> .95	1.38	3.00	< 10	0/-18	3a	-A
		120	ES1608A	0.25	30	> .97	0.87	2.90	< 10	0/-18	39a	ESA
		277	ES1608A	0.11	31	> .97	0.87	2.81	< 10	0/-18	39a	ESA
		120	B232PUNVHE-A	0.24	29	> .90	0.88	3.03	< 10	0/-18	30	-A
		277	B232PUNVHE-A	0.11	29	> .90	0.88	3.03	< 10	0/-18	30	-A
		120	B232PUNVEL-A	0.20	25	> .90	0.88	2.89	< 10	0/-18	30	-A
277	B232PUNVEL-A	0.09	23	> .90	0.88	3.09	< 10	0/-18	30	-A		
120	B132PUNVHP-A	0.26	31	> .99	0.88	2.84	< 10	0/-18	2	-A		
277	B132PUNVHP-A	0.11	30	> .98	0.88	2.93	< 10	0/-18	2	-A		
347	ES1510A	0.09	31	> .97	0.87	2.81	< 10	0/-18	40	ESA		
120	ES4800A	0.26	31	> .97	1.00	3.23	< 10	0/-18	37	ESA		
277	ES4800A	0.12	32	> .97	1.00	3.13	< 10	0/-18	37	ESA		
120	B232PUNVHP-A	0.27	32	> .99	1.00	3.13	< 10	0/-18	30	-A		
277	B232PUNVHP-A	0.12	32	> .95	1.00	3.13	< 15	0/-18	30	-A		
120	B232PUNVHE-B ²	0.29	TBD	> .99	TBD	TBD	< 10	0/-18	30	-A		
277	B232PUNVHE-B ²	0.13	TBD	> .98	TBD	TBD	< 10	0/-18	30	-A		
120	B232PUNVEL-B ²	0.27	TBD	> .99	TBD	TBD	< 10	0/-18	30	-A		
277	B232PUNVEL-B ²	0.12	TBD	> .93	TBD	TBD	< 10	0/-18	30	-A		

* For Residential Use Only

¹ Consult Lamp Manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

STARTING METHOD LEGEND

IS = Instant Start

RS = Rapid Start

PAR-PRS = Parallel Programmed Rapid Start

PAR-RS = Parallel Rapid Start

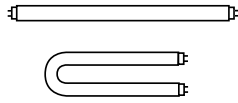
SER-IS = Series Instant Start

PRS = Programmed Rapid Start

PAR-IS = Parallel Instant Start

SER-PRS = Series Programmed Rapid Start

SER-RS = Series Rapid Start



- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (2) F32T8 LAMPS

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											
F32T8 - Two Lamp Applications												
2	PAR-IS	347	B232I347L-A	0.15	51	> .98	0.78	1.53	< 20	0/-18	3	-A
		120	B232I120RES-A*	0.80	56	> .50	0.88	1.57	< 120	0/-18	3	-A
		120	B232I120RES-G*	0.80	56	> .50	0.88	1.57	< 130	0/-18	3	-G
		120	B232I120RH-A	0.49	58	> .98	0.88	1.52	< 20	0/-18	3	-A
		277	B232I277RH-A	0.22	58	> .98	0.88	1.52	< 20	0/-18	3	-A
		347	B232I347RH-A	0.17	58	> .99	0.88	1.52	< 20	0/-18	3	-A
		347	B232I347HPL	0.14	50	> .99	0.78	1.56	< 10	0/-18	3	ST
		120	B232IUNVHP-B	0.47	56	> .99	0.88	1.57	< 10	0/-18	3	-B
		277	B232IUNVHP-B	0.19	55	> .99	0.88	1.60	< 10	0/-18	3	-B
		347	B232I347HP-A	0.17	58	> .99	0.88	1.52	< 10	0/-18	3	-A
		120	B232IUNV-C	0.48	58	> .98	0.88	1.52	< 10	0/-18	21	-C
		277	B232IUNV-C	0.20	56	> .98	0.88	1.57	< 10	0/-18	21	-C
		120	B232IUNVEL-A	0.40	48	> .95	0.77	1.60	< 10	0/-18	3	-A
		277	B232IUNVEL-A	0.17	48	> .95	0.77	1.60	< 10	0/-18	3	-A
		120	B232IUNVHE-A	0.45	55	> .95	0.87	1.58	< 10	0/-18	3	-A
		277	B232IUNVHE-A	0.20	54	> .95	0.87	1.61	< 10	0/-18	3	-A
		120	B232IUNVHEH-A	0.62	74	> .95	1.18	1.59	< 10	0/-18	3	-A
		277	B232IUNVHEH-A	0.26	73	> .95	1.18	1.62	< 10	0/-18	3	-A
2	SER-IS	347	B332IHRVHB-E	0.22	76	> .97	1.22	1.61	< 10	0/-18	46	-E
		480	B332IHRVHB-E	0.17	76	> .90	1.22	1.61	< 10	0/-18	46	-E
		120	ES1608A	0.48	57	> .97	0.87	1.53	< 10	0/-18	39	ESA
		277	ES1608A	0.21	56	> .97	0.87	1.55	< 10	0/-18	39	ESA
		120	B332I120RH-A	0.59	69	> .95	1.03	1.49	< 25	0/-18	6	-A
		347	B332I347RH	0.19	65	> .95	0.99	1.52	< 20	0/-18	6	ST
2	PAR-IS	347	B332I347HPL	0.16	56	> .99	0.87	1.55	< 10	0/-18	6	ST
		120	B332IUNVHP-A	0.53	63	> .99	0.99	1.57	< 10	0/-18	6	-A
		277	B332IUNVHP-A	0.24	63	> .95	0.99	1.57	< 10	0/-18	6	-A
		347	B332I347HP	0.19	66	> .99	0.99	1.50	< 10	0/-18	6	ST
		120	B332IUNVEL-A	0.48	57	> .99	0.89	1.56	< 10	0/-18	6	-A
		277	B332IUNVEL-A	0.21	56	> .97	0.89	1.59	< 10	0/-18	6	-A
		120	B332IUNVHE-A	0.53	64	> .99	0.99	1.55	< 10	0/-18	6	-A
		277	B332IUNVHE-A	0.23	63	> .98	0.99	1.57	< 10	0/-18	6	-A
		120	B332IUNVHEH-A ¹	0.69	83	> .95	1.27	1.53	< 10	0/-18	6	-A
		277	B332IUNVHEH-A ¹	0.30	81	> .95	1.27	1.57	< 10	0/-18	6	-A
2	SER-PRS	120	B232PUNVEL-A	0.40	47	> .90	0.71	1.51	< 10	0/-18	30	-A
		277	B232PUNVEL-A	0.17	46	> .90	0.71	1.54	< 10	0/-18	30	-A
		120	B232PUNVHE-A	0.47	56	> .90	0.88	1.57	< 10	0/-18	30	-A
		277	B232PUNVHE-A	0.20	55	> .90	0.88	1.60	< 10	0/-18	30	-A
		120	B232PUNVHP-A	0.52	62	> .99	0.88	1.42	< 10	0/-18	30	-A
		277	B232PUNVHP-A	0.22	60	> .98	0.88	1.47	< 10	0/-18	30	-A
		120	ES4800A	0.49	58	> .97	0.87	1.50	< 10	0/-18	37	ESA
		277	ES4800A	0.22	60	> .97	0.87	1.45	< 10	0/-18	37	ESA
347	ES1329A	0.17	59	> .97	0.87	1.47	< 10	0/-18	37	ESA		
120	B332PUNVHP-A	0.54	64	> .99	0.99	1.55	< 10	0/-18	23	-A		
277	B332PUNVHP-A	0.24	63	> .90	0.99	1.57	< 10	0/-18	23	-A		

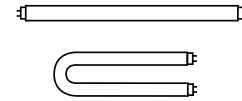
* For Residential Use Only

¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

TRIAD® ELECTRONIC BALLASTS

FOR (2) & (3) F32T8 LAMPS

- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 2 & 3 Lamp Applications



F32T8

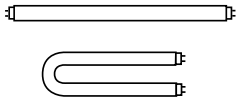
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F32T8 - Two Lamp Applications												
2	PAR-PRS	120	B232PUNVHE-B ¹	TBD	TBD	> .99	0.88	TDB	<10	0/-18	30	-B
		277		TBD	TBD	> .99	0.88	TDB				
		120	B232PUNVEL-B ¹	TBD	TDB	> .99	0.71	TDB	<10	0/-18	30	-B
		277		TBD	TDB	> .96	0.71	TDB				
2	PAR-PRS	120	B332PUNVHE-A ²	TBD	TDB	> .99	TDB	TDB	<10	0/-18	TBD	-A
		277		TBD	TDB	> .98	TDB	TDB				
		120	B332PUNVEL-A ²	TBD	TDB	> .99	TDB	TDB	<10	0/-18	TBD	-A
		277		TBD	TDB	> .97	TDB	TDB				
F32T8 - Three Lamp Applications												
3	PAR-IS	120	B332I120RH-A	0.75	86	> .98	0.88	1.02	< 20	0/-18	6	-A
		347	B332I347RH	0.25	85	> .98	0.88	1.04	< 20	0/-18	6	ST
		347	B332I347HPL	0.21	75	> .99	0.79	1.05	< 10	0/-18	6	ST
		120	B332IUNVHP-A	0.71	85	> .99	0.88	1.02	< 10	0/-18	6	-A
		277		0.31	83	> .98	0.88	1.05				
		347	B332I347HP	0.25	88	> .99	0.88	1.00	< 10	0/-18	6	ST
		120	B332IUNVEL-A	0.61	74	> .99	0.77	1.05	< 10	0/-18	6	-A
		277		0.26	73	> .98	0.77	1.07				
		120	B332IUNVHE-A	0.70	83	> .99	0.87	1.04	< 10	0/-18	6	-A
		277		0.30	81	> .98	0.87	1.05				
		120	B332IUNVHEH-A	0.91	111	> .98	1.18	1.06	< 10	0/-18	6	-A
		277		0.39	108			1.09				
3	SER-IS	347	B332IHRVHB-E	0.32	110	> .98	1.18	1.07	< 10	0/-18	46	-E
		480		0.24	109	> .95	1.18	1.08				
3	SER-RS	120	B332PUNVHP-A	0.77	92	> .99	0.88	0.96	< 10	0/-18	23	-A
		277		0.34	90	> .95	0.88	0.98				
3	PAR-IS	120	B432I120RES-A*	1.20	92	> .50	0.96	1.04	< 130	0/-18	7a	-A
		120	B432I120RH-A	0.78	92	> .95	0.94	1.02	< 20	0/-18	7a	-A
		347	B432I347RH	0.28	95	> .95	0.99	1.04	< 20	0/-18	7a	ST
		347	B432I347HPL	0.24	83	> .98	0.87	1.05	< 10	0/-18	7	ST
		120	B432IUNVHP-A	0.77	92	> .99	0.94	1.02	< 10	0/-18	7a	-A
		277		0.34	89	> .95	0.94	1.06				
		347	B432I347HP	0.28	92	> .98	0.99	1.08	< 10	0/-18	7a	S
		120	B432IUNV-D	0.77	92	> .98	0.96	1.02	< 10	0/-18	24	-D
		277		0.33	91			1.05				
		120	B432IUNVEL-A	0.67	80	> .99	0.86	1.08	< 10	0/-18	7a	-A
277		0.29	78	> .98	0.86	1.10						
120	B432IUNVHE-A	0.74	89	> .99	0.94	1.06	< 10	0/-18	7a	-A		
277		0.32	87	> .98	0.94	1.08						
277	B432I277HEH	0.43	119	> .99	1.28	1.08	< 10	0/-18	7	ST		

* For Residential Use Only

¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

Fluorescent-Electronic



- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 4 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (3) & (4) F32T8 LAMPS

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											
F32T8 - Three Lamp Applications												
3	SER-PRS	120	ES1720B	0.68	80	> .97	0.87	1.09	< 10	0/-18	38a	ESB
		277		0.31	82			1.06				
		120	B432PUNVHP-A	0.77	92	> .99	0.93	1.01	< 10	0/-18	8	-A
		277		0.34	90	> .95		1.03				
3	PAR-PRS	120	B332PUNVHE-A ²	TBD	TBD	> .99	0.87	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .98	0.87	TBD				
		120	B332PUNVEL-A ²	TBD	TBD	> .99	0.71	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .98	0.71	TBD				
		120	B432PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97	TBD	TBD				
		120	B432PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97	TBD	TBD				
F32T8 - Four Lamp Applications												
4	PAR-IS	120	B432I120RES-A*	1.40	109	> .50	0.87	0.80	< 130	0/-18	7a	-A
		120	B432I120RH-A	0.93	112	> .99	0.88	0.79	< 20	0/-18	7a	-A
		347	B432I347RH	0.33	114	> .98	0.88	0.77	< 20	0/-18	7a	ST
		347	B432I347HPL	0.29	101	> .99	0.78	0.77	< 10	0/-18	7	ST
		120	B432IUNVHP-A	0.93	112	> .99	0.88	0.79	< 10	0/-18	7a	-A
		277		0.40	108	> .98	0.88	0.80				
		347	B432I347HP	0.33	114	> .99	0.88	0.77	< 10	0/-18	7a	ST
		120	B432IUNV-D	0.93	111	> .98	0.88	0.77	< 10	0/-18	25	-D
4	PAR-IS	277		0.40	109			0.80				
		120	B432IUNVEL-A	0.80	97	> .99	0.77	0.79	< 10	0/-18	7a	-A
		277		0.34	96	> .98	0.77	0.80				
		120	B432IUNVHE-A	0.91	109	> .99	0.87	0.80	< 10	0/-18	7a	-A
		277		0.38	106			0.82				
		277	B432I277HEH	0.53	145	> .99	1.18	0.81	< 10	0/-18	7a	ST
		120	ES1720B	0.88	107	> .97	0.87	0.81	< 10	0/-18	38	ESB
		277		0.40	108			0.82				
4	SER-PRS	120	B432PUNVHP-A	1.00	119	> .99	0.88	0.74	< 10	0/-18	8	-A
		277		0.42	115	> .98	0.88	0.77				
4	PAR-PRS	120	B432PUNVHE-A ²	TBD	TBD	> .99	0.87	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .98	0.87	TBD				
		120	B432PUNVEL-A ²	TBD	TBD	> .99	0.70	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97	0.70	TBD				

* For Residential Use Only
² Consult Universal for Availability

See page 2-24 for Dimensions and Wiring Diagrams

STARTING METHOD LEGEND

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

TRIAD® ELECTRONIC BALLASTS

FOR F32T8 LAMPS

F32T8

Draw #	Overall Dimensions			Mounting Dimensions	
	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"
-B	9.50"	1.50"	1.00"	8.89"	0.88"
-C	14.25"	1.18"	1.00"	13.75"	---
-D	16.88"	1.18"	1.00"	16.20"	---
-E	16.88"	1.74"	1.18"	16.28"	---
-G	9.50"	1.18"	1.00"	8.89"	---
ESA	9.50"	1.56"	1.00"	8.88"	0.78"
ESB	9.50"	2.38"	1.00"	8.88"	---

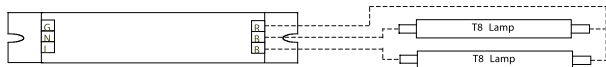
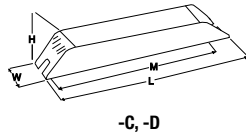
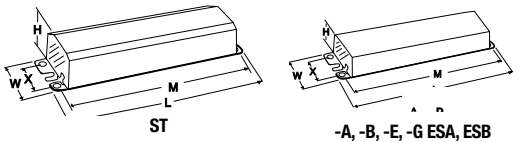


DIAGRAM 21

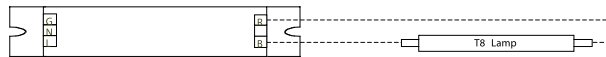
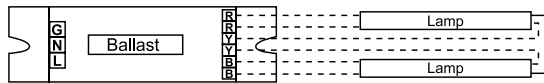


DIAGRAM 22



FOR ONE LAMP OPERATION, CAP YELLOW LEADS INDIVIDUALLY

DIAGRAM 37



Two Lamp Application

DIAGRAM 39



One Lamp Application

DIAGRAM 39a

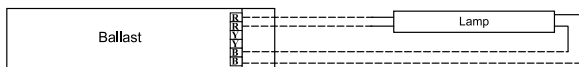
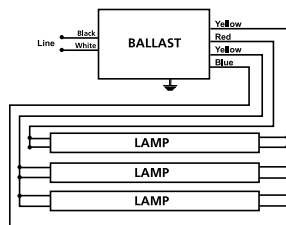


DIAGRAM 40



For two lamp application, cap one yellow lead, insulate to 600 volts.

DIAGRAM 46

WIRING DIAGRAMS

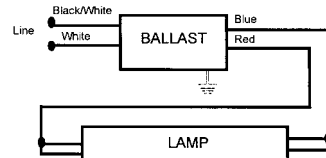


DIAGRAM 1

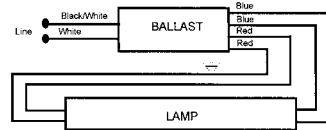


DIAGRAM 2

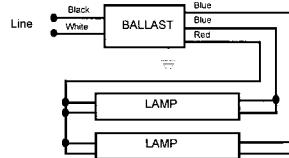
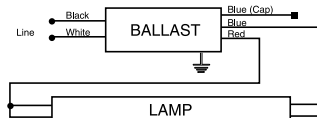
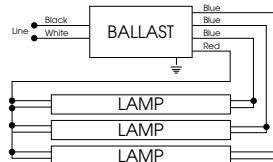


DIAGRAM 3



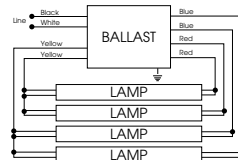
ONE LAMP APPLICATION
Cap unused blue lead, insulate to 600 volts

DIAGRAM 3a



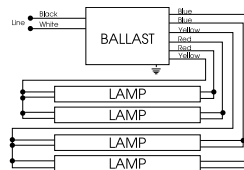
For Two Lamp operation,
Insulate one blue lead to 600V

DIAGRAM 6



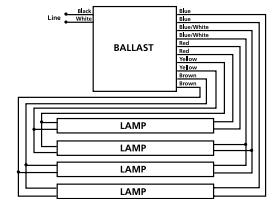
For Three Lamp Operation,
Insulate one blue lead to 600V

DIAGRAM 7



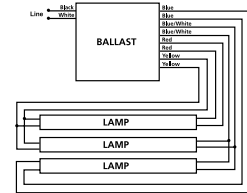
For three lamp operation, cap any
blue lead, insulate to 600V

DIAGRAM 7a



For Three Lamp Application, Individually
cap brown leads, Insulate to 600V

DIAGRAM 8



For Two Lamp operation, individually
cap yellow leads, Insulate to 600V

DIAGRAM 23

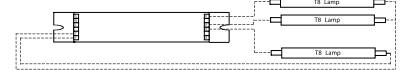


DIAGRAM 24

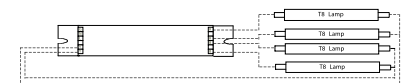
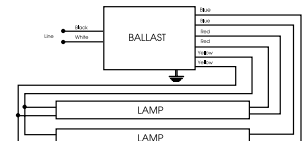


DIAGRAM 25



For One Lamp Operation, Individually cap
yellow leads, Insulate to 600V

DIAGRAM 30

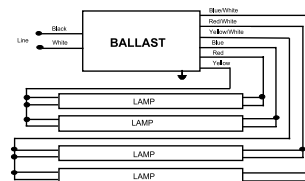
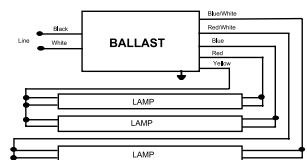


DIAGRAM 38

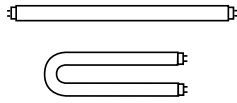


Note: For three lamp operation, cap Yellow/White leads, insulate to 600volts

DIAGRAM 38a

Fluorescent-Electronic

F32T8ES 30 WATT



- High Performance Models and Low Profile Designs
- Instant and Programmed Rapid Starting Options
- 1-2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (1) & (2) F32T8ES(30 WATT) LAMPS

Fluorescent-Electronic

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												
F32T8ES(30W) - One Lamp Applications													
1	IS	120	B132IUNVHP-B	0.25	29	> .95	0.88	3.03	< 10	60/16	1	-B	
		277		0.11									
1	PRS	120	B132IUNVEL-A	0.22	25	> .98	0.77	3.08	< 10	60/16	1	-A	
		277		0.11									
1	PAR-IS	120	B132IUNVHE-A	0.24	28	> .98	0.87	3.11	< 10	60/16	1	-A	
		277		0.12									
1	PAR-PR	120	B132PUNVHP-A	0.23	28	> .99	0.88	3.14	< 10	60/16	2	-A	
		277		0.10									
		277	B232I277L-A	0.12	33	> .90	0.98	2.97	< 32	60/16	3a	-A	
		347	B232I347L-A	0.15	51	> .98	0.78	1.53	< 20	60/16	3a	-A	
		120	B232I120RH-A	0.32	35	> .90	1.10	3.14	< 32	60/16	3a	-A	
		277	B232I277RH-A	0.15	38	> .90	1.10	2.89	< 25	60/16	3a	-A	
		347	B232I347RH-A	0.15	54	> .98	0.88	1.63	< 20	60/16	3a	-A	
		120	B232IUNVHP-B	0.28	33	> .99	1.05	3.18	< 10	60/16	3a	-B	
		277		0.12									
		347	B232I347HP-A	0.15	53	> .98	0.88	1.66	< 10	60/16	3a	-A	
1	PRS	120	B232IUNVEL-A	0.23	28	> .95	0.92	3.92	< 10	60/16	3a	-A	
		277		0.11									
		120	B232IUNVHE-A	0.25	32	> .95	1.05	3.28	< 10	60/16	3a	-A	
		277		0.12									
		120	B232IUNVHEH-A ¹	0.37	43	> .95	1.38	3.21	< 10	60/16	3a	-A	
		277		0.16									
		120	B232PUNVEL-A	0.19	22	> .90	0.72	3.27	< 10	60/16	30	-A	
		277		0.09	23			3.12					
		120	B232PUNVHE-A	0.22	27	> .90	0.88	3.26	< 10	60/16	30	-A	
		277		0.10	26			3.38					
1	PAR-PRS	120	B232PUNVHP-A	0.25	30	> .99	1.00	3.33	< 10	60/16	30	-A	
		277		0.11									
1	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	30	-B	
		277		TBD	TBD	> .98	TBD	TBD					
1	PAR-PRS	120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	30	-B	
		277		TBD	TBD	> .93	TBD	TBD					
F32T8ES(30W) - Two Lamp Applications													
2	PAR-IS	120	B232IUNVEL-A	0.38	46	> .95	0.77	1.67	< 10	60/16	3	-A	
		277		0.17									
		120	B232IUNVHE-A	0.42	52	> .95	0.87	1.67	< 10	60/16	3	-A	
		277		0.19	51			1.71					
		120	B232IUNVHEH-A	0.59	70	> .95	1.18	1.69	< 10	60/16	3	-A	
		277		0.25	68			1.74					
		277	B232I277L-A	0.18	49	> .95	0.77	1.57	< 20	60/16	3	-A	
		347	B232I347L-A	0.14	48	> .98	0.96	3.10	< 20	60/16	3	-A	
		120	B232I120RH-A	0.47	55	> .98	0.89	1.62	< 20	60/16	3	-A	
		277	B232I277RH-A	0.21	58	> .98	0.89	1.53	< 20	60/16	3	-A	
2	SER-PRS	347	B232I347RH-A	0.10	34	> .98	1.04	3.06	< 20	60/16	3	-A	
		120	B232IUNVHP-B	0.44	53	> .99	0.88	1.66	< 10	60/16	3	-B	
		277		0.19	52	> .98	0.88	1.69					
		347	B232I347HP-A	0.10	34	> .98	1.04	3.06	< 10	60/16	3	-A	
		120	B232PUNVEL-A	0.37	45	> .90	0.71	1.59	< 10	60/16	30	-A	
		277		0.16	44			1.61					
		120	B232PUNVHE-A	0.43	50	> .90	0.87	1.74	< 10	60/16	30	-A	
		277		0.18	49			1.78					
		120	B232PUNVHP-A	0.50	60	> .99	0.88	1.47	< 10	60/16	30	-A	
		277		0.21	58	> .98	0.88	1.52					
2	PAR-IS	120	B332I120RH-A	0.54	63	> .96	1.01	1.60	< 25	60/16	6	-A	
		120	B332IUNVHP-A	0.50	59	> .99	0.99	1.68	< 10	60/16	6	-A	
277		0.22											

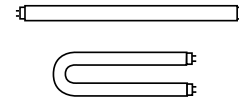
¹ Consult lamp manufacturers
² Consult Universal for Availability

See page 2-32 for Dimensions and Wiring Diagrams

TRIAD® ELECTRONIC BALLASTS

FOR (2)(cont.), (3) & (4) F32T8ES LAMPS

- High Performance Models and Low Profile Designs
- Instant and Programmed Rapid Starting Options
- 3-4 Lamp Applications



F32T8ES

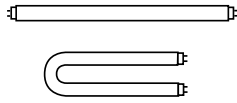
30 WATT

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											
F32T8ES(30W) - Two Lamp Applications												
2	PAR-IS	120	B332IUNVEL-A	0.46	54	> .99	0.89	1.65	< 10	60/16	6	-A
		277		0.20	53	> .98		1.68				
		120	B332IUNVHE-A	0.49	59	> .99	0.99	1.68	< 10	60/16	6	-A
		277		0.21	57	> .97		1.74				
		120	B332IUNVHEH-A ¹	0.65	78	> .95	1.28	1.64	< 10	60/16	6	-A
		277		0.28	76	> .95		1.68				
2	SER-IS	347	B332IHRVHB-E	0.21	71	> .97	1.22	1.72	< 10	60/16	46	-E
		480		0.16		> .90						
2	SER-PRS	120	B332PUNVHP-A	0.51	61	> .99	0.99	1.62	<10	60/16	23	-A
		277		0.23	60	> .90		1.65				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	30	-B
		277		TBD	TBD	> .99		TBD				
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	30	-B
		277		TBD	TBD	> .96		TBD				
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .97		TBD				
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .97		TBD				
F32T8ES(30W) - Three Lamp Applications												
		120	B332I120RH-A	0.69	81	> .98	0.88	1.09	< 20	60/16	6	-A
		277		0.66	79	> .99		1.13				
		120	B332IUNVHP-A	0.29	77	> .95	0.89	1.16	< 10	60/16	6	-A
		277		0.29	77	> .95		1.16				
3	PAR-IS	120	B332IUNVEL-A	0.58	70	> .99	0.77	1.10	< 10	60/16	6	-A
		277		0.25	69	> .98		1.12				
		120	B332IUNVHE-A	0.65	79	> .99	0.87	1.10	< 10	60/16	6	-A
		277		0.28	77	> .98		1.13				
		120	B332IUNVHEH-A	0.86	104	> .95	1.18	1.13	< 10	60/16	6	-A
		277		0.37	101	> .95		1.17				
3	SER-IS	347	B332IHRVHB-E	0.30	102	> .98	1.18	1.16	< 10	60/16	46	-E
		480		0.22	101	> .95		1.17				
3	SER-PRS	120	B332PUNVHP-A	0.73	87	> .99	0.88	1.01	< 10	60/16	23	-A
		277		0.32	85	> .95		1.04				
		120	B432I120RH-A	0.71	85	> .99	0.88	1.04	< 10	60/16	7a	-A
		347		0.26	88	> .98		1.13				
		347	B432I347RH	0.26	88	> .98	0.99	1.13	< 20	60/16	7a	ST
		277		0.26	88	> .98		1.13				
		120	B432IUNVHP-A	0.72	86	> .98	0.96	1.12	< 10	60/16	7a	-A
		277		0.32	84	> .95		1.14				
3	PAR-IS	120	B432IUNVEL-A	0.62	75	> .99	0.86	1.15	< 10	60/16	7a	-A
		277		0.27	73	> .98		1.18				
		120	B432IUNVHE-A	0.70	84	> .98	0.96	1.14	< 10	60/16	7a	-A
		277		0.30	82	> .98		1.17				
3	PAR-PRS	120	B432PUNVHP-A	0.73	87	> .99	0.93	1.07	< 10	60/16	8	-A
		277		0.32	85	> .95		1.09				
3	PAR-PRS	120	B332PUNVHE-A ²	0.66	TBD	TBD	TBD	TBD	<10	60/16	TBD	-A
		277		0.28	TBD	TBD		TBD				
		120	B332PUNVEL-A ²	0.53	TBD	TBD	TBD	TBD	<10	60/16	TBD	-A
		277		0.23	TBD	TBD		TBD				
		120	B432PUNVHE-A ²	0.71	TBD	TBD	TBD	TBD	<10	60/16	TBD	-A
		277		0.31	TBD	TBD		TBD				
		120	B432PUNVEL-A ²	0.60	TBD	TBD	TBD	TBD	<10	60/16	TBD	-A
		277		0.27	TBD	TBD		TBD				

¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

F32T8ES (30W -25W)



- High Performance Models and Low Profile Designs
- 1-2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS

FOR (1) & (2) F32T8ES (25 WATT) LAMPS

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											
F32T8ES(30W) - Four Lamp Applications												
4	PAR-IS	120	B432I120RH-A	0.87	104	> .99	0.88	0.85	< 10	60/16	7a	-A
		347	B432I347HP	0.31	106	> .99	0.88	0.83	< 10	60/16	7a	ST
		347	B432I347RH	0.31	106	> .99	0.88	0.83	< 20	60/16	7a	ST
		120	B432IUNVHP-A	0.87	104	> .98	0.88	0.85	< 10	60/16	7a	-A
		277	B432IUNVHP-A	0.38	101	> .95	0.88	0.87	< 10	60/16	7a	-A
		120	B432IUNVEL-A	0.80	97	> .99	0.77	0.79	< 10	60/16	7a	-A
		277	B432IUNVEL-A	0.34	96	> .98	0.77	0.80	< 10	60/16	7a	-A
		277	B432IUNVHE-A	0.91	109	> .99	0.87	0.80	< 10	60/16	7a	-A
4	SER-PRS	120	B432I277HEH	0.49	134	> .99	1.18	0.88	< 10	60/16	7a	ST
		277	B432I277HEH	0.49	134	> .99	1.18	0.88	< 10	60/16	7a	ST
4	PAR-PRS	120	B432PUNVHP-A	0.95	114	> .99	0.88	0.77	< 10	60/16	8	-A
		277	B432PUNVHP-A	0.41	110	> .95	0.88	0.80	< 10	60/16	8	-A
		120	B432PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	TBD	-A
		277	B432PUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	TBD	-A
120	B432PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	TBD	-A		
		277	TBD	TBD	> .98	TBD	TBD	< 10	60/16	TBD	-A	
F32T8ES (25W) - One Lamp Applications												
1	IS	120	B132IUNVHP-B	0.24	24	> .95	0.88	3.67	< 10	60/16	1	-B
		277	B132IUNVHP-B	0.09	24	> .95	0.88	3.67	< 10	60/16	1	-B
		120	B132IUNVEL-A	0.17	20	> .98	0.77	3.85	< 10	60/16	1	-A
		277	B132IUNVEL-A	0.07	20	> .95	0.77	3.85	< 10	60/16	1	-A
		120	B132IUNVHE-A	0.19	23	> .98	0.87	3.78	< 10	60/16	1	-A
		277	B132IUNVHE-A	0.09	23	> .95	0.87	3.78	< 10	60/16	1	-A
		120	B232IUNVHP-B	0.23	28	> .99	1.05	3.75	< 10	60/16	3a	-B
		277	B232IUNVHP-B	0.10	28	> .98	1.05	3.75	< 10	60/16	3a	-B
		120	B232IUNVEL-A	0.20	24	> .99	0.95	3.96	< 10	60/16	3a	-A
		277	B232IUNVEL-A	0.09	25	> .95	0.95	3.80	< 15	60/16	3a	-A
		120	B232IUNVHE-A	0.23	27	> .98	1.05	3.89	< 10	60/16	3a	-A
		277	B232IUNVHE-A	0.10	27	> .95	1.05	3.89	< 10	60/16	3a	-A
		120	B232IUNVHEH-A ¹	0.32	38	> .95	1.38	3.63	< 10	60/16	3a	-A
		277	B232IUNVHEH-A ¹	0.14	37	> .95	1.38	3.73	< 10	60/16	3a	-A
		120	B132PUNVHP-A	0.21	25	> .99	0.88	3.52	< 10	60/16	2	-A
		277	B132PUNVHP-A	0.09	25	> .99	0.88	3.52	< 10	60/16	2	-A
1	PRS	120	B232PUNVEL-A	0.16	19	> .90	0.71	3.74	< 10	60/16	30	-A
		277	B232PUNVEL-A	0.08	19	> .90	0.71	3.74	< 10	60/16	30	-A
		120	B232PUNVHE-A	0.20	25	> .90	0.88	3.52	< 10	60/16	30	-A
		277	B232PUNVHE-A	0.09	24	> .90	0.88	3.67	< 10	60/16	30	-A
120	B232PUNVHP-A	0.22	27	> .99	1.00	3.70	< 10	60/16	30	-A		
		277	0.10	27	> .94	1.00	3.70	< 10	60/16	30	-A	
1	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	30	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .97	TBD	TBD	< 10	60/16	30	-B
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	30	-B
277	B232PUNVEL-B ²	TBD	TBD	> .91	TBD	TBD	< 10	60/16	30	-B		
F32T8ES (25W) - Two Lamp Applications												
4	PAR-IS	120	B232IUNVHP-B	0.37	44	> .99	0.88	2.00	< 10	60/16	3	-B
		277	B232IUNVHP-B	0.16	43	> .98	0.88	2.05	< 10	60/16	3	-B
		120	B232IUNVEL-A	0.33	39	> .99	0.77	1.97	< 10	60/16	3	-A
		277	B232IUNVEL-A	0.14	38	> .98	0.77	2.03	< 10	60/16	3	-A
		120	B232IUNVHE-A	0.37	44	> .98	0.87	1.98	< 10	60/16	3	-A
		277	B232IUNVHE-A	0.16	43	> .98	0.87	2.02	< 10	60/16	3	-A
		120	B232IUNVHEH-A	0.49	59	> .95	1.18	2.00	< 10	60/16	3	-A
		277	B232IUNVHEH-A	0.21	58	> .95	1.18	2.03	< 10	60/16	3	-A

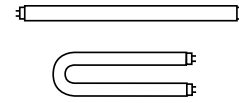
¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

TRIAD® ELECTRONIC BALLASTS

FOR (3) & (4) F32T8ES (25 WATT) LAMPS

- High Performance Models and Low Profile Designs
- 3-4 Lamp Applications



F32T8ES 25 WATT

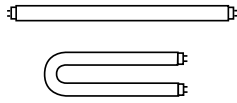
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F32T8ES (25W) - Two Lamp Applications												
2	PAR-IS	120	B332IUNVHP-A	0.43	51	> .98	1.00	1.96	< 10	60/16	6	-A
		277		0.20		> .90						
		120	B332IUNVHP-A	0.43	51	> .98	1.00	1.96	< 10	60/16	6	-A
		277		0.20		> .90						
		120	B332IUNVEL-A	0.37	44	> .99	0.89	2.02	< 10	60/16	6	-A
		277		0.16		> .95						
		120	B332IUNVHE-A	0.43	51	> .98	0.99	1.94	< 10	60/16	6	-A
		277		0.19		> .95						
		120	B332IUNVHEH-A ¹	0.55	66	> .95	1.28	1.94	< 10	60/16	6	-A
		277		0.25		> .95						
2	SER-IS	347	B332IHRVH-E	0.18	61	> .95	1.14	1.87	< 10	60/16	46	-E
		480		0.14		> .90						
2	SER-PRS	120	B232PUNVHP-A	0.43	52	> .99	0.88	1.69	< 10	60/16	30	-A
		277		0.19		> .98						
		120	B332PUNVHP-A	0.42	50	> .99	0.99	1.98	< 10	60/16	23	-A
		277		0.20		> .90						
		120	B232PUNVEL-A	0.32	38	> .90	0.71	1.87	< 10	60/16	30	-A
		277		0.14		> .90						
		120	B232PUNVHE-A	0.37	44	> .90	0.87	1.98	< 10	60/16	30	-A
		277		0.16		> .90						
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277		TBD		> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277		TBD		> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD		> .97						
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD		> .96						
F32T8ES (25W) - Three Lamp Applications												
		120	B332IUNVHP-A	0.57	69	> .99	0.90	1.30	< 10	60/16	6	-A
		277		0.26		> .95						
		120	B332IUNVEL-A	0.48	58	> .99	0.77	1.33	< 10	60/16	6	-A
		277		0.21		> .97						
3	PAR-IS	120	B332IUNVHE-A	0.24	66	> .98	0.87	1.32	< 10	60/16	6	-A
		277		0.60		> .95						
		120	B332IUNVHEH-A	0.72	87	> .95	1.18	1.36	< 10	60/16	6	-A
		277		0.32		> .95						
3	SER-IS	347	B332IHRVHB-E	0.26	88	> .97	1.11	1.26	< 10	60/16	46	-E
		480		0.19		> .90						
		120	B432IUNVHP-A	0.61	73	> .98	0.97	1.33	< 10	60/16	7a	-A
		277		0.27		> .95						
3	PAR-IS	120	B432IUNVHE-A	0.60	72	> .99	0.96	1.33	< 10	60/16	7a	-A
		277		0.26		> .95						
		120	B332PUNVHP-A	0.61	73	> .99	0.88	1.21	< 10	60/16	23	-A
		277		0.27		> .95						
3	SER-PRS	120	B432PUNVHP-A	0.62	75	> .99	0.93	1.24	< 10	60/16	8	-A
		277		0.28		> .95						

¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

Fluorescent-Electronic

F32T8ES 25 WATT



- High Performance Models and Low Profile Designs
- 1-2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS

FOR (1) & (2) F32T8ES (25 WATT) LAMPS

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											
F32T8ES (25W) - Three Lamp Applications												
3	PAR-PRS	120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .98						
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .97						
		120	B432PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .97						
		120	B432PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		TBD	TBD	> .97						
F32T8ES (25W) - Four Lamp Applications												
		120	B432IUNVHP-A	0.74	90	> .98	0.89	0.99	< 10	60/16	7a	-A
		277		0.33	88	> .95						
4	PAR-IS	120	B432IUNVHE-A	0.73	87	> .99	0.87	1.00	<10	60/16	7a	-A
		277		0.31	85	> .98						
4	SER-PRS	120	B432PUNVHP-A	0.84	100	> .99	0.88	0.88	< 10	60/16	8	-A
		277		0.36	98	> .95						
4	PAR-PRS	120	B232PUNVHE-A ²	0.73	87	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		0.32	86	> .98						
		120	B232PUNVEL-A ²	0.61	73	> .99	TBD	TBD	<10	60/16	TBD	-A
		277		0.27	73	> .97						

¹ Consult lamp manufacturers for applications with Ballast Factor > 1.20

² Consult Universal for Availability

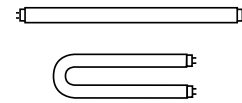
STARTING METHOD LEGEND

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

TRIAD® ELECTRONIC BALLASTS

FOR (1) & (2) F28T8 LAMPS

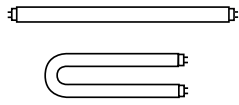
- High Performance Models and Low Profile Designs
- Instant and Programmed Rapid Starting Options
- 1-2 Lamp Applications



F28T8

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													
F28T8 - One Lamp Applications														
1	IS	277	B132I277RH-A	0.10	27	> .98	0.97	3.59	< 20	60/16	1	-A		
		120	B132IUNVHP-B	0.21	26	> .95	0.88	3.38	< 10	60/16	1	-B		
		277	B132IUNVEL-A	0.09	21	> .98	0.77	3.67	< 10	60/16	1	-A		
		120	B132IUNVHE-A	0.20	24	> .98	0.87	3.63	< 10	60/16	1	-A		
		277	B232I277L-A	0.12	30	> .90	0.96	3.20	< 32	60/16	3a	-A		
		347	B232I347L-A	0.08	29	> .98	0.96	3.31	< 20	60/16	3a	-A		
		120	B232I120RH-A	0.30	33	> .90	1.10	3.33	< 32	60/16	3a	-A		
		277	B232I277RH-A	0.13	33	> .90	1.10	3.33	< 32	60/16	3a	-A		
		347	B232I347RH-A	0.09	32	> .98	1.04	3.25	< 20	60/16	3a	-A		
		120	B232IUNVHP-B	0.26	31	> .99	1.05	3.39	< 10	60/16	3a	-B		
		277	B232IUNVHP-B	0.11	30	> .98	1.05	3.50	< 10	60/16	3a	-B		
		347	B232I347HP-A	0.09	32	> .98	0.88	3.25	< 10	60/16	3a	-A		
		120	B232IUNVEL-A	0.22	26	> .95	0.95	3.65	< 10	60/16	3a	-A		
		277	B232IUNVEL-A	0.10	27	> .95	0.95	3.52	< 10	60/16	3a	-A		
		120	B232IUNVHE-A	0.24	29	> .95	1.10	3.79	< 10	60/16	3a	-A		
		277	B232IUNVHE-A	0.11	29	> .95	1.10	3.79	< 10	60/16	3a	-A		
		120	B232IUNVHEH-A ¹	0.33	40	> .95	1.38	3.45	< 10	60/16	3a	-A		
		277	B232IUNVHEH-A ¹	0.15	39	> .95	1.38	3.54	< 10	60/16	3a	-A		
		1	PRS	120	B132PUNVHP-A	0.28	27	> .99	0.88	3.26	< 10	60/16	2	-A
				277	B132PUNVHP-A	0.11	27	> .99	0.88	3.26	< 10	60/16	2	-A
120	B232PUNVEL-A			0.18	21	> .90	0.71	3.38	< 10	60/16	30	-A		
277	B232PUNVEL-A			0.08	21	> .90	0.71	3.38	< 10	60/16	30	-A		
120	B232PUNVHE-A			0.21	25	> .90	0.88	3.49	< 10	60/16	30	-A		
277	B232PUNVHE-A	0.09	24	> .90	0.88	3.67	< 10	60/16	30	-A				
1	PAR-PRS	120	B232PUNVHP-A	0.25	30	> .99	1.00	3.33	< 10	60/16	30	-A		
		277	B232PUNVHP-A	0.11	30	> .95	1.00	3.33	< 10	60/16	30	-A		
		120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	TBD	-B		
277	B232PUNVHE-B ²	TBD	TBD	> .97	TBD	TBD	< 10	60/16	TBD	-B				
120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	< 10	60/16	TBD	-B				
277	B232PUNVEL-B ²	TBD	TBD	> .92	TBD	TBD	< 10	60/16	TBD	-B				
F28T8 - Two Lamp Applications														
2	PAR-IS	277	B232I277L-A	0.17	45	> .95	0.75	1.67	< 25	60/16	3	-A		
		347	B232I347L-A	0.13	44	> .98	0.78	1.77	< 20	60/16	3	-A		
		120	B232I120RH-A	0.43	51	> .98	0.90	1.76	< 20	60/16	3	-A		
		277	B232I277RH-A	0.19	51	> .98	0.90	1.76	< 20	60/16	3	-A		
		347	B232I347RH-A	0.14	50	> .98	0.88	1.76	< 20	60/16	3	-A		
		120	B232IUNVHP-B	0.41	48	> .99	0.88	1.83	< 10	60/16	3	-B		
		277	B232IUNVHP-B	0.17	47	> .98	0.88	1.87	< 10	60/16	3	-B		
		347	B232I347HP-A	0.14	50	> .98	1.04	1.76	< 10	60/16	3	-A		
		120	B232IUNVEL-A	0.36	43	> .95	0.77	1.79	< 10	60/16	3	-A		
		277	B232IUNVEL-A	0.15	43	> .95	0.77	1.79	< 10	60/16	3	-A		
		120	B232IUNVHE-A	0.40	49	> .95	0.87	1.78	< 10	60/16	3	-A		
		277	B232IUNVHE-A	0.18	48	> .95	0.87	1.81	< 10	60/16	3	-A		
		120	B232IUNVHEH-A	0.53	64	> .95	1.18	1.84	< 10	60/16	3	-A		
		277	B232IUNVHEH-A	0.23	62	> .95	1.18	1.90	< 10	60/16	3	-A		
		120	B332I120RH-A	0.50	57	> .95	1.02	1.79	< 32	60/16	6	-A		
		120	B332IUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	6	-A		
		277	B332IUNVHP-A	0.21	54	> .90	0.99	1.83	< 10	60/16	6	-A		
		120	B332IUNVEL-A	0.41	49	> .99	0.89	1.82	< 10	60/16	6	-A		
		277	B332IUNVEL-A	0.18	48	> .95	0.89	1.85	< 10	60/16	6	-A		

1 Consult lamp manufacturers for applications with Ballast Factors > 1.20
 2 Consult Universal for Availability



- High Performance Models and Low Profile Designs
- Instant and Programmed Rapid Starting Options
- 2-4 Lamp Applications

TRIAD® ELECTRONIC BALLASTS

FOR (2)/(cont.), (3) & (4) F28T8 LAMPS

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											
F28T8 - Two Lamp Applications												
2	PAR-IS	120	B332IUNVHE-A	0.45	54	> .99	0.99	1.83	< 10	60/16	6	-A
		277	B332IUNVHE-A	0.19	53	> .97		1.87				
		120	B332IUNVHEH-A ¹	0.57	71	> .95	1.28	1.80	< 10	60/16	6	-A
		277	B332IUNVHEH-A ¹	0.27	69	> .95		1.86				
2	SER-IS	347	B332IHRVH-E ¹	0.19	65	> .97	1.22	1.88	< 10	60/16	46	-E
		480	B332IHRVH-E ¹	0.15	> .90							
		120	B232PUNVHP-A	0.25	30	> .99	1.00	3.33	< 10	60/16	30	-A
		277	B232PUNVHP-A	0.11	> .95							
		120	B232PUNVEL-A	0.34	41	> .90	0.70	1.71	< 10	60/16	30	-A
		277	B232PUNVEL-A	0.15	40	> .90		1.75				
2	SER-PRS	120	B232PUNVHE-A	0.39	47	> .99	0.87	1.85	< 10	60/16	30	-A
		277	B232PUNVHE-A	0.17	46	> .90		1.89				
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				
2	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVHE-B ²	TBD	TBD	> .98						
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-B
		277	B232PUNVEL-B ²	TBD	TBD	> .95						
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	60/16	TBD	-A
		277	B332PUNVHE-A ²	TBD	TBD	> .98						
		120	B332PUNVHP-A	0.46	55	> .99	0.99	1.80	< 10	60/16	23	-A
		277	B332PUNVHP-A	0.21	54	> .90		1.83				

1 Consult lamp manufacturers for applications with Ballast Factors > 1.20

2 Consult Universal for Availability

TRIAD® ELECTRONIC BALLASTS

FOR F32T8ES AND F28T8 LAMPS

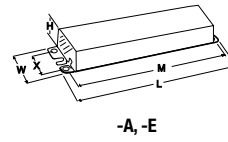
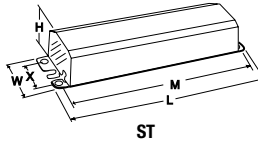
F32T8ES & F28T8

Fluorescent-Electronic

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.	
F28T8 - Four Lamp Applications													
4	PAR-IS	347	B432I347HP	0.28	95	> .99	0.88	0.93	< 10	60/16	7a	ST	
		347	B432I347RH	0.28	95	> .99	0.88	0.93	< 20	60/16	7a	ST	
		120	B432IUNVHP-A	0.80	96	> .98	0.89	0.93	< 10	60/16	7a	-A	
		277		0.35	93	> .95	0.88	0.95	< 10	60/16	7a	-A	
		120	B432IUNVEL-A	0.70	85	> .99	0.77	0.91	< 10	60/16	7a	-A	
		277		0.31	84	> .98	0.92	< 10	60/16	7a	-A		
	120	B432IUNVHE-A	0.77	97	> .99	0.90	0.90	< 10	60/16	7a	-A		
	277		0.33	94	> .98	0.87	0.93	< 10	60/16	7a	-A		
	277	B432I277HEH	0.45	123	> .99	1.18	0.96	< 10	60/16	7a	ST		
	4	SER-PRS	120	B432PUNVHP-A	0.89	107	> .99	0.88	0.82	< 10	60/16	8	-A
			277		0.39	104	> .95						
	4	PAR-PRS	120	B332PUNVHE-A ²	0.77	92	> .99	TBD	TBD	< 10	60/16	TBD	-A
277			0.34		91	> .98							
120			B332PUNVEL-A ²	0.64	77	> .99	TBD	TBD	< 10	60/16	TBD	-A	
277	0.28	76		> .97									

1 Consult lamp manufacturers for applications with Ballast Factors > 1.20
2 Consult Universal for Availability

Overall Dimensions			Mounting Dimensions		
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"
-E	16.88"	1.74"	1.18"	16.28"	---



WIRING DIAGRAMS

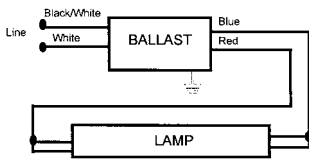


DIAGRAM 1

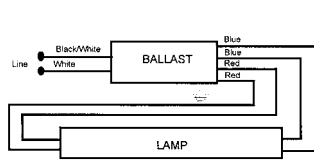


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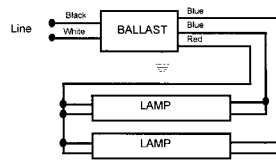
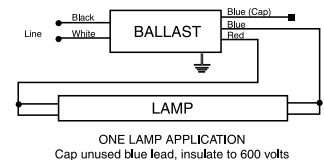
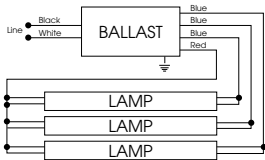


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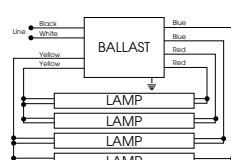


ONE LAMP APPLICATION
Cap unused blue lead, insulate to 600 volts
DIAGRAM 3a



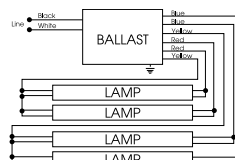
For Two Lamp operation,
Insulate one blue lead to 600V

DIAGRAM 6



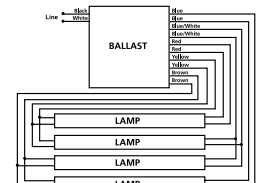
For Three Lamp Operation,
Insulate one blue lead to 600V

DIAGRAM 7



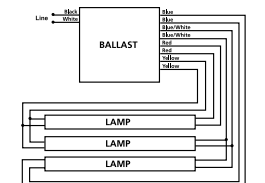
For three lamp operation, cap any
blue lead, insulate to 600V

DIAGRAM 7a



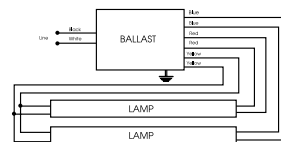
For Three Lamp Application, Individually
cap brown leads, Insulate to 600V

DIAGRAM 8



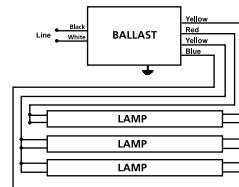
For Two Lamp operation, individually
cap yellow leads, Insulate to 600V

DIAGRAM 23



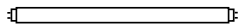
For One Lamp Operation, Individually cap
yellow leads, Insulate to 600V

DIAGRAM 30



For two lamp application, cap one yellow lead,
insulate to 600 volts

DIAGRAM 46



- Low Profile Designs Featured
- Instant & Programmed Rapid Starting Options
- 1-3 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR (1), (2), AND (3) F40T8 LAMPS

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											
F40T8 - One Lamp Applications												
1	IS	120	B132I120RH-A	0.30	35	> .96	0.83	2.37	< 15	50/10	1	-A
		277	B132I277RH-A	0.13	37	> .95	0.83	2.24	< 15	50/10	1	-A
		120	B132IUNVHP-B	0.31	37	> .95	0.85	2.30	< 10	32/0	1	-B
		277		0.13	36	> .95	0.85	2.36	< 10	32/0	1	-B
		120	B132IUNVEL-A	0.25	32	> .98	0.76	2.38	< 10	0/-18	1	-A
		277		0.13	> .95	0.76	2.38	< 10	0/-18	1	-A	
		120	B132IUNVHE-A	0.30	35	> .98	0.86	2.46	< 10	0/-18	1	-A
		277		0.14	> .95	0.86	2.46	< 10	0/-18	1	-A	
		347	B232I347L-A	0.11	38	> .98	0.95	2.50	< 20	0/-18	3a	-A
		120	B232I120RH-A	0.38	45	> .95	1.03	2.29	< 25	0/-18	3a	-A
		277	B232I277RH-A	0.17	45	> .95	1.03	2.29	< 25	0/-18	3a	-A
		347	B232I347HP-A	0.13	45	> .98	1.02	2.27	< 10	0/-18	3a	-A
		347	B232I347HPL	0.11	38	> .98	0.86	2.26	< 10	0/-18	3a	ST
		120	B232IUNVHP-B	0.36	43	> .99	1.03	2.40	< 10	32/0	3a	-B
		277		0.15	42	> .98	1.03	2.45	< 10	32/0	3a	-B
		347	B232I347RH-A	0.13	45	> .98	1.02	2.27	< 20	0/-18	3a	-A
		120	B232IUNV-C	0.37	43	> .98	0.99	2.30	< 10	0/-18	22	-C
		277		0.16	42	> .98	0.99	2.36	< 10	0/-18	22	-C
		120	B232PUNVEL-A	0.25	30	> .90	0.71	2.37	< 10	0/-18	30	-A
		277		0.11	29	> .90	0.71	2.45	< 10	0/-18	30	-A
1	PRS	120	B232PUNVHE-A	0.30	36	> .90	0.84	2.33	< 10	0/-18	30	-A
		277		0.13	35	> .90	0.84	2.40	< 10	0/-18	30	-A
		347	ES4800A	0.31	37	> .97	1.05	2.84	< 10	0/-18	37	ESA
277	ES4800A	0.14	39	> .97	1.05	2.69	< 10	0/-18	37	ESA		
347	ES1679A	0.13	44	> .97	0.87	1.98	< 10	0/-18	37	ESA		
1	PAR-PRS	120	B232PUNVHE-B ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-B
		277		TBD	TBD	> .98	TBD	TBD	< 10	0/-18	TBD	-B
		120	B232PUNVEL-B ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	-B
		277		TBD	TBD	> .94	TBD	TBD	< 10	0/-18	TBD	-B
F40T8 - Two Lamp Applications												
2	PAR-IS	347	B259I347HP	0.22	76	> .98	0.91	1.20	< 10	0/-18	14	ST
		120	B332I120L-A	0.60	71	> .98	0.87	1.23	< 20	0/-18	6	-A
		277	B332I277L-A	0.26	72	> .98	0.89	1.24	< 20	0/-18	6	-A
		347	B332I347L	0.20	69	> .99	0.82	1.18	< 20	0/-18	6	ST
		120	B332I120RH-A	0.73	82	> .98	0.96	1.17	< 20	0/-18	6	-A
		277	B332I277RH-A	0.31	82	> .98	1.00	1.22	< 20	0/-18	6	-A
		347	B332I347HPL	0.20	69	> .99	0.82	1.19	< 10	0/-18	6	ST
		120	B332IUNVHP-A	0.65	78	> .99	0.95	1.22	< 10	0/-18	6	-A
		277		0.29	77	> .95	0.95	1.23	< 10	0/-18	6	-A
		120	B332IUNVEL-A	0.57	68	> .99	0.89	1.31	< 10	0/-18	6	-A
		277		0.25	66	> .98	0.89	1.35	< 10	0/-18	6	-A
		120	B332IUNVHE-A	0.64	77	> .99	0.99	1.29	< 10	0/-18	6	-A
		277		0.27	75	> .98	0.99	1.32	< 10	0/-18	6	-A
		120	B332IUNVHEH-A	0.84	101	> .95	1.26	1.25	< 10	0/-18	6	-A
		277		0.36	101	> .95	1.26	1.25	< 10	0/-18	6	-A
		2	PAR-PRS	120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	< 10	0/-18
277	TBD			TBD		> .98	TBD	TBD	< 10	0/-18	TBD	TBD
120	B332PUNVEL-A ²			TBD	TBD	> .99	TBD	TBD	< 10	0/-18	TBD	TBD
277		TBD	TBD	> .98	TBD	TBD	< 10	0/-18	TBD	TBD		
F40T8 - Three Lamp Applications												
3	PAR-IS	120	B432I120RH-A	0.93	112	> .99	0.90	0.80	< 10	0/-18	7a	-A
		347	B432I347HPL	0.29	100	> .99	0.81	0.81	< 10	0/-18	7	ST

2 Consult Universal for Availability

TRIAD® ELECTRONIC BALLASTS

FOR F40T8 LAMPS

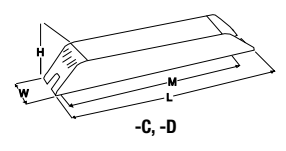
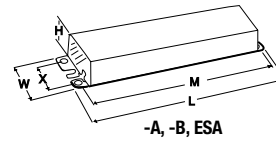
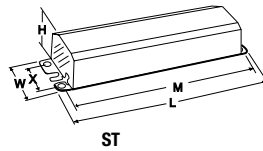
F40T8

Fluorescent-Electronic

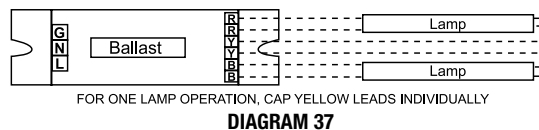
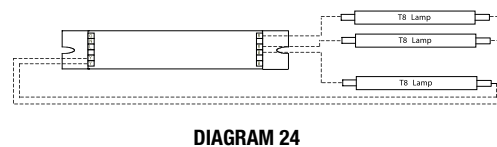
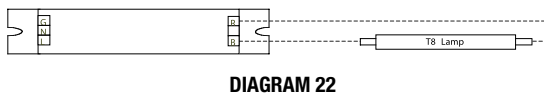
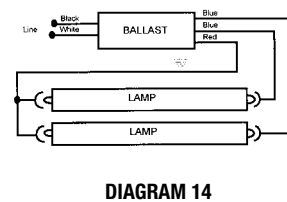
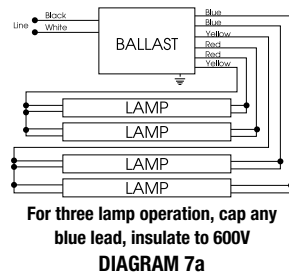
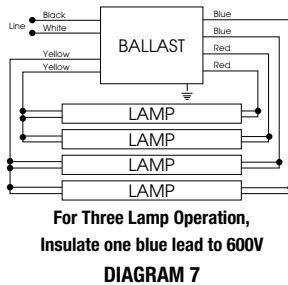
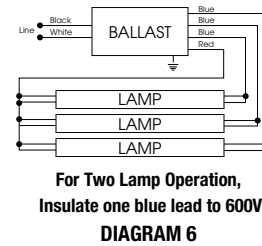
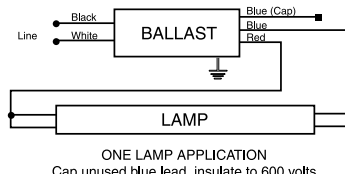
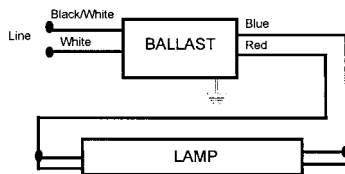
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F40T8 - Three Lamp Applications												
3	PAR-IS	120	B432IUNVHP-A	0.95	114	> .99	0.92	0.81	< 10	0/-18	7a	-A
		277		0.41	109	> .98		0.84				
		120	B432IUNV-D	0.94	112	> .98	0.94	0.84	< 10	0/-18	24	-D
		277		0.40	109	> .98		0.86				
		120	B432IUNVEL-A	0.81	97	> .99	0.86	0.89	< 10	0/-18	7a	-A
		277		0.35	94	> .98		0.91				
3	PAR-PRS	120	B432IUNVHE-A	0.93	111	> .99	0.96	0.86	< 10	0/-18	7a	-A
		277		0.39	107	> .98		0.90				
		120	B332PUNVHE-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .97		TBD				
		120	B332PUNVEL-A ²	TBD	TBD	> .99	TBD	TBD	<10	0/-18	TBD	-A
		277		TBD	TBD	> .98		TBD				

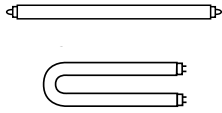
² Consult Universal for Availability

Overall Dimensions			Mounting Dimensions		
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"
-B	9.50"	1.50"	1.00"	8.89"	0.88"
-C	14.25"	1.18"	1.00"	13.75"	---
-D	16.88"	1.18"	1.00"	16.20"	---
ESA	9.50"	1.56"	1.00"	8.88"	0.78"



WIRING DIAGRAMS





- Instant Starting Options
- 1-2 Lamp Applications
- 8' T8 SLIMLINE
- High Performance Models

TRIAD® ELECTRONIC BALLASTS

FOR (1) AND (2)
F48T8, F72T8, F96T8 AND F96T8ES LAMPS

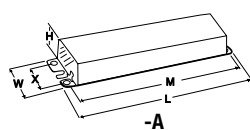
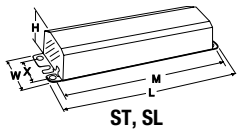
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F48T8 - One Lamp Applications												
1	IS	120	B259I120HE	0.29	34	> .98	1.07	3.15	< 10	0/-18	14	ST
F48T8 - Two Lamp Applications												
2	PAR-IS	120	B259I120HE	0.47	56	> .99	0.90	1.61	< 10	0/-18	14	ST
F72T8 - One Lamp Applications												
1	IS	120	B259I120HE	0.42	50	> .99	1.05	2.10	< 10	0/-18	14	ST
F72T8 - Two Lamp Applications												
2	PAR-IS	120	B259I120HE	0.71	84	> .99	0.88	1.05	< 10	0/-18	14	ST
F96T8 - One Lamp Applications												
1	IS	120	B259I120HPL	0.51	60	> .98	0.92	1.53	< 10	50/10	14	ST
		120	B259IUNVHP-A	0.60	72	> .99	1.08	1.50	< 10	32/0	14	-A
		277	B259IUNVHP-A	0.26	71	> .98	1.08	1.52	< 10	32/0	14	-A
		347	B259I347HP	0.20	68	> .97	1.05	1.54	< 10	32/0	14	ST
		120	B259I120HE	0.58	69	> .97	1.05	1.53	< 10	32/0	13	ST
		120	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A
		277	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A
120	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A		
277	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A		
F96T8 - Two Lamp Applications												
2	PAR-IS	120	B259I120HPL	0.84	100	> .98	0.78	0.78	< 10	50/10	14	ST
		120	B259IUNVHP-A	0.95	113	> .99	0.88	0.78	< 10	32/0	14	-A
		277	B259IUNVHP-A	0.40	110	> .98	0.88	0.80	< 10	32/0	14	-A
		347	B259I347HP	0.33	113	> .99	0.89	0.79	< 10	32/0	14	ST
		120	B259I120HE	0.92	108	> .99	0.88	0.81	< 10	32/0	14	ST
		120	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A
		277	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A
120	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A		
277	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	32/0	14	-A		
F96T8ES - One Lamp Applications												
1	PAR-IS	120	B259I120HE	0.53	63	> .97	1.05	1.66	< 10	60/16	13	ST
		120	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A
		277	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A
		120	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A
277	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A		
F96T8ES - Two Lamp Applications												
2	PAR-IS	120	B259I120HE	0.85	102	> .99	0.88	0.86	< 10	60/16	14	ST
		120	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A
		277	B259IUNVEL-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A
120	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A		
277	B259IUNVHE-A ²	TBD	TBD	> .98	TBD	TBD	< 10	60/16	14	-A		

² Consult Universal for Availability

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

STARTING METHOD LEGEND

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
SL	11.75"	3.13"	1.78"	11.14"	2.00"
-A	9.50"	1.70"	1.18"	8.89"	1.69"



WIRING DIAGRAMS

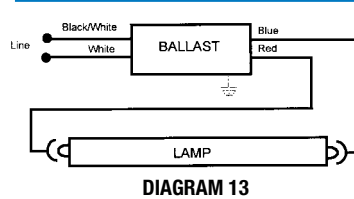
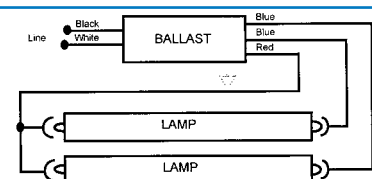


DIAGRAM 13



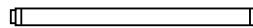
For One Lamp Operation, Insulate one blue lead to 600V
DIAGRAM 14

TRIAD® ELECTRONIC BALLASTS

FOR (1) AND (2)

F48T8HO, F60T8HO, F72T8HO AND F96T8HO LAMPS

- Instant Starting Options
- 1-2 Lamp Applications
- 4-8' T8 High Output



T8HO

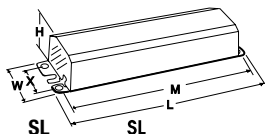
Fluorescent-Electronic

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											
F48T8HO - One Lamp Applications												
1	IS	120	B286I120RH	0.47	48	> .90	1.00	2.08	< 30	-20/-29	3	SL
		277	B286I277RH	0.20	47	> .90	1.00	2.13	< 30	-20/-29	3	SL
F60T8HO - One Lamp Applications												
1	IS	120	B286I120RH	0.56	60	> .90	0.99	1.65	< 30	-20/-29	3	SL
		277	B286I277RH	0.23	57	> .90	0.98	1.72	< 30	-20/-29	3	SL
F72T8HO - One Lamp Applications												
1	IS	120	B286I120RH	0.64	71	> .90	0.98	1.38	< 30	-20/-29	3	SL
		277	B286I277RH	0.26	67	> .90	0.98	1.46	< 30	-20/-29	3	SL
F96T8HO - One Lamp Applications												
1	IS	120	B286I120RH	0.79	92	> .90	0.96	1.04	< 25	-20/-29	3	SL
		277	B286I277RH	0.32	87	> .90	0.93	1.07	< 25	-20/-29	3	SL
F48T8HO - Two Lamp Applications												
2	PAR-IS	120	B286I120RH	0.70	80	> .95	0.85	1.06	< 25	-20/-29	3	SL
		277	B286I277RH	0.30	77	> .90	0.84	1.09	< 25	-20/-29	3	SL
F60T8HO - Two Lamp Applications												
2	PAR-IS	120	B286I120RH	0.85	99	> .95	0.85	0.86	< 20	-20/-29	3	SL
		277	B286I277RH	0.36	96	> .95	0.84	0.88	< 20	-20/-29	3	SL
F72T8HO - Two Lamp Applications												
2	PAR-IS	120	B286I120RH	1.00	117	> .95	0.85	0.73	< 20	-20/-29	3	SL
		277	B286I277RH	0.42	114	> .95	0.84	0.74	< 20	-20/-29	3	SL
F96T8HO - Two Lamp Applications												
2	PAR-IS	120	B286I120RH	1.30	151	> .95	0.81	0.54	< 20	-20/-29	3	SL
		277	B286I277RH	0.53	144	> .95	0.81	0.56	< 20	-20/-29	3	SL

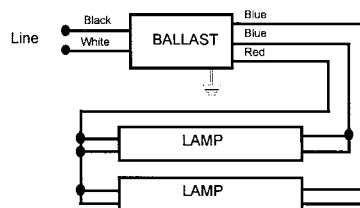
STARTING METHOD LEGEND

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

Overall Dimensions			Mounting Dimensions		
Draw #	L	W	H	M	X
SL	11.75"	3.13"	1.78"	11.14"	2.00"

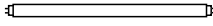


WIRING DIAGRAMS



For One Lamp Operation, Insulate one blue lead to 600V

DIAGRAM 3



- Multiple Lamp Operation
- Rapid and Programmed Rapid Starting Options
- T5 Ballasts meet ANSI requirement for end-of-lamp life safety shutdown
- Super Low Profile Designs
- 1-2 Lamp Applications

TRIAD® T5 ELECTRONIC BALLASTS

FOR F8, F13, F14, F21 AND F24 LAMPS

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											
design												
F14T5 - One Lamp Applications												
1	PRS	120	B228PUNV-C	0.15	17	> .98	1.05	6.17	< 10	0/-18	37	-C
		277		0.07		> .90			< 15			
		120	B228PUNV90-C	0.14	17	> .98	0.89	5.56	< 15	0/-18	37	-C
		277		0.07		> .85			< 20			
F14T5 - Two Lamp Applications												
2	SER-PRS	120	B228PUNV-C	0.28	32	> .98	1.00	3.12	< 10	0/-18	37	-C
		277		0.13		> .95			< 15			
		120	B228PUNV85-D	0.24	29	> .99	0.88	TBD	< 10	0/-18	37	-D
		277		0.11		> .97			< 15			
		120	B228PUNV90-C	0.24	29	> .99	0.89	3.07	< 10	0/-18	37	-C
		277		0.11		> .90			< 15			
		120	B228PUNV95-D	0.25	31	> .99	0.95	3.06	< 10	0/-18	37	-D
		277		0.11		> .98			< 15			
		120	B228PUNV115-D	0.31	37	> .99	1.15	3.12	< 10	0/-18	37	-D
		277		0.13		> .98			< 15			
F21T5 - One Lamp Applications												
1	PRS	120	B228PUNV-C	0.21	24	> .98	1.03	4.29	< 10	0/-18	37	-C
		277		0.10		> .95			< 15			
		120	B228PUNV90-C	0.19	23	> .99	0.89	4.05	< 10	0/-18	37	-C
		277		0.09		> .90			< 15			
F21T5 - Two Lamp Applications												
2	SER-PRS	120	B228PUNV-C	0.41	48	> .98	1.00	2.08	< 10	0/-18	37	-C
		277		0.18		46			2.17			
		120	B228PUNV85-D	0.35	41	> .99	0.86	TBD	< 10	0/-18	37	-D
		277		0.15		40			> .98			
		120	B228PUNV90-C	0.35	42	> .99	0.89	2.12	< 10	0/-18	37	-C
		277		0.16		42			> .95			
		120	B228PUNV95-D	0.37	44	> .99	0.95	2.16	< 10	0/-18	37	-D
		277		0.16		44			> .98			
		120	B228PUNV115-D	0.44	52	> .99	1.15	2.21	< 10	0/-18	37	-D
		277		0.19		51			> .98			

See page 2-40 for Dimensions and Wiring Diagrams

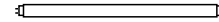
STARTING METHOD LEGEND

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

TRIAD® T5 ELECTRONIC BALLASTS

FOR F28 AND F35T5 LAMPS

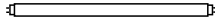
- Multiple Lamp Operation
- Rapid and Programmed Rapid Starting Options
- T5 Ballasts meet ANSI requirement for end-of-lamp life safety shutdown
- Super Low Profile Designs
- 1-2 Lamp Applications



T5

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											
F28T5 - One Lamp Applications												
1	PRS	120	B228PUNV-C	0.27	32	> .98	1.00	3.12	< 10	0/-18	37	-C
		277		0.12		> .95						
		120	B228PUNV85-D	0.25	30	> .99	0.88	TBD	< 10	0/-18	37	-D
		277		0.11		> .98						
		120	B228PUNV90-C	0.11	29	> .99	0.90	3.10	< 10	0/-18	37	-C
		277		0.25		> .90						
F28T5 - Two Lamp Applications												
2	SER-PRS	120	B228PUNV-C	0.55	63	> .98	1.00	1.59	< 10	0/-18	37	-C
		277		0.23		> .95						
		120	B228PUNV85-D	0.45	54	> .99	0.85	TBD	< 10	0/-18	37	-D
		277		0.19		> .98						
		120	B228PUNV90-C	0.48	58	> .98	0.90	1.55	< 10	0/-18	37	-C
		277		0.21		> .98						
		120	B228PUNV95-D	0.50	58	> .99	0.95	1.64	< 10	0/-18	37	-D
		277		0.21		> .98						
		120	B228PUNV115-D	0.59	69	> .99	1.15	1.67	< 10	0/-18	37	-D
		277		0.25		> .98						

Fluorescent-Electronic



- Multiple Lamp Operation
- Programmed Rapid and Instant Starting Models
- T5HO Ballasts meet ANSI requirements for end-of-lamp life safety shutdown
- Super Low Profile Designs
- 1-4 Lamp Applications

TRIAD® T5HO ELECTRONIC BALLASTS

FOR F24, F39 AND F54 T5HO LAMPS

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.
1	PRS	120	B224PUNV-C	0.23	28	> .98	1.06	3.79	< 10	0/-18	37	-C
		277		0.10								
F24T5HO - Two Lamp Applications												
2	SER-PRS	120	B224PUNV-C	0.45	53	> .98	1.00	1.89	< 10	0/-18	37	-C
		277		0.19								
		120	B239PUNV-D	0.51	59	> .98	1.15	1.95	< 10	0/-18	37	-D
		277		0.22								
F39T5HO - One Lamp Applications												
1	PRS	120	B224PUNV-C	0.34	41	> .98	0.95	2.32	< 10	0/-18	37	-C
		277		0.15								
		120	B239PUNV-D	0.39	47	> .98	1.10	2.34	< 10	0/-18	37	-D
		277		0.18								
F39T5HO - Two Lamp Applications												
2	SER-PRS	120	B239PUNV-D	0.75	89	> .98	1.00	1.12	< 10	0/-18	37	-D
		277		0.32	88			1.14				
F54T5HO - One Lamp Applications												
1	PRS	347	B254PHRVHB-E	0.19	66	> .98	1.02	1.55	< 10	0/-18	42	-E
		480		0.15								
		120	B254PUNV-D	0.52	63	> .99	1.02	1.62	< 10	0/-18	37	-D
		277		0.23								
		120	B254PUNVHB-D	0.52	63	> .99	1.02	1.62	< 10	0/-18	37	-D
		277		0.23								
347	B254P347-D	0.19	64	> .95	1.02	1.59	< 10	0/-18	4b	-D		
F54T5HO - Two Lamp Applications												
2	SER-PRS	347	B254PHRVHB-E	0.35	120	> .98	1.00	0.83	< 10	0/-18	41	-E
		480		0.26								
		120	B254PUNV-D	1.03	120	> .99	1.00	0.83	< 10	0/-18	37	-D
		277		0.43								
		120	B254PUNVHB-E	1.03	120	> .99	1.00	0.83	< 10	0/-18	37	-D
		277		0.43								
		347	B254P347-D	0.35	120	> .98	1.00	0.83	< 10	0/-18	4b	-D
		120	B454PUNV-E	1.01	121	> .95	1.00	0.83	< 10	0/-18	44	-E
		277		0.44								
		120	B454PUNVHB-E	1.01	122	> .95	1.00	0.82	< 10	0/-18	44	-E
277	0.44											
F54T5HO - Three Lamp Applications												
3	SER-PRS	120	B454PUNV-E	1.52	181	> .98	1.05	0.58	< 10	0/-18	44	-E
		277		0.66								
		120	B454PUNVHB-E	1.52	184	> .98	1.05	0.57	< 10	0/-18	44	-E
		277		0.66								
F54T5HO - Four Lamp Applications												
4	SER-PRS	120	B454PUNV-E	2.01	240	> .98	1.00	0.42	< 10	0/-18	44	-E
		277		0.86								
		120	B454PUNVHB-E	1.96	235	> .98	1.00	0.43	< 10	0/-18	44	-E
		277		0.84								
F80T5HO - One Lamp Applications												
1	PRS	120	ES4515K	0.73	87	> .97	1.00	1.15	< 10	0/-18	43	ESK
		277		0.32								

See page 2-38 for Dimensions and Wiring Diagrams

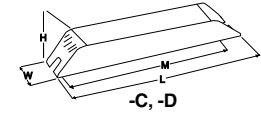
STARTING METHOD LEGEND

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

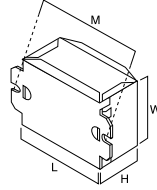
TRIAD® T5 & T5HO ELECTRONIC BALLASTS

T5 & T5HO

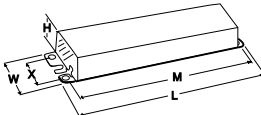
Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
-C	14.25"	1.18"	1.00"	13.75"	—
CBT	3.86"	2.00"	1.00"	3.50"	—
-D	16.88"	1.18"	1.00"	16.20"	—
-E	16.88"	1.74"	1.18"	16.28"	—
ESK	16.65"	1.24"	1.00"	16.30"	—
ESX	14.13"	1.24"	0.73"	13.78"	—



-C, -D



CBT



-E, ESK, ESX

T5 ballasts incorporate poke in connectors, for easy installation

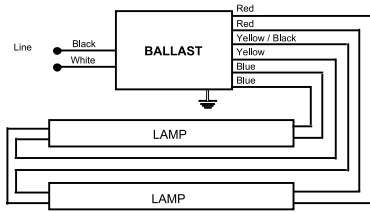


DIAGRAM 41

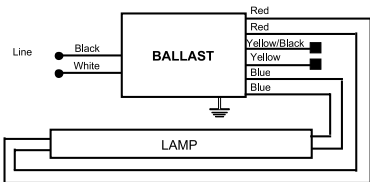


DIAGRAM 42

For one lamp operation, individually cap yellow and yellow/black leads, insulate to 600V.

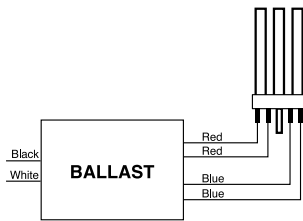


DIAGRAM 47

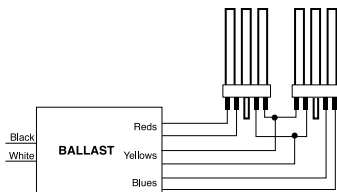


DIAGRAM 48

WIRING DIAGRAMS

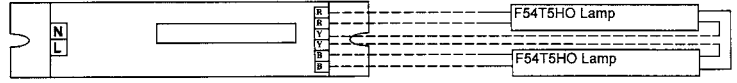
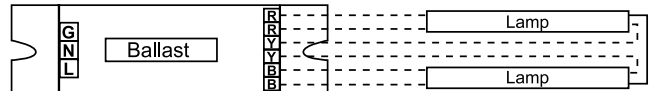


DIAGRAM 4b

FOR ONE LAMP OPERATION
CAP YELLOW LEADS INDIVIDUALLY



FOR ONE LAMP OPERATION, CAP YELLOW LEADS INDIVIDUALLY

DIAGRAM 37

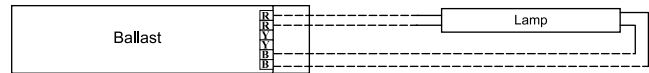


DIAGRAM 40

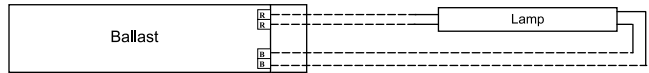
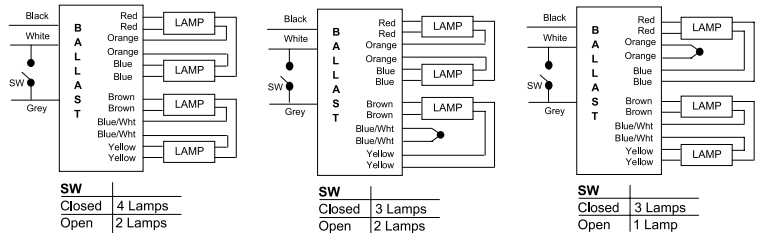


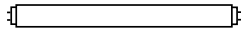
DIAGRAM 43



Application Notes:

- "SW" controls the lamps connected between the Brown and Yellow leads
- For lamp switching applications, connect "SW" between the white and the grey leads as shown in the wiring diagram above OR between the Black and Grey leads. The switch "SW" may be an on-off switch, an occupancy sensor, a relay, etc.
- If lamp switching is not required, short the white and grey leads OR the black and the grey leads
- A single control device, "SW", may be connected to control multiple ballasts
- For three lamp use: Short Blue/White leads or Orange leads and cap

DIAGRAM 44



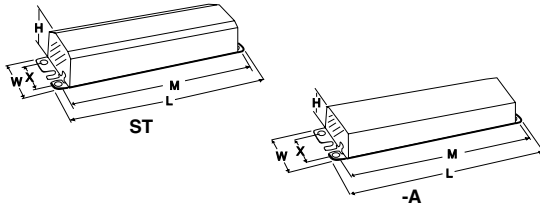
- Rapid Starting Options
- Standard & High Performance Models
- 1-3 Lamp Applications

TRIAD® ELECTRONIC BALLASTS

FOR (1), (2) AND (3)
F30T12, F30T12ES, & (2)F32T12 LAMPS

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											
F30T12 - One Lamp Applications												
1	RS	120	B240R120HP	0.33	37	> .95	1.05	2.84	< 10	50/10	4	ST
F30T12 - Two Lamp Applications												
2	PAR-RS	120	B240R120HP	0.50	60	> .95	0.92	1.53	< 10	50/10	4	ST
F30T12 - Three Lamp Applications												
3	PAR-RS	120	B340R120HP	0.75	90	> .98	0.91	1.01	< 10	50/10	5	ST
		277	B340R277HP	0.33	90	> .98	0.91	1.01	< 10	50/10	5	ST
F30T12ES - Two Lamp Applications												
2	PAR-RS	120	B240R120HP	0.46	53	> .98	0.88	1.66	< 10	60/16	4	ST
F30T12ES - Three Lamp Applications												
3	PAR-RS	120	B340R120HP	0.64	76	> .98	0.88	1.16	< 10	60/16	5	ST
		277	B340R277HP	0.28	76	> .98	0.88	1.16	< 10	60/16	5	ST
F32T12 - Two Lamp Applications												
2	SER-RS	120	B234SR120M-A	0.48	56	> .98	0.90	1.61	< 25	50/10	2	-A

Draw #	Overall Dimensions		Mounting Dimensions		
	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"



WIRING DIAGRAMS

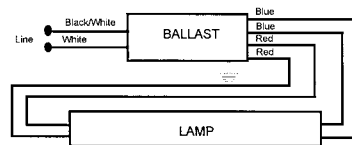
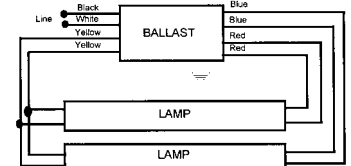


DIAGRAM 2



For One lamp Operation, Individually Cap
blue leads, Insulate to 600V

DIAGRAM 4

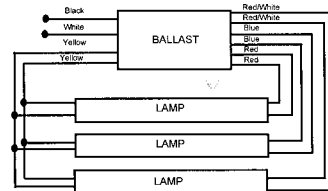
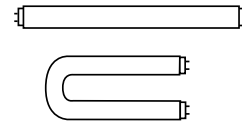


DIAGRAM 5

TRIAD® ELECTRONIC BALLASTS

FOR (1), (2) AND (3) F40T12 AND F34T12ES LAMPS

- Standard & High Performance Models
- Rapid Starting Options
- 1-3 Lamp Applications

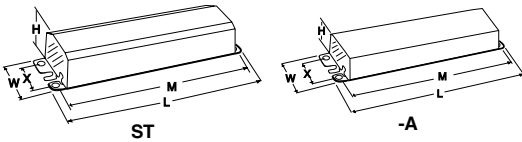


F40T12 & F34T12ES

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											
F40T12 - One Lamp Applications												
1	RS	120	B134R120M-A	0.36	36	> .90	0.86	2.39	< 30	50/10	2	-A
		277	B234SR277M-A	0.17	42	> .88	0.94	2.24	< 30	50/10	4	-A
		120	B240R120HP	0.42	46	> .98	1.02	2.22	< 10	50/10	4	ST
F40T12 - Two Lamp Applications												
2	SER-RS	120	B240R120HP	0.65	75	> .99	0.90	1.20	< 10	50/10	4	ST
		120	B340R120HP	0.70	84	> .98	1.04	1.24	< 10	50/10	5	ST
		277	B340R277HP	0.31	84	> .98	1.04	1.24	< 10	50/10	5	ST
		120	B234SR120M-A	0.63	71	> .90	0.90	1.27	< 30	50/10	30	-A
		277	B234SR277M-A	0.26	70	> .90	0.87	1.24	< 30	50/10	4	-A
F40T12 - Three Lamp Applications												
3	PAR-RS	120	B340R120HP	0.94	113	> .99	0.88	0.78	< 10	50/10	5	ST
		277	B340R277HP	0.41	113	> .99	0.88	0.78	< 10	50/10	5	ST
F34T12ES - One Lamp Applications												
1	RS	120	B134R120M-A	0.30	31	> .90	0.86	2.77	< 30	60/16	2	-A
		277	B234SR277M-A	0.15	25	> .80	0.94	2.69	< 30	50/10	4	-A
		120	B240R120HP	0.35	39	> .98	0.97	2.49	< 10	60/16	4	ST
F34T12ES - Two Lamp Applications												
2	PAR-RS	120	B240R120HP	0.54	63	> .99	0.86	1.37	< 10	60/16	4	ST
2	SER-RS	120	B234SR120M-A	0.49	59	> .90	0.86	1.46	< 30	60/16	30	-A
		277	B234SR277M-A	0.23	60	> .90	0.87	1.45	< 30	50/10	4	-A
F34T12ES - Three Lamp Applications												
3	PAR-RS	120	B340R120HP	0.78	93	> .99	0.86	0.92	< 10	60/16	5	ST
		277	B340R277HP	0.34	93	> .99	0.86	0.92	< 10	60/16	5	ST

Fluorescent-Electronic

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
-A	9.50"	1.70"	1.18"	8.89"	1.69"



WIRING DIAGRAMS

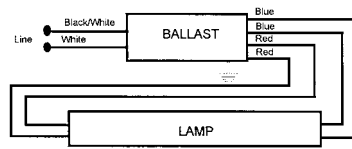
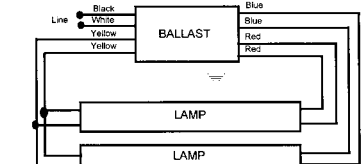


DIAGRAM 2



For One Lamp Applications, individually cap blue leads, Insulate to 600V

DIAGRAM 4

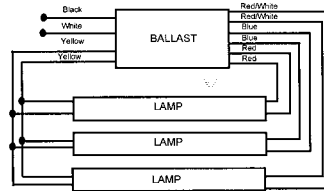
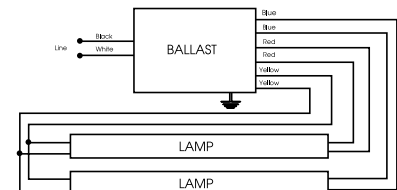


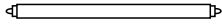
DIAGRAM 5



For One Lamp Operation, Individually cap yellow leads, Insulate to 600V

DIAGRAM 30

T12 SLIMLINE



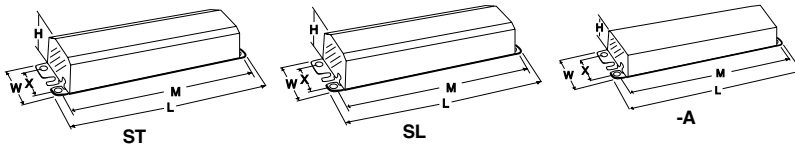
- Standard & High Performance Models
- Instant Starting Options
- 1-2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS FOR F48T12, F48T12ES, F60T12, F64T12 & F72T12 LAMPS

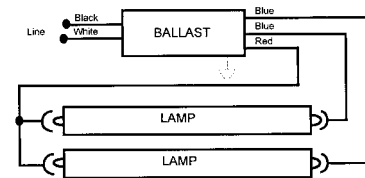
Lamp		Line Volts	Catalog Number	Line Current (Amps)	Input Power (Watts)	Power Factor (PF)	Ballast Factor (BF)	Ballast Efficacy Factor (BEF)	THD %	Min. F/C Start Temp	Wiring Diag.	Dim.
Qty.	Starting Method											
F48T12 - One Lamp Applications												
1	IS	120	B260IUNVHP	0.39	47	> .95	1.10	2.34	< 10	0/-18	14	SL
		277		0.18								
F48T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.68	76	> .95	0.92	1.21	< 20	0/-18	14	ST
		120	B260I120M-A	0.62	68	> .90	0.90	1.32	< 30	50/10	14	-A
		120	B260IUNVHP	0.61	75	> .98	0.95	1.27	< 10	0/-18	14	SL
		277		0.27	74	> .95		1.28				
F48T12ES - One Lamp Applications												
1	IS	120	B260IUNVHP	0.32	38	> .98	1.10	2.89	< 10	60/16	14	SL
		277		0.15	39	> .95		2.82				
F48T12ES - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.60	64	> .95	0.92	1.44	< 20	60/16	14	ST
		120	B260IUNVHP	0.57	67	> .95	0.93	1.39	< 10	60/16	14	SL
		277		0.25	66	> .95		1.41				
F60T12 - One Lamp Applications												
1	PAR-IS	120	B260I120RH	0.46	55	> .95	1.02	1.85	< 20	0/-18	14	ST
		120	B260IUNVHP	0.49	58	> .98	1.10	1.90	< 10	0/-18	14	SL
		277		0.22		> .95						
F60T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.74	89	> .95	0.90	1.01	< 20	0/-18	14	ST
		120	B260IUNVHP	0.77	92	> .98	0.92	1.00	< 10	0/-18	14	SL
		277		0.33	91	> .95		1.01				
F64T12 - One Lamp Applications												
1	PAR-IS	120	B260I120RH	0.49	59	> .95	1.03	1.75	< 20	0/-18	14	ST
		120	B260IUNVHP	0.51	61	> .98	1.10	1.80	< 10	0/-18	14	SL
		277		0.35	96	> .95		1.15				
F64T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.80	95	> .95	0.90	0.95	< 20	0/-18	14	ST
		120	B260IUNVHP	0.81	97	> .98	0.92	0.95	< 10	0/-18	14	SL
		277		0.35	96	> .95		0.96				
F72T12 - One Lamp Applications												
1	IS	120	B260I120RH	0.60	66	> .95	1.04	1.58	< 20	0/-18	14	ST
		277	B260IUNVHP	0.25	67	> .95	1.06	1.58	< 10	0/-18	14	SL

Fluorescent-Electronic

Overall Dimensions		Mounting Dimensions				
Draw #	L	W	H	M	X	
SL	11.75"	3.13"	1.78"	11.14"	2.00"	
-A	9.50"	1.70"	1.18"	8.89"	1.69"	
ST	9.50"	2.40"	1.55"	8.89"	1.69"	



WIRING DIAGRAMS



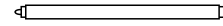
For One Lamp Operation, Insulate one blue lead to 600V

DIAGRAM 14

TRIAD® ELECTRONIC BALLASTS

F72T12(cont.), F84T12, F96T12 & F96T12ES LAMPS

- Standard & High Performance Models
- Instant Starting Options
- 1-2 Lamp Applications



**T12
SLIMLINE**

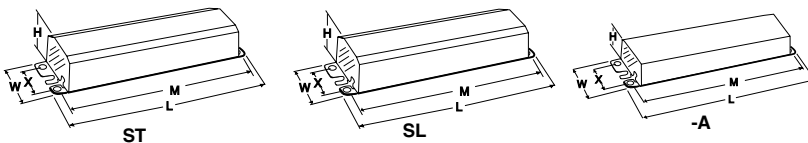
Fluorescent-Electronic

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											
F72T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.92	107	> .95	0.90	0.84	< 20	0/-18	14	ST
		120	B260I120M-A	0.90	105	> .95	0.90	0.86	< 30	50/10	14	-A
		120	B260IUNVHP	0.90	109	> .99	0.91	0.83	< 10	0/-18	14	SL
		277	B260IUNVHP	0.39	107	> .99	0.91	0.85	< 10	0/-18	14	SL
F84T12 - One Lamp Applications												
1	IS	120	B260I120RH	0.63	74	> .95	1.05	1.42	< 20	0/-18	14	ST
		120	B260IUNVHP	0.63	76	> .98	1.10	1.45	< 10	0/-18	14	-A
		277	B260IUNVHP	0.28	75	> .98	1.10	1.47	< 10	0/-18	14	-A
F84T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	1.02	120	> .95	0.88	0.73	< 20	0/-18	14	ST
		120	B260IUNVHP	1.03	123	> .98	0.88	0.72	< 10	0/-18	14	-A
		277	B260IUNVHP	0.44	120	> .98	0.88	0.73	< 10	0/-18	14	-A
F96T12 - One Lamp Applications												
1	IS	120	B260I120RH	0.73	83	> .95	1.02	1.23	< 20	0/-18	14	ST
		120	B260IUNVHP	0.70	85	> .98	1.05	1.24	< 10	0/-18	14	SL
		277	B260IUNVHP	0.31	84	> .98	1.05	1.25	< 10	0/-18	14	SL
F96T12 - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	1.16	133	> .95	0.86	0.65	< 20	0/-18	14	ST
		120	B260IUNVHP	1.16	139	> .99	0.88	0.63	< 10	0/-18	14	SL
		277	B260IUNVHP	0.50	137	> .99	0.88	0.64	< 10	0/-18	14	SL
F96T12ES - One Lamp Applications												
1	IS	120	B260I120RH	0.60	66	> .95	1.05	1.59	< 20	60/16	14	ST
		120	B260I120M-A	0.61	66	> .90	1.09	1.65	< 30	60/16	14	-A
		120	B260IUNVHP	0.59	72	> .98	1.03	1.43	< 10	60/16	14	SL
		277	B260IUNVHP	0.26	70	> .98	1.03	1.47	< 10	60/16	14	SL
F96T12ES - Two Lamp Applications												
2	PAR-IS	120	B260I120RH	0.93	107	> .95	0.88	0.82	< 20	60/16	14	ST
		120	B260I120M-A	0.90	105	> .95	0.88	0.84	< 30	60/16	14	-A
		120	B260IUNVHP	0.96	112	> .99	0.88	0.79	< 10	60/16	14	SL
		277	B260IUNVHP	0.40	110	> .99	0.88	0.80	< 10	60/16	14	SL

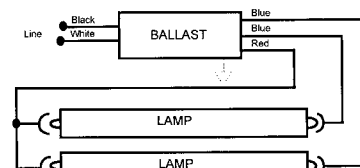
STARTING METHOD LEGEND

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

Draw #	Overall Dimensions		Mounting Dimensions		
	L	W	H	M	X
SL	11.75"	3.13"	1.78"	11.14"	2.00"
-A	9.50"	1.70"	1.18"	8.89"	1.69"
ST	9.50"	2.40"	1.55"	8.89"	1.69"

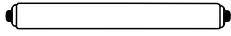


WIRING DIAGRAMS



For One Lamp Operation, Insulate one blue lead to 600V

DIAGRAM 14



- High Performance Models
- Rapid Starting Options
- 2 Lamp Applications

TRIAD® ELECTRONIC BALLASTS

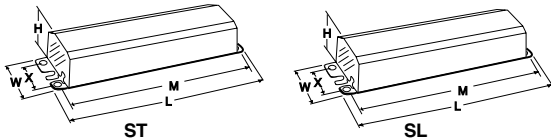
FOR T12 HIGH OUTPUT LAMPS

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											
F48T12HO - Two Lamp Applications												
2	SER-RS	120 277	B295SRUNVHP	0.92 0.40	110 109	> .98	0.89	0.81 0.82	< 10	-20/-29	4	SL
F60T12HO - Two Lamp Applications												
2	SER-RS	120 277	B295SRUNVHP	1.11 0.48	134 132	> .98	0.89	0.66 0.67	< 10	-20/-29	4	SL
F72T12HO - Two Lamp Applications												
2	SER-RS	120 277	B295SR120HP B295SRUNVHP ^o	1.40 1.40 0.61	169 162 160	> .99	0.95 0.89	0.56 0.55 0.56	< 10	-20/-29	4	SL
F73T12/BL/HO - Two Lamp Applications												
2	SER-RS	120	493B2	1.60	180	> .90	1.00	0.56	< 25	50/10	4	ST
F84T12HO - Two Lamp Applications												
2	SER-RS	120 277	B295SR120HP B295SRUNVHP	1.60 1.60 0.69	185 176 173	> .99	0.89	0.48 0.48 0.49	< 10	-20/-29	4	SL
F96T12HO - Two Lamp Applications												
2	SER-RS	120 277	B295SR120HP B295SRUNVHP	1.77 1.77 0.76	208 205 209	> .99	0.88	0.43 0.43 0.44	< 10	-20/-29	4	SL
F96T12HOES - Two Lamp Applications												
2	SER-RS	120 277	B295SR120HP B295SRUNVHP	1.47 1.47 0.63	174 174 171	> .99	0.88	0.51 0.51	< 10	60/16	4	SL

STARTING METHOD LEGEND

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

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ST	9.50"	2.40"	1.55"	8.89"	1.69"
SL	11.75"	3.13"	1.78"	11.14"	2.00"



WIRING DIAGRAMS

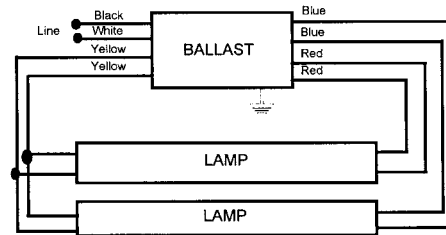
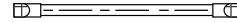


DIAGRAM 4

TRIAD® ELECTRONIC BALLASTS

FOR F6T2, F8T2, F11T2 AND F13T2 LAMPS

- Programmed Rapid Starting Options
- 1-2 Lamp Applications



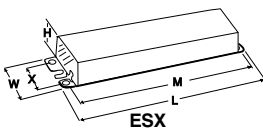
T2

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											
F6T2 - One And Two Lamp Applications												
2	SER-PRS	120	ES1786X	0.12	14	> .97	1.00	7.14	< 10	0/-18	37	ESX
		277		0.07	15			6.67				
1	PRS	120	ES1786X	0.07	8	> .97	1.00	12.50	< 10	0/-18	37	ESX
		277		0.05	9			11.11				
F8T2 - One And Two Lamp Applications												
2	SER-PRS	120	ES1786X	0.17	20	> .97	1.00	5.00	< 10	0/-18	37	ESX
		277		0.08	21			4.76				
1	PRS	120	ES1786X	0.10	11	> .97	1.00	9.09	< 10	0/-18	37	ESX
		277		0.06								
F11T2 - One And Two Lamp Applications												
2	SER-PRS	120	ES1786X	0.20	26	> .97	1.00	3.85	< 10	0/-18	37	ESX
		277		0.09								
1	PRS	120	ES1786X	0.12	15	> .97	1.00	6.67	< 10	0/-18	37	ESX
		277		0.07								
F13T2 - One And Two Lamp Applications												
2	SER-PRS	120	ES1786X	0.27	31	> .97	1.00	3.23	< 10	0/-18	37	ESX
		277		0.13	32			3.13				
1	PRS	120	ES1786X	0.15	16	> .97	1.00	6.25	< 10	0/-18	37	ESX
		277		0.08	17			5.88				

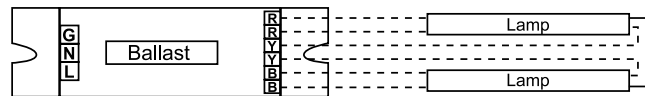
STARTING METHOD LEGEND

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

Overall Dimensions		Mounting Dimensions			
Draw #	L	W	H	M	X
ESX	14.13"	1.24"	0.73"	13.78"	—



WIRING DIAGRAMS



FOR ONE LAMP OPERATION, CAP YELLOW LEADS INDIVIDUALLY

DIAGRAM 37