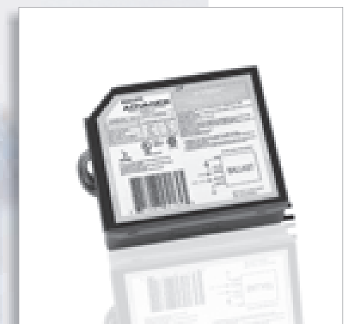
Lighting Electronics Atlas

Full Line Catalog 2010-2011

PHILIPS
ADVANCE

Lighting Electronics Atlas

Full Line Catalog 2010-2011



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Visit our on-line product catalog at www.philips.com/advance for the latest updates on all Philips Advance products.


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T5HO


PureVOLT™

ELECTRONIC FLUORESCENT BALLASTS

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ELECTRONIC FLUORESCENT BALLASTS

Fluorescent Ballasts - Electronic - Standard Electronic

For T12 Fluorescent Lamps

Reliable and energy-efficient, Philips Lighting Electronics broad line of standard electronic ballasts for T12 fluorescent lamps offers performance and fast payback of investment based on the up to 30% energy savings they drive relative to standard magnetic ballast models. A widely popular product that also qualifies for rebates by a host of utility demand-side management programs nationwide, the Philips Advance line of standard electronic ballasts are ideal for a broad range of commercial retrofit and new construction applications.

These ballasts are ideal for general office applications as well as conference, meeting, and board rooms.

Improved efficiency over magnetic counterparts
Potential Savings of up to 30% over magnetic ballasts*

2-lamp 34/40W versions are now available with IntelliVolt®
Stock 1 ballast for 4-foot, 2-lamp fixtures

High frequency operation
Delivers flicker-free operation

Fits the exact footprint of the magnetic ballasts they replace
Enhances ease of installation in retrofit applications

* Based on input watts of Philips Advance's REL-1S40-SC (35W) and R-140-TP (50W) both operating a 40W lamp. (50W - 35W = 15) (15 / 50 = .3 or 30%)

Fluorescent Ballasts - Electronic - Centium®

Electronics Ballasts for T5, T8, T12 and Long Twin Tube Fluorescent Lamps

Reliable and energy-efficient, Philips Advance broad line of Centium high frequency electronic ballasts offer all of the energy-saving properties of our standard electronic line plus the added benefits of lamp striation reduction technology making the T8 ballasts compatible with all energy saving T8 lamps. This provides your customers with a more sustainable lighting solution over standard T8 fixtures.

Our Centium ballasts are an optimal choice for a broad range of new construction and retrofit applications within the commercial sector including general office lighting, conference, meeting, and board room applications, indirect and decorative lighting, and new fixture designs requiring smaller ballasts.

Setting Industry Standards for Ballast Efficiency

The National Electrical Manufacturers Association (NEMA) has created this program to help lighting professionals and end users recognize the market's highest-performing ballast products. A selection of Centium ballasts meet these requirements. For more information on which products comply with this program, visit www.philips.com/advance and click on the "Sustainability" tab.

Lamp Striation Reduction Technology

Reduces the likelihood of striation often associated with energy-saving lamps, for consistent light output

IntelliVolt® Technology

Enhances accuracy and ease of ordering while reducing stocking requirement

Cold temperature lamp ignition down to -20 degrees F

Brings energy-efficient T5 and T8 performance to a variety of new applications such as parking garages, warehouses, and cold storage areas

NEMA Premium

The following ballasts are NEMA Premium®:

ICN2P32N
ICN3P32SC
ICN4P32SC
ICN2P32LWSC
ICN3P32LWSC
ICN4P32LWSC

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.

ELECTRONIC FLUORESCENT BALLASTS

Fluorescent Ballasts - Electronic - Optanium®

High-efficiency electronic ballasts for a broad range of T5 and T8 lamps

Optanium ballasts for T5 and T8 lamps are part of our effort to promote environmental responsibility through Smart Solutions™ - energy efficient products, lighting systems, services and expertise through Philips Advance branded products. They are also one of the charter products of the NEMA Premium® Ballast Program. All of this makes these ballasts part of an overall high-efficiency lighting system that may help you achieve LEED certification, meet ASHRAE standards, become compliant with California Title 24 Energy Efficiency Standards, or any other local energy code you or your customers need to be in compliance.

Optanium ballasts will help you and your customers meet a variety of application challenges including luminaire design, installation, maintenance, and evolving lamp technology. Optanium ballasts are available in a standard light output, low-watt, and a high light output design. Also these ballasts come in options with cold-starting capability down to -20°F (with standard fluorescent lamps). These two features combined make it ideal for just about any T5 or T8 fixture design and application. These ballasts are available in either instant start or programmed start ignition for extended lamp life in frequent switching applications such as those where occupancy sensors or motion detectors are being used. Optanium ballasts are also available in program start with parallel wiring.

Setting Industry Standards for Ballast Efficiency

As a charter product in the NEMA Premium® Ballast Program, Optanium ballasts are recognized as supporting energy-efficient lighting objectives. The National Electrical Manufacturers Association (NEMA) has created this program to help lighting professionals and end users recognize the market's highest-performing ballast products. For more information on the NEMA Premium Ballast Program, visit www.philips.com/advance and click on the "Sustainability" tab.

Striation-reduction technology

Reduces the likelihood of striation often associated with energy-saving lamps, for consistent light output

Cold temperature lamp ignition down to -20°F for instant or program start ballasts

Brings energy-efficient T5 and T8 performance to a variety of new applications such as parking garages, warehouses, and cold storage areas

Arc-reduction technology — UL Type CC

UL Type CC* (on certain ballasts)

Program start parallel (PSP)

Program start ballasts with parallel wiring delivers independent lamp operation preventing premature lamp shut down ultimately reducing maintenance

High efficiency design

Maximize energy savings with improved ballast efficiency

NEMA Premium

The following ballasts are NEMA Premium®:

IOP-1P32-SC	IOP-3P32-HL-90C-SC	IOPA-2P32-LW-SC
IOP-1P32-LW-SC	IOP-4P32-SC	IOPA-2P32-HL-SC
IOP-2P32-SC	IOP-4P32-LW-SC	IOPA-3P32-SC
IOP-2P32-LW-SC	IOP-4P32-HL-90C-G	IOPA-3P32-LW-SC
IOP-2P32-HL-SC	IOPA-1P32-SC	IOPA-3P32-HL-SC
IOP-3P32-SC	IOPA-1P32-LW-SC	IOPA-4P32-SC
IOP-3P32-LW-SC	IOPA-2P32-SC	IOPA-4P32-LW-SC
		IOPA-4P32-HL

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.

Fluorescent Ballasts - Electronic - SmartMate®

Electronic Ballasts for 4-Pin Compact Fluorescent Lamps

Offering maximum versatility, the Philips Advance family of SmartMate electronic ballasts for 4-pin compact fluorescent lamps drive a broad range of quad and triple-tube, circline, 2D, and long twin-tube lamps. Representing an innovative breakthrough in CFL ballast technology, SmartMate Ballasts' energy-efficient design, compact and lightweight housing, and user-friendly features make SmartMate Ballasts an ideal choice for fixture manufacturers, retrofitters, and MRO replacement.

SmartMate Ballasts are ideal in such applications as restaurants, reception areas, conference and meeting rooms, hotel and convention center ballrooms, and houses of worship, as well as in place of incandescent down-lighting systems.

We also offer our distribution partners a way to eliminate the need to stock loose components with SmartMate® Ballast Replacement Kits

Conveniently-packaged these kits come complete with a Philips Advance SmartMate Ballast, a mounting plate adaptor, lead wire, and a wire extraction tool for the ultimate in ease and versatility. See page 1-21 for details on kits.

Dual-entry connector

Reduces SKU requirements and inventory costs, as unit can be used with side or bottom exit leads

Color-coded, poke-in terminals

Enhances wiring accuracy and ease of assembly/installation

Operation between 42kHz and 52kHz

Eliminates interference with infrared systems, anti-theft devices, or other electronic equipment

Lamp End-Of-Life (EOL) Protection Circuit

Removes power to lamps upon lamp failure

ELECTRONIC FLUORESCENT BALLASTS

Fluorescent Ballasts - Electronic - AmbiStar™

Residential Ballasts for 4-pin CFL, T5, T8 or T12 Lamps

Today's fixed and dimmable fluorescent fixtures offer greater flexibility and energy savings for residential and hospitality settings than ever before, thanks to Philips Advance AmbiStar™ electronic ballasts. No matter what type of fluorescent lighting you're considering, these ballasts help create warm, inviting interiors while providing Class B FCC EMI Rating - a requirement for the EPA ENERGY STAR® residential lighting fixtures -at a very competitive price.

AmbiStar ballasts feature sleek, compact designs to fit in today's stylish fixtures. AmbiStar ballasts deliver quiet, flicker-free performance, which makes them perfect for any residential or hospitality setting. Fluorescent lighting isn't just for garages and basements anymore.

AmbiStar dimming ballasts are designed to work with most incandescent dimmers, so they are easy to install with new or existing dimming systems. Now you can create any ambiance with dimmable lighting and still enjoy the energysaving benefits of fluorescent lighting.

Class B FCC EMI Rating

Requirement for the EPA ENERGY STAR Residential Lighting Fixtures

Title 24 Energy Efficiency Requirements

Enables California's Title 24 Residential Lighting Energy Efficiency standards with applicable luminaire design

Electronic circuitry

Enable ballast to run cooler and operate quieter than many magnetic ballast alternatives.

Fast Start Times

Flicker free ignition starts in less than 1.0 second to meet EPA ENERGY STAR Requirements for Residential Lighting Fixtures

NOTE: AmbiStar ballasts meet the ballast-controlled performance requirements in the ENERGY STAR Program Requirements for Residential Light Fixtures. The most current list of ballasts can be found at www.philips.com/advance in the file "ENERGY STAR Ballast Matrix".

Electronic Ballast Fundamentals

The job of a ballast

In all fluorescent lighting systems, the ballast's basic tasks include:

- Providing the proper voltage to establish an arc between the two electrodes.
- Regulating the electric current flowing through the lamp to stabilize light output.

In some fluorescent lighting systems, the ballast also provides a controlled amount of electrical energy to preheat or maintain the temperature of the lamp electrodes at levels specified by the manufacturer. This is required to prevent electrode filaments deteriorating prematurely and shortening the lamp life.

Starting Methods

For many years there were only three types of lighting systems: preheat, rapid start and slimline instant start. With the introduction of electronic ballasts, two additional types of lighting system circuits have been added: instant start for T8 lamps and programmed start. Each requires a special ballast design to operate the lamps in the circuit properly.

Instant start electronic ballasts start lamps without delay (<0.1 seconds) or flicker by providing a starting voltage that is sufficiently high to start a discharge through the lamps without the need for heating lamp electrodes. For F32T8 systems, the starting voltage is about 600V. The elimination of electrode heating maximizes energy savings — typically saving 2W per lamp compared to rapid start ballasts. Instant start ballasts are best suited for applications with limited switches each day. Lamps operated by instant start ballasts typically operate 10,000 to 15,000 switch cycles before failure.

Rapid start electronic ballasts start lamps quickly (0.5 — 1.0 seconds) without flicker by heating the lamp electrodes and simultaneously applying a starting voltage. The starting voltage of about 500V for F32T8 systems is sufficient to start a discharge through the lamps when the electrodes have reached an adequate temperature. Electrode heating continues during operation and typically consumes 2W per lamp. Lamps operated by rapid start ballasts typically operate 15,000 to 20,000 switch cycles before failure.

Programmed start electronic ballasts also start lamps quickly (1.0 -1.5 seconds) without flicker. Programmed start ballasts are designed to maximize lamp life in frequent lamp starting applications such as in areas where occupancy sensor controls are used. Programmed start electronic ballasts precisely heat the lamp electrodes, tightly controlling the preheat duration before applying the starting voltage. This enhancement over rapid start ballasts minimizes electrode stress and depletion of emitter material, thereby maximizing lamp life. Lamps operated by programmed start ballasts typically operate up to 50,000 switch cycles before failure.

Circuits

Series vs. Parallel. Lighting systems are typically wired in a series or parallel circuit. When a ballast is operating multiple lamps in a series circuit, if one lamp fails, the circuit is opened and all the lamps will extinguish. When a ballast operates multiple lamps in a parallel circuit, the lamps operate independently of each other so, if one lamp fails, the others can keep operating as the circuit between them and the ballast remains unbroken.

As a general rule, rapid start ballasts are wired with the lamps in series. Programmed start ballasts are also typically wired with lamps in series. However, some three- and four-lamp ballasts feature series-parallel operation; so that when a single lamp in one branch fails, the lamp(s) in the parallel branch will continue to operate. Instant start ballasts are typically wired with the lamps in parallel.

The Language of Ballasts

Input Voltage (dedicated vs. multi). Most ballasts are designed to operate at specific voltages. Newer electronic ballasts, including Philips Advance models that use IntelliVolt® technology, offer much greater flexibility and other advantages such as inventory reduction. Today's increasing demands on electrical utilities can cause wide voltage variations during load demand changes which in turn cause light output from lamps operated on dedicated electronic and electromagnetic ballasts to vary with the input voltage changes. With IntelliVolt technology, many Philips Advance ballasts maintain constant light output through nominal input voltage ranges of 120 to 277 volts, thereby compensating for any change in input voltage. Some ballasts operate from 277 to 480 volts or 347 to 480 volts.

Input Watts/ANSI Watts. Input watts published by ballast manufacturers are the total watts consumed by both the ballast and the lamps it operates. ANSI watts are the rating given for a ballast measured under the strict testing procedures specified by ANSI standards and are a dependable measure of this lamp/ballast performance. Energy savings can be determined by comparing the input watts of different lighting systems.

Input watts may be affected by tolerance build-up from the ballast, lamp, input voltage and ambient temperature. The input watts published in this catalog are for nominal conditions only.

Ballast Factor (BF) is the ratio of light output from a lamp operated on a commercial ballast to the light output of that same lamp operated on a "reference ballast" as specified by ANSI standards. Light output ratings published by lamp manufacturers, are based on this "reference ballast".

$$\text{BF} = \frac{\text{light output of lamp operated on commercial ballast}}{\text{light output of lamp operated on reference ballast}}$$

BF is a measure of light output best thought of as a 'multiplier'. Multiplying the BF times rated lumens will determine actual light output of a given system operated on commercial ballasts.

Ballast Efficacy Factor (BEF) is the ratio of ballast factor to input watts. This measurement is generally used to compare the efficiency of various lighting systems — higher numbers being more efficient.

$$\text{Ballast Efficacy Factor} = \frac{\text{Ballast Factor x 100}}{\text{Input Watts}}$$

This comparison is only valid, however, for ballasts operating the same number and type of lamps. In order to compare different types of lighting systems, the lumen output of the lamps must also be used.

ELECTRONIC FLUORESCENT BALLASTS

Power Factor (PF) is the measurement of how effectively a ballast converts the voltage and current supplied by the power source into watts of usable power delivered to the ballast and lamps. Perfect power utilization would result in a power factor of one.

$$PF = \frac{\text{Input Watts}}{\text{Input Current x Input Voltage}}$$

A ballast's power factor may be classified under any one of the following categories:

High Power Factor (HPF)	0.90 or greater
Power Factor Corrected (PFC)	0.80 to 0.89
Normal (Low) Power Factor (NPF)	0.79 or less

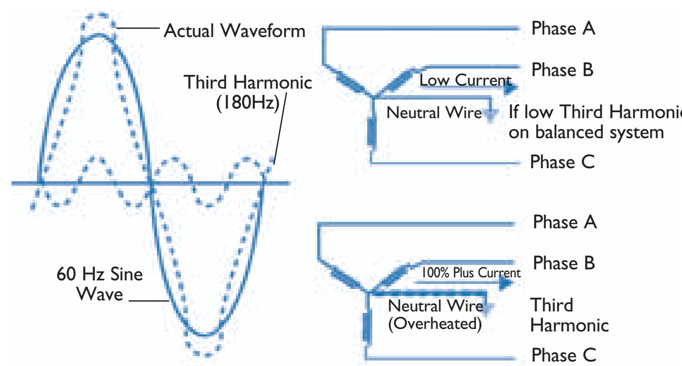
Power factor measurements pertain only to the effective use of power supplied to the ballast. They are not an indication of the ballast's ability to supply light through the lamps. Because low power factor ballasts require about twice the current needed by high power factor ballasts, they allow fewer fixtures per circuit and create added wiring costs. High power factor ballasts are generally specified for all commercial lighting applications.

EMI/RFI. Because they operate at high frequency, electronic ballasts may produce electromagnetic interference (EMI) or radio frequency interference (RFI). RFI frequencies are a subset of EMI frequencies. EMI issues cover all possible operating frequencies while RFI is only concerned with radio and television frequencies. This interference could affect the operation of sensitive electrical equipment, such as radios, televisions or medical equipment. All Philips Advance electronic ballasts incorporate features necessary to afford maximum protection for the operating environment and operate well within regulatory limits.

Ballast Noise. The slight "humming" sound associated with fluorescent lighting systems results from vibration caused by the inherent electromagnetic action in the core-and-coil assembly of the ballasts. All electromagnetic and some electronic ballasts make this sound. Ballasts are assigned a sound rating, "A" through "F", based on the amount of sound produced, with "A" being the quietest. Generally, the larger the lamp and ballast, the higher the sound level and the sound rating will be. Because electronic ballasts have smaller components, they have the lowest sound rating. Some electronic ballasts make almost no sound. There is no ANSI standard for this rating and it is left up to the manufacturer to rate their ballasts.

Inrush Current. All electrical devices including ballasts have an initial current surge that is greater than their steady-state operating current. A standard published by the National Electrical Manufacturers Association (NEMA) — NEMA 410 — Performance Testing for Lighting Controls and Switching Devices with Electronic Fluorescent Ballasts — covers worst-case ballast inrush currents. All circuit breakers and light switches are designed for inrush currents. The electrical system should be designed with this issue in mind.

Total Harmonic Distortion (THD). Harmonic distortion occurs when the wave-shape of current or voltage varies from a pure sine wave. Except for a simple resistor, all electronic devices, including electro-magnetic and electronic ballasts, contribute to power-line distortion. For ballasts, THD is generally considered the percent of harmonic current the ballast adds to the power distribution system. The ANSI standard for electronic ballasts specifies a maximum THD of 32% for commercial applications.. However, most electric utilities now require that the THD of electronic ballasts be 20% or less. Almost all Philips Advance electronic ballasts are rated for either less than 20% THD or less than 10% THD.



Indicates ballast is listed with Underwriters Laboratories, Inc. and complies with UL935 Standard for Fluorescent Lamp Ballasts (File No. E14927).

Visit www.ul.com to find a current listing of Philips Advance ballasts under File No. E14927.

Indicates ballast is certified by Canadian Standards Association and complies with CSA C22.2 No. 74 Standard for Fluorescent Lamp Ballasts (File No. 007310)

Visit www.csa.ca to find current listing of Philips Advance ballasts under File No. 007310.

Normal Input Voltage	Catalog Number Prefix Code	Label Color Coding
120V	R	Yellow
277V	V	Red
347V	G	Grey
120V to 277V	I	Blue
277V to 480V	J	Brown
347V to 480V	H	Purple

Total Harmonic Current

Non-Dimming Applications

When selecting a ballast for a lighting application, the Total Harmonic Current (THC) rating of the ballast is more significant than Total Harmonic Distortion (THD). This is because the absolute value of harmonic current, not the percentage, affects the electrical power distribution system. As can been seen in the table below, the THC rating of our Standard 2-lamp electronic T8 lamp ballast (REL-2P32-SC) is well below that of both the conventional (RQM-2S40-TP) and energy-saving magnetic T12 lamp ballasts (R-2S40-TP) it replaces. Moreover, the THC rating of our Centium electronic ballast is even lower.

Dimming Applications

Mark 7® 0-10V and ROVR™

Traditional low voltage controlled ballasts and ROVR typically produce less than 10% THD at full light output and less than 20% THD throughout the entire dimming range, but require extra wires for the control circuit. THC is always lower than that of the conventional or energy-saving magnetic system.

Mark 10® Powerline

Mark 10 *Powerline* electronic dimming ballasts are controlled by 2-wire modified powerline phase-cut style line voltage dimmers. Whenever the ballast is dimmed, the input voltage is cut or "chopped", causing the THD to increase and the Power Factor to decrease.

Mark 10 *Powerline* electronic dimming systems (ballast and controller) have similar THD and Power Factor levels as the conventional lighting systems they replace. Since a much smaller load is required by the Mark 10 *Powerline* electronic dimming system to achieve the same illumination level as a magnetic ballast system (20-30% less), the total input current will be considerably less. As a result, the magnitude of the total harmonic current will be less.

For example, a typical Mark 10 *Powerline* electronic ballast and dimmer control might draw a line current of 0.58A at 15% THD at full light output. If the light level is reduced to 5% of the maximum, the input power is decreased to 0.19A at 95% THD. While the THD level may seem high at the 5% maximum light output setting, the total harmonic current is still lower (0.13A) than the conventional T12 magnetic system (0.20A). Moreover, the overall heating effect on the wires and the distribution transformer is never higher than the existing conventional or energy saving T12 magnetic systems.[1]

Conclusions

A simple ballast retrofit to electronic ballasts should not cause harmonic problems if none existed before the retrofit. Also, in new fixture applications, total harmonic distortion should not be a concern when specifying electronic ballasts. Finally, it is important to remember that electronic ballasts are not the greatest source of THD in an electrical distribution system. Other electronic devices such as computers, laser printers, and other electronic equipment can draw current with more than 100% THD in some cases.

Table 1: Comparison of THD and THC Levels

Philips Advance Part No.	Ballast Type	Light Output Setting	Lamp Type	Input Current	% THD	THC[2]
RQM-2S40-TP	Conventional Magnetic	100% (Ballast Factor is 0.98)	(2) F40T12	0.84A	<25%	0.20A
R2S40-TP	Energy Saving Magnetic	100% (Ballast Factor is 0.95)	(2) F34T12	0.63A	<20%	0.12A
REL-2P32-SC	*Standard* Electronic	100% (Ballast Factor is 0.88)	(2) F32T8	0.49A	<20%	0.10A
ICN-2P32-N	*Centium* Electronic	100% (Ballast Factor is 0.88)	(2) F32T8	0.49A	<10%	0.05A
IZT-2S32-SC + Dimming Control	*Mark 7 0-10V* Electronic	100% (Ballast Factor is 1.0)	(2) F32T8	0.57A	<10%	0.05A
IZT-2S32-SC + Dimming Control	*Mark 7 0-10V* Electronic	5% (Ballast Factor is 0.05)	(2) F32T8	0.12A	<20%	0.02A
REZ-2S32-SC (Ballast Only)	*Mark 10 Powerline* Electronic	100% (Ballast Factor is 1.0)	(2) F32T8	0.58A	<10%	0.06A
REZ-2S32-SC + Dimming Control	*Mark 10 Powerline* Ballast + Dimmer	100% (Ballast Factor is 1.0)	(2) F32T8	0.58A	<15%	0.09A
REZ-2S32-SC + Dimming Control	*Mark 10 Powerline* Ballast + Dimmer	5% (Ballast Factor is 0.05)	(2) F32T8	0.19A	<95%	0.13A

[1] For a more technical study comparing the a Mark 10 *Powerline* electronic dimming system to an energy saving magnetic system that it replaces, see the article THD in Philips Advance Mark 10 *Powerline* Electronic Dimming Systems by O.C. Morse.

[2] The Total Harmonic Current (THC) of a ballast is calculated by the following equation: An approximation of THC may be obtained by simply multiplying the ballast input current by %THD.

$$\frac{\text{Ballast Input Current}}{\text{Square Root of } (1 + 1/\text{THD}^2)}$$

ELECTRONIC FLUORESCENT BALLASTS

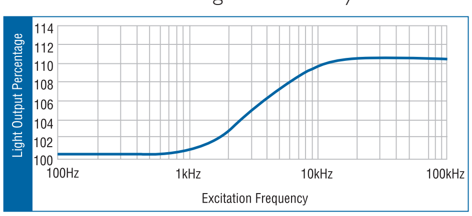
Ballast Life

Philips Advance fluorescent electronic and magnetic ballasts are designed and manufactured to engineering standards correlating to an average life expectancy of 50,000 hours of operation at maximum rated case temperature. Since Philips Advance ballasts operate below their maximum case temperature in the majority of applications, increased ballast life can be expected. As a rule of thumb, ballast life may be doubled for every 10°C reduction in ballast case operating temperature. However, there are many variables, such as input voltage, ambient temperature, etc. which affect ballast operating temperatures, and therefore ballast life.

Lamp Operating Frequency

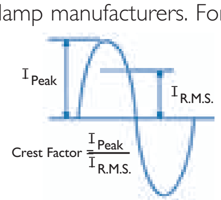
Electromagnetic ballasts and the lamps connected to them operate at an input voltage frequency of 60 Hertz (Hz), 60 cycles per second — which is the standard alternating voltage/current frequency provided in North America. Electronic ballasts, on the other hand, convert this 60 Hz input to operate lamps at much higher frequencies above 20 Kilohertz (kHz), 20,000 cycles per second. Philips Advance ballasts operate above 20 kHz, but avoid certain ranges such as 30-40 kHz (infrared) and 54-62 kHz (theft deterrent systems) due to interference issues.

Because electronic ballasts function at high frequency, the fluorescent lighting systems that they operate can convert power to light more efficiently than systems operated by electromagnetic ballasts (See chart below). For example, lamps operated on electronic ballasts can produce over 10 percent more light then if operated on electro-magnetic ballasts at the same power levels. In effect, today's electronic ballasts provide additional energy savings by matching the light output from electromagnetic ballasts while operating the lamps at lower power. This is the main reason why electronic ballast systems are more efficient than magnetic ballast system.



Crest Factor

Lamp manufacturers use crest factor to determine ballast performance as it relates to lamp life. Lamp Current Crest Factor is a measurement of current supplied by a ballast to start and operate the lamp. It is basically the ratio of peak current to RMS (average) current. High crest factor currents may cause the lamp electrodes to wear out faster, reducing lamp life. Crest factor requirements are regulated by ANSI (American National Standards Institute) standards and specified by lamp manufacturers. For rapid start and instant start T8 lamps the ratio is 1.7 maximum, and for instant start slimline lamps, it is 1 .85 maximum.



Weight and Size Advantages

Since electronic components in electronic ballasts are smaller and lighter than the core-and-coil assembly in electromagnetic ballasts, electronic ballasts can weigh less than half as much as comparable electromagnetic models. Almost all Philips Advance electronic ballasts have a smaller cross-section than electromagnetic ballasts but maintain the same mounting dimensions. This means that they can fit into all new fixture designs and can be easily retrofitted into existing fluorescent lighting systems.

Controllability

The ability of a building's occupants to control how they light their space is becoming an increasingly important factor for organizations in determining what real estate they will lease, buy or invest in. The ability to dim the lights or easily shut them off completely is a trend fueled not just by a desire to help the environment, but also by significant economic benefits. These benefits include greater energy efficiency — in terms of reduced HVAC costs as well as energy savings for lighting — more comfortable and productive working environments, and compliance with ever tighter energy efficiency regulations. Philips Advance offers three families of electronic controllable ballasts — ROVR, Mark 7 *0-10V* and Mark 10 *Powerline*.

Compatibility With Powerline Carrier Systems

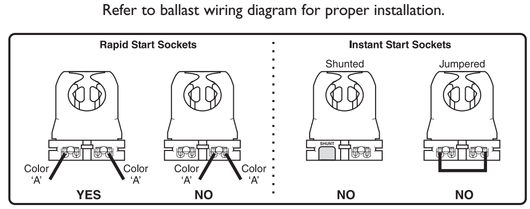
A powerline carrier system (PLC) uses electronic wiring devices to send information via a high frequency signal over the 120V or 277V electrical power distribution system of a building. For example, PLC systems are used in automatic clock systems (master time systems) to synchronize all of the clocks in a building or reset the time after a power outage. They eliminate the need for maintenance personnel to reset hundreds of clocks throughout a facility.

In a PLC system, a generator is used to impose a 1 to 4V high frequency signal on top of the existing voltage sine wave (60 Hz). This signal is generally in the 2500 to 9500Hz range, with some older systems operating at 19,500Hz or higher. Some electronic ballasts which are capacitive can absorb the signal from a PLC system. As a result, the signal becomes too weak to be "heard" by the receiver (like a timeclock) connected to the powerline.

Instant Start vs. Rapid Start Sockets for Dimming

When using dimming ballasts in fixtures, sockets must be of the Rapid Start type. Many fixtures with T-8 Instant Start electronic ballasts use jumpered or "shunted" Instant Start sockets. Controllable ballasts require two distinctly separate wires for each lamp socket. If you encounter shunted or jumpered sockets in a retrofit application, they must be removed and replaced with Rapid Start sockets.

Improper socket application will damage the ballast and void the ballast warranty. Refer to ballast wiring diagram for proper installation.



Fluorescent Lamp Burn-In

Today, most lamp manufacturers do not require the burn-in of linear fluorescent lamps prior to dimming in order to attain rated lamp life and stable electrical measurements. However, some manufacturers compact fluorescent lamp sources do require a 100 hour burn-in prior to dimming. Consult your lamp manufacturer for their latest requirements.

Ordering Information

How to Order

Philips Lighting Electronics has developed the industry's broadest distribution system for electronic ballasts. More than 3000 stocking distributors nationwide. For information on the distributor best able to serve your needs, please call 800-372-3331.

Electronic Ballast Part Number Breakdown

I	CF	–	2	S	26	–	H1	–	LD

CFL Mounting/Connector Options

BL = Bottom leads
BLS = Bottom leads with mounting studs
BS = Bottom mounting studs with single entry color coded connectors
EL = End leads
ELS = End leads with mounting studs
LD = Length mounting feet with SmartMate® dual entry color coded connectors
LS = Length mounting feet with single entry color coded connectors
QS = QuikStart

Linear Fluorescent Mounting/Connector Options

TP* = Thermal Protected
2LS = 2 Level Switching

CFL Can Desription
H1 = Hybrid metal / plastic case, size 1
L2 = Linear
M1 = Metal case, size 1
M2 = Metal case, size 2
M3 = Metal case, size 3
M4 = Metal case, size 4
M5 = Metal case, size 5
M6 = Metal case, size 6
N = "N" can
S1 = Square, style 1
S2 = Square, style 2

Linear Fluorescent Can Desription
90C = 90°C maximum case temperature rating
A = "A" can
D = 'D' can
G = 'G' can
HL = High light output
L = "L" can
LW = Low watt
MC = Micro can
RH* = Reduced harmonics
S = Slimline
SC = Small can

Lamp Watts (Primary lamp)

Wiring Configuration

D = 2D, series
M = Modified parallel**
P = Parallel
PSP = Programmed Start Parallel
Q = Quad CFL, series
S = Series
T = Triple CFL, series
TTS = Long twin tube, series
TTP = Long twin tube, parallel

Maximum Number of Lamps

Family Name

CF = Compact Fluorescent
DA = ROVR
EB = AmbiStar
EL = Standard
IC = Mark 5®
MB = AmbiStar
ZT = Mark 7® *0-10V*
CN = Centium
DL = ROVR
ELB = AmbiStar
EZ = Mark 10® *Powerline*
LV = Low Cost 0-10V
OP = Optanium

Input Voltage

G = 347V
H = IntelliVolt 347V to 480V 50/60 Hz
I = IntelliVolt 120V to 277V 50/60 Hz
J = IntelliVolt 277V to 480V 50/60 Hz
R = 120V
V = 277V

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(+) 1 847 390-5000 (International)

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- Plan your lighting installation carefully; consider using the services of a qualified lighting designer
- Consult your local electric utility regarding demand side management rebate programs.
- Select the Philips Advance electronic ballast which best matches the requirements of your application. The technical specifications in this catalog (located on pages 9-5 to 9-14) will be useful in obtaining bids from electrical contractors.
- Contact your local Philips Lighting Electronics distributor. You will find them to be a helpful supplier of both products and information.

* Many current and all future electronic ballast part numbers will not use the "RH-TP" suffixes even though these ballasts will be thermally protected.
** Parallel Wiring Configuration. However, if one lamp fails, all other lamps in the circuit will extinguish.

ELECTRONIC FLUORESCENT BALLASTS

Remote, Tandem or Through Wiring Distances

Remote Mounting of Electronic Ballasts

Unlike magnetic ballasts, electronic ballasts are limited in remote mounting distance from the lamps they operate. The factors limiting the distance from the electronic ballasts to the lamps are: open circuit voltage as opposed to operating voltage, operating frequency and the lamp operating current.

As the distance from the high frequency electronic ballasts to the lamp increases, so does the capacitance across the lead wire to the lamp. This increase in capacitance is important for two reasons. First, if the capacitance is too high, there will not be sufficient open circuit voltage across the lamp for proper lamp ignition.

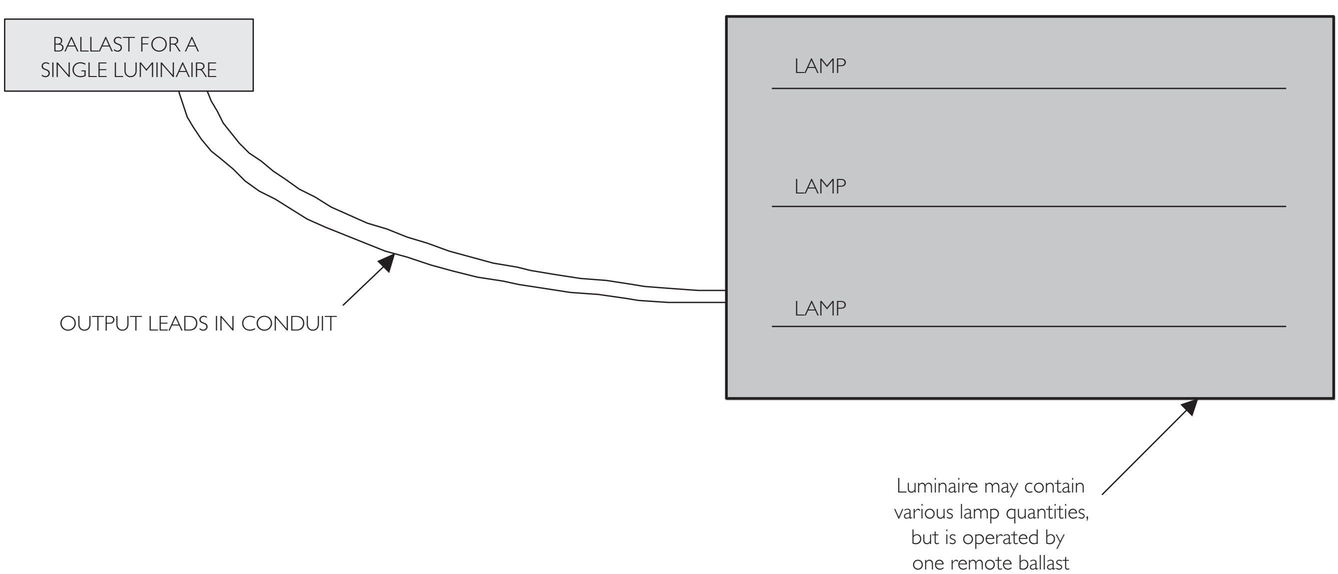
Second, if the lamp is capable of ignition, the increased capacitance will cause a loss in the current to the lamp. The added capacitance creates what is known as a "shunt" around the lamp; in other words the current will leak from the red wire (or blue) to the yellow, completely bypassing the lamp. The current through the lamp will be reduced, resulting in lower lumens, with the possibility that the lamp will not be capable of sustained operation.

The Mark 7 *0-10V*, Mark 10 *Powerline,* and ROVR dimming ballasts are particularly sensitive to high capacitance associated with long lead wires. The dimming ballast is capable of very low dim levels because constant filament heat is provided to the lamp. If there is any loss of current, the filament current will be reduced and the lamp will begin to flicker, or it will be completely extinguished. It is also important that the red and blue leads not be twisted together. Twisting the red and blue leads will add capacitance, causing the lamp to flicker at the lower dimming levels.

Open circuit voltage is a function of input voltage in some ballast designs, particularly for dedicated voltage ballasts. Cold temperature starting is a function of open circuit voltage. The lead length recommendations in the following table are for normal rated input voltages (120V, 277V, 347V) at 25°C ambient temperature.

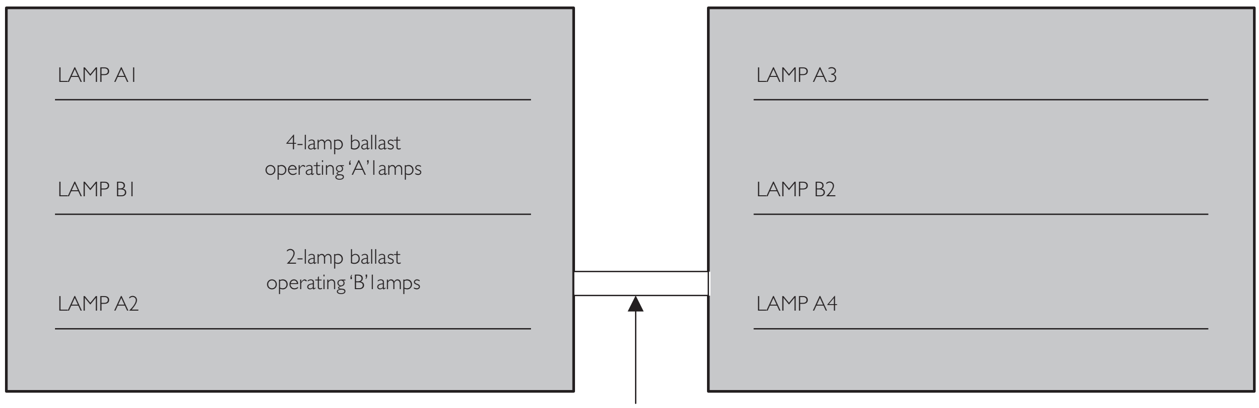
In summary, there is a wide range and varying types of electronic ballast architectures that are capable of being remote mounted for an equally wide range of distances. If you are uncertain of the remote mounting restrictions for a particular electronic ballast please consult Philips Lighting Electronics Customer Care (Warranty/Technical Service)

Remote Wiring



ELECTRONIC FLUORESCENT BALLASTS

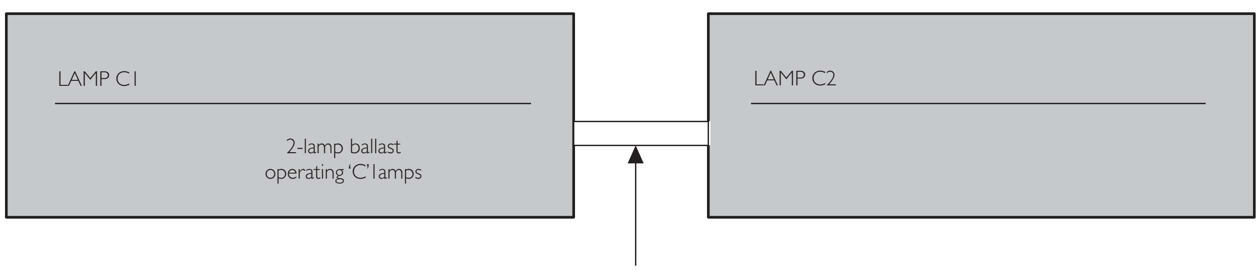
Tandem Wiring



2 BALLAST EXAMPLE

Conduit for
running output lead wire
to adjacent luminaire

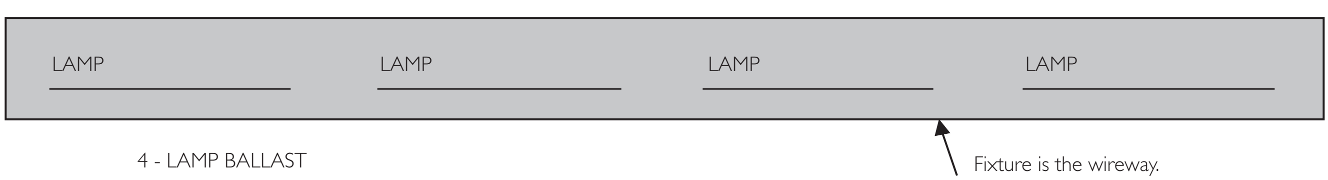
BALLAST 'A' OPERATES OUTBOARD LAMPS
BALLAST 'B' OPERATES INBOARD LAMPS



1 BALLAST EXAMPLE

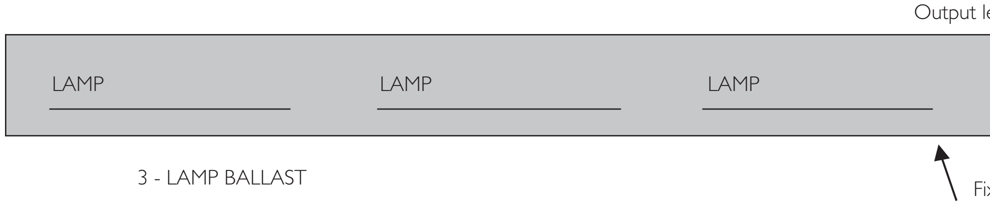
Conduit for
running output lead wire
to adjacent luminaire

Through Wiring



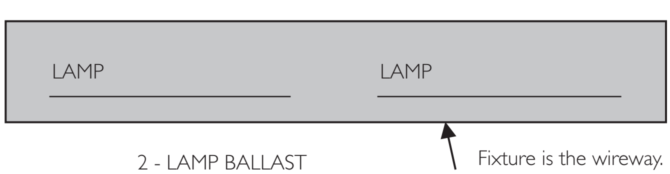
4 - LAMP BALLAST

Fixture is the wireway.
Output leads are not run in conduit.



3 - LAMP BALLAST

Fixture is the wireway.
Output leads are not run in conduit.



2 - LAMP BALLAST

Fixture is the wireway.
Output leads are not run in conduit.

Diagrams are also aplicable for multiple lamp cross-section luminaires. For example, an 8-foot luminaire with two lamps in cross section and a single 4-lamp ballast.

Note: Ballast should be mounted at center of fixture to minimize lead lengths.

ELECTRONIC FLUORESCENT BALLASTS

	Allowed Wiring Configuration			Maximum Lead Length (Feet) for Tandem or Through Wiring (Total length of all wires between ballast and lamp sockets)						Application Note
	Remote (max length)	Tandem	Through	Blue	Red	Yellow	Blue/White	Brown	Orange	
GOPA-1P32-LW-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-1P32-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-2P32-LW-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-2P32-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-3P32-LW-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-3P32-SC (c)	8'	Yes	Yes	8'	8'					1
GOPA-4P32-LW-SC (c)	8'	Yes	Yes	8'	8'	8'				1
GOPA-4P32-SC (c)	8'	Yes	Yes	8'	8'	8'				1
HCN-2S54-90C-WL	20'	Yes	Yes	20'	4'	20'				3
HCN-4S54-90C-2LS-G	20'	Yes	Yes	20'	4'	4'	20'	20'	20'	7
ICF-1D38-H1-LD	15'	NA	NA							4
ICF-1H120-M4-LD 2-Lamp	6'	Yes	Yes	2'	6'	6'				2
ICF-2S13-H1-LD ICF-2S13-M1-BS 1-Lamp	15'	NA	NA							4
ICF-2S18-H1-LD ICF-2S18-M1-BS 1-Lamp	15'	NA	NA							4
ICF-2S26-H1-LD ICF-2S26-M1-BS 1-Lamp	15'	NA	NA							4
ICF-2S42-M2-BS ICF-2S42-M2-LD 1-Lamp	15'	NA	NA							4
ICF-2S42-90C-M2-BS ICF-2S42-90C-M2-LD 1-Lamp	15'	NA	NA							4
ICF-2S70-M4-LD	6'	Yes	Yes	2'	6'	6'				2
ICN-132-MC	20'	NA	NA							4
ICN-1P32-N	20'	NA	NA							4
ICN-1S80	20'	NA	NA							4
ICN-1TTP40-SC	20'	NA	NA							4
ICN-2M32-MC	20'	Yes	Yes	20'	20'					1
ICN-2P32-N	20'	Yes	Yes	20'	20'					1e
ICN-2P60-SC	20'	Yes	Yes	20'	20'					1
ICN-2S24	20'	Yes	Yes	20'	4'	20'				3
ICN-2S28	8'	Yes	Yes	8'	4'	8'				3
ICN-2S28-N	10'	Yes	Yes	10'	10'	10'				3
ICN-2S39	20'	Yes	Yes	20'	4'	20'				3
ICN-2S40-N	20'	Yes	Yes	4'	10'	10'				2
ICN-2S54	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-WL	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-90C	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-90C-SC	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-90C-WL	20'	Yes	Yes	20'	4'	20'				3
ICN-2S86 (b)	12'	Yes	Yes	12'	4'	12'				3
ICN-2S110-SC	20'	Yes	Yes	4'	20'	20'				2
ICN-2TTP40-SC	20'	Yes	Yes	20'	20'					1
ICN-3P32-SC	20'	Yes	Yes	20'	20'					1e
ICN-3S14-D	No	No	No							5
ICN-3TTP40-SC	20'	Yes	Yes	20'	20'					1
ICN-4P32-SC	20'	Yes	Yes	20'	20'	20'				1e

For nominal input voltage and 25°C ambient temperature. See all notes on page 1-19.

ELECTRONIC FLUORESCENT BALLASTS

	Allowed Wiring Configuration			Maximum Lead Length (Feet) for Tandem or Through Wiring (Total length of all wires between ballast and lamp sockets)						Application Note
	Remote (max length)	Tandem	Through	Blue	Red	Yellow	Blue/White	Brown	Orange	
ICN-4S54-90C-2LS-G	20'	Yes	Yes	20'	4'	4'	20'	20'	20'	7
IDA-132-SC	No	NA	NA							5
IDA-154	No	NA	NA							5
IDA-2S32-SC	No	No	Yes	5'	4'	4'				3
IDA-2S54	No	No	Yes	5'	4'	4'				3
IDA-3S32-G	No	No	No							5
IDA-4S32	No	No	Yes-8'	1'	1.25'	5.2'	1.25'	4.2'		3
IDL-2S26-M5-BS IDL-2S26-M5-LD	No	No	No							5
IDL-2T42-M5-BS IDL-2T42-M5-LD	No	No	No							5
IEZ-2S24-D	No	No	Yes	3'	2'	2'				3
ILV-2S32-SC	6'	Yes	Yes	6'	6'	6'				1
ILV-4S32-G	No	No	Yes-8'	1'	1.25'	5.2'	1.25'	4.2'		3
IOP-1P32-LW-SC (c)	20'	NA	NA							1e
IOP-1P32-SC (c)	20'	NA	NA							1e
IOP-1S32-LW-SC (c)	10'	NA	NA							4
IOP-1S32-SC (c)	10'	NA	NA							4
IOP-2P32HL-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-2P32-LW-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-2P32-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-2P59-SC	20'	Yes	Yes	20'	20'					1e
IOP-2PSP32-LW-SC	20'	Yes	Yes	20'	20'	18'				1e
IOP-2PSP32-SC	20'	Yes	Yes	20'	20'	18'				1e
IOP-2PSP54-SC	20'	Yes	Yes	20'	20'	15'				1e
IOP-2S28-95-SC-SD	7'	Yes	Yes	7'	7'	7'				1
IOP-2S28-115-SC-SD	7'	Yes	Yes	7'	7'	7'				1
IOP-2S28-95-SC	20'	Yes	Yes	20'	20'	20'				1
IOP-2S28-115-SC	20'	Yes	Yes	20'	20'	20'				1
IOP-2S32-LW-SC (d)	10'	Yes	Yes	4'	10'	10'				2
IOP-2S32-SC (d)	10'	Yes	Yes	4'	10'	10'				2
IOP-3P32-HL-90C-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-3P32-LW-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-3P32-SC (c)	20'	Yes	Yes	20'	20'					1e
IOP-3PSP32-LW-SC	20'	Yes	Yes	20'	20'	18'	18'			1e
IOP-3PSP32-SC	20'	Yes	Yes	20'	20'	18'	18'			1e
IOP-3S32-LW-SC (d)	10'	Yes	Yes	10'	4'	4'	10'			7
IOP-3S32-SC (d)	10'	Yes	Yes	10'	4'	4'	10'			7
IOP-4PSP54-2LS-G (c)	20'	Yes	Yes	20'	20'	8'				1e
IOP-4P32-LW-SC (c)	20'	Yes	Yes	20'	20'	8'				1e
IOP-4P32-SC (c)	20'	Yes	Yes	20'	20'	8'				1e
IOP-4PSP32-LW-SC	20'	Yes	Yes	20'	20'	18'	18'	18'		1e
IOP-4PSP32-SC	20'	Yes	Yes	20'	20'	18'	18'	18'		1e
IOP-4PSP54-90C-G	20'	Yes	Yes	20'	20'	15'	15'	15'		1e
IOP-4S32-LW-SC (d)	10'	Yes	Yes	10'	4'	4'	10'	10'		7
IOP-4S32-SC (d)	10'	Yes	Yes	10'	4'	4'	10'	10'		7

For nominal input voltage and 25°C ambient temperature. See all notes on page 1-19.

ELECTRONIC FLUORESCENT BALLASTS

		Allowed Wiring Configuration			Maximum Lead Length (Feet) for Tandem or Through Wiring (Total length of all wires between ballast and lamp sockets)						Application Note
		Remote (max length)	Tandem	Through	Blue	Red	Yellow	Blue/White	Brown	Orange	
IOPA-1P32-HL-SC (c)		20'	Yes	Yes	20'	20'					1e
IOPA-1P32-LW-SC (c)		20'	Yes	Yes	20'	20'					1e
IOPA-1P32-SC (c)		20'	Yes	Yes	20'	20'					1e
IOPA-2P32-HL-SC (c)		20'	Yes	Yes	20'	20"					1e
IOPA-2P32-LW-SC (c)		20'	Yes	Yes	20'	20'					1e
IOPA-2P32-SC (c)		20"	Yes	Yes	20'	20"					1e
IOPA-3P32-HL-SC (c)		20"	Yes	Yes	20'	20"					1e
IOPA-3P32-LW-SC (c)		20'	Yes	Yes	20'	20'					1e
IOPA-3P32-SC (c)		20"	Yes	Yes	20'	20"					1e
IOPA-4P32-HL (c)		20"	Yes	Yes	20'	20'	8'				1e
IOPA-4P32-LW-SC (c)		20'	Yes	Yes	20'	20'	8'				1e
IOPA-4P32-SC (c)		20'	Yes	Yes	20'	20'	8'				1e
IZT-132-SC		6'	NA	NA							4
IZT-2S26-M5-BS IZT-2S26-M5-LD		No	No	No							5
IZT-2S32-SC		6'	Yes	Yes	6'	6'	6'				1
IZT-2T42-M3-BS IZT-2T42-M3-LD		No	No	No							5
IZT-2T42-M5-BS IZT-2T42-M5-LD		No	No	No							5
IZT-2TTS40-SC		6'	No	No							4
IZT-3S32-SC		No	No	No							5
IZT-4S32		No	No	Yes-8'	1'	1.25'	5.2'	1.25'	4.2'		3
JOP-2S84-G		20'	Yes	Yes	4'	20'	20'				2
RCF-2S13-H1-LD	1-Lamp	15'	No	No							4
RCF-2S13-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
RCF-2S18-H1-LD	1-Lamp	15'	No	No							4
RCF-2S18-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
RCF-2S26-H1-LD	1-Lamp	15'	No	No							4
RCF-2S26-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
RCN-1S32-SC		20"	NA	NA							4
RCN-2S32-SC (d)		No	Yes	Yes	20'	4'	20'				3
RCN-3S32-SC (d)		No	Yes	Yes	4'	4'	20'	20'			6
RCN-4S32-SC (d)		No	Yes	Yes	4'	4'	20'	20'	20'		6
REB-113-M6-BLS		No	No	No							5
REB-113-M6-EL		No	No	No							5
REB-118-M6-BLS		No	No	No							5
REB-118-M6-EL		No	No	No							5
REB-126-M6-BLS		No	No	No							5
REB-126-M6-EL		No	No	No							5
REB-2P32-SC		20"	Yes	Yes	20'	20'					1
REB-2S26-M1-LD-DIM	1-LAMP	20"	No	No							4
	2-LAMP	No	Yes	Yes	12'	2'	12'				3
REB-4P32-SC		20"	Yes	Yes	20'	20'	20'				1
REB-2S13-M6-EL		No	No	No							5
REB-2S13-M6-BL		No	No	No							5
REB-2S18-M6-EL		No	No	No							5
REB-2S18-M6-BL		No	No	No							5
REB-2S26-M6-EL		No	No	No							5
REB-2S26-M6-BL		No	No	No							5

For nominal input voltage and 25°C ambient temperature. See all notes on page 1-19.

ELECTRONIC FLUORESCENT BALLASTS

	Allowed Wiring Configuration			Maximum Lead Length (Feet) for Tandem or Through Wiring (Total length of all wires between ballast and lamp sockets)						Application Note
	Remote (max length)	Tandem	Through	Blue	Red	Yellow	Blue/White	Brown	Orange	
RELB-1S40-SC	20'	NA	NA							4
RELB-2S40-SC	20''	Yes	Yes	4'	10'	10'				2
REZ-132-SC	6'	NA	NA							4
REZ-154	No	NA	NA							5
REZ-132-SC	6'	NA	NA							4
REZ-154	No	NA	NA							5
REZ-1Q18-M2-BS REZ-1Q18-M2-LD	No	NA	NA							5
REZ-1T42-M2-BS	No	NA	NA							5
REZ-1T42-M2-LD REZ-1TTS40-SC	6'	NA	NA							4
REZ-2Q18-M2-BS REZ-2Q18-M2-LD	No	No	No							5
REZ-2Q26-M2-BS REZ-2Q26-M2-LD	No	No	No							5
REZ-2S32-SC	6'	Yes	Yes	6'	6'	6'				1
REZ-2S54	No	No	Yes	5'	4'	4'				3
REZ-2T42-M3-BS REZ-2T42-M3-LD	No	No	No							5
REZ-2TTS40-SC	6'	No	No							5
REZ-3S32-SC	No	No	No							5
RK-132-TP (a)	20'	No	No							4
RK-2S32-TP (a)	20'	Yes	Yes	4'	20'	20'				2
RMB-1P13-S1	20'	NA	NA							4
RMB-1P26-S2	20'	NA	NA							4
RMB-2P13-S2	20'	Yes	Yes	20'	20'	20'				1
RZT-154	No	NA	NA							5
RZT-2S54	No	No	Yes	5'	4'	4'				3
VCN-1S32-SC	20''	No	No							4
VCN-2S32-SC (d)	No	Yes	Yes	20'	4'	20'				3
VCN-3S32-SC (d)	No	Yes	Yes	4'	4'	20'	20'			6
VCN-4S32-SC (d)	No	Yes	Yes	4'	4'	20'	20'	20'		6
VEL-1S40-SC	20'	NA	NA							4
VEZ-132-SC	6'	NA	NA							4
VEZ-154	No	NA	NA							5
VEZ-1Q18-M2-BS VEZ-1Q18-M2-LD	No	NA	NA							5
VEZ-1T42-M2-BS VEZ-1T42-M2-LD	No	NA	NA							5
VEZ-1TTS40-SC	6'	NA	NA							4
VEZ-2Q18-M2-BS VEZ-2Q18-M2-LD	No	No	No							5
VEZ-2Q26-M2-BS VEZ-2Q26-M2-LD	No	No	No							5
VEZ-2S32-SC	6'	Yes	No	6'	6'	6'				1
VEZ-2S54	No	No	Yes	5'	4'	4'				5

For nominal input voltage and 25°C ambient temperature. See all notes on page 1-19.

ELECTRONIC FLUORESCENT BALLASTS

	Allowed Wiring Configuration			Maximum Lead Length (Feet) for Tandem or Through Wiring (Total length of all wires between ballast and lamp sockets)						Application Note
	Remote (max length)	Tandem	Through	Blue	Red	Yellow	Blue/White	Brown	Orange	
VEZ-2T42-M3-BS VEZ-2T42-M3-LD	No	No	No							5
VEZ-2TTS40-SC	6'	No	No							4
VEZ-3S32-SC	No	No	No							5
VK-132-TP (a)	20'	NA	NA							4
VK-2S32-TP (a)	20'	Yes	Yes	4'	20'	20'				2
VZT-154	No	NA	NA							5
VZT-180	No	NA	NA							5
VZT-1TTS40	6'	NA	NA							4
VZT-2S54	No	No	Yes	5'	4'	4'				3
VZT-4S32-HL	No	No	Yes-8'	1'	1.25'	5.2'	1.25'	4.2'		3
VZT-4PSP32-G	No	No	Yes-8'	5'	5'	1'	5'	R/W=5'		3
VZT-4S32-G	No	No	Yes-8'	1'	1.25'	5.2'	1.25'	4.2'		3

For nominal input voltage and 25°C ambient temperature.

Notes:
1. For Tandem or Through wiring, any lamp can be remote mounted.
2. For Tandem or Through wiring, BLUE lamp must be in same fixture as ballast.
3. For Tandem or Through wiring, RED lamp must be in same fixture as ballast.
4. No Tandem or Through wiring allowed.
5. No Remote, Tandem or Through wiring allowed.
6. For Tandem or Through wiring, RED lamp and BLUE lamp must be in same fixture as ballast.
7. For Tandem or Through wiring, RED lamp and YELLOW lamp must be in same fixture as ballast.
(a) Ballast can be Remote, Tandem or Through wired farther than 20'. Consult factory.
(b) Ballast can be Remote, Tandem or Through wired to a maximum 12 feet between ballast and lampholder for (2)F96T8/HO lamps or 20 feet for all other T8/HO lamps.
(c) Ballast can be Remote, Tandem or Through wired to a maximum 6 feet between ballast and lampholder for energy-saving lamps or 8 feet for standard lamps.
(d) For tandem wiring, lamp leads from multiple ballast cannot be run in same conduit. Separate conduit must be used for each ballast.
(e) Ballast can be Remote, Tandem, or Through wired to a maximum of 20' for standard lamps and 6' for energy-saving lamps

Use 18 AWG wire or larger

Reading Date Codes for Warranty Date on Electronic Ballasts

Most date codes are stamped on the back of the ballast (opposite the label side). The date code is part of a larger group of numbers and letters, which call out the various codes for the factory where the ballast was manufactured. Depending upon which Philips Lighting Electronics factory manufactured the ballast, the date stamp can vary slightly, in terms of its position on the ballast and the number sequence.

Some electronic ballasts manufactured from 1988 to 1991 may have the date code in ink stamped on the ballast label. Some ballasts have the manufacturing code printed in ink on the end of the ballast.

A typical date code for an electronic ballast will have the week and the year the ballast was manufactured. Some ballasts will have the day of the week included too.

Some examples of these different date codes that you may find are:

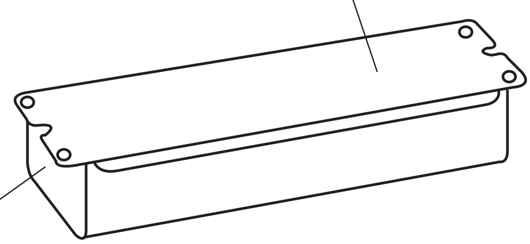
937N1B
B41893
The date code is the 18th week of 1993, stamped one line over the other.

937N1J
P23292
The date code is the 32nd week of 1992, stamped one line over the other.

16
93
973N20P3
The date code is the 16th week of 1993, stamped at the end of the ear on the back.

892P
259P
24
94
The date code is the 4th week of 1994, stamped on four separate lines.

91405BB0291N
The date code is the 2nd week of 1991, stamped on one line.



9716T032HD
120432IS24
The date code is the 16th week of 1997, stamped in ink on the end of the ballast.

The above examples are for ballasts that are already out of warranty. The next two examples are for ballasts that may still be covered under warranty. In 2006 the date code configuration was switched to the bottom example.

693P0MMA
53301707
The date code is the 5th day, of the 33rd week of 2001, stamped on the back of the ballast.

06127M50
F2104571
The date code is the 127th day of 2006 stamped on the back of the ballast.

For Assistance in Determining a Date Code – Call Customer Care (Technical Services /Warranty) at 1-800-372-3331

ELECTRONIC FLUORESCENT BALLASTS

SmartMate and Mark 10 *Powerline* Ballast Kits

Kit Contents and Key Features	Key Benefits
SmartMate or Mark 10 *Powerline* ballast • Intellivolt Technology • Dual-entry color-coded connectors • Multi-Lamp Capability	Makes ballast selection and installation a breeze • Provides full range input voltage from 120V to 277V • Adds to application versatility; simplifies wiring • Encompasses a wide variety of applications, including quads, triple tubes, circline, 2D and long twin-tube lamps
Mounting Plate Adapter • Multiple lead wire cutouts, including center hole • Integral mounting studs	Takes the guess-work out of mounting • Allows wiring and mounting to existing fixture's mounting plate • Eliminates need to stock units with and without studs
Lead Wire • Color-coded • Pre-stripped 3/8" on one end — 5/8" on the other	Allows installer to pre-wire • Ensures wiring accuracy • Meets UL poke-in connector requirements and facilitates final connection
Wire Extraction Tool	Makes for quick disconnections if necessary
Individually Shrink-Wrapped Kits	

ICF-2S13-H1-LD-K* REZ-2Q26-M2-LD-K**
ICF-2S18-H1-LD-K* VEZ-2Q26-M2-LD-K*
ICF-2S26-H1-LD-K* REZ-1T42-M2-LD-K*
ICF-2S42-M2-LD-K* VEZ-1T42-M2-LD-K*
Kits contain the standard ballasts.
For lamp and operational data consult
pages 1-23 through 1-35 and 2-9

• Ideally suited for replacement of expired electronic ballasts, regardless of brand or mounting configuration.
• Dramatically simplifies the upgrading of incandescent fixtures to energy-saving CFL.
• Compatible with most J-Box covers

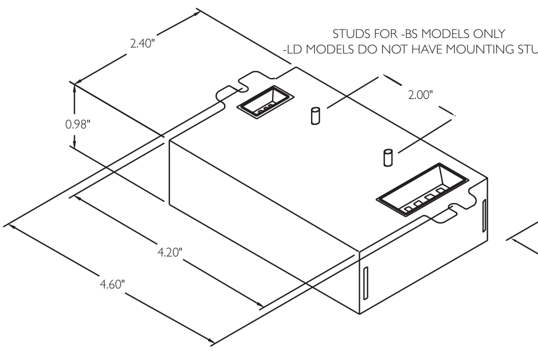
Notes

For 7-9W Lamps

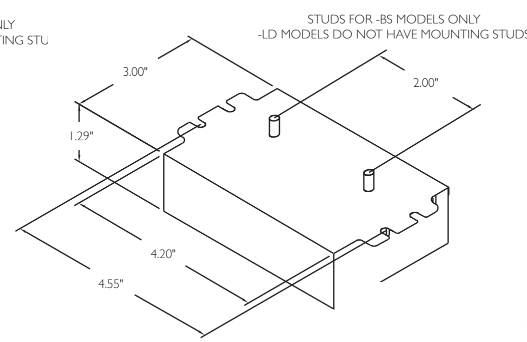
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFT7W/2G7 - 7W CFL Twin Tube Lamp (CF7DS/E)											
1	120	IS	AmbiStar	RMB-1P13-S1*	8	1.00	150	0.13	0/-18	S1	160
2	120	IS	AmbiStar	RMB-2P13-S2*	16	1.10	150	0.24	0/-18	S2	159
CFT9W/2G7 - 9W CFL Twin Tube Lamp (CF9DS/E)											
1	120	IS	AmbiStar	RMB-1P13-S1*	10	1.10	150	0.16	0/-18	S1	160
2	120	IS	AmbiStar	RMB-2P13-S2*	20	1.10	125	0.29	0/-18	S2	159

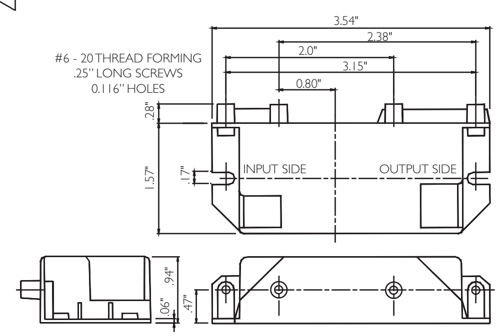
* Normal Power Factor



Size 1 Enclosure

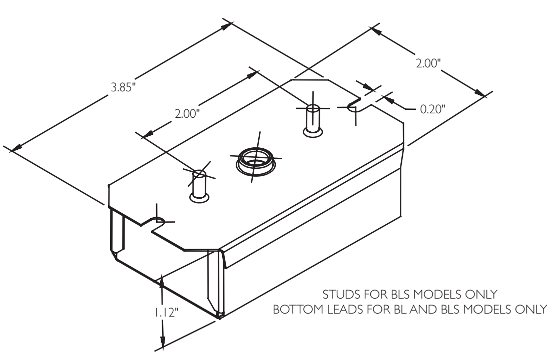


Size 2 Enclosure

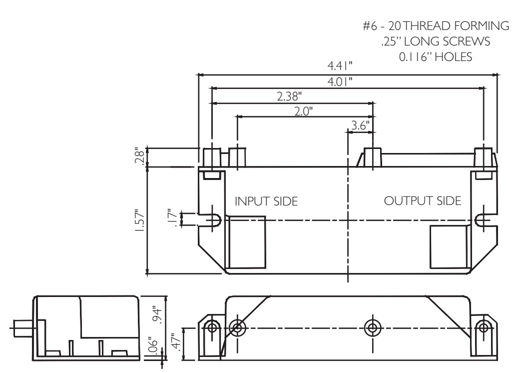


1 LAMP RECTANGULAR BALLAST, PLASTIC ENCLOSURE

S1 Model



Size 6 Enclosure



2 LAMP RECTANGULAR BALLAST, PLASTIC ENCLOSURE

S2 Model

Refer to page 1-24 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 13-18W Quad Lamps

HIGH POWER FACTOR SOUND RATED A

Electronic Fluorescent Ballasts

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFQ13W/G24q - 13W CFL Quad Tube Lamp (PL-C13W/4P, F13DBX/4P, CF13DD/E)											
1	120	IS	AmbiStar	REB-113-M6-BLS*	13	1.00	150	0.23	0/-18	Size 6	160A
				REB-113-M6-EL*							
				RMB-1P13-S1*	14	1.00	150	0.20		S1	160
		RS		RCF-2S13-H1-LD-QS	16	1.00	10	0.13		Size 1	
				RCF-2S13-M1-BS-QS							
	120-277		SmartMate	ICF-2S13-M1-BS-QS	16	1.00	10	0.13-0.06			
		PS		ICF-2S13-H1-LD							
				ICF-2S13-H1-LD-K ⑩							
				ICF-2S13-M1-BS							
2	120	IS	AmbiStar	REB-2S13-M6-EL*	27	0.88	135	0.42	0/-18	Size 6	159
				REB-2S13-M6-BL*							
				RMB-2P13-S2*	25	0.95	125	0.35		S2	
		RS		RCF-2S13-H1-LD-QS	29	1.00	10	0.25		Size 1	
				RCF-2S13-M1-BS-QS							
	120-277		SmartMate	ICF-2S13-M1-BS-QS	29	1.00	10	0.25-0.11			
		PS		ICF-2S13-H1-LD							
				ICF-2S13-H1-LD-K ⑩							
				ICF-2S13-M1-BS							
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4 P, F18DBX/4P, CF18DD/E)											
1	120	IS	AmbiStar	REB-118-M6-BLS*	18	1.00	150	0.29	0/-18	Size 6	160A
				REB-118-M6-EL*							
				RMB-2P13-S2*	16	0.80	150	0.26		S2	*159
		RS		RCF-2S18-H1-LD-QS	19	1.00	10	0.16		Size 1	160
				RCF-2S18-M1-BS-QS							
	120-277		SmartMate	ICF-2S18-M1-BS-QS	19	1.00	10	0.16-0.07			
		PS		ICF-2S18-H1-LD							
				ICF-2S18-H1-LD-K ⑩							
				ICF-2S18-M1-BS							
2	120	RS	AmbiStar	REB-2S18-M6-EL*	37	0.90	135	0.55	0/-18	Size 6	159
				REB-2S18-M6-BL*							
				RCF-2S18-H1-LD-QS	35	0.95	10	0.30		Size 1	
				RCF-2S18-M1-BS-QS							
	120-277		SmartMate	ICF-2S18-M1-BS-QS	35	0.95	10	0.30-0.13			
		PS		ICF-2S18-H1-LD							
				ICF-2S18-H1-LD-K ⑩							
				ICF-2S18-M1-BS							

*Normal Power Factor

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

Refer to page 1-22 for dimensions

Refer to page 1-24 for wiring diagrams

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

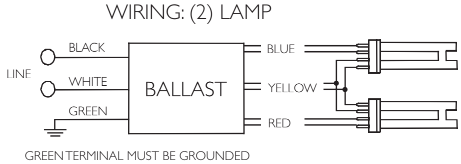
For 26W Quad Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFQR26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E)											
1	120	IS	AmbiStar	REB-126-M6-BLS*	25	1.00	150	0.38	0/-18	Size 6	160A
				REB-126-M6-EL*							
				RMB-1P26-S2*	26	0.95	125	0.38		S2	160
		RS		RCF-2S26-H1-LD-QS	27	1.00	10	0.23		Size 1	
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	27	1.00	10	0.23-0.10			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ⓾							
				ICF-2S26-M1-BS							
2	120	QS	AmbiStar	REB-2S26-M6-EL*	52	0.88	135	0.77	0/-18	Size 6	159
				REB-2S26-M6-BL*							
		RS		RCF-2S26-H1-LD-QS	51	1.00	10	0.43		Size 1	
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	51	1.00	10	0.43-0.19			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ⓾							
				ICF-2S26-M1-BS							
				ICF-2S42-M2-BS	52	1.00	10	0.43-0.19		Size 2	
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⓾							
				ICF-2S42-90C-M2-BS	52	1.00	10	0.43-0.19			
				ICF-2S42-90C-M2-LD							

* Normal Power Factor
⓾ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

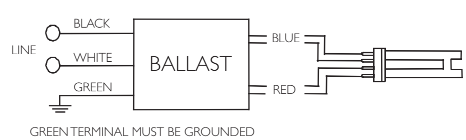
WIRING: (2) LAMP



Diag. 159

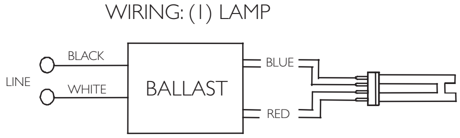
Note: For AmbiStar 1-lamp operation on 2-lamp ballast, use red and blue connectors

WIRING: (1) LAMP



Diag. 160

WIRING: (1) LAMP



Diag. 160A

Refer to page 1-22 for dimensions
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 13W Triple Lamps

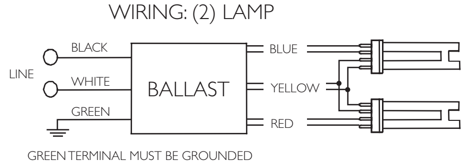
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFTR13W/GX24q - 13W CFL Triple Tube Lamp (F13TBX/4P, CF13DT/E)											
1	120	IS	AmbiStar	REB-113-M6-BLS*	13	1.00	150	0.23	0/-18	Size 6	160A
				REB-113-M6-EL*							
				RMB-1P13-S1*	14	1.00	150	0.20		S1	160
		RS		RCF-2S13-H1-LD-QS	16	1.00	10	0.13		Size 1	
				RCF-2S13-M1-BS-QS							
	120-277		SmartMate	ICF-2S13-M1-BS-QS	16	1.00	10	0.13-0.06			
		PS		ICF-2S13-H1-LD							
				ICF-2S13-H1-LD-K ❿							
				ICF-2S13-M1-BS							
2	120	IS	AmbiStar	REB-2S13-M6-EL*	27	0.88	135	0.42	0/-18	Size 6	159
				REB-2S13-M6-BL*							
				RMB-2P13-S2*	25	0.95	125	0.35		S2	
		RS		RCF-2S13-H1-LD-QS	29	1.00	10	0.25		Size 1	
				RCF-2S13-M1-BS-QS							
	120-277		SmartMate	ICF-2S13-M1-BS-QS	29	1.00	10	0.25-0.11			
		PS		ICF-2S13-H1-LD							
				ICF-2S13-H1-LD-K ❿							
				ICF-2S13-M1-BS							

* Normal Power Factor

❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

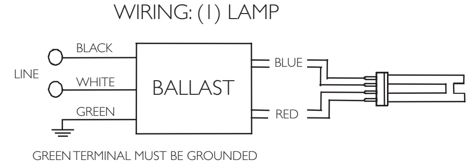
WIRING: (2) LAMP



Diag. 159

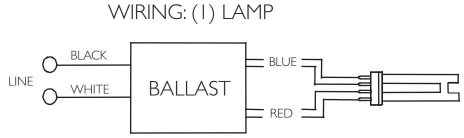
Note: For AmbiStar 1-lamp operation on 2-lamp ballast, use red and blue connectors

WIRING: (1) LAMP



Diag. 160

WIRING: (1) LAMP



Diag. 160A

Refer to page 1-22 for dimensions

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 18W Triple Lamps

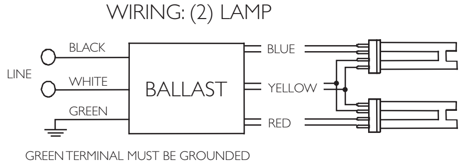
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)											
1	120	IS	AmbiStar	REB-1S18-M6-BLS*	18	1.00	150	0.29	0/-18	Size 6	160A
1	120	IS	AmbiStar	REB-1S18-M6-EL*	18	1.00	150	0.29	0/-18	Size 6	160A
1	120	IS	AmbiStar	RMB-2P13-S2*	16	0.80	150	0.26	0/-18	S2	*159
1	120	RS	AmbiStar	RCF-2S18-H1-LD-QS	20	1.05	10	0.17	0/-18	Size 1	160
1	120	RS	AmbiStar	RCF-2S18-M1-BS-QS	20	1.05	10	0.17	0/-18	Size 1	160
1	120-277	RS	SmartMate	ICF-2S18-M1-BS-QS	20	1.05	10	0.17-0.08	0/-18	Size 1	160
1	120-277	PS	SmartMate	ICF-2S18-H1-LD	20	1.05	10	0.17-0.08	0/-18	Size 1	160
1	120-277	PS	SmartMate	ICF-2S18-H1-LD-K ⑩	20	1.05	10	0.17-0.08	0/-18	Size 1	160
1	120-277	PS	SmartMate	ICF-2S18-M1-BS	20	1.05	10	0.17-0.08	0/-18	Size 1	160
2	120	IS	AmbiStar	REB-2S18-M6-EL*	37	0.90	135	0.55	0/-18	Size 6	159
2	120	IS	AmbiStar	REB-2S18-M6-BL*	37	0.90	135	0.55	0/-18	Size 6	159
2	120	RS	AmbiStar	RCF-2S18-H1-LD-QS	39	1.05	10	0.33	0/-18	Size 1	159
2	120	RS	AmbiStar	RCF-2S18-M1-BS-QS	39	1.05	10	0.33	0/-18	Size 1	159
2	120-277	RS	SmartMate	ICF-2S18-M1-BS-QS	39	1.05	10	0.33-0.14	0/-18	Size 1	159
2	120-277	PS	SmartMate	ICF-2S18-H1-LD	39	1.05	10	0.33-0.14	0/-18	Size 1	159
2	120-277	PS	SmartMate	ICF-2S18-H1-LD-K ⑩	39	1.05	10	0.33-0.14	0/-18	Size 1	159
2	120-277	PS	SmartMate	ICF-2S18-M1-BS	39	1.05	10	0.33-0.14	0/-18	Size 1	159

* Normal Power Factor

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

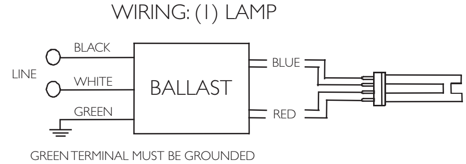
WIRING: (2) LAMP



Diag. 159

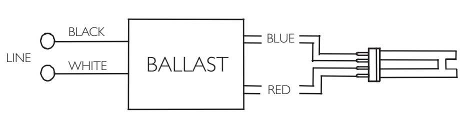
Note: For AmbiStar 1-lamp operation on 2-lamp ballast, use red and blue connectors

WIRING: (1) LAMP



Diag. 160

WIRING: (1) LAMP



Diag. 160A

Refer to page 1-22 for dimensions

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 26-32W Triple Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120	IS	AmbiStar	REB-126-M6-BLS*	25	1.00	150	0.38	0/-18	Size 6	160A
				REB-126-M6-EL*							
				RMB-1P26-S2*	26	0.95	125	0.38		S2	160
		RS		RCF-2S26-H1-LD-QS	29	1.10	10	0.24		Size 1	
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	29	1.10	10	0.24-0.11			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ⓾							
				ICF-2S26-M1-BS							
2	120	IS	AmbiStar	REB-2S26-M6-EL*	52	0.88	135	0.55	0/-18	Size 6	159
				REB-2S26-M6-BL*							
		RS		RCF-2S26-H1-LD-QS	54	1.00	10	0.45		Size 1	
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	54	1.00	10	0.45-0.20			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ⓾							
				ICF-2S26-M1-BS							
				ICF-2S42-M2-BS	55	1.00	10	0.46-0.21		Size 2	
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⓾							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120	RS	AmbiStar	RCF-2S26-H1-LD-QS	36	0.98	10	0.31	0/-18	Size 1	160
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	36	0.98	10	0.31-0.13			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ⓾							
				ICF-2S26-M1-BS							
2	120-277	PS	SmartMate	ICF-2S42-M2-BS	68	0.98	10	0.57-0.25	0/-18	Size 2	159
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⓾							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							

* Normal Power Factor
⓾ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

Refer to page 1-22 for dimensions
Refer to page 1-24 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 42-70W Triple Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120	RS	AmbiStar	RCF-2S26-H1-LD-QS	46	0.98	10	0.38	0/-18	Size 1	160
				RCF-2S26-M1-BS-QS							
	120-277		SmartMate	ICF-2S26-M1-BS-QS	46	0.98	10	0.38-0.17			
		PS		ICF-2S26-H1-LD							
				ICF-2S26-H1-LD-K ➓							
				ICF-2S26-M1-BS							
2	120-277	PS	SmartMate	ICF-2S42-M2-BS	93	0.97	10	0.78-0.33	0/-18	Size 2	159
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ➓							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
CFTR57W/GX24q - 57W CFL Lamp (PL-T57W, F57QBX/4P, F57DT/E)											
1	120-277	PS	SmartMate	ICF-2S42-M2-BS	59	0.94	10	0.50-0.21	14/-10	Size 1	160
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ➓							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
2	120-277	PS	SmartMate	ICF-2S70-M4-LD	128-126	1.00	10	1.07-0.46	0/-18	Size 4	159
CFTR70W/GX24q - 70W CFL Lamp (F70QBX/4P, CF70DT/E)											
1	120-277	PS	SmartMate	ICF-2S42-M2-BS	75	0.96	10	0.63-0.27	14/-10	Size 2	160
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ➓							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
2	120-277	PS	SmartMate	ICF-2S70-M4-LD	156-152	1.00	10	1.30-0.56	0/-18	Size 4	159

➓ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

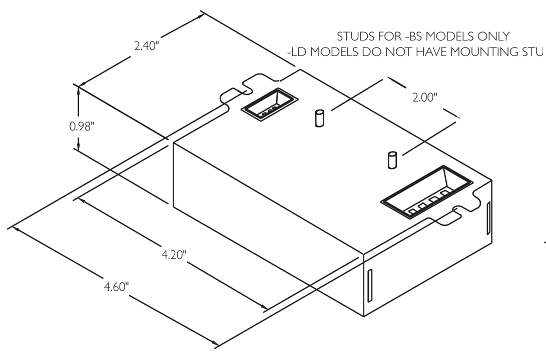
Refer to page 1-29 for dimensions and wiring diagrams

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

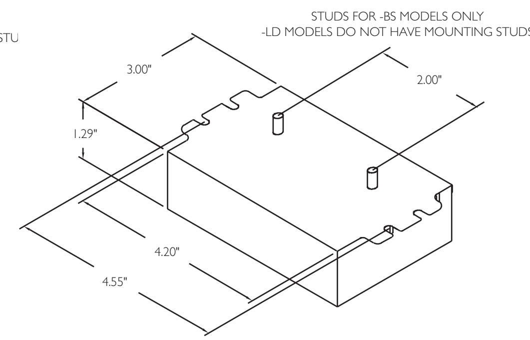
For 60-120W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
60W PLH (PL-H60W/4P)											
1	120-277	PS	SmartMate	ICF-1H120-M4-LD	70	1.00	15	0.59-0.26	-22/-30	Size 4	160
2	120-277	PS		ICF-1H120-M4-LD	139-136	1.00	10	1.16-0.50	-22/-30	Size 4	159
85W PLH (PL-H85W/4P)											
1	120-277	PS	SmartMate	ICF-1H120-M4-LD	98-97	1.00	10	0.82-0.36	-22/-30	Size 4	160
120W PLH (PL-H120W/4P)											
1	120-277	PS	SmartMate	ICF-1H120-M4-LD	139-136	1.00	10	1.16-0.50	-22/-30	Size 4	160

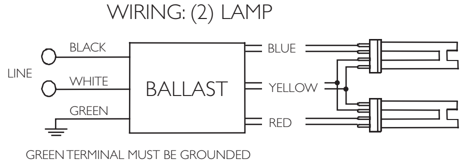


Size 1 Enclosure



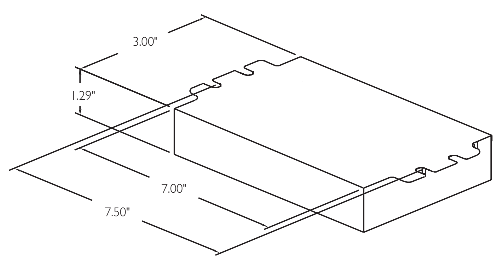
Size 2 Enclosure

WIRING: (2) LAMP



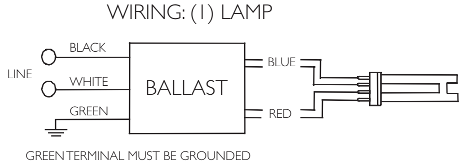
Diag. 159

Note: For AmbiStar 1-lamp operation on 2-lamp ballast, use red and blue connectors



Size 4 Enclosure

WIRING: (1) LAMP



Diag. 160

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 18-36W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT18W/2G11/RS - 18W (F18BX/RS, FT18DL/RS)											
1	120	IS	AmbiStar	RMB-1P26-S2*	23	1.00	150	0.37	0/-18	S2	160
FT24W/2G11 - 24/27W (PL-L24W, F27BX/RS, FT24DL)											
1	120	IS	AmbiStar	RMB-1P26-S2*	26	0.95	150	0.40	0/-18	S2	160
	120-277	PS	Centium	ICN-2S24+	27	1.02	10	0.23-0.10		D	73
				ICN-2S39	29	1.12	15	0.24-0.12			
2	120-277	PS	SmartMate	ICF-2S26-H1-LD	48	0.93	10	0.41-0.18	0/-18	Size 1	160
				ICF-2S26-H1-LD-K ❿							
				ICF-2S26-M1-BS							
				ICF-2S42-M2-BS	48	0.93	15	0.40-0.18		Size 2	159
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ❿							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
			Centium	ICN-2S24+	52	1.00	10	0.44-0.19		D	74A
				ICN-2S39	54	1.10	10	0.46-0.20			
FT36W/2G11 - 36/39W (PL-L36W, F39BX/RS, FT36DL)											
1	120-277	PS	Centium	ICN-2S24+	34	0.90	10	0.29-0.13	0/-18	D	73
				ICN-2S39	36	0.96	15	0.30-0.13			
				ICN-2S54+	46	1.22	20	0.39-0.18	-20/-29		
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	46	1.20	10	0.39-0.18			
	347-480		Centium	HCN-2S54-90C-WL	46	1.22	15	0.13-0.10		L	
2	120-277	PS	Centium	ICN-2S39	69	0.94	10	0.59-0.25	0/-18	D	74A
				ICN-2S54+	89-86	1.20	10	0.75-0.32	-20/-29		
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	88-85	1.20	10	0.73-0.31			
	347-480		Centium	HCN-2S54-90C-WL	89	1.20	10	0.26-0.19		L	
3	120-277	PS	Centium	ICN-4S54-90C-2LS	133-132	1.20	10	1.11-0.49	-20/-29	E	75A
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4P2P54-2LS-G	128-127	1.20	10	1.07-0.31			
	347-480		Centium	HCN-4S54-90C-2LS-G	137-135	1.20	10	0.40-0.29			
4	120-277	PS	Centium	ICN-4S54-90C-2LS	176-173	1.20	10	1.47-0.64	-20/-29	E	75
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4P2P54-2LS-G	170-167	1.20	10	1.42-0.61			
	347-480		Centium	HCN-4S54-90C-2LS-G	182-180	1.20	10	0.53-0.38			

* Normal Power Factor.
\+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)
❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

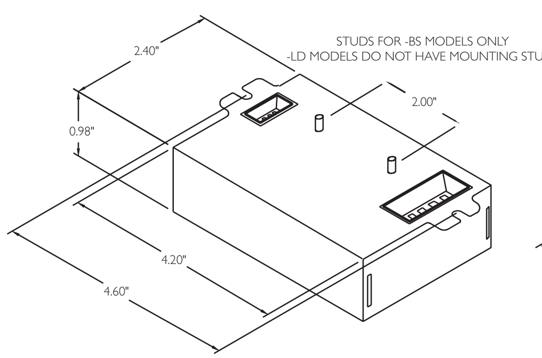
Refer to pages 1-31 and 1-32 for dimensions
Refer to page 1-33 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 40W Lamps

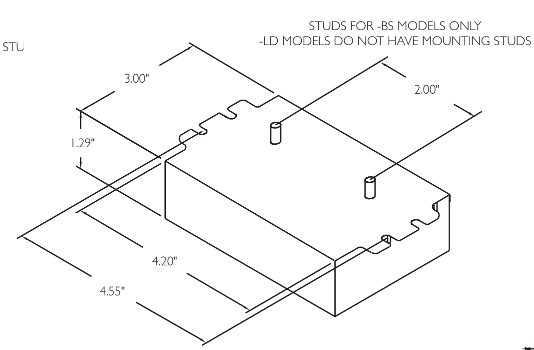
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT40W/2G11/RS - 40W (PL-L40W, F40BX, FT40DL/RS)											
1	120-277	IS	Centium	ICN-1TTP40-SC	39	0.90	10	0.33-0.14	0/-18	B	70
				ICN-2TTP40-SC	41	1.00	10	0.35-0.15			
		PS		ICN-2S24*+	47	1.00	10	0.40-0.17		D	73
				ICN-2S39	50	1.10	10	0.42-0.19			
			SmartMate	ICF-2S42-M2-BS	44	0.95	10	0.37-0.16		Size 2	160
				ICF-2S42-M2-LD-K ❿							
				ICF-2S42-M2-LD							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
2	120-277	IS	Centium	ICN-2TTP40-SC	67	0.88	10	0.57-0.25	0/-18	B	71
				ICN-3TTP40-SC	72	0.96	10	0.61-0.27			
		PS	SmartMate	ICF-2S42-M2-BS	78	0.95	10	0.66-0.28		Size 2	159
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ❿							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
3	120-277	IS	Centium	ICN-3TTP40-SC	99	0.88	10	0.83-0.35	0/-18	B	72

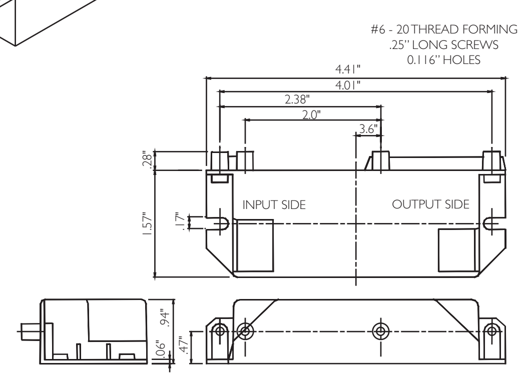
* Normal Power Factor.
\+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)
❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.



Size 1 Enclosure



Size 2 Enclosure



S2 Model

Refer to page 1-32 for additional dimensions
Refer to page 1-33 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 50W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT50W/2G11/RS - 50W (PL-L50W, F50BX/RS)											
1	120-277	PS	Centium	ICN-2S54+	61	1.12	15	0.51-0.23	-20/-29	D	73
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-90C-SC	61	1.10	10	0.51-0.23			
	347-480		Centium	HCN-2S54-90C-WL	61	1.12	10	0.18-0.13		L	
2	120-277	PS	Centium	ICN-2S54+	118-115	1.10	10	0.99-0.43	-20/-29	D	74A
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	117-114	1.10	10	0.97-0.42			
	347-480		Centium	HCN-2S54-90C-WL	118	1.10	10	0.34-0.25		L	
3	120-277	PS	Centium	ICN-4S54-90C-2LS	178-175	1.10	10	1.49-0.65	-20/-29	E	75A
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	172-169	1.10	10	1.44-0.62			
	347-480		Centium	HCN-4S54-90C-2LS-G	185-183	1.10	10	0.54-0.39			
4	120-277	PS	Centium	ICN-4S54-90C-2LS	235-230	1.10	10	1.96-0.84	-20/-29	E	75
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	228-223	1.10	10	1.90-0.81			
	347-480		Centium	HCN-4S54-90C-2LS-G	236-234	1.10	10	0.68-0.49			

+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)

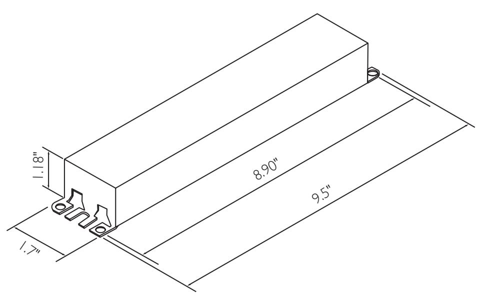


Fig. B

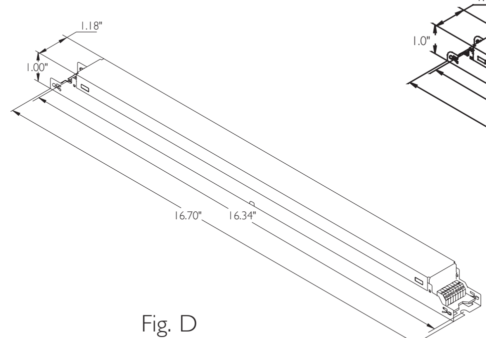


Fig. D
Includes connectors with no leads

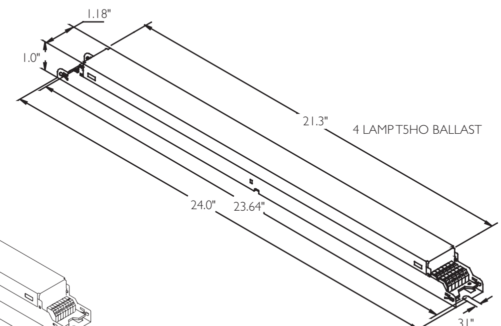


Fig. E

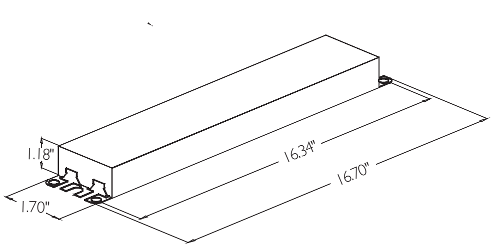


Fig. G

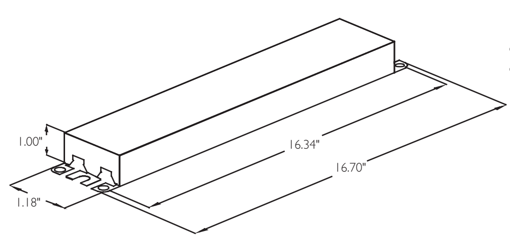
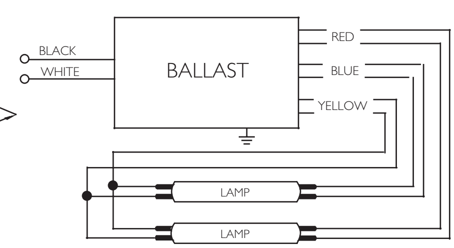
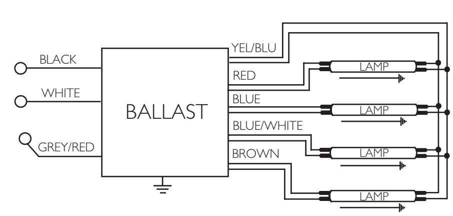


Fig. L



Diag. 78



Diag. 79

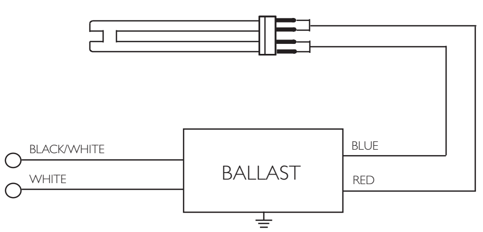
Refer to page 1-33 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 55-80W Lamps

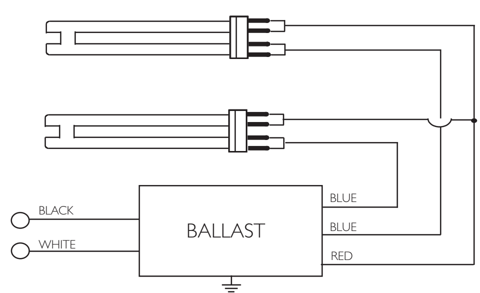
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT55W/2G11 - 55W (PL-L55W, F55BX, FT55DL)											
1	120-277	PS	Centium	ICN-2S54+	58	0.92	15	0.49-0.22	-20/-29	D	73
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-90C-SC	58	0.90	10	0.49-0.22			78
	347-480		Centium	HCN-2S54-90C-WL	58	0.92	10	0.17-0.13		L	73
2	120-277	PS	Centium	ICN-2S54+	112-109	0.90	10	0.94-0.41	-20/-29	D	74A
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-90C-SC	110-108	0.90	10	0.92-0.40			78
	347-480		Centium	HCN-2S54-90C-WL	112	0.90	10	0.33-0.24		L	74A
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	169-166	0.90	10	1.41-0.61	-20/-29	G	75A
			Optanium	IOP-4PSP54-2LS-G	164-161	0.90	10	1.37-0.59			79
	347-480		Centium	HCN-4S54-90C-2LS-G	178-176	0.90	10	0.52-0.37			75A
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	222-217	0.90	10	1.86-0.80	-20/-29	G	75
			Optanium	IOP-4PSP54-2LS-G	217-212	0.90	10	1.81-0.77			79
	347-480		Centium	HCN-4S54-90C-2LS-G	228-226	0.90	10	0.66-0.47			75
FT80W/2G11 - 80W (PL-L80W, FT80DL)											
1	120-277	PS	Centium	ICN-1S80	91-89	1.00	10	0.76-0.33	0/-18	D	73

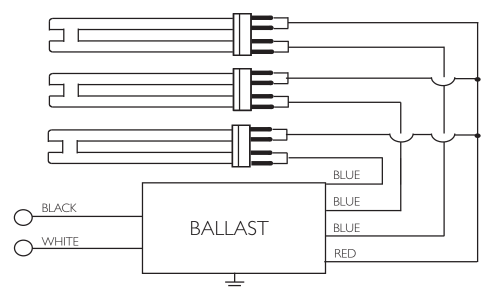
+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)



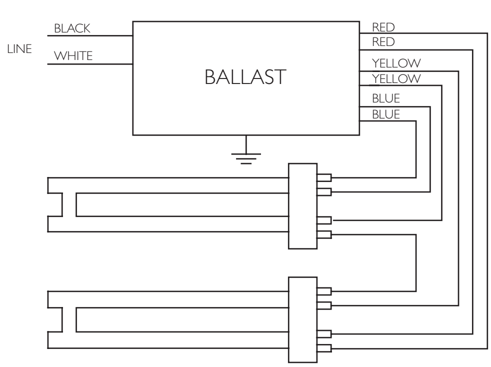
Diag. 70



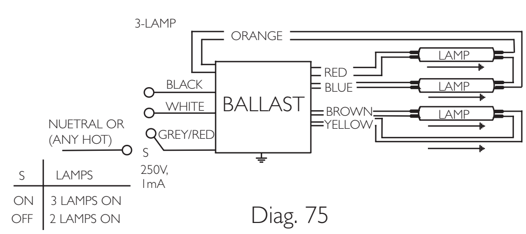
Diag. 71



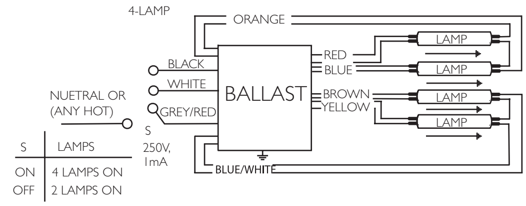
Diag. 72



Diag. 74A



Diag. 75



Diag. 75A

Refer to page 1-32 for dimensions
Refer to page 1-37 for diagram 73 and page 1-32 for diagrams 78 and 79.
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

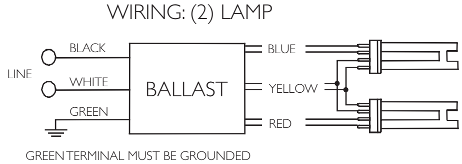
For 10-21W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFS10W/GR10q - 10W 2D Lamp (F10 2D/4P)											
1	120-277	PS	SmartMate	ICF-2S13-H1-LD ICF-2S13-H1-LD-K ❿ ICF-2S13-M1-BS	13	1.05	15	0.11-0.05	0/-18	Size 1	160
2	120-277	PS	SmartMate	ICF-2S13-H1-LD ICF-2S13-H1-LD-K ❿ ICF-2S13-M1-BS	23	0.95	15	0.19-0.09	0/-18	Size 1	159
CFS16W/GR10q - 16W 2D Lamp (F16 2D/4P)											
1	120-277	PS	SmartMate	ICF-2S13-H1-LD ICF-2S13-H1-LD-K ❿ ICF-2S13-M1-BS	17	1.00	15	0.14-0.06	0/-18	Size 1	160
2	120-277	PS	SmartMate	ICF-2S18-H1-LD ICF-2S18-H1-LD-K ❿ ICF-2S18-M1-BS	37	1.00	10	0.31-0.13	0/-18	Size 1	159
CFS21W/GR10q - 21W 2D Lamp (F21 2D/4P)											
1	120-277	PS	SmartMate	ICF-2S18-H1-LD ICF-2S18-H1-LD-K ❿ ICF-2S18-M1-BS	20	0.90	15	0.16-0.07	0/-18	Size 1	160
2	120-277	PS	SmartMate	ICF-2S18-H1-LD ICF-2S18-H1-LD-K ❿ ICF-2S18-M1-BS	40	0.91	10	0.33-0.14	0/-18	Size 1	159
				ICF-2S26-H1-LD ICF-2S26-H1-LD-K ❿ ICF-2S26-M1-BS	51	1.12	10	0.42-0.18			

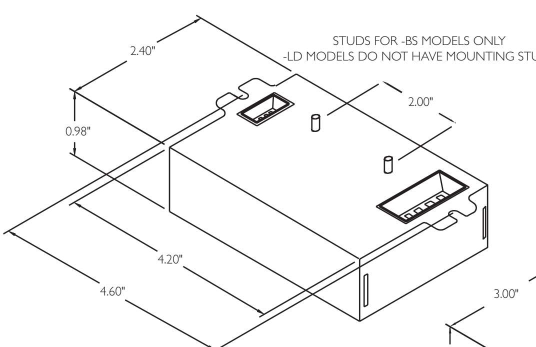
❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

WIRING: (2) LAMP



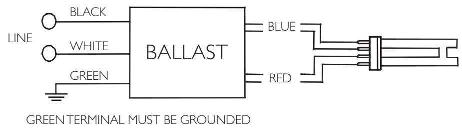
Diag. 159

Note: For AmbiStar 1-lamp operation on 2-lamp ballast, use red and blue connectors

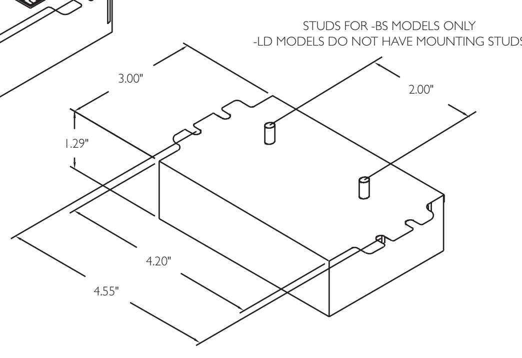


Size 1 Enclosure

WIRING: (1) LAMP



Diag. 160



Size 2 Enclosure

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 28-38W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFS28W/GR10q - 28W 2D Lamp (PL-Q 28W/4P, F28 2D/4P)											
1	120-277	PS	SmartMate	ICF-1D38-H1-LD	27	1.00	10	0.23-0.10	0/-18	Size 1	160
				ICF-2S42-M2-BS							
				ICF-2S42-M2-LD							
2	120-277	PS	SmartMate	ICF-2S42-M2-LD-K [10]	57	1.00	10	0.48-0.21	0/-18	Size 2	159
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
CFS38W/GR10q - 38W 2D Lamp (PL-Q 38W/4P, F38 2D/4P)											
1	120-277	PS	SmartMate	ICF-1D38-H1-LD	31	0.85	10	0.26-0.11	0/-18	Size 1	160
				ICF-2S42-M2-BS							
				ICF-2S42-M2-LD							
2	120-277	PS	SmartMate	ICF-2S42-M2-LD-K [10]	62	0.80	10	0.55-0.23	0/-18	Size 2	159
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							

[10] Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 1-21 for details.

Refer to page 1-34 for dimensions

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 8-13W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F8T5 (8W)											
1	120	IS	AmbiStar	RMB-1P13-S1*	10	1.30	150	0.16	0/-18	S1	163
2	120	IS	AmbiStar	RMB-2P13-S2*	19	1.30	125	0.27	0/-18	S2	162
(1) F8T5 & (1) F13T5 {(1) 8W & (1) 13W}											
1	120	IS	AmbiStar	RMB-2P13-S2*	23	1.10	125	0.33	0/-18	S1	162
F13T5 (13W)											
1	120	IS	AmbiStar	RMB-1P13-S1*	14	1.00	150	0.21	0/-18	S1	163
2	120	IS	AmbiStar	RMB-2P13-S2*	27	0.95	125	0.38	0/-18	S2	162

* Normal Power Factor

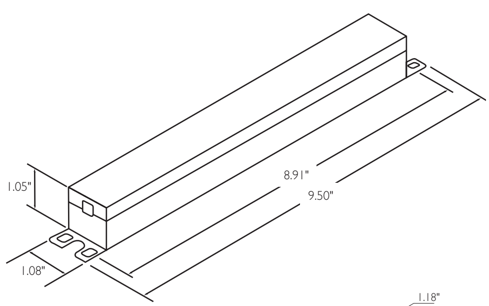


Fig. A2

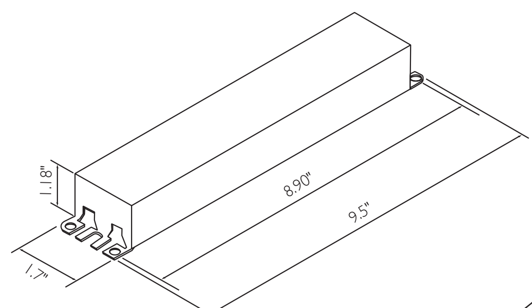


Fig. B

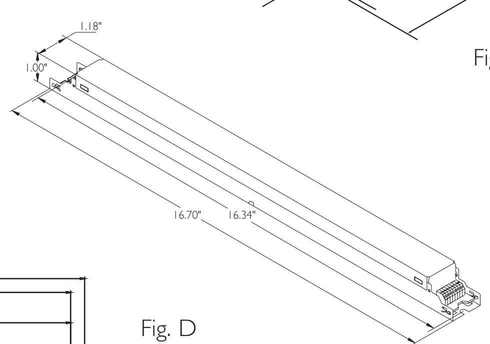


Fig. D

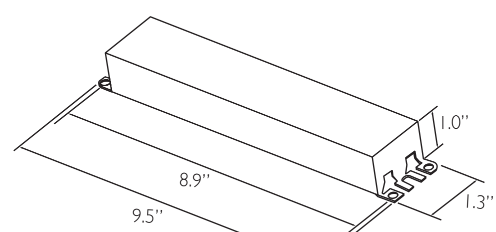
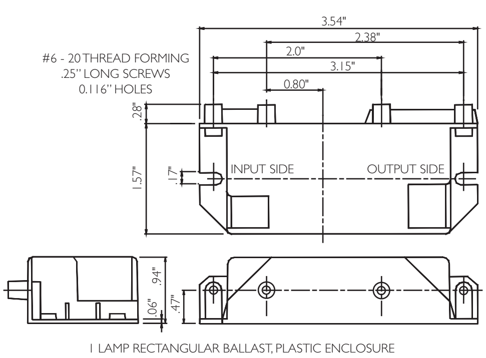
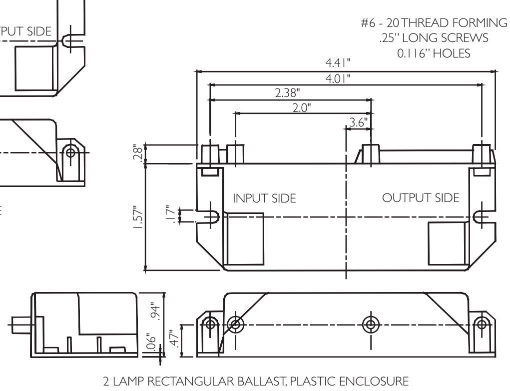


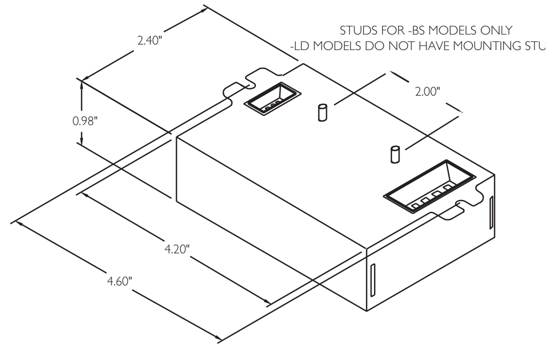
Fig. N



S1 Model



S2 Model



Size 1 Enclosure

Refer to page 1-37 for wiring diagrams

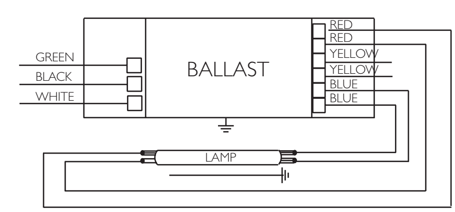
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 14-35W Lamps

HIGH POWER FACTOR SOUND RATED A

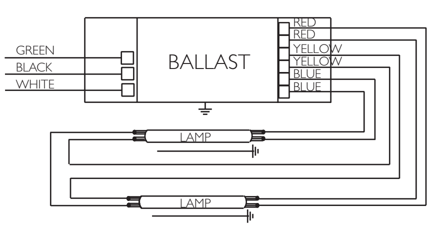
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F14T5 (14W)											
1	120	IS	AmbiStar	RMB-1P13-S1*	14	0.95	150	0.21	0/-18	S1	163
	120-277	PS	Centium	ICN-2S28-N	17	1.07	10	0.14-0.07		N	73
2	120	IS	AmbiStar	RMB-2P13-S2*	27	0.90	125	0.40	0/-18	L2	162
	120-277	PS	Centium	ICN-2S28-N	33	1.04	10	0.28-0.13	0/-18	N	74
				ICN-3S14-D	36	1.10	10	0.31-0.13		D	172
3	120-277	PS	Centium	ICN-3S14-D	50	1.00	10	0.42-0.18	0/-18	D	171
F21T5 (21W)											
1	120-277	PS	Centium	ICN-2S28-N	25	1.06	10	0.22-0.10	0/-18	N	73
2	120-277	PS	Centium	ICN-2S28-N	49	1.02	10	0.43-0.19	0/-18	N	74
F28T5 (25W)											
1	120-277	PS	Centium	ICN-2S28-N	30	1.05	10	0.25-0.11	0/-18	N	73
2	120-277	PS	Centium	ICN-2S28-N	58-57	1.00	10	0.49-0.21	0/-18	N	74
				IOP-2S28-95-SC	54	0.95	10	0.45		B	
				IOP-2S28-115-SC	63	1.15	10	0.53-0.23		B	
F28T5 (28W)											
1	120-277	PS	Centium	ICN-2S28-N	31	1.05	10	0.29-0.12	0/-18	N	73
2	120-277	PS	Centium	ICN-2S28-N	62-61	1.00	10	0.59-0.23	0/-18	N	74
				IOP-2S28-95-SC	59-58	0.95	10	0.55-0.22		B	
				IOP-2S28-115-SC	71-69	1.15	10	0.60-0.26		B	

* Normal Power Factor.



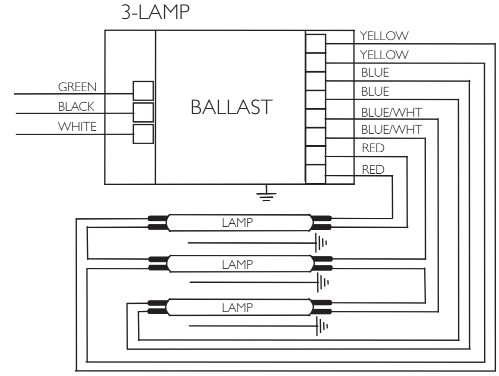
FOR 1 LAMP OPERATION, DO NOT USE YELLOW LEADS

Diag. 73



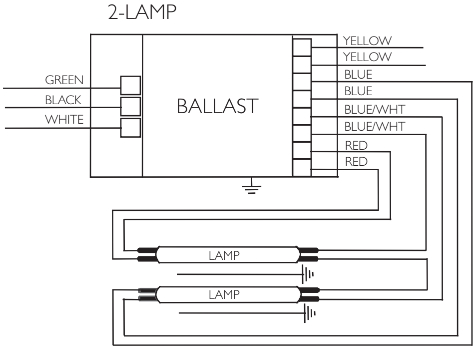
Diag. 74

3-LAMP

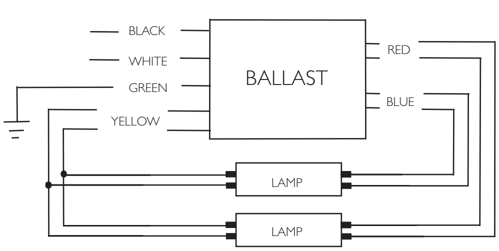


Diag. 171

2-LAMP

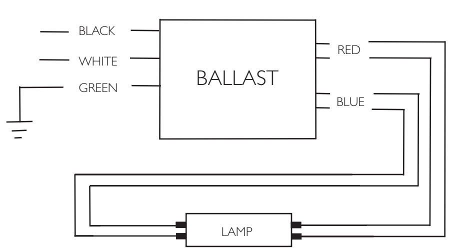


Diag. 172



GREEN TERMINAL MUST BE GROUNDED

Diag. 162



GREEN TERMINAL MUST BE GROUNDED

Diag. 163

Refer to page 1-36 for dimensions

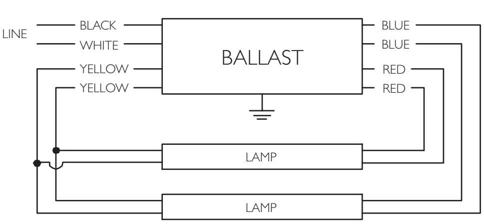
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 22-55W Lamps

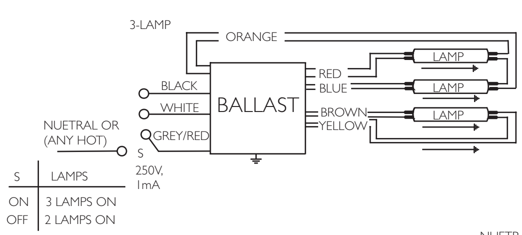
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FC9T5 (22W Circline)											
1	120	IS	AmbiStar	RMB-1P26-S2*	25	1.00	150	0.39	0/-18	S2	163
	120-277	PS	SmartMate	ICF-1D38-H1-LD	25	1.00	15	0.21-0.09		Size 1	
			Centium	ICN-2S24+	27	1.02	10	0.23-0.10		D	73
				ICN-2S39	29	1.12	15	0.24-0.12			
2	120-277	PS	Centium	ICN-2S24+	52	1.00	10	0.44-0.19	0/-18	D	74
				ICN-2S39	54	1.10	10	0.46-0.20			
FC12T5 (40W Circline)											
1	120-277	PS	SmartMate	ICF-1D38-H1-LD	38	0.95	10	0.32-0.14	0/-18	Size 1	163
			Centium	ICN-2S24+	40	0.84	10	0.34-0.15		D	73
				ICN-2S39	42	0.92	10	0.35-0.16			
2	120-277	PS	Centium	ICN-2S39	80	0.90	10	0.68-0.29	0/-18	D	74
(1) FC9T5 & (1) FC12T5 {(1) 22W & (1) 40W Circline}											
1&1	120-277	PS	SmartMate	ICF-2S42-M2-BS	61	0.85	10	0.51-0.22	0/-18	Size 2	162
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⑩							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
			Centium	ICN-2S39	68	1.00	10	0.58-0.25		D	74
FC12T5/HO (55W Circline)											
1	120-277	PS	Centium	ICN-2S54*+	55	0.87	15	0.46-0.21	0/-18	D	73
				ICN-2S54-90C*+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-90C-SC	53	0.85	10	0.44			
	347-480		Centium	HCN-2S54-90C-WL	55	0.87	10	0.16-0.12		L	
2	120-277	PS	Centium	ICN-2S54*+	106-103	0.85	10	0.89-0.38	0/-18	D	74
				ICN-2S54-90C*+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-90C-SC	103-100	0.85	10	0.86-0.36			
	347-480		Centium	HCN-2S54-90C-WL	106	0.85	10	0.31-0.22		L	

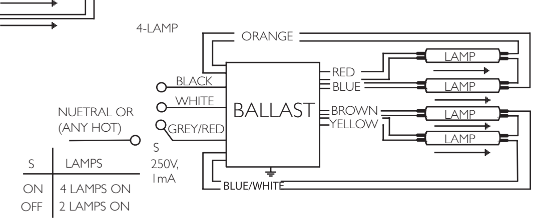
* Normal Power Factor.
\+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)



Diag. 21



Diag. 75



Diag. 75A

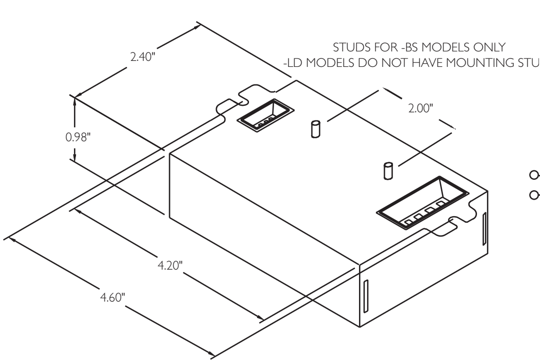
Refer to page 1-36 for dimensions
Refer to page 1-37 for diagrams 73, 74, 162 and 163
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 24-54W Lamps

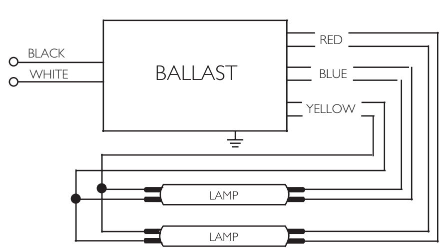
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F24T5/HO (24W)											
1	120-277	PS	Centium	ICN-2S24+	27	1.02	10	0.23-0.10	0/-18	D	73
				ICN-2S39	29	1.12	15	0.25-0.12			
2	120-277	PS	Centium	ICN-2S24+	52	1.00	10	0.44-0.19	0/-18	D	74
				ICN-2S39	55	1.10	10	0.47-0.21			
F39T5/HO (39W)											
1	120-277	PS	Centium	ICN-2S24+	40	0.90	10	0.34-0.15	0/-18	D	73
				ICN-2S39	43	1.02	10	0.36-0.16			
2	120-277	PS	Centium	ICN-2S39	87-85	1.00	10	0.73-0.31	0/-18	D	74
F54T5/HO (49W)											
1	120-277	PS	Centium	ICN-2S54+	58	1.02	10	0.49-0.21	-20/-29	D	73
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	57	1.00	10	0.47-0.21			78
	347-480		Centium	HCN-2S54-90C-WL	58	1.02	10	0.18-0.13		L	73
2	120-277	PS	Centium	ICN-2S54+	112-109	1.00	10	0.93-0.40	-20/-29	D	74
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	109-105	1.00	10	0.91-0.38			78
	347-480		Centium	HCN-2S54-90C-WL	112-109	1.00	10	0.35-0.25		L	74
3	120-277	PS	Centium	ICN-4S54-90C-2LS	168-165	1.00	10	1.52-0.66	-20/-29	E	75
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	162-159	1.00	10	1.35-0.58			79
	347-480		Centium	HCN-4S54-90C-2LS-G	175-172	1.00	10	0.54-0.39			75
4	120-277	PS	Centium	ICN-4S54-90C-2LS	222-216	1.00	10	2.00-0.86	-20/-29	E	75A
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	224-208	1.00	10	1.79-0.76			79
	347-480		Centium	HCN-4S54-90C-2LS-G	223-221	1.00	10	0.69-0.50			75A

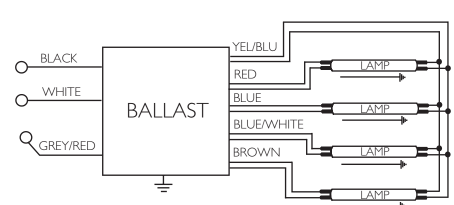
\+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)



Size 1 Enclosure



Diag. 78



Diag. 79

Refer to pages 1-37 and 1-38 for wiring diagrams
Refer to page 1-40 for dimensions B, D, G, L, and E
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 54-80W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F54T5/HO (54W)											
1	120-277	PS	Centium	ICN-2S54+	62	1.02	10	0.52-0.23	-20/-29	D	73
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	60	1.00	10	0.50 - 0.22			TBD
	347-480		Centium	HCN-2S54-90C-WL	62	1.02	10	0.18-0.13		L	73
2	120-277	PS	Centium	ICN-2S54+	120-117	1.00	10	1.00-0.43	-20/-29	D	74
				ICN-2S54-90C+							
				ICN-2S54-90C-SC						B	
			Optanium	IOP-2PSP54-SC	117-114	1.00	10	0.98 - 0.41			TBD
	347-480		Centium	HCN-2S54-90C-WL	120-119	1.00	10	0.35-0.25		L	74
3	120-277	PS	Centium	ICN-4S54-90C-2LS	182-179	1.00	10	1.52-0.66	-20/-29	E	75A
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	176-174	1.00	10	1.47-0.83			TBD
	347-480		Centium	HCN-4S54-90C-2LS-G	188-186	1.04	10	0.54-0.39			75
4	120-277	PS	Centium	ICN-4S54-90C-2LS	240-234	1.00	10	2.00-0.86	-20/-29	E	75
				ICN-4S54-90C-2LS-G						G	
			Optanium	IOP-4PSP54-2LS-G	235-229	1.00	10	1.96-0.83			TBD
	347-480		Centium	HCN-4S54-90C-2LS-G	239-237	1.00	10	0.69-0.50			75
F80T5/HO (80W)											
1	120-277	PS	Centium	ICN-1S80	91-89	1.00	10	0.76-0.33	0/-18	D	73

\+ Also available with leads (ICN-2S24-WL, ICN-2S54-WL, or ICN-2S54-90C-WL)

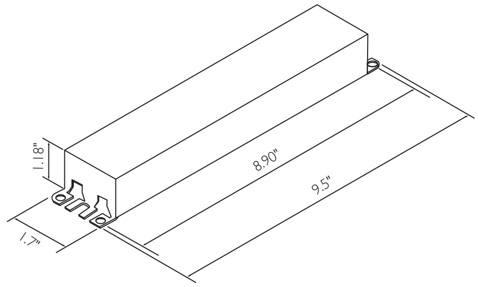


Fig. B

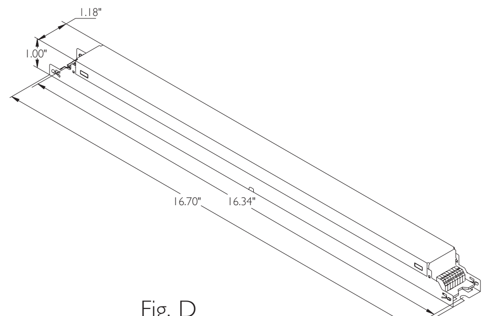


Fig. D
Includes connectors with no leads

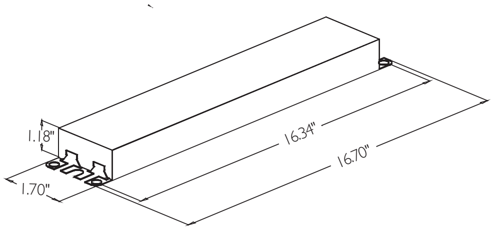


Fig. G

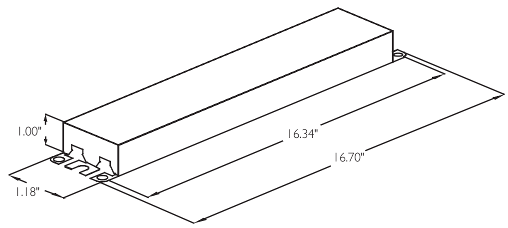


Fig. L

Refer to page 1-37 and 1-38 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
1	120	IS	AmbiStar‡	REB-2P32-SC	19	1.02	150	0.30	0/-18	B	*64
		PS	Centium	RCN-1S32-SC	22	1.00	10	0.19	32/0		20
	277			VCN-1S32-SC	22	1.00	10	0.08			
	120-277	IS	Centium	ICN-132-MC	17	0.88	20	0.14-0.06	0/-18	A2	63
				ICN-1P32-LW-SC	16	0.80	10	0.13-0.06		B	
				ICN-1P32-N	19	0.93	15	0.16-0.07			
				ICN-2P32-LW-SC	19	0.90	20	0.16-0.07			*64
				ICN-2P32-N	22	1.07	15	0.18-0.09			
			Optanium	IOP-1P32-LW-SC	15	0.80	10	0.13-0.06	-20/-29		63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	16	0.90	10	0.14-0.07			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	22	1.23	15	0.19-0.08			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	18	0.90	20	0.15-0.07			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	19	1.06	15	0.17-0.08			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	25	1.42	20	0.21-0.10			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	14	0.79	10	0.12-0.05	0/-18		20
				IOP-1S32-SC	16	0.97	10	0.14-0.07			
				IOP-2S32-LW-SC	15	0.78	15	0.12-0.06			39
				IOP-2S32-SC	17	0.97	15	0.14-0.07			
	347	IS	Optanium	GOPA-1P32-LW-SC	15	0.80	10	0.05	-20/-29		63
				GOPA-1P32-SC	16	0.93		0.06			
				GOPA-2P32-LW-SC	17	0.89		0.06			*64
				GOPA-2P32-SC	20	1.07		0.06			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

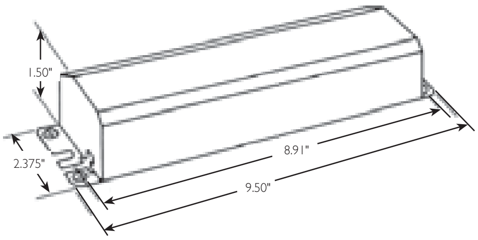


Fig. A

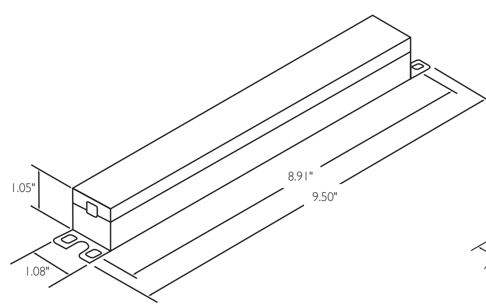


Fig. A2

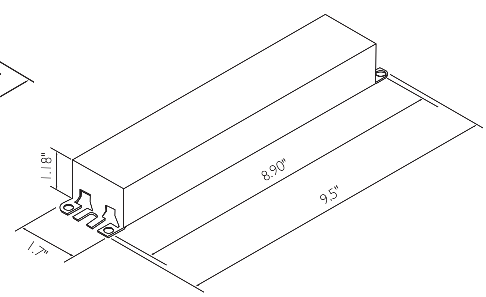


Fig. B

Refer to page 1-43 and 1-44 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
2	120	IS	AmbiStar‡	REB-2P32-SC	31	0.91	140	0.45	0/-18	B	64
		PS	Centium	RCN-2S32-SC	39	1.00	10	0.33	32/0		21
	277			VCN-2S32-SC	39	1.00	10	0.15			
	120-277	IS	Centium	ICN-2M32-MC	31	0.88	10	0.26-0.11	0/-18	A2	64
				ICN-2P32-LW-SC	28	0.79	20	0.23-0.10		B	
				ICN-2P32-N	33	0.93	15	0.28-0.13			
				ICN-3P32-LW-SC	32	0.88	20	0.27-0.18			*65
				ICN-3P32-SC	38	1.07	15	0.32-0.14			
			Optanium	IOP-2P32-LW-SC	27	0.80	10	0.23-0.10	-20/-29		64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	31	0.90	10	0.26-0.11			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	41	1.23	15	0.34-0.15			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	31	0.87	20	0.26-0.12			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	35	1.01	15	0.30-0.14			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	47	1.37	10-30	0.39-0.20			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	25	0.73	10	0.21-0.09	0/-18		21
				IOP-2S32-SC	29	0.90	15	0.24-0.11			
	347	IS	Optanium	GOPA-2P32-LW-SC	27	0.78	10	0.08	-20/-29	B	64
				GOPA-2P32-SC	30	0.88		0.09			
				GOPA-3P32-LW-SC	30	0.87		0.09			*65
				GOPA-3P32-SC	34	1.01		0.10			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

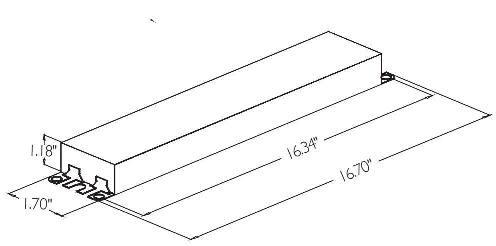


Fig. G

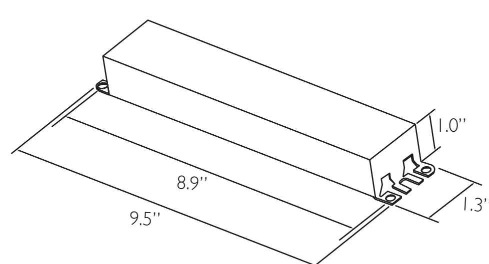


Fig. N

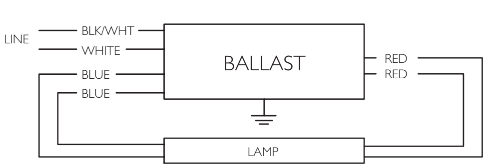
Refer to page 1-41 for additional dimensions
Refer to page 1-43 and 1-44 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17W Lamps

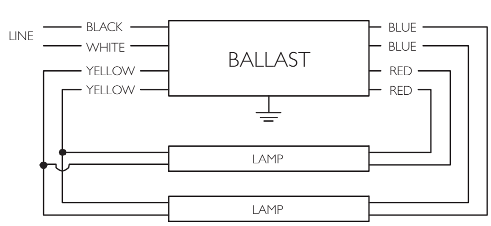
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
3	120	IS	AmbiStar‡	REB-4P32-SC	44	0.81	135	0.87	0/-18	B	*66
		PS	Centium	RCN-3S32-SC	61	1.00	10	0.51	32/0		30
	277			VCN-3S32-SC	61	1.00	10	0.22			
	120-277	IS	Centium	ICN-3P32-LW-SC	42	0.80	15	0.35-0.16	0/-18	B	65
				ICN-3P32-SC	48	0.92	15	0.39-0.17			
				ICN-4P32-LW-SC	43	0.85	15	0.36-0.16			*66
				ICN-4P32-SC	53	1.04	15	0.45-0.20			
			Optanium	IOP-3P32-LW-SC	40	0.81	10	0.34-0.15	-20/-29	B	65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	45	0.90	10	0.38-0.17			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	59	1.22	10-15	0.49-0.22			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	43	0.85	20	0.36-0.17			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	49	1.00	15	0.41-0.18			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	69	1.28	10-15	0.58-0.26		G	
				IOPA-4P32-HL						A	
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD	0/-18	B	TBD
				IOP-3PSP-SC	47	0.90	10	0.39-0.17			
				IOP-3S32-LW-SC	37	0.72	10	0.31-0.14			30
				IOP-3S32-SC	43	0.89	10	0.36-0.16			
	347	IS	Optanium	GOPA-3P32-LW-SC	39	0.81	10	0.12	-20/-29	B	65
				GOPA-3P32-SC	44	0.92		0.13			
				GOPA-4P32-LW-SC	45	0.82		0.13			*66
				GOPA-4P32-SC	50	1.00		0.15			

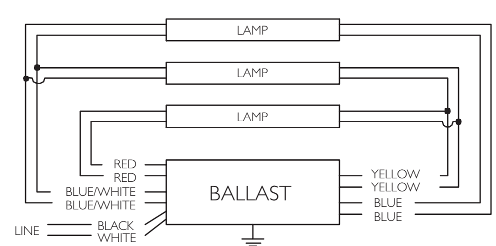
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'



Diag. 20



Diag. 21



Diag. 30

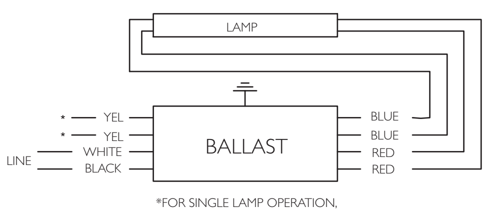
Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-44 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17W Lamps

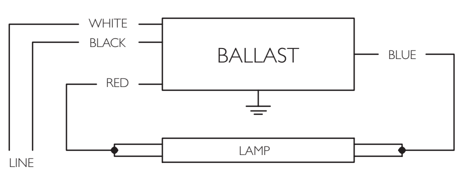
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
4	120	IS	AmbiStar‡	REB-4P32-SC	52	0.82	135	1.00	0/-18	B	66
		PS	Centium	RCN-4S32-SC	79	1.00	10	0.67	32/0		138
	277			VCN-4S32-SC	79	1.00	10	0.29			
	120-277	IS	Centium	ICN-4P32-LW-SC	53	0.79	15	0.44-0.19	0/-18	B	66
				ICN-4P32-SC	64	0.93	10	0.54-0.23			
			Optanium	IOP-4P32-LW-SC	53	0.81	10	0.45-0.20	-20/-29		
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	58	0.90	10	0.49-0.22			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	79	1.22	10-15	0.66-0.29		G	
				IOPA-4P32-HL						A	
		PS		IOP-4PSP32-LW-SC	TBD	0.71	10	TBD	0/-18	B	177
				IOP-4S32-LW-SC	48	0.72	10	0.40-0.18			138
				IOP-4PSP32-SC	60	0.90	10	0.50-0.22			177
				IOP-4S32-SC	57	0.89	10	0.47-0.21			138
	347	IS	Optanium	GOPA-4P32-LW-SC	53	0.79	10	0.16	-20/-29	B	66
				GOPA-4P32-SC	60	0.93		0.17			

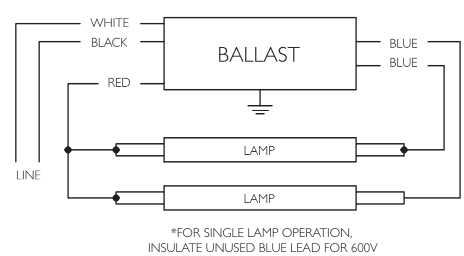
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'



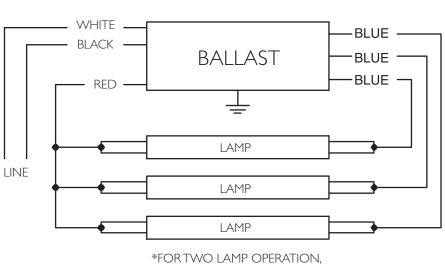
Diag. 39



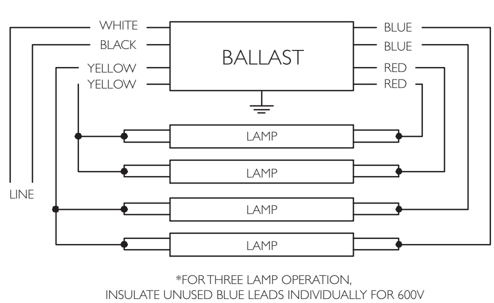
Diag. 63



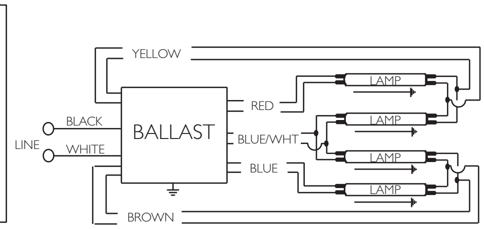
Diag. 64



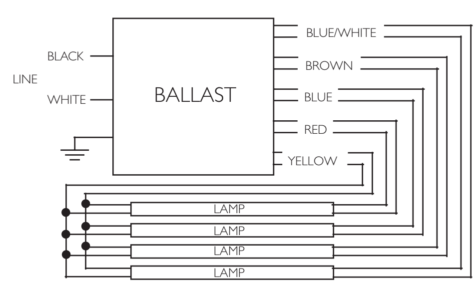
Diag. 65



Diag. 66



Diag. 138



Diag. 177

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-43 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 25W-36" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F25T8, FBO24T8 (25W - 36”)											
1	120	IS	AmbiStar‡	REB-2P32-SC	26	1.00	150	0.39	0/-18	B	*64
		PS	Centium	RCN-1S32-SC	28	0.95	10	0.24	32/0		20
	277			VCN-1S32-SC	28	0.95	10	0.10			
	120-277	IS	Centium	ICN-132-MC	23	0.88	15	0.19-0.09	0/-18	A2	63
				ICN-1P32-LW-SC	22	0.80	15	0.18-0.08		B	
				ICN-1P32-N	26	0.91	10	0.22-0.10			
				ICN-2P32-LW-SC	25	0.88	20	0.21-0.10			*64
				ICN-2P32-N	29	1.06	15	0.24-0.11			
			Optanium	IOP-1P32-LW-SC	21	0.78	10	0.17-0.08	-20/-29		63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	23	0.88	10	0.20-0.09			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	30	1.22	10	0.26-0.11			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	24	0.90	10	0.20-0.09			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	28	1.05	10	0.23-0.10			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	35	1.40	20	0.29-0.13			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	20	0.74	10	0.16-0.07	0/-18		20
				IOP-1S32-SC	22	0.92	10	0.19-0.08			
				IOP-2S32-LW-SC	20	0.73	15	0.17-0.08			39
				IOP-2S32-SC	23	0.90	15	0.19-0.09			
	347	IS	Optanium	GOPA-1P32-LW-SC	20	0.80	10	0.07	-20/-29		63
				GOPA-1P32-SC	22	0.91		0.07			
				GOPA-2P32-LW-SC	24	0.88		0.08			*64
				GOPA-2P32-SC	27	1.05		0.08			

‡ The above AmbiStar ballasts are normal power factor and labeled ‘For Residential Use Only’

Refer to page 1-41 and 1-42 for dimensions
Refer to pages 1-47 & 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Electronic Fluorescent Ballasts

For 25W-36" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F25T8, FBO24T8 (25W - 36")											
2	120	IS	AmbiStar‡	REB-2P32-SC	43	0.89	130	0.61	0/-18	B	64
		PS	Centium	RCN-2S32-SC	53	0.95	10	0.45	32/0		21
	277			VCN-2S32-SC	53	0.95	10	0.20			
	120-277	IS	Centium	ICN-2M32-MC	44	0.88	15	0.37-0.16	0/-18	A2	64
				ICN-2P32-LW-SC	40	0.77	15	0.34-0.14		B	
				ICN-2P32-N	48	0.91	10	0.40-0.18			
				ICN-3P32-LW-SC	44	0.85	15	0.37-0.16			*65
				ICN-3P32-SC	51	1.03	15	0.43-0.19			
			Optanium	IOP-2P32-LW-SC	39	0.78	10	0.32-0.14	-20/-29		64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	43	0.88	10	0.37-0.16			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	57	1.20	10	0.48-0.21			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	43	0.86	10	0.36-0.16			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	49	1.00	10	0.42-0.18			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	64	1.32	10-15	0.54-0.24			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	36	0.71	10	0.30-0.13	0/-18		21
				IOP-2S32-SC	43	0.89	10	0.36-0.16			
	347	IS	Optanium	GOPA-2P32-LW-SC	38	0.78	10	0.12	-20/-29	B	64
				GOPA-2P32-SC	44	0.88		0.13			
				GOPA-3P32-LW-SC	42	0.85		0.12			*65
				GOPA-3P32-SC	48	1.01		0.14			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

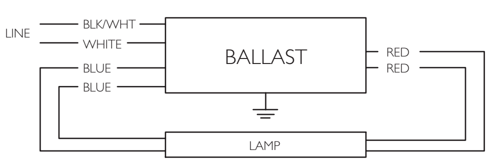
Refer to page 1-41 and 1-42 for dimensions
Refer to pages 1-47 and 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 25W-36" Lamps

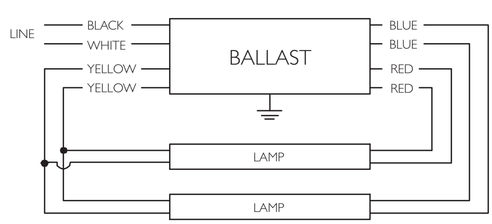
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F25T8, FBO24T8 (25W - 36")											
3	120	IS	AmbiStar‡	REB-4P32-SC	63	0.86	125	1.14	0/-18	B	*66
		PS	Centium	RCN-3S32-SC	77	0.95	10	0.65	32/0		30
	277			VCN-3S32-SC	77	0.95	10	0.28			
	120-277	IS	Centium	ICN-3P32-LW-SC	58	0.79	15	0.49-0.21	0/-18		65
				ICN-3P32-SC	67	0.90	10	0.56-0.24			
				ICN-4P32-LW-SC	62	0.85	10	0.52-0.22			*66
				ICN-4P32-SC	74	1.01	10	0.62-0.27			
			Optanium	IOP-3P32-LW-SC	57	0.79	10	0.48-0.21	-20/-29	B	65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	64	0.88	10	0.54-0.24			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	84	1.20	10	0.70-0.31			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	62	0.85	10	0.52-0.22			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	71	0.97	10	0.59-0.26			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	94	1.28	10	0.80-0.35		G	
				IOPA-4P32-HL-G						A	
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD	0/-18	B	TBD
				IOP-3PSP32-SC	66	0.89	10	0.55-0.24			
				IOP-3S32-LW-SC	54	0.71	10	0.45-0.20			30
				IOP-3S32-SC	64	0.88	10	0.53-0.23			
	347	IS	Optanium	GOPA-3P32-LW-SC	56	0.77	10	0.16	-20/-29	B	65
				GOPA-3P32-SC	63	0.90		0.18			
				GOPA-4P32-LW-SC	62	0.81		0.18			*66
				GOPA-4P32-SC	70	0.96		0.20			

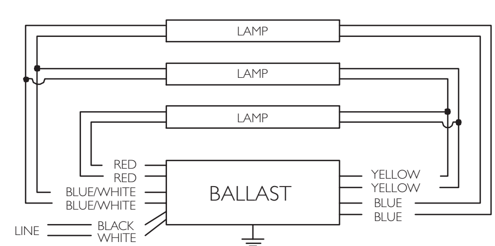
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'



Diag. 20



Diag. 21



Diag. 30

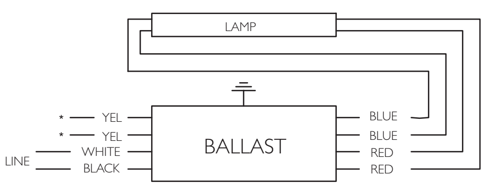
Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-48 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 25W-36" Lamps

HIGH POWER FACTOR SOUND RATED A

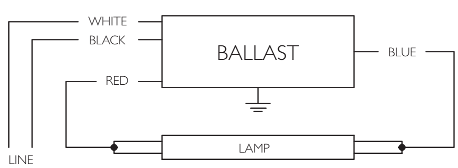
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F25T8, FBO24T8 (25W - 36")											
4	120	IS	AmbiStar‡	REB-4P32-SC	77	0.81	125	1.31	0/-18	B	66
		PS	Centium	RCN-4S32-SC	101	0.95	10	0.84	32/0		138
	277			VCN-4S32-SC	101	0.95	10	0.36			
	120-277	IS	Centium	ICN-4P32-LW-SC	75	0.79	10	0.63-0.27	0/-18	B	66
				ICN-4P32-SC	89	0.91	10	0.74-0.32			
			Optanium	IOP-4P32-LW-SC	76	0.79	10	0.64-0.27	-20/-29		
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	85	0.88	10	0.72-0.31			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	113	1.20	10	0.96-0.41		G	
				IOPA-4P32-HL-G						A	
		PS		IOP-4PSP32-LW-SC	TBD	0.71	10	TBD	0/-18	B	177
				IOP-4S32-LW-SC	69	0.72	10	0.58-0.25			138
				IOP-4PSP32-SC	85	0.90	10	0.71-0.31			177
				IOP-4S32-SC	85	0.88	10	0.72-0.31			138
	347	IS	Optanium	GOPA-4P32-LW-SC	74	0.79	10	0.22	-20/-29	B	66
				GOPA-4P32-SC	86	0.91		0.25			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

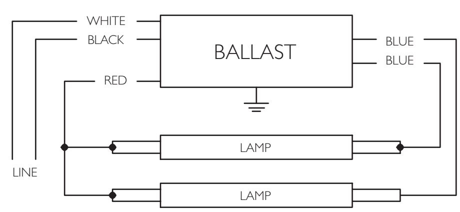


*FOR SINGLE LAMP OPERATION, INSULATE YELLOW LEADS INDIVIDUALLY FOR 600V

Diag. 39

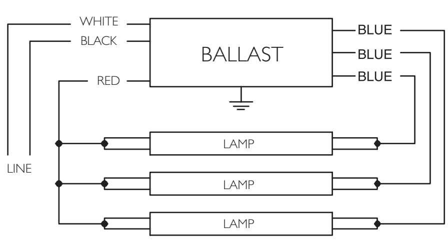


Diag. 63



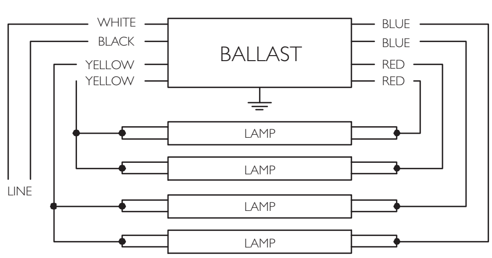
*FOR SINGLE LAMP OPERATION, INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



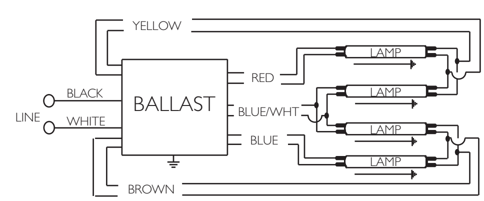
*FOR TWO LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65

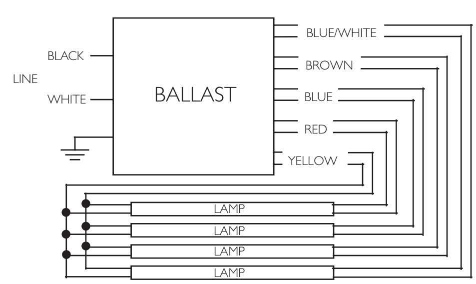


*FOR THREE LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66



Diag. 138



Diag. 177

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-47 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 25W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (25W - 48")											
1	120-277	IS	Optanium	IOP-1P32-LW-SC	21	0.77	10	0.17-0.07	60/16	B	63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	23	0.87	10	0.20-0.09			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	32	1.21	10	0.26-0.12			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	24	0.90	10	0.20-0.09			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	27	1.05	10	0.23-0.10			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	37	1.40	15	0.31-0.14			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	21	0.72	10	0.17-0.07			20
				IOP-1S32-SC	24	0.88	10	0.20-0.08			
				IOP-2S32-LW-SC	21	0.73	10	0.17-0.08			39
				IOP-2S32-SC	24	0.89	10-15	0.20-0.09			
	347	IS	Optanium	GOPA-1P32-LW-SC	21	0.77	10	0.06			63
				GOPA-1P32-SC	23	0.88		0.06			
				GOPA-2P32-LW-SC	25	0.88		0.07			
				GOPA-2P32-SC	27	1.04		0.09			*64
2	120-277	IS	Optanium	IOP-2P32-LW-SC	38	0.77	10	0.32-0.14	60/16	B	64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	44-43	0.87	10	0.37-0.06			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	60	1.19	10	0.50-0.22			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	43	0.86	10	0.36-0.16			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	49	1.00	10	0.42-0.18			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	70	1.32	10-20	0.59-0.27			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	39-38	0.71	10	0.32-0.14			21
				IOP-2S32-SC	45-44	0.88	10	0.38-0.16			
	347	IS	Optanium	GOPA-2P32-LW-SC	39	0.78	10	0.12			63
				GOPA-2P32-SC	44	0.88		0.13			
				GOPA-3P32-LW-SC	43	0.86		0.13			*64
				GOPA-3P32-SC	48	1.00		0.14			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-47 and 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 25W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (25W - 48")											
3	120-277	IS	Optanium	IOP-3P32-LW-SC	58-57	0.77	10	0.49-0.21	60/16	B	65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	65-64	0.87	10	0.55-0.24			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	95-93	1.20	10	0.79-0.35			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	62-61	0.85	10	0.52-0.22			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	70-69	0.97	10	0.59-0.26			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	101-100	1.27	10	0.85-0.37		G	
				IOPA-4P32-HL						A	
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD		B	TBD
				IOP-3PSP32-SC	70	0.88	10	0.59-0.26			
				IOP-3S32-LW-SC	57-56	0.71	10	0.48-0.21			30
				IOP-3S32-SC	67-66	0.89	10	0.56-0.25			
	347	IS	Optanium	GOPA-3P32-LW-SC	58	0.77	10	0.17	60/16	B	65
				GOPA-3P32-SC	64	0.88		0.19			
				GOPA-4P32-LW-SC	65	0.81		0.19			*66
				GOPA-4P32-SC	74	0.95		0.21			
4	120-277	IS	Optanium	IOP-4P32-LW-SC	77-75	0.77	10	0.65-0.28	60/16	B	66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	87-85	0.87	10	0.73-0.31			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	124-122	1.19	10	1.05-0.45		G	
				IOPA-4P32-HL						A	
		PS		IOP-4PSP32-LW-SC	TBD	0.71	10	TBD		B	177
				IOP-4S32-LW-SC	74-73	0.71	10	0.62-0.27			138
				IOP-4PSP32-SC	90	0.88	10	0.75-0.33			177
				IOP-4S32-SC	87-85	0.87	10	0.73-0.31			138
	347	IS	Optanium	GOPA-4P32-LW-SC	78	0.78	10	0.22	60/16	B	66
				GOPA-4P32-SC	89	0.88		0.26			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-47 and 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 28W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (28W - 48")											
1	120-277	IS	Optanium	IOP-1P32-LW-SC	22	0.77	10	0.19-0.08	60/16	B	63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	25	0.87	10	0.22-0.10			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	33	1.21	10	0.28-0.12			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	26	0.90	10	0.22-0.10			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	31	1.05	10	0.26-0.11			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	39	1.38	10	0.33-0.15			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	21	0.72	10	0.18-0.07			20
				IOP-1S32-SC	25	0.88	10	0.20-0.09			
				IOP-2S32-LW-SC	22	0.73	10	0.18-0.08			39
				IOP-2S32-SC	26	0.88	10-15	0.21-0.09			
	347	IS	Optanium	GOPA-1P32-LW-SC	22	0.77	10	0.07	60/16		63
				GOPA-1P32-SC	25	0.88		0.07			
				GOPA-2P32-LW-SC	26	0.88		0.08			*64
				GOPA-2P32-SC	29	1.04		0.09			
2	120-277	IS	Optanium	IOP-2P32-LW-SC	42	0.77	10	0.35-0.15	60/16	B	64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	48-47	0.87	10	0.41-0.18			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	65-64	1.19	10	0.55-0.24			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	47	0.86	10	0.40-0.18			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	55-54	1.00	10	0.46-0.20			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	74-73	1.31	10-15	0.62-0.27			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	41-40	0.71	10	0.34-0.15			21
				IOP-2S32-SC	49-48	0.88	10	0.41-0.18			
	347	IS	Optanium	GOPA-2P32-LW-SC	42	0.78	10	0.12	60/16	B	64
				GOPA-2P32-SC	47	0.88		0.14			
				GOPA-3P32-LW-SC	46	0.77		0.13			*65
				GOPA-3P32-SC	52	1.00		0.16			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-47 and 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 28W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (28W - 48")											
3	120-277	IS	Optanium	IOP-3P32-LW-SC	64-63	0.77	10	0.54-0.23	60/16	B	65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	72-71	0.87	10	0.61-0.26			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	99-97	1.20	10	0.83-0.36			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	69-68	0.85	10	0.58-0.25			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	79-78	0.97	10	0.66-0.28			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	107-106	1.24	10	0.90-0.39		G	
				IOPA-4P32-HL							
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD		B	TBD
				IOP-3PSP32-SC	75	0.88	10	0.62-0.27			
				IOP-3S32-LW-SC	62-61	0.71	10	0.51-0.22			30
				IOP-3S32-SC	72-71	0.89	10	0.60-0.26			
	347	IS	Optanium	GOPA-3P32-LW-SC	62	0.77	10	0.18	60/16	B	65
				GOPA-3P32-SC	70	0.88		0.20			
				GOPA-4P32-LW-SC	70	0.81		0.20			*66
				GOPA-4P32-SC	79	0.97		0.23			
4	120-277	IS	Optanium	IOP-4P32-LW-SC	84-82	0.77	10	0.71-0.30	60/16	B	66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	96-94	0.87	10	0.81-0.35			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	130-129	1.19	10	1.10-0.47		G	
				IOPA-4P32-HL						A	
		PS		IOP-4PSP32-LW-SC	TBD	0.71	10	TBD		B	177
				IOP-4S32-LW-SC	80-79	0.71	10	0.67-0.29			138
				IOP-4PSP32-SC	97	0.88	10	0.81-0.35			177
				IOP-4S32-SC	97-96	0.88	10	0.82-0.35			138
	347	IS	Optanium	GOPA-4P32-LW-SC	84	0.78	10	0.24	60/16	B	66
				GOPA-4P32-SC	96	0.88		0.28			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-47 and 1-48 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 30W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (30W - 48")											
1	120	PS	Centium	RCN-1S32-SC	32	0.90	10	0.27	60/16	B	20
	277			VCN-1S32-SC	32	0.90	10	0.12			
	120-277	IS	Centium	ICN-132-MC	27	0.88	10	0.23-0.10	60/16	A2	63
				ICN-1P32-LW-SC	25	0.77	10	0.21-0.09		B	
				ICN-1P32-N	29	0.90	10	0.24-0.11			
				ICN-2P32-LW-SC	29-28	0.85	15-20	0.24-0.11			*64
				ICN-2P32-N	33	1.03	10	0.28-0.12			
			Optanium	IOP-1P32-LW-SC	24	0.77	10	0.20-0.09			63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	27	0.87	10	0.23-0.10			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	37-36	1.20	10	0.31-0.13			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	28	0.90	10	0.24-0.10			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	33	1.05	10	0.28-0.12			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	42	1.38	10	0.35-0.16			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	23	0.72	10	0.19-0.08			20
				IOP-1S32-SC	27	0.88	10	0.22-0.10			
				IOP-2S32-LW-SC	24-23	0.73	10	0.20-0.09			39
				IOP-2S32-SC	27	0.90	10	0.23-0.10			
	347	IS	Optanium	GOPA-1P32-LW-SC	24	0.77	10	0.07	60/16		63
				GOPA-1P32-SC	27	0.88		0.08			
				GOPA-2P32-LW-SC	28	0.88		0.08			*64
				GOPA-2P32-SC	32	1.04		0.10			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-55 and 1-56 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 30W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

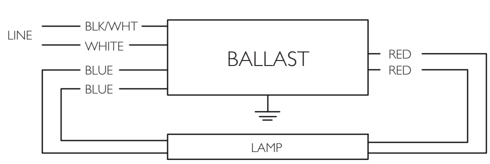
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (30W - 48")											
2	120	PS	Centium	RCN-2S32-SC	60	0.88	10	0.51	60/16	B	21
	277			VCN-2S32-SC	60	0.88	10	0.22			
	120-277	IS	Centium	ICN-2M32-MC	54	0.88	10	0.45-0.20	60/16	A2	64
				ICN-2P32-LW-SC	47-46	0.77	10	0.39-0.17		B	
				ICN-2P32-N	54	0.88	10	0.45-0.20			
				ICN-3P32-LW-SC	52	0.83	10	0.44-0.19			*65
				ICN-3P32-SC	61	1.01	10	0.51-0.22			
			Optanium	IOP-2P32-LW-SC	45	0.77	10	0.38-0.17			64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	52-51	0.87	10	0.44-0.19			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	72-70	1.19	10	0.60-0.26			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	51	0.85	10	0.43-0.19			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	59-58	1.00	10	0.50-0.21			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	78-77	1.31	10	0.65-0.29			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	44-43	0.71	10	0.36-0.16			21
				IOP-2S32-SC	52	0.88	10	0.44-0.19			
	347	IS	Optanium	GOPA-2P32-LW-SC	46	0.78	10	0.13	60/16	B	64
				GOPA-2P32-SC	51	0.88		0.15			
				GOPA-3P32-LW-SC	50	0.86		0.15			*65
				GOPA-3P32-SC	57	1.00		0.17			

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-55 and 1-56 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

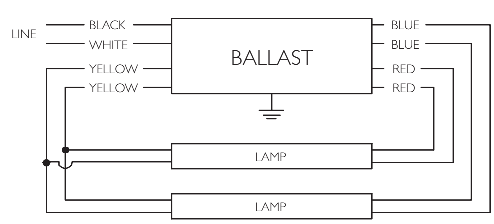
For 30W-48" Lamps

HIGH POWER FACTOR SOUND RATED A

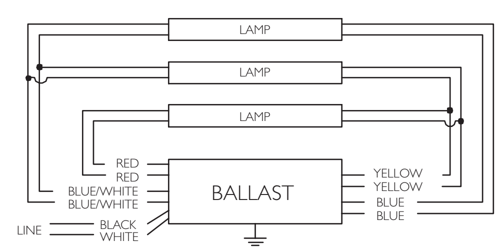
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (30W - 48")											
3	120	PS	Centium	RCN-3S32-SC	22	0.88	10	0.72	60/16	B	30
	277			VCN-3S32-SC	85	0.88	10	0.31			
	120-277	IS	Centium	ICN-3P32-LW-SC	69-68	0.77	10	0.57-0.25	60/16	B	65
				ICN-3P32-SC	79	0.88	10	0.66-0.29			
				ICN-4P32-LW-SC	75-74	0.80	10	0.62-0.27			*66
				ICN-4P32-SC	87	1.00	10	0.73-0.32			
			Optanium	IOP-3P32-LW-SC	68-67	0.77	10	0.57-0.25			65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	77-76	0.87	10	0.65-0.28			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	106-104	1.20	10	0.88-0.38			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	75-74	0.84	10	0.63-0.27			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	84-82	0.97	10	0.70-0.30			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	115-114	1.24	10	0.97-0.42		G	
				IOPA-4P32-HL						A	
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD		B	TBD
				IOP-3PSP32-SC	79	0.88	10	0.66-0.29			
				IOP-3S32-LW-SC	66-65	0.71	10	0.55-0.24			30
				IOP-3S32-SC	77-76	0.88	10	0.64-0.28			
	347	IS	Optanium	GOPA-3P32-LW-SC	67	0.77	10	0.19	60/16	B	65
				GOPA-3P32-SC	76	0.88		0.22			
				GOPA-4P32-LW-SC	74	0.81		0.22			*66
				GOPA-4P32-SC	84	0.95		0.25			



Diag. 20



Diag. 21



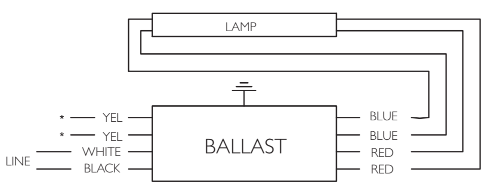
Diag. 30

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-56 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 30W-48" Lamps

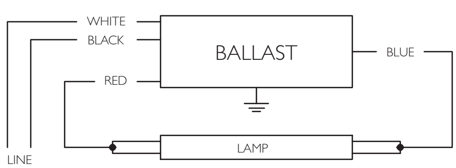
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (30W - 48")											
4	120	PS	Centium	RCN-4S32-SC	114	0.88	10	0.97	60/16	B	138
	277			VCN-4S32-SC	114	0.88	10	0.42			
	120-277	IS	Centium	ICN-4P32-LW-SC	91-89	0.77	10	0.76-0.32	60/16	B	66
				ICN-4P32-SC	105	0.88	10	0.88-0.38			
			Centium	IOP-4P32-LW-SC	90-88	0.77	10	0.76-0.33			
				IOPA-4P32-LW-SC							
			Optanium	IOP-4P32-SC	102-100	0.87	10	0.86-0.37			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	143-140	1.18	10	1.21-0.51		G	
				IOPA-4P32-HL-G						A	
		PS		IOP-4PSP32-LW-SC	TBD	0.71	10	TBD		B	177
				IOP-4S32-LW-SC	86-84	0.71	10	0.71-0.31			138
				IOP-4PSP32-SC	103	0.88	10	0.86-0.37			177
				IOP-4S32-SC	102-100	0.88	10	0.86-0.37			138
	347	IS	Optanium	GOPA-4P32-LW-SC	89	0.78	10	0.26	60/16	B	66
				GOPA-4P32-SC	102	0.88		0.30			

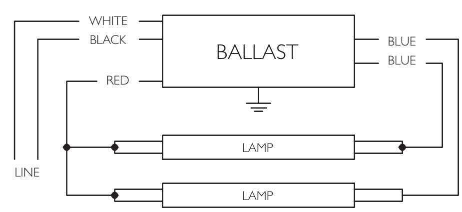


*FOR SINGLE LAMP OPERATION, INSULATE YELLOW LEADS INDIVIDUALLY FOR 600V

Diag. 39

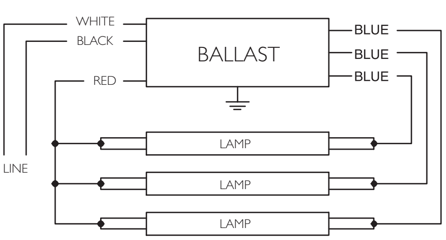


Diag. 63



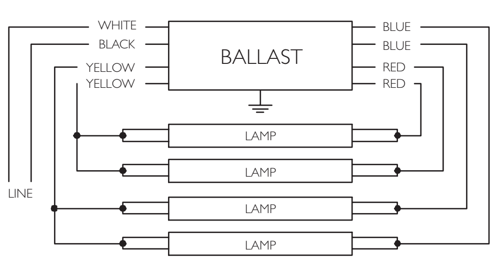
*FOR SINGLE LAMP OPERATION, INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



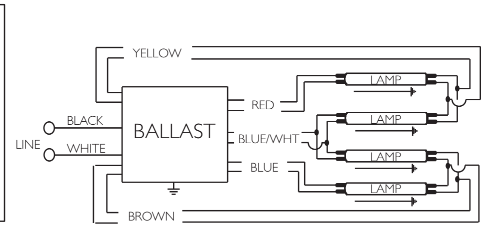
*FOR TWO LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65

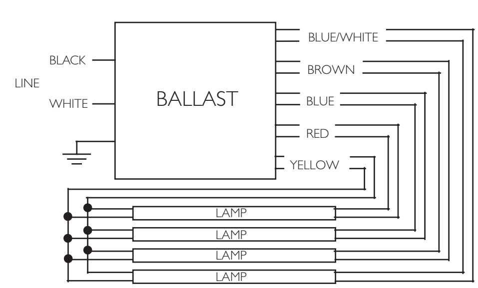


*FOR THREE LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66



Diag. 138



Diag. 177

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-55 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 32W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120	IS	AmbiStar‡	REB-2P32-SC	33	1.00	140	0.48	0/-18	B	*64
		PS	Centium	RCN-1S32-SC	34	0.90	10	0.29	32/0		20
		RS	PowrKut	RK-132-TP	34	0.85	20	0.31	50/10	A	
	277	PS	Centium	VCN-1S32-SC	34	0.90	10	0.13	32/0	B	
		RS	PowrKut	VK-132-TP	34	0.85	20	0.13	50/10	A	
	120-277	IS	Centium	ICN-132-MC	30	0.88	10	0.25-0.11	0/-18	A2	63
				ICN-1P32-LW-SC	27	0.77	10	0.22-0.10		B	
				ICN-1P32-N	31	0.90	10	0.26-0.12			
				ICN-2P32-LW-SC	32	0.85	15-20	0.27-0.12			*64
				ICN-2P32-N	36	1.03	15	0.30-0.14			
			Optanium	IOP-1P32-LW-SC	25	0.77	10	0.22-0.10	-20/-29		63
				IOPA-1P32-LW-SC							
				IOP-1P32-SC	28	0.87	10	0.25-0.11			
				IOPA-1P32-SC							
				IOP-1P32-HL-SC	39-38	1.18	10	0.33-0.14			
				IOPA-1P32-HL-SC							
				IOP-2P32-LW-SC	31	0.90	10	0.26-0.11			*64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	35	1.05	10	0.30-0.13			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	45	1.37	10	0.37-0.17			
				IOPA-2P32-HL-SC							
		PS		IOP-1S32-LW-SC	25	0.72	10	0.20-0.09	0/-18		20
				IOP-1S32-SC	28	0.88	10	0.24-0.10			
				IOP-2S32-LW-SC	25	0.73	10	0.20-0.09			39
				IOP-2S32-SC	29	0.90	10	0.24-0.11			
	347	IS	Optanium	GOPA-1P32-LW-SC	26	0.77	10	0.08	-20/29		63
				GOPA-1P32-SC	30	0.88		0.09			
				GOPA-2P32-LW-SC	31	0.88		0.09			*64
				GOPA-2P32-SC	34	1.03		1.03			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

NEMA Premium

See pages 1-3 and 1-4 for specific SKU's that meet the NEMA Premium Standard

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-59 and 1-60 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 32W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8, FBO31T8, F32T8/U6 (32W)											
2	120	IS	AmbiStar‡	REB-2P32-SC	56	0.88	120	0.80	0/-18	B	64
		PS	Centium	RCN-2S32-SC	63	0.88	10	0.53	32/0		21
		RS	PowrKut	RK-2S32-TP	66	0.86	15	0.60	50/10	A	
	277	PS	Centium	VCN-2S32-SC	63	0.88	10	0.23	32/0	B	*65
		RS	PowrKut	VK-2S32-TP	66	0.85	15	0.26	50/10	A	21
	120-277	IS	Centium	ICN-2M32-MC	59	0.88	10	0.50-0.21	0/-18	A2	64
				ICN-2P32-LW-SC	50-49	0.77	10	0.42-0.12		B	
				ICN-2P32-N	59	0.88	10	0.49-0.22			
				ICN-3P32-LW-SC	57-56	0.86	10	0.48-0.21			*65
				ICN-3P32-SC	65	1.01	10	0.54-0.24			
			Optanium	IOP-2P32-LW-SC	48	0.77	10	0.41-0.17	-20/-29		64
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	55-54	0.87	10	0.47-0.20			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	74-72	1.18	10	0.62-0.26			
				IOPA-2P32-HL-SC							
				IOP-3P32-LW-SC	55-54	0.85	10	0.46-0.20			*65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	63-62	1.00	10	0.53-0.23			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	80-79	1.38	10	0.67-0.29			
				IOPA-3P32-HL-SC							
		PS		IOP-2S32-LW-SC	47-46	0.71	10	0.38-0.17	0/-18		21
				IOP-2S32-SC	56-55	0.88	10	0.47-0.20			
	347	IS	Optanium	GOPA-2P32-LW-SC	48	0.78	10	0.14	-20/-29	B	64
				GOPA-2P32-SC	54	0.88		0.16			
				GOPA-3P32-LW-SC	55	0.86		0.16			*65
				GOPA-3P32-SC	63	1.00		0.18			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

NEMA Premium

See pages 1-3 and 1-4 for specific SKU's that meet the NEMA Premium Standard

Refer to page 1-41 and 1-42 for dimensions
Refer to page 1-59 and 1-60 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 32W Lamps

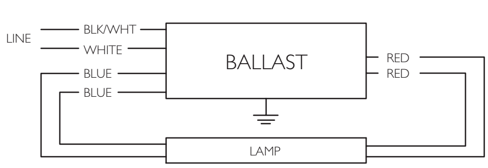
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8, FBO31T8, F32T8/U6 (32W)											
3	120	IS	AmbiStar‡	REB-4P32-SC	80	0.84	125	1.36	0/-18	B	*66
		PS	Centium	RCN-3S32-SC	91	0.88	10	0.78	32/0		30
	277			VCN-3S32-SC	91	0.88	10	0.34			
	120-277	IS	Centium	ICN-3P32-LW-SC	74-73	0.77	10	0.62-0.27	0/-18	B	65
				ICN-3P32-SC	85	0.88	10	0.71-0.31			
				ICN-4P32-LW-SC	80-79	0.82	10	0.67-0.29			*66
				ICN-4P32-SC	93	1.00	10	0.78-0.33			
			Optanium	IOP-3P32-LW-SC	73-71	0.77	10	0.62-0.27	-20/-29		65
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	82-80	0.87	10	0.70-0.30			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	110-107	1.18	10	0.91-0.39			
				IOPA-3P32-HL-SC							
				IOP-4P32-LW-SC	80-79	0.84	10	0.67-0.29			*66
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	90-88	0.97	10	0.75-0.32			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	120-119	1.26	10	1.02-0.44		G	
				IOPA-4P32-HL						A	
		PS		IOP-3PSP32-LW-SC	TBD	0.71	10	TBD	0/-18	B	TBD
				IOP-3PSP32-SC	85	0.88	10	0.71-0.31			
				IOP-3S32-LW-SC	71-70	0.71	10	0.59-0.21			30
				IOP-3S32-SC	83-81	0.88	10	0.70-0.30			
	347	IS	Optanium	GOPA-3P32-LW-SC	74	0.77	10	0.21	-20/-29	B	65
				GOPA-3P32-SC	84	0.88		0.24			
				GOPA-4P32-LW-SC	77	0.81		0.23			*66
				GOPA-4P32-SC	89	0.96		0.26			

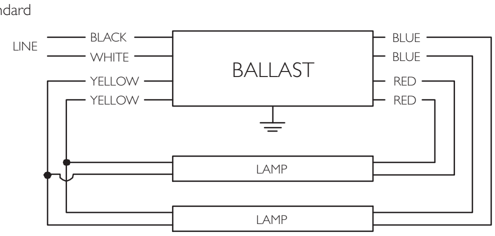
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

NEMA Premium

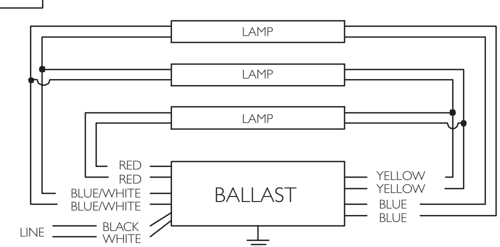
See pages 1-3 and 1-4 for specific SKU's that meet the NEMA Premium Standard



Diag. 20



Diag. 21



Diag. 30

Refer to page 1-41 for dimensions
Refer to page 1-60 for additional wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 32W Lamps

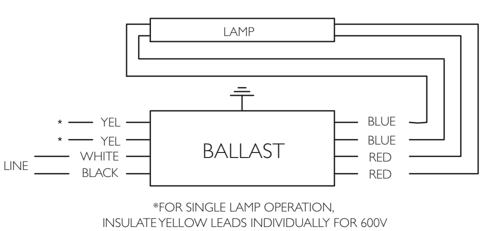
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8, FBO31T8, F32T8/U6 (32W)											
4	120	IS	AmbiStar‡	REB-4P32-SC	103	0.81	125	1.57	0/-18	B	66
		PS	Standard	RCN-4S32-SC	121	0.88	10	1.03	32/0		138
	277		Centium	VCN-4S32-SC	121	0.88	10	0.45			
	120-277	IS	Centium	ICN-4P32-LW-SC	97-95	0.77	10	0.81-0.34	0/-18	B	66
				ICN-4P32-SC	112	0.88	10	0.94-0.41			
			Optanium	IOP-4P32-LW-SC	96-94	0.77	10	0.81-0.35	-20/-29		
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	109-106	0.87	10	0.92-0.39			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	146-143	1.18	10	1.23-0.53		G	
				IOPA-4P32-HL						A	
		PS		IOP-4PSP-LW-SC	TBD	0.71	10	TBD	0/-18	B	177
				IOP-4S32-LW-SC	93-91	0.71	10	0.77-0.33			138
				IOP-4PSP32-SC	110	0.88	10	0.93-0.40			177
				IOP-4S32-SC	110	0.88	10	0.92-0.40			138
	347	IS	Optanium	GOPA-4P32-LW-SC	92	0.78	10	0.27	-20/-29	B	66
				GOPA-4P32-SC	107	0.88		0.31			

‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

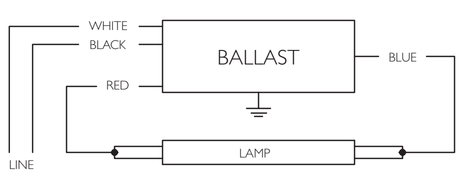
NEMA Premium

See pages 1-3 and 1-4 for specific SKU's that meet the NEMA Premium Standard

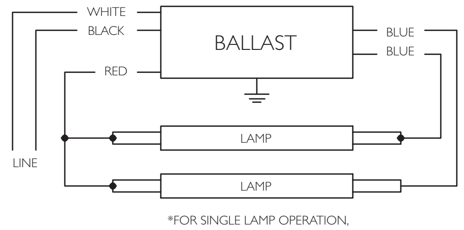


*FOR SINGLE LAMP OPERATION, INSULATE YELLOW LEADS INDIVIDUALLY FOR 600V

Diag. 39

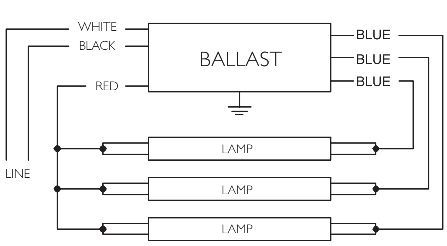


Diag. 63



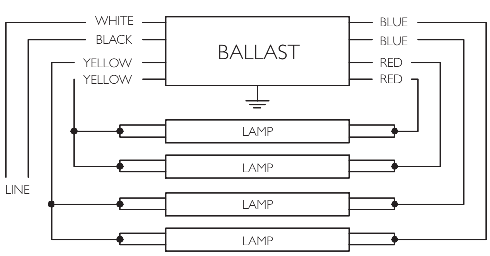
*FOR SINGLE LAMP OPERATION, INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



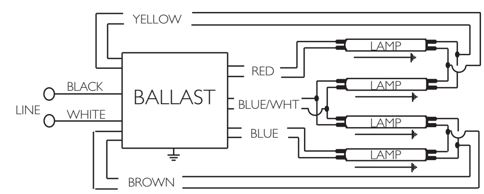
*FOR TWO LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65

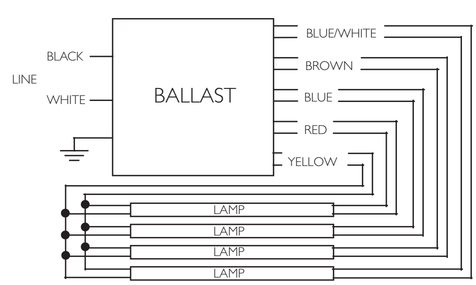


*FOR THREE LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66



Diag. 138



Diag. 177

Refer to page 1-62 for dimensions

Refer to page 1-59 for additional wiring diagrams

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 40W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F40T8 (40W)											
1	120-277	IS	Centium	ICN-2P32-LW-SC	37	0.86	10-15	0.31-0.14	32/0	B	*64
				ICN-2P32-N	42	1.00	10	0.35-0.15			
			Optanium	IOP-2P32-LW-SC	35	0.87	10	0.29-0.13			
				IOPA-2P32-LW-SC							
				IOP-2P32-SC	41	1.01	10	0.35-0.15			
				IOPA-2P32-SC							
				IOP-2P32-HL-SC	55-54	1.35	10	0.46-0.20			
				IOPA-2P32-HL-SC							
		PS		IOP-2S32-LW-SC	31-30	0.73	10	0.73-0.11			39
				IOP-2S32-SC	36	0.90	10	0.30-0.13			
	347	IS	Optanium	GOPA-2P32-LW-SC	37	0.86	10	0.11			*64
				GOPA-2P32-SC	42	1.02		0.12			
2	120-277	IS	Centium	ICN-3P32-LW-SC	69-67	0.83	10	0.58-0.25	32/0	B	*65
				ICN-3P32-SC	77	1.00	10	0.65-0.28			
			Optanium	IOP-3P32-LW-SC	67-66	0.85	10	0.58-0.25			
				IOPA-3P32-LW-SC							
				IOP-3P32-SC	74-72	1.01	10	0.64-0.27			
				IOPA-3P32-SC							
				IOP-3P32-HL-90C-SC	102-100	1.30	10	0.85-0.37			
				IOPA-3P32-HL-SC							
	347	IS	Optanium	GOPA-3P32-LW-SC	65	0.85	10	0.19			
				GOPA-3P32-SC	75	1.00		0.22			

Refer to page 1-62 for wiring diagrams and dimensions
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 40W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F40T8 (40W)											
3	120-277	IS	Centium	ICN-4P32-LW-SC	97-95	0.82	10	0.81-0.34	32/0	B	*66
				ICN-4P32-SC	112	0.97	10	0.94-0.40			
			Optanium	IOP-4P32-LW-SC	98-96	0.84	10	0.82-0.35			
				IOPA-4P32-LW-SC							
				IOP-4P32-SC	110-107	0.93	10	0.92-0.38			
				IOPA-4P32-SC							
				IOP-4P32-HL-90C-G	150-147	1.25	10	1.27-0.54		G	
				IOPA-4P32-HL						A	
	347	IS	Optanium	GOPA-4P32-LW-SC	97	0.84	10	0.28		B	
				GOPA-4P32-SC	113	0.93		0.28			

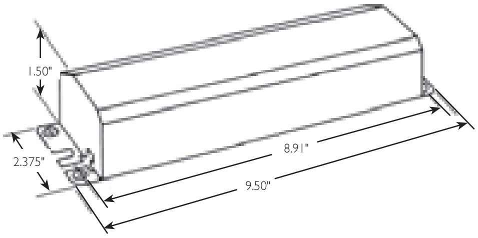


Fig. A

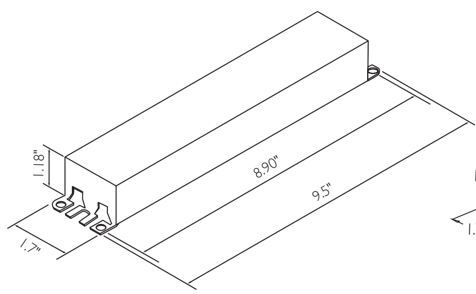


Fig. B

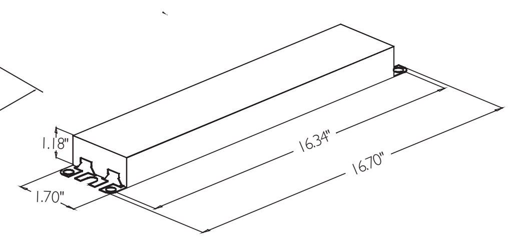


Fig. G

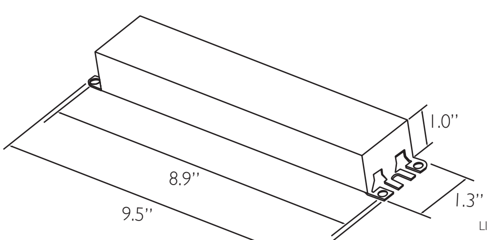
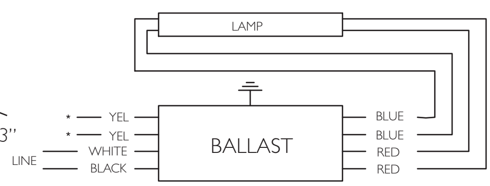
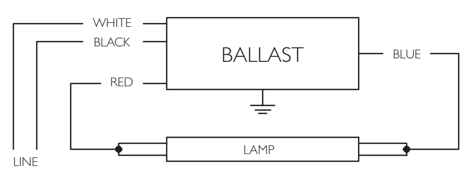


Fig. N

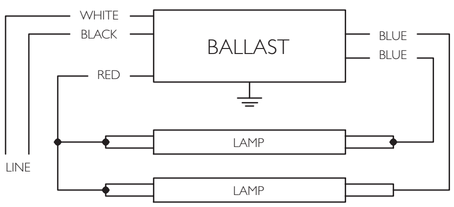


*FOR SINGLE LAMP OPERATION,
INSULATE YELLOW LEADS INDIVIDUALLY FOR 600V

Diag. 39

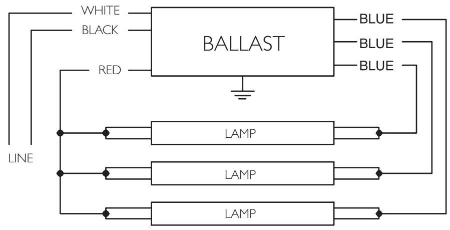


Diag. 63



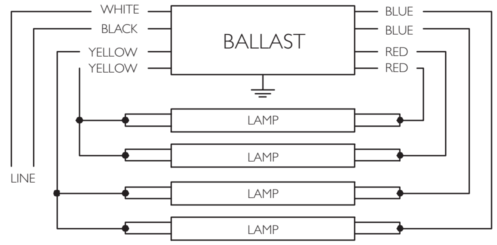
*FOR SINGLE LAMP OPERATION,
INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



*FOR TWO LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65



*FOR THREE LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 46-59W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F72T8 (46W)											
1	120-277	IS	Optanium	IOP-2P59-SC	54	1.09	10	0.46-0.20	32/0	B	*64A
2	120-277	IS	Optanium	IOP-2P59-SC	88	0.92	10	0.74-0.32	32/0	B	64A
F96T8/ES (57W)											
1	120-277	IS	Optanium	IOP-2P59-SC	64	1.05	10	0.56-0.25	60/16	B	*64A
2	120-277	IS	Optanium	IOP-2P59-SC	103	0.87	10	0.86-0.37	60/16	B	64A
F96T8 (59W)											
1	120-277	IS	Optanium	IOP-2P59-SC	67	1.05	10	0.56-0.25	32/0	B	*64A
2	120-277	IS	Optanium	IOP-2P59-SC	107	0.87	10	0.91-0.39	32/0	B	64A

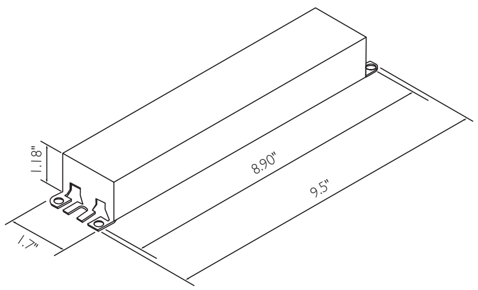
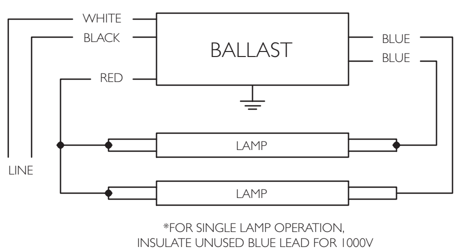


Fig. B



Diag. 64A

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 44-86W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F48T8/HO (44W)											
1	120-277	PS	Centium	ICN-2S86	59	1.02	20	0.50-0.23	-20/-29	C	39A
2	120-277			ICN-2S86	98	0.95	10	0.84-0.36			21
F60T8/HO (55W)											
1	120-277	PS	Centium	ICN-2S86	70	1.00	20	0.58-0.26	-20/-29	C	39A
2	120-277			ICN-2S86	118	0.92	10	1.04-0.45			21
F72T8/HO (65W)											
1	120-277	PS	Centium	ICN-2S86	81	1.00	15	0.68-0.30	-20/-29	C	39A
2	120-277			ICN-2S86	140	0.94	10	1.21-0.54			21
F96T8/HO (86W)											
1	120-277	PS	Centium	ICN-2S86	100	1.00	10	0.84-0.36	-20/-29	C	39A
2	120-277			ICN-2S86	185	0.95	10	1.57-0.68			21

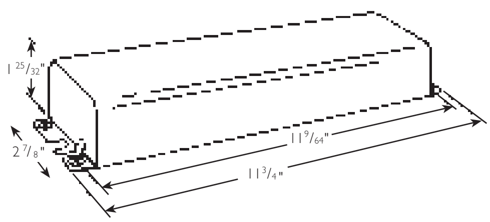
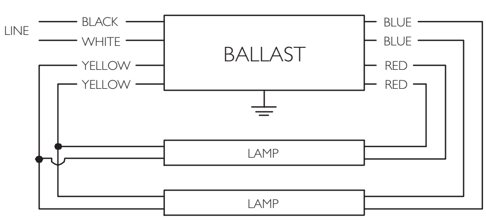
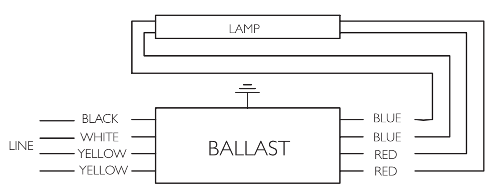


Fig C



Diag. 21



*FOR SINGLE LAMP OPERATION,
INSULATE YELLOW LEADS INDIVIDUALLY FOR 1000V

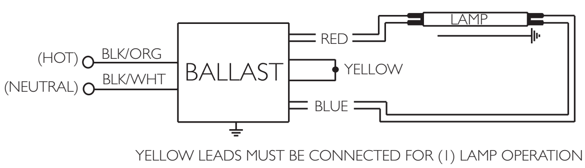
Diag. 39A

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

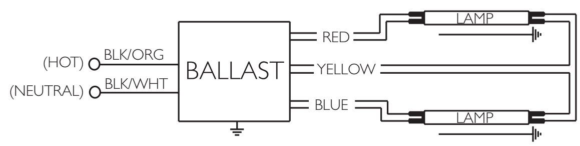
For 55 - 75W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F48T8/VHO (84W)											
1	277	PS	Optanium	JOP-2S84-G	97	1.05	10	0.35	-20/-29	G	70
	347							0.28			
	480							0.21			
2	277	PS	Optanium	JOP-2S84-G	185	1.00	10	0.67	-20/-29	G	71
	347							0.53			
	480							0.38			



Diag. 70



Diag. 71

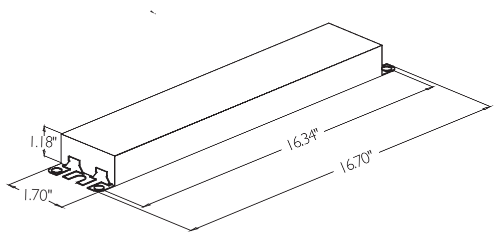


Fig. G

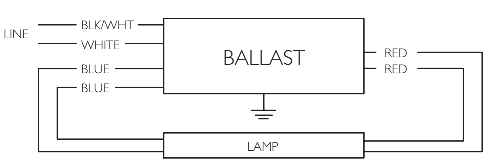
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 22-40W Lamps

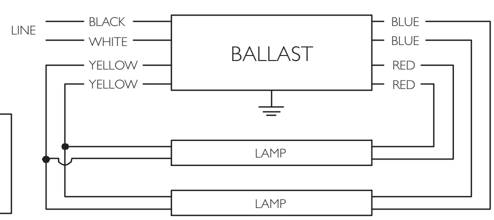
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F30T12 (30W - 36")											
1	120	RS	AmbiStar	RELB-1S40-SC	30	0.98	20	0.27	50/10	B	20
	277		Standard	VEL-1S40-SC				0.12			
2	120-277		Centium	ICN-2S40-N	58	0.93		0.48-0.20			21
F34T12, F34T12/U (34W)											
1	120	RS	AmbiStar	RELB-1S40-SC	35	0.92	20	0.29	50/10	B	20
	277		Standard	VEL-1S40-SC	31	0.88		0.12			
2	120		AmbiStar	RELB-2S40-SC	62	0.85		0.53			21
2	120-277		Centium	ICN-2S40-N	62	0.85	10	0.53-0.23		N	
F40T12, F40T12/U (40W)											
1	120	RS	AmbiStar	RELB-1S40-SC	38	0.88	20	0.31	50/10	B	20
	277		Standard	VEL-1S40-SC	35	0.85		0.13			
2	120		AmbiStar	RELB-2S40-SC	72	0.85		0.62			21
2	120-277		Centium	ICN-2S40-N	72	0.85	10	0.62-0.26		N	
FC8T9 (22W Circline)											
1	120	IS	AmbiStar	RMB-1P26-S2*	22	0.95	150	0.35	0/-18	S2	163

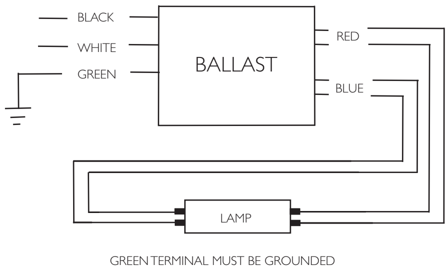
* Normal Power Factor



Diag. 20



Diag. 21



Diag. 163

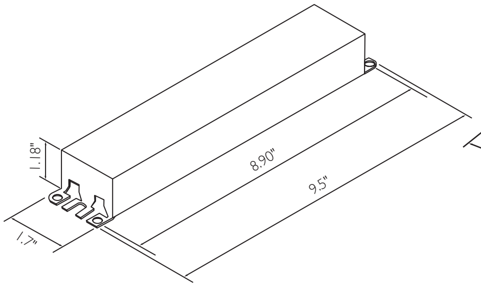


Fig. B

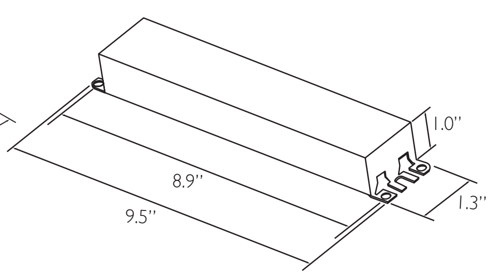
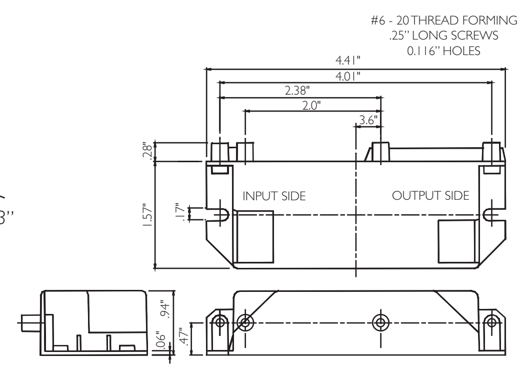


Fig. N



2 LAMP RECTANGULAR BALLAST, PLASTIC ENCLOSURE

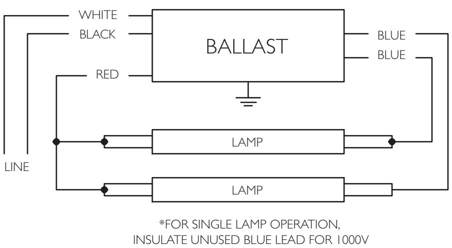
S2 Model

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 55-75W Lamps

HIGH POWER FACTOR   SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F72T12 (55W)											
1	120-277	IS	Centium	ICN-2P60-SC	68-67	1.05	10	0.70-0.31	0/-18	B	*64A
2	120-277				108-107	0.92	10	0.91-0.40			64A
F96T12/ES (60W)											
1	120-277	IS	Centium	ICN-2P60-SC	70-68	1.04	10	0.53-0.24	60/16	B	*64A
2	120-277				105-103	0.89	10	0.88-0.38			64A
F96T12 (75W)											
1	120-277	IS	Centium	ICN-2P60-SC	84-82	1.04	10	0.55-0.25	0/-18	B	*64A
2	120-277				137-135	0.90	10	1.17-0.50			64A



Diag. 64A

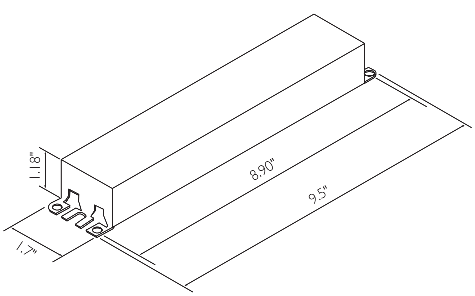


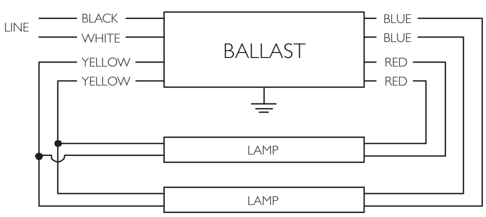
Fig. B

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

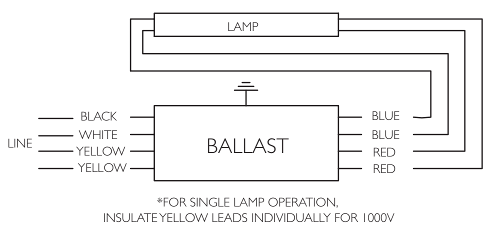
For 95 - 110W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F96T12/HO (95W)											
1	120-277	RS	Standard	ICN-2S110-SC	78-77	0.91	10	0.65-0.31 1.28-0.57	60/16	C	39A
2	120-277				154-151	0.89	10	0.84-0.58 1.60-0.89			21
F96T12/HO (110W)											
1	120-277	RS	Standard	ICN-2S110-SC	100-92	0.91	10	1.10 0.48	-20/-29	C	39A
2	120-277				194-190	0.89	10	1.74 0.76			21



Diag. 21



Diag. 39A

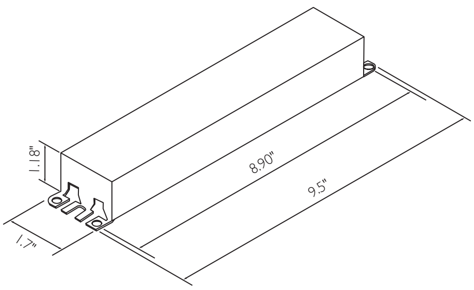


Fig. B

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Notes

Optanium® Step Dim

AmbiStar™

Mark 10® *Powerline*

Mark 7® *0-10V*

EssentiLine™ 0-10V

ROVR™

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Contents

Select the control you need for your application from a list of manufacturers that offer compatible controls for the Mark 7 *0-10V* and Mark 10 *Powerline* electronic dimming ballasts, as well as, ROVR digital addressable ballasts. The manufacturers that offer Mark 10 *Powerline* controls have built the control according to our specifications to assure the system is compatible. Part numbers and/or brands are listed along with the manufacturer's phone number.

Note: Refer to pages 9-15 to 9-19 for ballast specifications.

Controlable

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ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Controllable

Optanium Step-Dim

Fluorescent Ballasts - Electronic - Optanium® Step-Dim

High Efficiency Electronic Ballast with Step-Dim Capability for T5 Fluorescent Lamps.

Philips Advance Optanium ballasts with step-dim capability for T5 fluorescent lamps represent an affordable, energy-efficient, and versatile lighting solution designed to meet California's Title 24 requirements by allowing the end-user the option to dim the lights by up to 50%, thus reducing power consumption by up to 50%.

Operating from any line voltage switching device, the ballast's programmed-start circuitry provides extended lamp life in frequent switching applications like those associated with the use of occupancy sensors making this product the sustainable choice for many commercial applications.

Title 24 Energy Efficiency Standards for Residential and Non-residential Buildings

Meets California's Title 24 by allowing the end-user the option to dim the lights by 50%

Light levels are adjustable — 100% power, 50% power, and off

Dims all the lamps together providing equal burn hours on all lamps reducing uneven lifetimes as experienced with on-off switching systems

IntelliVolt multiple-voltage technology enables operation from 120 to 277V, 50/60 Hz

Allows for greater design flexibility while reducing SKU requirements

Lamp End-Of-Life (EOL) protection circuit

Removes power to the lamps upon lamp failure

For 28W Lamps

HIGH POWER FACTOR SOUND RATED A

Optanium Step-Dim Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F28T5 (28W)											
2	120-277	PS	Optanium	IOP-2S28-95-SC-SD	58/28	0.95/0.35	10	0.50	32/0	B	173
				IOP-2S28-115-SC-SD	71/35	1.15/0.48		0.60			

For fixed output version see page 1-37

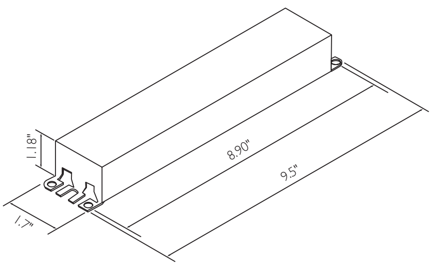
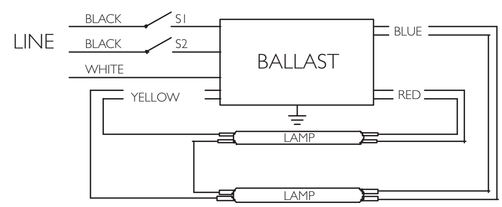


Fig. B



Diag. 173
Line (black) inputs must be connected to the same phase of the line voltage

Power Output	Position S1	Position S2
100%	On	On
50%	On	Off
50%	Off	On
0%	Off	Off

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Controllable

Ambistar

Electronic Fluorescent Ballasts - Dimming - AmbiStar™

Controllable Electronic Ballasts for 4-pin Compact Fluorescent Lamps

Today's fluorescent fixtures offer the opportunity for greater flexibility and energy savings for residential and hospitality settings than ever before by using Philips Advance AmbiStar electronic ballasts. These electronic ballasts for dimmable compact fluorescent lamps deliver warm, comfortable, and cost-effective solutions for such applications as downlighting, task, ambient, hallway, and staircase lighting.

AmbiStar dimming ballasts are designed to work with most incandescent dimmers,* so they are easy to install with new or existing dimming systems. Now you can create any ambiance with dimmable lighting and still enjoy the energy saving benefits of fluorescent lighting.

A single model operates one and two-lamp 26W models, one-lamp 32W models, and one-lamp 42W 4-pin compact fluorescent lamps.

Class B FCC EMI Rating
Requirement for EPA ENERGY STAR residential lighting fixtures

Title 24 Energy Efficiency Standards for Residential and Non-residential Buildings
For use in high frequency residential fixtures as stated in California's Title 24 requirements

Electronic circuitry
Enables ballasts to run cooler and operate quieter than magnetic alternatives

Dimming from 100% down to 15% of relative light output
Offers a large variety of end-user options

* Consult control manufacturer for compatibility

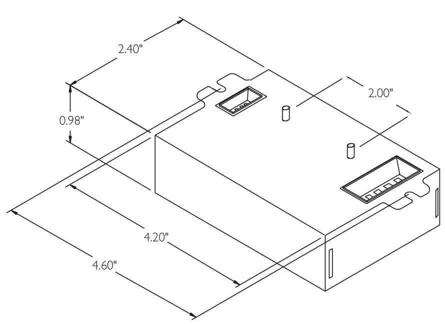
For 18 - 42W Lamps

HIGH POWER FACTOR SOUND RATED A

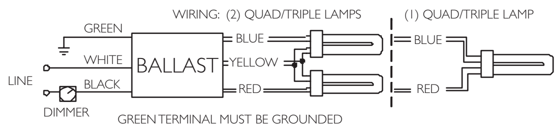
AmbiStar Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E) CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120	RS	AmbiStar	REB-2S26-M1-BS-DIM REB-2S26-M1-LS-DIM	27/9	0.85/0.15	150	0.23	50/10	Size 1	138
2	120			REB-2S26-M1-BS-DIM REB-2S26-M1-LS-DIM	52/17			0.45			
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120	RS	AmbiStar	REB-2S26-M1-BS-DIM REB-2S26-M1-LS-DIM	35/10	0.85/0.15	150	0.30	50/10	Size 1	138
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120	RS	AmbiStar	REB-2S26-M1-BS-DIM REB-2S26-M1-LS-DIM	47/11	0.85/0.15	150	0.40	50/10	Size 1	138

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.
Ballast dimmable from many incandescent or Mark 10 *Powerline* dimmers. Consult control manufacturer for compatibility.



Size 1 Enclosure
Studs for -BS models only



Diag. 138

ONLY USE 4-PIN RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Controllable

EssentiaLine

Fluorescent Ballasts – Electronic - EssentiaLine™

EssentiaLine Electronic Dimming Ballasts for Linear Fluorescent T8 Lamps

The Philips Advance EssentiaLine *0-10V* dimmable ballasts are an alternative-feature set ballast for 0-10V dimming systems. With lower up-front costs than other 0-10V systems, it provides the same energy savings as these solutions over the life of the system. These ballasts optimize the benefits of such popular sustainable lighting techniques as daylight harvesting, occupancy sensors, and load shedding to satisfy the need for a more affordable and flexible controllable lighting solution.

These ballasts offer separate control leads for use with a wide array of controllers, including occupancy sensors, daylight harvesting controls, and building management systems from more than 30 control manufacturers. In addition, the 0 -10V operation of the ballast reduces the number of controls required and allows for a single control to operate across multiple branch circuits.

These ballasts are ideal to optimize energy savings in such applications as offices, conference rooms, educational facilities, hotels, and retail as well as other new construction or retrofit installations. For a complete list of compatible controls, visit www.philips.com/advance.

Meets NEMA Premium® and CSA Energy Efficiency requirements

Helps your efforts to create a more sustainable workplace

Continuous dimming range from 100% light output down to 20%

Provides task appropriate comfort only where necessary to increase potential energy savings while supporting LEED performance standards

Programmed start operation

Potentially extends lamp life in frequent switching applications such as occupancy sensors and daylight

NEMA Premium

The following ballasts meet NEMA Premium®:
ILV-2S32-SC, ILV-4S32-G

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.

Note: Easy way to test dimming functionality is to 'short' together the violet and grey control wires. If the lamps go to full dim, then the ballast is dimming fine.

For 17 - 32W Lamps

EssentiaLine Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
F17T8, FBO16T8 (17W)											
2	120-277	PS	EssentiaLine	ILV-2S32-SC	32/13	0.88/0.20	20	0.25 - 0.11	50/10	B	175A
F25T8, FBO24T8 (25W)											
2	120-277	PS	EssentiaLine	ILV-2S32-SC	44/15	0.88/0.20	20	0.37 - 0.16	50/10	B	175A
F32T8, FBO31T8, F32T8/U6 (32W)											
2	120-277	PS	EssentiaLine	ILV-2S32-SC	59/18	0.88/0.20	20	0.50 - 0.21	50/10	B	175A
4				ILV-4S32-G	116/40			1.00 - 0.43		G	176

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.

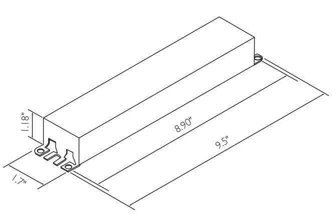


Fig. B

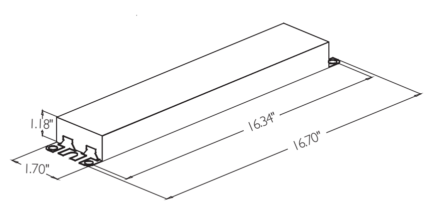
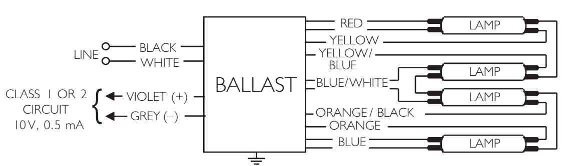


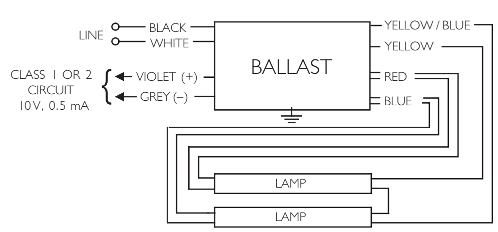
Fig. G



Diag. 176

EssentiaLine Ballast 0-10V DC Control Wiring (Grey and Violet)

Wire Size	Maximum Length (Ft.)
AWG-16	800
AWG-18	500
AWG-20	320
AWG-22	200
AWG-24	120



Diag. 175A

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Fluorescent Ballasts - Dimming - Mark 10® *Powerline*

Mark 10® *Powerline* Electronic Dimming Ballasts for Linear Fluorescent and 4-Pin Compact Fluorescent Lamps

For companies looking to make their fixed-output linear T8, 4-pin CFL, and T5/HO fluorescent systems more cost effective and sustainable, Mark 10 *Powerline* ballasts provide an easy solution without the need for additional control leads. Simply, replace the ballast, replace the switch, dim the lights, that is all it takes.

It's that easy to bring the convenience and flexibility of fluorescent dimming to conference rooms, private offices, auditoriums, architectural cove lighting – anywhere dimming is required.

Available in linear T8, 4-pin CFL, and T5/HO models
Making this ideal for a variety of applications

Full range continuous dimming (100% light output down to 5% - T5/HO to 1%)
Provides task appropriate comfort only where necessary to increase potential energy savings while supporting LEED performance standards

Programmed start operation
Potentially extends lamp life in frequent switching applications such as occupancy sensors and daylight harvesting

Input voltage to dimmer	Control Voltage to Ballast (from Dimmer)	
	Max Light Output	Min Light Output
120V	120V	56V
277V	277V	129V

NEMA Premium

The following ballasts meet NEMA Premium®:
REZ-132-SC, REZ-2S32-SC, REZ-3S32-SC,
VEZ-132-SC, VEZ-2S32-SC, VEZ-3S32-SC

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.

For 18 - 70W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 10 Powerline Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E) CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-1Q18-M2-BS REZ-1Q18-M2-LD	22/7	1.00/0.05	10	0.18	50/10	Size 2	138
	277			VEZ-1Q18-M2-BS VEZ-1Q18-M2-LD				0.07			
2	120			REZ-2Q18-M2-BS REZ-2Q18-M2-LD	43/14			0.36			138
	277			VEZ-2Q18-M2-BS VEZ-2Q18-M2-LD				0.16			
CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E) CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-1T42-M2-BS REZ-1T42-M2-LD **REZ-1T42-M2-LD-K**	31/8	1.00/0.05	10	0.26	50/10	Size 2	138
	277			VEZ-1T42-M2-BS VEZ-1T42-M2-LD **VEZ-1T42-M2-LD-K**				0.11			
2	120			REZ-2Q26-M2-BS REZ-2Q26-M2-LD **REZ-2Q26-M2-LD-K**	58/16			0.48			138
	277			VEZ-2Q26-M2-BS VEZ-2Q26-M2-LD **VEZ-2Q26-M2-LD-K**				0.21			
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-1T42-M2-BS REZ-1T42-M2-LD **REZ-1T42-M2-LD-K**	38/9	1.00/0.05	10	0.32	50/10	Size 2	138
	277			VEZ-1T42-M2-BS VEZ-1T42-M2-LD **VEZ-1T42-M2-LD-K**				0.14			
2	120			REZ-2T42-M3-BS REZ-2T42-M3-LD	76/20			0.64		Size 3	138
	277			VEZ-2T42-M3-BS VEZ-2T42-M3-LD				0.28			
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-1T42-M2-BS REZ-1T42-M2-LD **REZ-1T42-M2-LD-K**	49/10	1.00/0.05	10	0.41	50/10	Size 2	138
	277			VEZ-1T42-M2-BS VEZ-1T42-M2-LD **VEZ-1T42-M2-LD-K**				0.18			
2	120			REZ-2T42-M3-BS REZ-2T42-M3-LD	98/20			0.82		Size 3	138
	277			VEZ-2T42-M3-BS VEZ-2T42-M3-LD				0.36			
CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-2T42-M3-BS REZ-2T42-M3-LD	66/18	1.00/0.05	10	0.55	50/10	Size 3	138
	277			VEZ-2T42-M3-BS VEZ-2T42-M3-LD				0.24			
CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)											
1	120	PS	Mark 10 *Powerline*	REZ-2T42-M3-BS REZ-2T42-M3-LD	80/18	1.00/0.05	10	0.67	50/10	Size 3	138
	277			VEZ-2T42-M3-BS VEZ-2T42-M3-LD				0.29			

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-10 for ballast dimensions and wiring diagram
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Note: Replacement/Retrofit Ballast Kits indicated by **Bold Type** with suffix **-K** are available to distributors only. Refer to page1-21 for details.
Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

ONLY USE 4-PIN RAPID-START SOCKETS

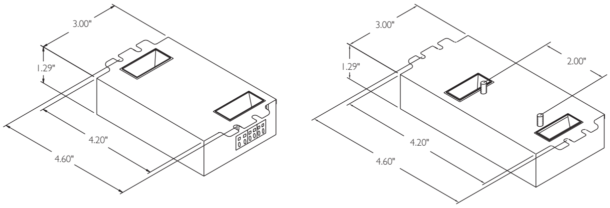
For 24 - 55W Lamps

HIGH POWER FACTOR SOUND RATED A

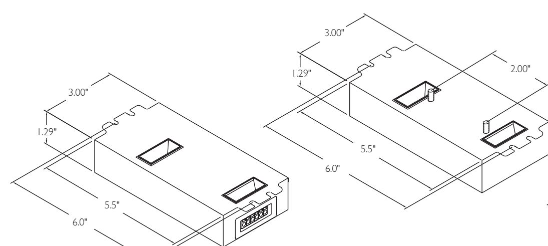
Mark 10 Powerline Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT24W/2G11 - 24/27W Long Twin Tube Lamp (PL-L24W, F27BX/RS, FT24DL)											
2	120-277	PS	Mark 10 *Powerline*	IEZ-2S24-D	57/16	1.00/0.05	10	0.48-0.21	50/10	D	132
FT36W/2G11 - 36/39W Long Twin Tube Lamp (PL-L36W, F39BX/RS, FT36DL)											
1	120	PS	Mark 10 *Powerline*	REZ-1TTS40-SC	38/9	1.00/0.05	10	0.32	50/10	B	134
	277			VEZ-1TTS40-SC				0.14			
2	120			REZ-2TTS40-SC	75/16			0.64			132
	277			VEZ-2TTS40-SC				0.27			
FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40BX, FT40DL/RS)											
1	120	PS	Mark 10 *Powerline*	REZ-1TTS40-SC	41/10	1.00/0.05	10	0.32	50/10	B	134
	277			VEZ-1TTS40-SC				0.15			
2	120			REZ-2TTS40-SC	80/17			0.68			132
	277			VEZ-2TTS40-SC				0.30			
FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)											
1	120	PS	Mark 10 *Powerline*	REZ-154	59/13	0.90/0.05	10	0.50	50/10	D	134
	277			VEZ-154				0.22			
2	120			REZ-2S54	114/24			0.96			132
	277			VEZ-2S54				0.42			

Burn in new lamps 100 hours at full light before dimming.
Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.



Size 2 Enclosure



Size 3 Enclosure
Dual connector for input only

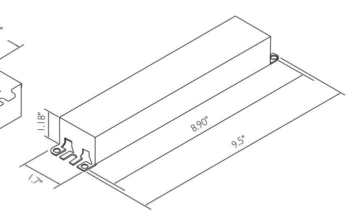
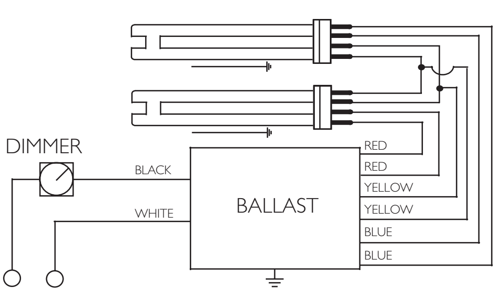
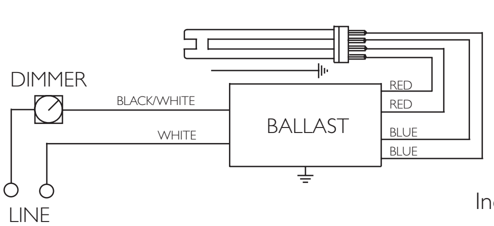


Fig. B



Diag. 132



Diag. 134

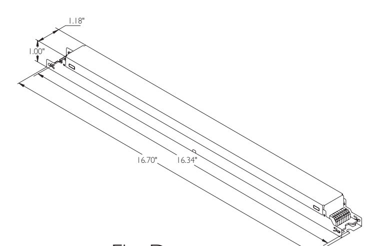
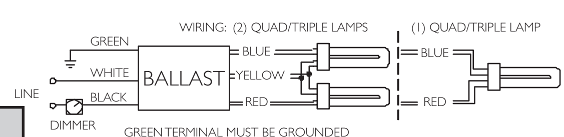


Fig. D
Includes connectors with no leads

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data



Diag. 138

For 24 - 55W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 10 Powerline Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F24T5/HO (24W)											
2	120-277	PS	Mark 10 *Powerline*	IEZ-2S24-D	57/16	1.00/0.05	10	0.48-0.21	50/10	D	153
F54T5/HO/ES (49W)											
1	120	PS	Mark 10 *Powerline*	REZ-154	59/13	1.00/0.03	10	0.49	50/10	D	152
	277			VEZ-154				0.21			
2	120			REZ-2S54	117/24			0.98			153
	277			VEZ-2S54				0.42			
F54T5/HO (54W)											
1	120	PS	Mark 10 *Powerline*	REZ-154	63/13	1.00/0.03	10	0.53	50/10	D	152
	277			VEZ-154				0.23			
2	120			REZ-2S54	125/24			1.05			153
	277			VEZ-2S54				0.45			
FC12T5/HO (55W)											
1	120	PS	Mark 10 *Powerline*	REZ-154	59/13	0.90/0.03	10	0.50	50/10	D	152
	277			VEZ-154				0.22			
2	120			REZ-2S54	114/24			0.96			153
	277			VEZ-2S54				0.42			

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.

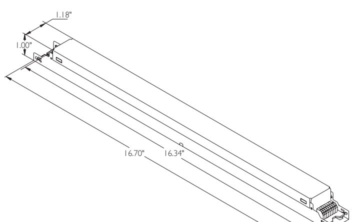
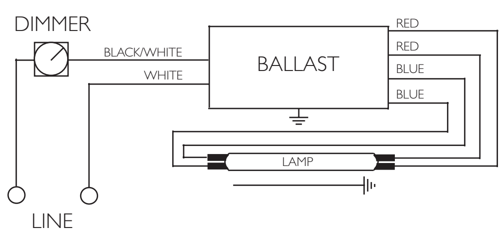
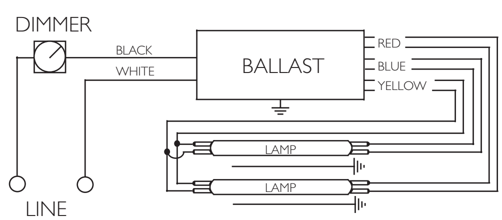


Fig. D
Includes connectors with no leads



Diag. 152



Diag. 153

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Mark 10 *Powerline*

Controllable

For 17 - 32W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 10 Powerline *Electronic Dimming Ballast*

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
1	120	PS	Mark 10 *Powerline*	REZ-132-SC	24/7	1.05/0.05	10	0.20	50/10	B	152
	277			VEZ-132-SC				0.09			
2	120			REZ-2S32-SC	38/13			0.32			153
	277			VEZ-2S32-SC				0.14			
3	120			REZ-3S32-SC	56/18			0.47			155
	277			VEZ-3S32-SC				0.21			
F25T8, FBO24T8 (25W)											
1	120	PS	Mark 10 *Powerline*	REZ-132-SC	30/7	1.05/0.05	10	0.26	50/10	B	152
	277			VEZ-132-SC				0.11			
2	120			REZ-2S32-SC	55/13			0.46			153
	277			VEZ-2S32-SC				0.20			
3	120			REZ-3S32-SC	79/19			0.66			155
	277			VEZ-3S32-SC				0.29			
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120	PS	Mark 10 *Powerline*	REZ-132-SC	35/9	1.00/0.05	10	0.29	50/10	B	152
	277			VEZ-132-SC				0.13			
2	120			REZ-2S32-SC	68/15			0.57			153
	277			VEZ-2S32-SC				0.25			
3	120			REZ-3S32-SC	100/20			0.86			155
	277			VEZ-3S32-SC				0.37			

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.

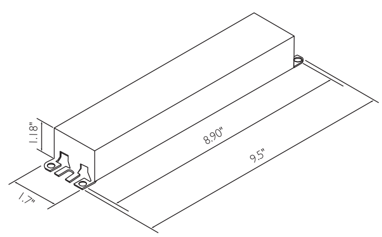
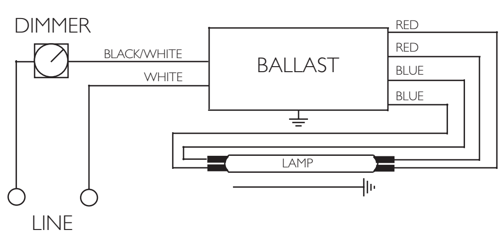
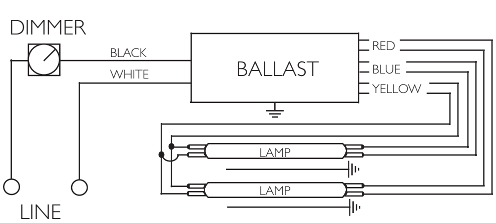


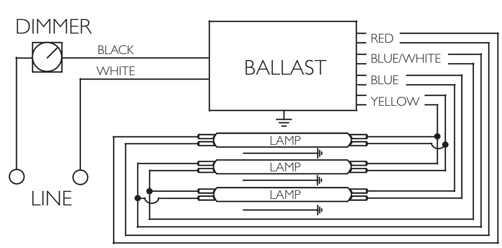
Fig. B



Diag. 152



Diag. 153



Diag. 155

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Fluorescent Ballasts - Dimming - Mark 7® *0-10 V*

0-10V Electronic Dimming Ballasts for Linear Fluorescent and 4-Pin Compact Fluorescent Lamps

The Mark 7 *0–10V* series of dimmable electronic ballasts offer maximum versatility by incorporating separate control leads for use with a wide array of controllers, including occupancy sensors, daylight harvesting controls, and building management systems from more than 30 manufacturers.

When paired with linear fluorescent and 4-pin compact fluorescent lamps, Mark 7 *0–10V* ballasts optimize the benefits of such popular sustainable lighting techniques as daylight harvesting, occupancy sensors, and load shedding to satisfy the need for an affordable, flexible and versatile controllable lighting solution

Available in linear fluorescent and 4-pin compact fluorescent models
Making this ideal for a variety of applications

Full range continuous dimming (100% light output down to 5% - T5/HO to 1%)
Provides task appropriate comfort only where necessary to increase potential energy savings while supporting LEED performance standards

Programmed start operation
Potentially extends lamp life in frequent switching applications such as occupancy sensors and daylight harvesting

IntelliVolt® technology (120 - 277V, 50/60Hz)
Enhances accuracy and ease of ordering while reducing stocking/SKU requirements

Mark 7 *0-10V*

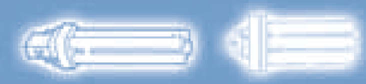
Controllable

NEMA Premium

The following ballasts meet NEMA Premium®:
IZT-132-SC, IZT-2S32-SC, IZT-3S32-SC,
IZT-4S32, VZT-4S32-HL, VZT-4S32-G, VZT-4PSP32-G

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.

Note: Easy way to test dimming functionality is to 'short' together the violet and grey control wires. If the lamps go to full dim, then the ballast is dimming fine.



For 13 - 70W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 7 0-10V Electronic Dimming Ballast

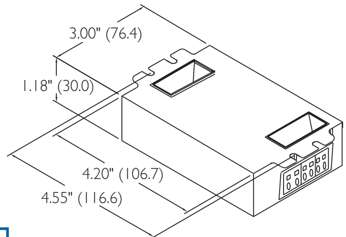
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFQ13W/G24q - 13W CFL Quad Tube Lamp (PL-C13W/4P, F13DBX/4P, CF13DD/E) CFTR13W/GX24q - 13W CFL Triple Tube Lamp (F13TBX/4P, CF13DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2S26-M5-BS IZT-2S26-M5-LD	18/6	1.00/0.03	10	0.15-0.07	50/10	Size 5	166
2				IZT-2S26-M5-BS IZT-2S26-M5-LD	33/19			0.28-0.12			166
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E) CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2S26-M5-BS IZT-2S26-M5-LD	23/7	1.00/0.03	10	0.19-0.09	50/10	Size 5	166
2				IZT-2S26-M5-BS IZT-2S26-M5-LD	41/11			0.34-0.15			166
CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E) CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2S26-M5-BS IZT-2S26-M5-LD	30/8	1.00/0.03	10	0.25-0.11	50/10	Size 5	166
2				IZT-2S26-M5-BS IZT-2S26-M5-LD	55/13			0.46-0.20			166
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2S26-M5-BS IZT-2S26-M5-LD	36/9	1.00/0.03	10	0.30-0.13	50/10	Size 5	166
2				IZT-2T42-M5-BS IZT-2T42-M5-LD	75/19			0.63-0.21			166
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2S26-M5-BS IZT-2S26-M5-LD	47/9	1.00/0.03	10	0.39-0.17	50/10	Size 5	166
2				IZT-2T42-M5-BS IZT-2T42-M5-LD	98/18			0.82-0.36			166
CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2T42-M5-BS IZT-2T42-M5-LD	65/16	1.00/0.03	10	0.55-0.24	50/10	Size 5	166
CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)											
1	120-277	PS	Mark 7 *0-10V*	IZT-2T42-M5-BS IZT-2T42-M5-LD	75/16	1.00/0.03	10	0.63-0.27	50/10	Size 5	166

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

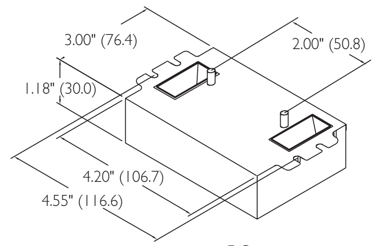
Mark 7 *0-10V* Control Wiring (Grey and Violet)

Wire Size	Maximum Length (Ft.)
AWG-16	800
AWG-18	500
AWG-20	320

ONLY USE 4-PIN RAPID-START SOCKETS



-LD



-BS

Size 5 Enclosure

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-15 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 36 - 80W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 7 0-10V Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min		Full Light Output		Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %	Line Current (Amps)			
FT36W/2G11 - 36/39W Long Twin Tube Lamp (PL-L36W, F39BX/RS, FT36DL)											
2	120-277	PS	Mark 7 *0-10V*	IZT-2TTS40-SC	75/16	1.00/0.03	10	0.64-0.27	50/10	B	59A
FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40BX, FT40DL/RS)											
2	120-277	PS	Mark 7 *0-10V*	IZT-2TTS40-SC	76/16	1.00/0.03	10	0.64-0.28	50/10	B	59A
FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)											
1	120	PS	Mark 7 *0-10V*	RZT-154	59/13	0.90/0.03	10	0.50	50/10	D	58A
	277			VZT-154				0.22			
2	120			RZT-2S54	114/24			0.96			59A
	277			VZT-2S54				0.42			
FT80W/2G11 - 80W Long Twin Tube Lamp (PL-L80W, FT80DL)											
1	277	PS	Mark 7 *0-10V*	VZT-180	94/16	1.00/0.03	10	0.34	50/10	D	58A

Burn in new lamps 100 hours at full light output before dimming.
Ballasts utilizing poke-in connectors can accept wire gauge AWG 16-20.

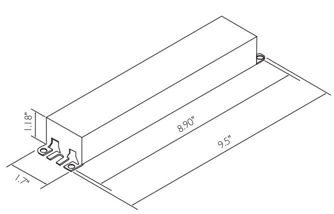


Fig. B

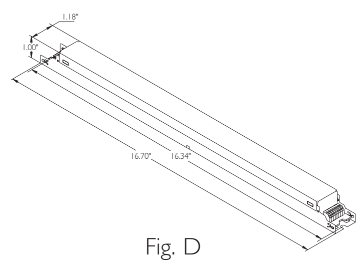
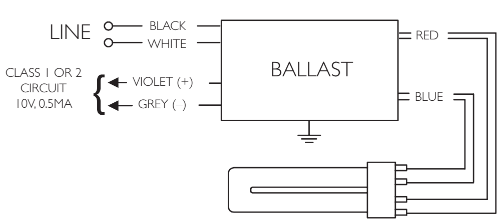
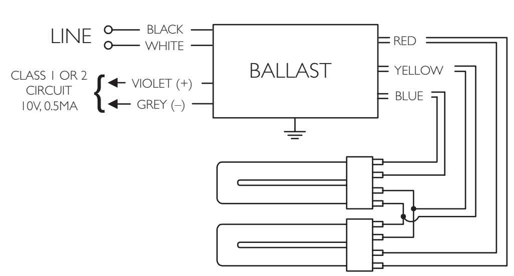


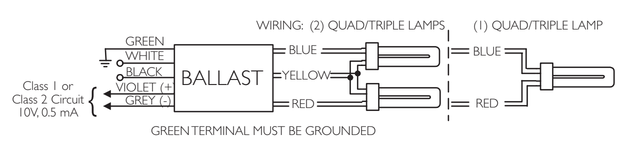
Fig. D
Includes connectors with no leads



Diag. 58A



Diag. 59A



Diag. 166

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 49 - 80W Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 7 0-10V Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Ballast Factor	Full Light Output THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F54T5/HO/ES (49W)											
1	120	PS	Mark 7 *0-10V*	RZT-154	59/13	1.00/0.03	10	0.49	50/10	D	55A
	277			VZT-154				0.21			
2	120			RZT-2S54	117/24			0.98			56A
	277			VZT-2S54				0.42			
F54T5/HO (54W)											
1	120	PS	Mark 7 *0-10V*	RZT-154	63/13	1.00/0.03	10	0.53	50/10	D	55A
	277			VZT-154				0.23			
2	120			RZT-2S54	125/24			1.05			56A
	277			VZT-2S54				0.45			
F80T5/HO (80W)											
1	277	PS	Mark 7 *0-10V*	VZT-180	94/18	1.00/0.03	10	0.34	50/10	D	55A
FC12T5/HO (55W)											
1	120	PS	Mark 7 *0-10V*	RZT-154	59/13	0.90/0.03	10	0.50	50/10	D	55A
	277			VZT-154				0.22			
2	120			RZT-2S54	114/24			0.96			56A
	277			VZT-2S54				0.42			

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

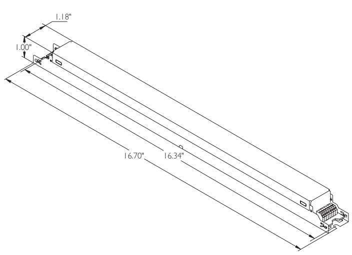
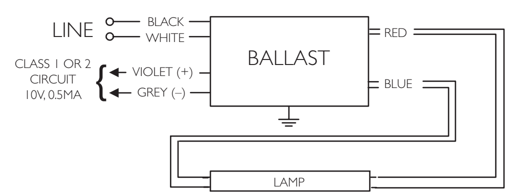


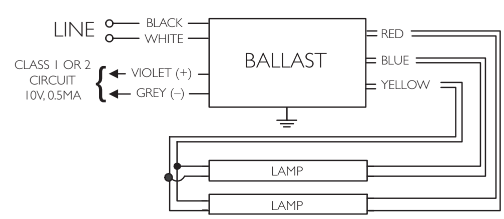
Fig. D
Includes connectors with no leads



Diag. 55A

Mark 7 0-10V Control Wiring (Grey and Violet)

Wire Size	Maximum Length (Ft.)
AWG-16	800
AWG-18	500
AWG-20	320



Diag. 56A

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17 - 25W Lamps

Mark 7 0-10V Electronic Dimming Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-132-SC	20/7	1.00/0.03	10	0.16-0.07	50/10	B	55A
2				IZT-2S32-SC	36/11			0.30-0.13			56A
3				IZT-3S32-SC	56/18			0.46-0.20			57A
F25T8, FBO24T8 (25W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-132-SC	28/8	1.00/0.03	10	0.24-0.11	50/10	B	55A
2				IZT-2S32-SC	52/12			0.43-0.19			56A
3				IZT-3S32-SC	79/19			0.65-0.28			57A
4				IZT-4S32	96/22	0.88/0.03		0.77-0.35		D	16A

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

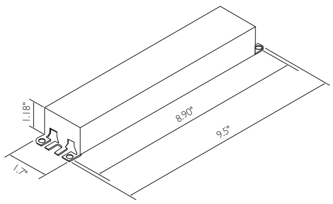


Fig. B

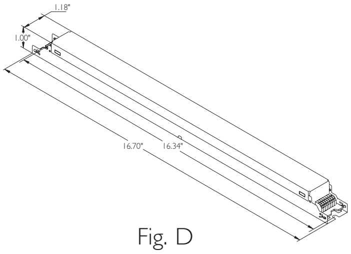


Fig. D
Includes connectors with no leads

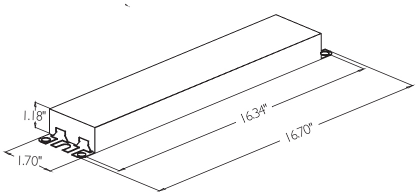


Fig. G

Mark 7 *0-10V* Control Wiring (Grey and Violet)

Wire Size	Maximum Length (Ft.)
AWG-16	800
AWG-18	500
AWG-20	320
AWG-22	200
AWG-24	120

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-18 for wiring diagrams
Refer to pages 2-24 & 2-25 for compatible low voltage controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 32W Lamps

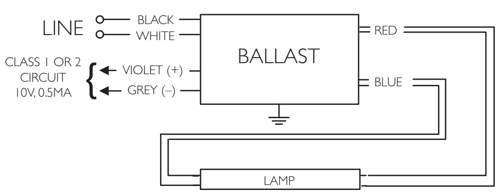
HIGH POWER FACTOR SOUND RATED A

Mark 7 0-10V Electronic Dimming Ballast

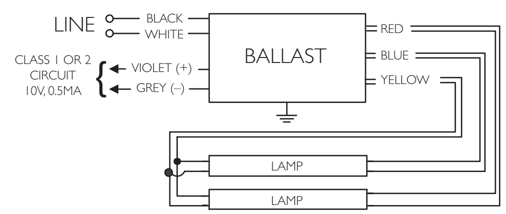
<table>
<tr><th rowspan="2">No. of Lamps</th><th rowspan="2">Input Volts</th><th rowspan="2">Lamp Starting Method</th><th rowspan="2">Ballast Family</th><th rowspan="2">Catalog Number</th><th colspan="2">Max/Min</th><th colspan="2">Full Light Output</th><th rowspan="2">Min. Starting Temp. (°F/°C)</th><th rowspan="2">Dim.</th><th rowspan="2">Wiring Dia.</th></tr>
<tr><th>Input Power ANSI (Watts)</th><th>Ballast Factor</th><th>THD %</th><th>Line Current (Amps)</th></tr>
<tr><td colspan="12">F32T8, FBO31T8, F32T8/U6 (32W)</td></tr>
<tr><td>1</td><td rowspan="3">120-277</td><td rowspan="7">PS</td><td rowspan="7">Mark 7 0-10V</td><td>IZT-132-SC</td><td>35/8</td><td rowspan="3">1.00/0.03</td><td rowspan="7">10</td><td>0.30-0.13</td><td rowspan="7">50/10</td><td rowspan="3">B</td><td>55A</td></tr>
<tr><td>2</td><td>IZT-2S32-SC</td><td>68/14</td><td>0.57-0.24</td><td>56A</td></tr>
<tr><td>3</td><td>IZT-3S32-SC</td><td>100/20</td><td>0.86-0.37</td><td>57A</td></tr>
<tr><td rowspan="4">4</td><td rowspan="3">277</td><td>VZT-4S32-G</td><td>116/25</td><td>0.88/0.05</td><td>0.42</td><td rowspan="3">G</td><td rowspan="2">16A</td></tr>
<tr><td>VZT-4S32-HL</td><td>149/27</td><td>1.18/0.05</td><td>0.54</td></tr>
<tr><td>VZT-4PSP32-G</td><td>112/27</td><td>0.88/0.10</td><td>0.41</td><td>174</td></tr>
<tr><td>120-277</td><td>IZT-4S32</td><td>116/25</td><td>0.88/0.03</td><td>0.98-0.42</td><td>D</td><td>16A</td></tr>
</table>

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

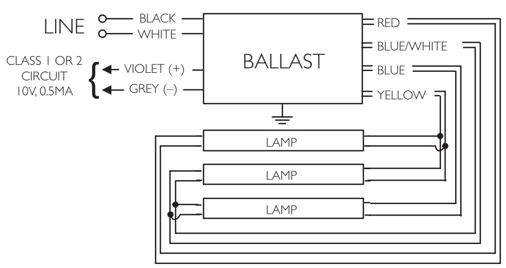
NEMA Premium



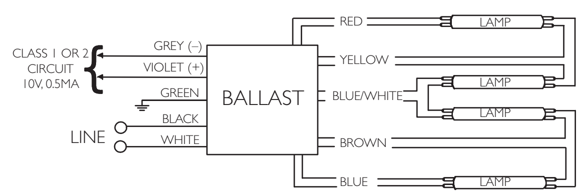
Diag. 55A



Diag. 56A



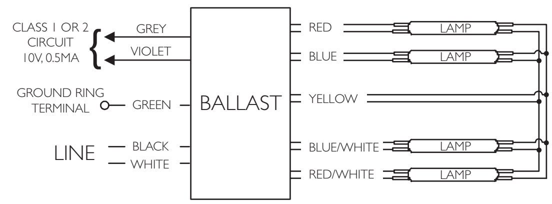
Diag. 57A



Diag. 16A

Mark 7 *0-10V* Control Wiring (Grey and Violet)

Wire Size	Maximum Length (Ft.)
AWG-16	800
AWG-18	500
AWG-20	320
AWG-22	200
AWG-24	120



Diag. 174

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-17 for ballast dimensions
Refer to pages 2-24 & 2-25 for compatible low voltage controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Fluorescent Ballasts - Dimming - ROVR™

Digital Addressable Ballasts for Linear Fluorescent and 4-Pin Compact Fluorescent Lamps

Philips Advance ROVR ballasts reflect the latest approach to controlling fluorescent lighting. Rather than simply responding to instructions from control components, ROVR ballasts enable two-way communication, allowing for virtually unlimited design flexibility.

This two-way communication is made possible through the industry-standard digital communication protocol known as DALI (Digital Addressable Lighting Interface).

This protocol allows ROVR ballasts to provide users with operational data while controlling the output of individual luminaires. This fully supports sustainable design principles such as daylight harvesting and occupancy sensors while enabling a proactive response to maintenance concerns.

Available in linear fluorescent and 4-pin compact fluorescent models
Making this ideal for a variety of applications

Full range continuous dimming (100% light output down to 3% - T5/HO to 1%)
Provides task appropriate comfort only where necessary to increase potential energy savings while supporting LEED performance standards

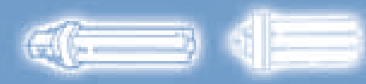
Programmed start operation
Potentially extends lamp life in frequent switching applications such as occupancy sensors and daylight

IntelliVolt Technology (120-277V, 50/60Hz)
Enhances accuracy and ease of ordering while reducing stocking/SKU requirements

NEMA Premium

The following ballasts meet NEMA Premium®:
IDA-132-SC, IDA-2S32-SC, IDA-3S32-SC, IDA-4S32

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics has determined that these products meet the NEMA Premium specification for premium energy efficiency.



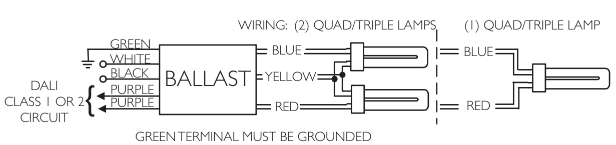
For 13 - 70W Lamps

HIGH POWER FACTOR   SOUND RATED A

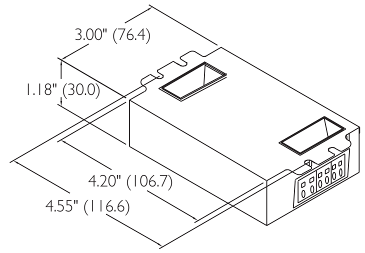
ROVR Digital Addressable Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFQ13W/G24q - 13W CFL Quad Tube Lamp (PL-C13W/4P, F13DBX/4P, CF13DD/E) CFTR13W/GX24q - 13W CFL Triple Tube Lamp (F13TBX/4P, CF13DT/E)											
1	120-277	PS	ROVR	IDL-2S26-M5-BS IDL-2S26-M5-LD	18/6	1.00/0.03	10	0.15-0.07	50/10	Size 5	165
2				IDL-2S26-M5-BS IDL-2S26-M5-LD	33/19			0.28-0.12			165
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E) CFTR18W/GX24q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)											
1	120-277	PS	ROVR	IDL-2S26-M5-BS IDL-2S26-M5-LD	23/7	1.00/0.03	10	0.19-0.09	50/10	Size 5	165
2				IDL-2S26-M5-BS IDL-2S26-M5-LD	41/11			0.34-0.15			165
CFQ26W/G24q - 26W CFL Quad Tube Lamp (PL-C26W/4P, F26DBX/4P, CF26DD/E) CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120-277	PS	ROVR	IDL-2S26-M5-BS IDL-2S26-M5-LD	30/8	1.00/0.03	10	0.25-0.11	50/10	Size 5	165
2				IDL-2S26-M5-BS IDL-2S26-M5-LD	55/13			0.46-0.20			165
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120-277	PS	ROVR	IDL-2S26-M5-BS IDL-2S26-M5-LD	36/9	1.00/0.03	10	0.30-0.13	50/10	Size 5	165
2				IDL-2T42-M5-BS IDL-2T42-M5-LD	75/19			0.63-0.21			165
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120-277	PS	ROVR	IDL-2S26-M5-BS IDL-2S26-M5-LD	47/9	1.00/0.03	10	0.39-0.17	50/10	Size 5	165
2				IDL-2T42-M5-BS IDL-2T42-M5-LD	98/18			0.82-0.36			165
CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)											
1	120-277	PS	ROVR	IDL-2T42-M5-BS IDL-2T42-M5-LD	65/16	1.00/0.03	10	0.55-0.24	50/10	Size 5	165
CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)											
1	120-277	PS	ROVR	IDL-2T42-M5-BS IDL-2T42-M5-LD	75/16	1.00/0.03	10	0.63-0.27	50/10	Size 5	165

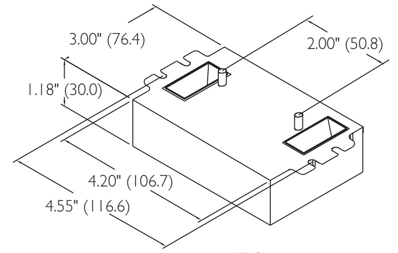
Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.



Diag. 165



-LD



-BS

Size 5

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

ONLY USE 4-PIN RAPID-START SOCKETS

For 55W Lamps

HIGH POWER FACTOR SOUND RATED A

ROVR Digital Addressable Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)											
1	120-277	PS	ROVR	IDA-154	59/13	0.90/0.03	10	0.50-0.22	50/10	D	165
2				IDA-2S54	114/24			0.96-0.42			

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

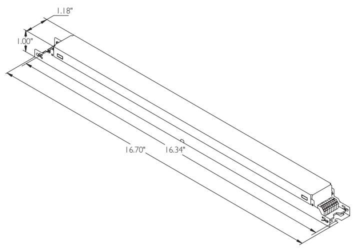
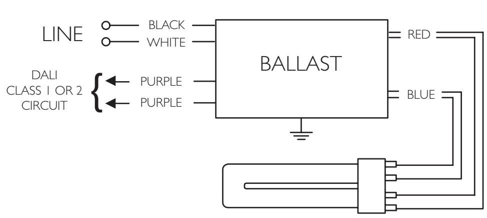
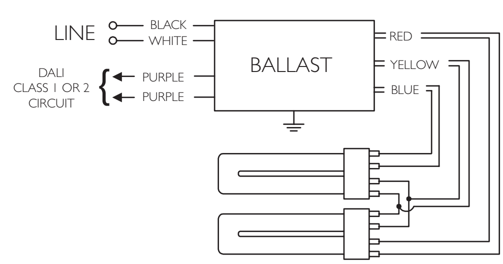


Fig. D
Includes connectors with no leads



Diag. 58B



Diag. 59B

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Controllable

ROVR

For 49 - 55W Lamps

HIGH POWER FACTOR SOUND RATED A

ROVR Digital Addressable Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F54T5/HO/ES (49W)											
1	120-277	PS	ROVR	IDA-154	59/13	1.00/0.03	10	0.49-0.21	50/10	D	55B
2				IDA-2S54	117/24			0.98-0.42			56B
F54T5/HO (54W)											
1	120-277	PS	ROVR	IDA-154	63/13	1.00/0.03	10	0.53-0.23	50/10	D	55B
2				IDA-2S54	125/24			1.05-0.45			56B
FC12T5/HO (55W)											
1	120-277	PS	ROVR	IDA-154	59/13	0.90/0.03	10	0.50-0.22	50/10	D	55B
2				IDA-2S54	114/24			0.96-0.42			56B

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

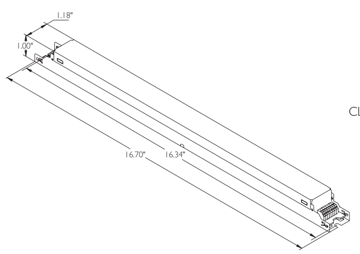
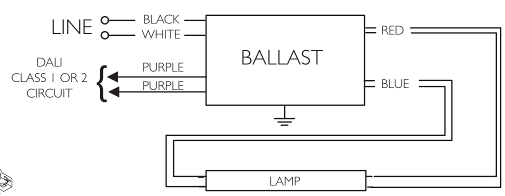
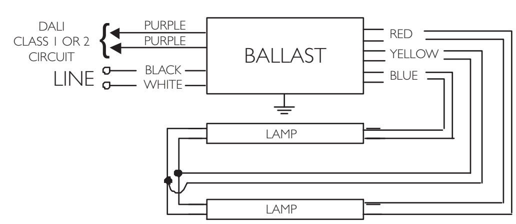


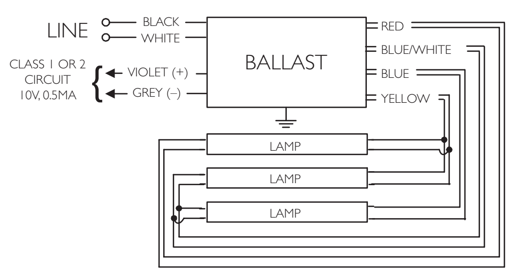
Fig. D
Includes connectors with no leads



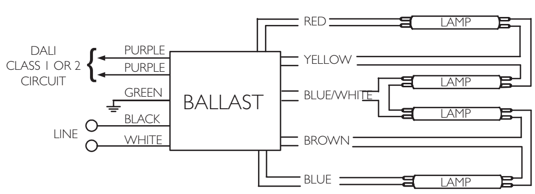
Diag. 55B



Diag. 56B



Diag. 57B



Diag. 167

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-24 & 2-25 for compatible Mark 10 Powerline controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

For 17 - 32W Lamps

HIGH POWER FACTOR SOUND RATED A

ROVR Digital Addressable Ballast

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
1	120-277	PS	ROVR	IDA-132-SC	20/7	1.00/0.03	10	0.16-0.07	50/10	B	55B
2				IDA-2S32-SC	36/11			0.30-0.13			56B
F25T8, FBO24T8 (25W)											
1	120-277	PS	ROVR	IDA-132-SC	28/8	1.00/0.03	10	0.24-0.11	50/10	B	55B
2				IDA-2S32-SC	52/12			0.43-0.19			56B
3				IDA-3S32-G	79/19			0.65-0.28		G	57B
4				IDA-4S32	96/22	0.88/0.03		0.77-0.35		D	167
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120-277	PS	ROVR	IDA-132-SC	35/8	1.00/0.03	10	0.30-0.13	50/10	B	55B
2				IDA-2S32-SC	68/14			0.58-0.25			56B
3				IDA-3S32-G	100/20			0.86-0.37		G	57B
4				IDA-4S32	116/25	0.88/0.03		0.98-0.42		D	167

Some lamp manufacturers recommend burning in new lamps 100 hours at full light output before dimming. Consult lamp manufacturer.
Ballasts utilizing poke-in connectors can accept wire gauges from AWG 16 - 20.

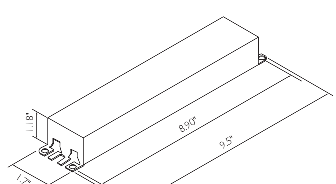


Fig. B

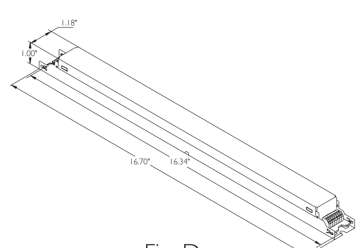


Fig. D
Includes connectors with no leads

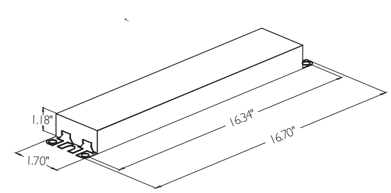


Fig. G

ONLY USE RAPID-START SOCKETS

Refer to pages 1-13 & 1-14 for information on remote/tandem wiring and lead length extension
Refer to pages 2-22 for wiring diagrams and ballast dimensions
Refer to pages 2-24 & 2-25 for compatible ROVR controls
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Controllable

Compatible Control

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Control Manufacturers who have products compatible with Philips Advance Mark 7 *0-10V* Electronic Dimming Ballasts, Mark 10 *Powerline* Electronic Dimming Ballasts and ROVR Digital Addressable Ballasts as of February 2010

For a more detailed listing please visit http://www.advance.philips.com/documents/uploads/literature/EL-2100-AB-R03.pdf

MANUFACTURER	PHONE	MARK 7 *0-10V* (4-Wire Low Voltage)	MARK 10 *Powerline* (2-Wire Line Voltage)	ROVR (DALI)
AMX Corporation	800-222-0193	Radia RDM-DC, RDM-2DC and RDM-3DC	Radia RE-DM4 and RE-DM6 RDM-INC, RDM-2INC and RDM-INC50	
Anigmo	800-749-0518	SEM & SEZ	ST2-600LVE	
Automated Logic Corp.	770-429-3000	S Line, M Line	S Line, M Line	
Avab America	415-505-5515	PWR Series	PWR Series	
CentraLite System, Inc.	877-466-5483		StarLite, Elegance, LiteJet	
Colortran, Inc.	503-682-1941	Digital Ballast Controller	ENR, I Series, I Series E, and I Series Quad	
Cooper Controls	800-553-3879	Greengate, iLumin	Greengate, iLumin	iLumin
Cooper Wiring Devices	866-853-4293		SF8AP, DF8AP, 9568 Aspire	
Crestron Electronics	201-767-3400	CresLite™ Lighting System	CresLite™ Lighting System	
Digital Lighting Systems	305-969-8442	Protocol	Protocol	
DimOnOff	418-682-3636	Distributed Lighting Controls	Distributed Lighting Controls	
Douglas Lighting Controls	604-873-2797	MC6000, Dilor ALC3, WPC, WPN, WBC, WSP	MC6000, Dilor ALC3, ALC-DCM-12	
Eaton	877-386-2273	POW-R-Command System		
ETC (Electronic Theatre Controls)	608-831-4116	Unison Paradigm, Unison DRd, SmartLink	Unison Paradigm, Unison DRd, SmartPack, Sensor, SmartLink	Unison Paradigm, Unison DRd, SmartLink
Electronics Diversified, Inc.	503-645-5533	MVP System, Versa-Pak System, Mark 10 System Rack	MVP System, Versa-Pak System, Mark 10 System Rack	
Encelium	888-ENCELIUM	Encelium ECS Control System, DSC-500, MYC-RS-500		
Entertainment Technologies	800-223-9477	Tap Glide, IPS, Capio Plus, Oasis	Intelli Set Plus, Tap Glide, U-Set, IPS, Capio Plus	
Exergy	562-981-2127			XRG-200, XRG-300, XRG-400, XRG-1000
Hubbell Building Automation	888-698-3242	DLC-7, OMNI, Light Owl, Light Hawk, UVPP	OMNI, Light Owl, Light Hawk, WASP High Bay Sensor, LX Networked Lighting Controls, UVPP	
Hunt Dimming	970-484-9048	PS, FD and SSD Simplicity Series	PS, SC, FD and SSD Simplicity Series	PS Series
Intelligent Lighting Controls	800-922-8004	Light Master		
Johnson Controls	414-274-4000	Application Specific		
Leax Controls	970-927-4845	Consult Factory	Consult Factory	
Legrand/Pass and Seymour	315-468-6211	Slide-to-Off Titan, Preset Titan	Scene Director, Harmony, Slide-to-Off Titan, Preset Titan, LightSense	
Lehigh Electric Products Co.	610-395-3386	Sentry, Solitaire, DX2, Sunburst, ALX and DX with DCFL Interface	Solitaire, DX2, SlimDim Sunburst, ALX and DX with ACFL Interface	
Leprecon	810-231-9546		VX Series, MX Series, Lightscape	

The listed manufacturers have indicated that they manufacture products that are compatible with the Philips Advance Mark 7 *0-10V* electronic dimming ballasts, Philips Advance Mark 10 *Powerline* electronic dimming ballasts, or Philips Advance ROVR digital addressable ballasts. Philips Lighting Electronics provides this list as a service to our customers and control manufacturers. Philips Lighting Electronics does not support or recommend one manufacturer over another. Please refer to each manufacturer's catalog for a complete product description and performance specifications.

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Control Manufacturers who have products compatible with Philips Advance Mark 7 *0-10V* Electronic Dimming Ballasts, Mark 10 *Powerline* Electronic Dimming Ballasts and ROVR Digital Addressable Ballasts as of February 2010

For a more detailed listing please visit http://www.advance.philips.com/documents/uploads/literature/EL-2100-AB-R03.pdf

MANUFACTURER	PHONE	MARK 7 *0-10V* (4-Wire Low Voltage)	MARK 10 *Powerline* (2-Wire Line Voltage)	ROVR (DALI)
Leviton Lighting Control Div.	800-824-3005	Centura, Wallbox: IllumaTech, PE300-D (Slave Pack). Occupancy Sensors: Multi-Tech, Wide View, High Bay, Ultrasonic. Systems: a-2000, MDS, D3200 MiniZ Daylight Control System MZD Series, Power Extenders PE Series, Z-MAX Relay System	Wallbox Dimmers: Monet, Renoir, Mural, TouchPoint, IllumaTech, SureSlide. Occupancy Sensors: Multi-Tech, Wide View, High Bay, Ultrasonic, PIR. Systems: a-2000, I series e, MDS, Power Master Station, Dimensions D3200, Power Extenders PE Series, Z-MAX Relay System	CD100 CD250
Lighting Control and Design (an Acuity Brands Controls company)	323-226-0000	GR4000	GR4000	
Lightolier Controls	800-526-2731	Sunrise Preset, Momentum Preset, Vega Slider, Lytemode module	MultiSet Pro, Sunrise Preset, Momentum Preset, Onset, Vega Slider, Lytemode module	
Lutron	800-523-9466	See www.lutron.com/advance	See www.lutron.com/advance	
Marlin Controls	800-788-5750	HERCULES, MATRIX, SMP, MXI, MXII, MXIV, EFD, Stellar	Starbright Dimming System, HERCULES, MATRIX, SMP, MXI, MXII, MXIV, Stellar	Stellar
NexLight	218-828-3700	WR, WRT, Glacier Series 5600	WR, WRT	EZ-DALI
Novar Controls	216-682-1600	FDI (Fluorescent Dimming Interface)		
Payne Sparkman Mfg., Inc.	812-944-4893	LTRD/4W Series	LTRD/2W Series	
PDM Electrical Products	514-342-6581	MC6000, Dilor ALC3, WPC, WPN, WBC, WSP	MC6000, Dilor ALC3 , ALC-DCM-12	
PLC Multipoint	425-353-7552	EDSAB and RCD Dial	EDSPR	
Philips Dynalite	800-372-3331	Dynet Load Controller	Dynet Load Controller	Dynet Load Controller
Philips Teletrol	603-645-6061	eBuilding	eBuilding	eBuilding
Sensor Switch, Inc. (an Acuity Brands Controls company)	800-727-7483	WV16/WVR16, WVPDT16/WVR, CM9/CMR9, CMPDT9/CMRPDT9, CM10/CMR10, CMPDT10/CMRPDT10, CMRB6, WSD/WSDPDT, CMADC, nLight Control System	WV16/WVR16, WVPDT16/WVR, CM9/CMR9, CMPDT9/CMRPDT9, CM10/CMR10, CMPDT10/CMRPDT10, CMRB6	
Starfield Controls	303-427-1661	TR217, CoreNet Digital Lighting Control System		TR217, CoreNet Digital Lighting Control System,
Sterner Controls	320-543-3595	BPM-SFL, BPM-DFL series	BPM-SN, BPM-DN series	
Strand Lighting	714-230-8200	Vision.net, Light Palette, A21 Dimming Series	Vision.net, Light Palette, Environ3 C21 Dimming Series (120V), A21 Dimming Series (120/277V)	
Synergy Lighting Controls (an Acuity Brands Controls company)	800-533-2719	Synergy, Sequel, ISD	DSD, Synergy, Sequel, ISD	Synergy
Touch-Plate Lighting	260-426-1565	CPD-8000D & MCP Series	MCD-4000 & CPD-4000	
Vantage Lighting Control	801-229-2800	SD4008-120, SD9008-277, LVOS	SD4008-120, SD9008-277, Scenepoint, Radiolink Scenepoint, Powerstation 110V, Powerstation 277V	
Watt Stopper, Inc.	408-988-5331	LS, IRT, W, WT, CI, CX, DT, IRC, LIGHTSAVER, PW,UW,DW,TS, CB,UT	WD 170, WD 180, WD270, and WD 280	ezDALI

The listed manufacturers have indicated that they manufacture products that are compatible with the Philips Advance Mark 7 *0-10V* electronic dimming ballasts, Philips Advance Mark 10 *Powerline* electronic dimming ballasts, or Philips Advance ROVR digital addressable ballasts. Philips Lighting Electronics provides this list as a service to our customers and control manufacturers. Philips Lighting Electronics does not support or recommend one manufacturer over another. Please refer to each manufacturer's catalog for a complete product description and performance specifications.

Mark III®

ELECTROMAGNETIC FLUORESCENT BALLASTS

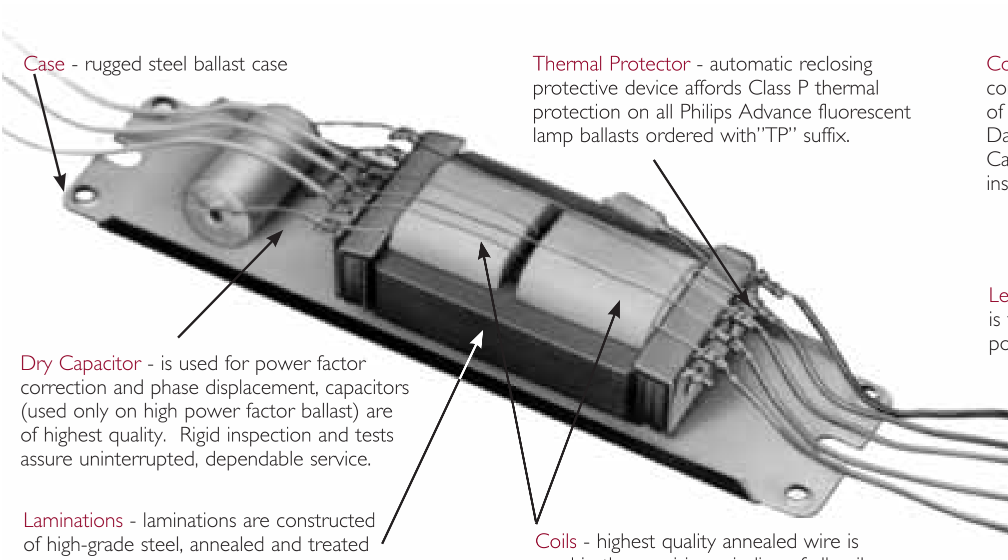
Contents

Corporate Offices
(800) 322-2086

Customer Support/Technical Service
(800) 372-3331 • (+) 1 847 390-5000 (International)

Visit our web site at www.philips.com/advance

ELECTROMAGNETIC FLUORESCENT BALLASTS



Case - rugged steel ballast case

Thermal Protector - automatic reclosing protective device affords Class P thermal protection on all Philips Advance fluorescent lamp ballasts ordered with"TP" suffix.

Compound - special thermal-pliable compound containing a high percentage of silica allows for rapid heat conductivity. Dampens vibration and ballast hum. Careful filling excludes moisture, increases insulation resistance.

Lead Wire - PVC covered solid lead wire is firmly anchored to the coils to facilitate positive and permanent connections.

Dry Capacitor - is used for power factor correction and phase displacement, capacitors (used only on high power factor ballast) are of highest quality. Rigid inspection and tests assure uninterrupted, dependable service.

Laminations - laminations are constructed of high-grade steel, annealed and treated to assure lowest wattage losses. They are precision stamped with carbide steel dies for positive, tight stacking to provide consistent electrical characteristics.

Coils - highest quality annealed wire is used in the precision winding of all coils. Uniform, firmly wound coils assure consistent operating characteristics. Complete core & coil assembly is vacuum impregnated with an exclusive Philips Advance asphalt-wax impregnant.

Supply Voltage and Frequency

Each ballast is designed to operate at the nominal voltage shown on the Philips Advance ballast label. Abnormal deviation from these values will result in damage to either the ballast or lamp or both. It is therefore necessary that the voltage applied to ballasts be maintained within the respective limits shown in the adjoining table.

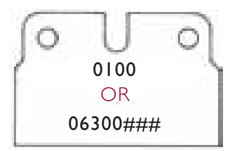
A ballast subjected to higher than nominal voltages will operate at increased temperatures. This will result in reduced ballast life. Low voltage can cause premature lamp failures as well as unreliable lamp starting.

All ballasts are designed for single frequency operation. Therefore, best results will be obtained when that ballast is used on the frequency shown on the ballast label. Frequency limitations are as follows:

Nominal	Frequency Limits
60HZ	57.5 to 62.5
50HZ	47.5 to 52.5

Prefix Code Letters	Normal Voltage	Applied Voltage Limits	Color Label Identification
H	120	112-127	Yellow
R	120	112-127	Yellow
L	120	112-127	Yellow
S	120	112-127	Yellow
X	220	210-230	Green
M	220/250	210-230 / 235-260	–
Y	240	225-250	Orange
V	277	255-290	Red
G	347	322-365	Gray

Ballast Date Codes



Philips Advance electromagnetic fluorescent lamp ballasts are date stamped on the ballast cover to designate month and year of manufacture. The month is indicated first, followed by the year. In the example shown 0100, the manufacturing date is January, 2000. In 2006 a new date stamp was implemented. The year is indicated first, followed by the calendar day of year and closes with an internal number (06 300 ###). For warranty information go to www.philips.com/advancewarranty.

See catalog table of contents for important change Certifications

Indicates ballast is listed with Underwriters Laboratories, Inc. and complies with UL935 Standard for Fluorescent -Lamp Ballasts (File No. E14927).

U.L. RECOGNIZED

Indicates ballast is component recognized with UL. and complies with UL935 Standard for Fluorescent -Lamp Ballasts (File No. E14927).

Visit www.ul.com to find a current listing of Philips Advance ballasts under File No. E14927.

Indicates ballast is certified by Canadian Standards Association and complies with CSA-22.2 File No. 74for Fluorescent-Lamp Ballasts (File No. 007310).

Visit www.csa.ca to find a current listing of Philips Advance ballasts under File No. 007310

Indicates ballast complies with U.S. Energy Standards.

Indicates ballast complies with Canadian Energy Standards.

Philips Advance fluorescent ballasts are designed and manufactured in accordance with the American National Standards Institute standard for fluorescent ballasts, ANSI C82.1.

ELECTROMAGNETIC FLUORESCENT BALLASTS

Class P Ballasts

Section 410-73(e) of the National Electrical Code (NEC) requires that all indoor fluorescent fixtures shall incorporate ballast protection. Those fixtures employing a simple reactive type ballast are exempted.

The protector is located within the ballast case to prevent physical damage and tampering.

Philips Advance electromagnetic ballasts ordered with Class P ballast protection (TP suffix) are equipped with a thermally actuated automatic reclosing protective device. This revolutionary development was originally designed and introduced by Philips Lighting Electronics, and today this Class P device is a requirement of the National Electrical Code in all indoor lighting installations.

Safety

The National Electrical Code requires grounding of fluorescent fixtures. The fluorescent ballast case must be grounded either to the fluorescent fixture or, if remote mounted, by other means such as a wire from the ballast case to ground. Without proper fixture and ballast grounding, a shock hazard may exist due to the fluorescent fixture becoming energized by an internal ballast failure to case. Also, all ballasts have normal leakage current. When the ballast is properly grounded, the leakage current does not constitute a hazard.

Starting

The metal of a fluorescent fixture is a starting aid when properly grounded. T12 fluorescent lamps rated at 40W or less used for rapid or trigger start operation must be mounted within 1/2" of a grounded metal surface. T8 lamps must be mounted within 3/4" of a grounded metal surface. All other lamps must be mounted within 1" of a grounded metal surface.

An important additional factor for proper lamps starting is polarity. The white ballast lead must be connected to the ground of the power supply (neutral) and the black lead to the hot line wire. A reversal of polarity may result in lamp damage or improper lamp starting.

Cold Weather Operation

Lumen ratings of fluorescent lamps apply for operation in still air at a temperature of 77°F. While many fluorescent lamps and fluorescent lamp ballasts are designed to give their best performance at 77°F, they will provide reasonably good light output down to 50°F. Further decreases in ambient temperature will result in decreased light output.

Variables such as humidity, line voltage, fixture design and variations within the particular design of the lamp and the fluorescent lamp ballast play an important part in determining the low temperature starting limit.

These are the two considerations for low temperature application:

1. Starting of the lamps

   Low temperatures change the electrical starting characteristics of a fluorescent lamp. As the fluorescent lamp becomes colder, it becomes more difficult to start. Therefore, a fluorescent ballast must have a higher starting voltage. Ballasts designed for low temperature use ensure reliable starting only and not the light output.

2. Operating the Lamps

   The light output of any fluorescent lamp depends on the mercury vapor pressure within the lamp. Maximum light output for most fluorescent lamps occurs when the bulb temperature is about 100°F. As bulb wall temperature goes above 100°F the mercury vapor pressure within the tube increases and the light output decreases.

   Interestingly enough, at lower bulb-wall temperatures, the mercury condenses on the tube, pressure drops and the light output again decreases. This is inherent in all fluorescent lamps. In order to prevent reduction in light output at low temperatures the lamp should be enclosed so it has a chance to overcome the low bulb-wall temperature by the heat generated by the lamp.

In general, outdoor lighting installations have tended toward 800 and 1500mA lamps since the additional heat generated by these lamps will provide better illumination in cold weather than can be obtained with 430mA lamps.
The 430mA lamps are not recommended by the lamp manufacturer for starting conditions below 0°F. Above this temperature, shielding is required to a greater degree than with the more heavily loaded lamps. Special low temperature lamps, which may be purchased with shields, are available for 1500mA operation.

ELECTROMAGNETIC FLUORESCENT BALLASTS

Ballast Sound

The slight hum present in fluorescent lighting installations originates from the inherent magnetic action in the core & coil assembly of the ballasts. This hum may be amplified by the method of mounting the ballast in the fixture...the fixture design...and, more often than not, this hum is amplified by the resonant qualities of the ceiling, walls, floors and furniture. In planning a lighting installation, careful consideration must be given to the selection of the fluorescent lamp ballast, the lighting fixture and room components. These precautions will helped to achieve the quietest installation possible.

The choice of fluorescent lamp ballast should be made on the basis of selecting the one rated quietest for a specific location or interior as some ballast have a more discernable hum due to basic construction features and electrical ratings.

Sound Ratings

For Any Installation in:	Average Ambient Noise Level Of Interior	Sound Level Rating*
TV or Radio Station, Library, Reception or Reading Room, Church, School Study Hall	20-24 Decibels	A
Residence, Quiet Office, Night School Classroom	25-30 Decibels	B
General Office Area, Commercial Building, Storeroom	31-36 Decibels	C
Manufacturing Facility, Retail Store,Noisy Office	37-42 Decibels	D

*These sound ratings are based on measurements of Average Ambient noise levels during conditions of normal occupancy. Audible ballast hum may appear amplified during exceptionally quiet periods and at times when area is unoccupied.

Temperature and Ventilation

Underwriters' Laboratories, Inc. stipulates that the temperature limitation of a fluorescent lamp ballast using Class A insulation at normal operation should have a maximum ballast coil temperature of 105°C (221°F) and maximum ballast case temperature of 90°C (194°F) at its hottest spot. Ballast life will be reduced if it is operated at a temperature above these limits.

A fluorescent lamp ballast, like other electrical equipment, generates heat during normal operation. If not maintained within prescribed limits, this heat will become the primary cause of reduced ballast life. Heat generated in the conventional ballast is transferred to the case through a silica compound which totally surrounds the internal components and is then dissipated to the surrounding air or mounting surface by conduction, convection or radiation.

It is therefore essential that a ballast which is placed in an enclosure be suitably ventilated. Where more than one ballast is installed in an enclosure, the ballast should be positioned far enough apart to provide adequate heat dissipation.

To assist in limiting the temperature rise of ballasts, the following procedures are recommended:

- **Mount ballast with maximum number of sides in direct contact with the metal channel of fixture. Radiators are an excellent way of dissipating heat.**
- **Provide fixture ventilation.**
- **Paint the unpainted fixture channels with a non-metallic finish to increase radiation.**
- **Place ballast in a cooler location outside the fixture.**
- **Place fixture to attain maximum dissipation of heat by conduction, convection or radiation.**

Ballast Type

Standard Magnetic – Electromagnetic core & coil construction continues to provide reliable service and economy over a wide variety of lighting system applications. Operates lamps at 60 Hz.

Mark III® – Energy-saving electromagnetic ballast designed to provide 10% energy savings over corresponding standard magnetic units while maintaining equivalent full light output. Operates lamps at 60 Hz. (e.g. RQM-2S40-TP vs R-2S40-TP).

E-PAK® – Energy-saving electromagnetic ballast specifically optimized for energy saving lamps to provide 17% energy savings over corresponding standard magnetic units while maintaining equivalent light output. Operates lamps at 60 Hz (e.g. RQM-2S40-TP vs R-2S34-TP).

The Federal Ballast Law prohibits the manufacture of the following ballasts starting on July 1, 2010	
R-140-TP	V-140-TP
R-2S34-TP	V-2S34-TP
R-2S40-TP	V-2S40-TP
R-2E60-S-TP	V-2E60-S-TP
R-2E75-S-TP	V-2E-75-S-TP

See pages 1-66 to 1-68 for electronic replacement ballasts

Straight & U-Shaped

HIGH POWER FACTOR SOUND RATED A

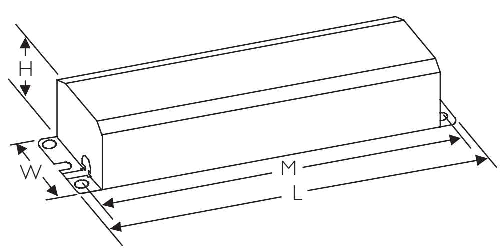
Rapid Start Lamps

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications (4th mark)	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F32T8, FBO32T8, F32T8/U (265mA)															
1	32	50	120	R-1P32-TP Mark III	✓	✓			0.32	35	0.95	<15	0.91	T-2	20
			277	V-1P32-TP Mark III	✓	✓			0.16	41	0.98	<15	0.93		
2	32	50	120	R-2P32-TP Mark III	✓	✓		✓	0.61	71	0.99	<10	0.97	T-2	21
			277	V-2P32-TP Mark III	✓	✓		✓	0.29	76	0.95	<10	0.95		
F25T12 (455mA)															
2	25	60	120	RM-2SP30-TP	✓	✓			0.58	70	0.90	<10	0.99	T-2	21
F30T12 (430mA)															
1	30	50	120	RL-140-TP ❇❖	✓	✓			0.60	33	0.71	<10	0.46	R-4	16
2	30	50	120	RM-2SP30-TP	✓	✓			0.66	79	0.97	<10	0.99	T-2	21

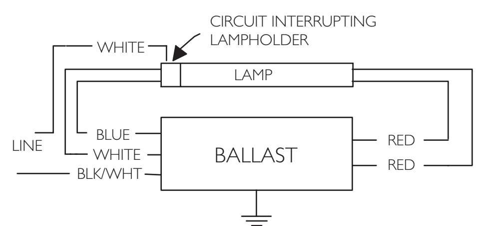
❇ Normal Power Factor
❖ Requires Circuit-Interrupting Lamp Holders
+ Mounting dimensions refer to slots only

DIMENSIONS

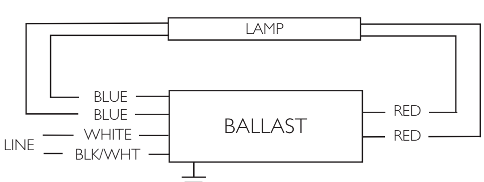
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
T-2	9½	$2\frac{3}{8}$	1½	$8\frac{29}{32}$
R-4	6½	$1\frac{15}{16}$	$1\frac{3}{8}$	6+



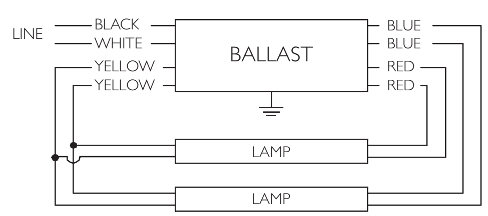
Case T



Diag. 16



Diag. 20



Diag. 21

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Straight & U-Shaped

HIGH POWER FACTOR   SOUND RATED A

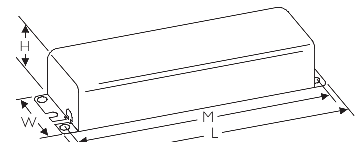
Rapid Start Lamps

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F34T12 (430mA)															
1	34	60	120	R-140-TP Mark III [R]	✓	✓	✓	✓	0.38	43	0.88	<15	0.94	T-2	20
			277	V-140-TP Mark III [R]	✓	✓	✓	✓	0.16	43	0.88	<10	0.94		
2	34	60	120	RM-2S35-TP ✪ ❇	✓				0.61	60	0.66	<20	0.82	T-2	21
				R-2S34-TP E-PAK [R]	✓	✓	✓	✓	0.57	68	0.87	<15	0.99		
				R-2S40-TP Mark III [R]	✓	✓	✓	✓	0.63	72	0.88	<15	0.95		
			277	V-2S34-TP E-PAK [R]	✓	✓	✓	✓	0.25	68	0.87	<15	0.98		
				V-2S40-TP Mark III [R]	✓	✓	✓	✓	0.27	72	0.88	<20	0.96		
4	34	60	120	R-4S40-A-TP-AC Mark III	✓	✓	✓	✓	1.26	144	0.88	<20	0/95	D-2	25
F40T12 (430mA)															
1	40	50	120	R-140-TP Mark III [R]	✓	✓	✓	✓	0.43	50	0.95	<10	0.97	T-2	20
				RL-140-TP ✪ ❖ ❇	✓	✓			0.53	32	0.63	<15	0.50	R-4	16
			277	V-140-TP Mark III [R]	✓	✓	✓	✓	0.19	50	0.95	<10	0.95	T-2	20
2	40	50	120	RM-2S35-TP ✪ ❇	✓				0.72	70	0.68	<20	0.81	T-2	21
				R-2S34-TP E-Pak [R]	✓	✓	✓	✓	0.67	79	0.86	<15	0.98		
				R-2S40-TP Mark III [R]	✓	✓	✓	✓	0.73	86	0.95	<15	0.98		
			277	V-2S34-TP E-Pak [R]	✓	✓	✓	✓	0.30	79	0.86	<15	0.95		
				V-2S40-TP Mark III [R]	✓	✓	✓	✓	0.32	86	0.95	<20	0.97		
4	40	50	120	R-4S40-A-TP-AC Mark III	✓	✓	✓	✓	1.46	172	0.95	<20	0.98	D-2	25

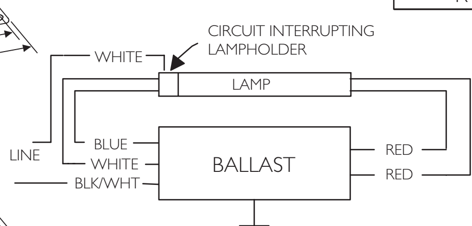
Note: 2-Lamp Ballasts will also operate U-Shaped Lamps
❇ Normal Power Factor
✪ For Residential Use Only
❖ Requires Circuit-Interrupting Lamp Holders
R For Replacement Use Only - not available after July 1, 2010
+ Mounting dimensions refer to slots only

DIMENSIONS

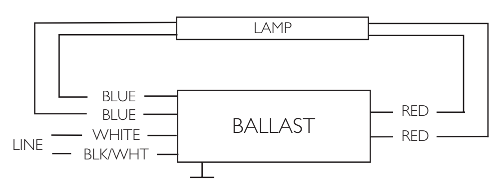
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
D-2	17	$2^3/_8$	1½	$16^5/_{16}$
T-2	9½	$2^3/_8$	1½	$8^{29}/_{32}$
R-4	6½	$1^{15}/_{16}$	$1^3/_8$	6+



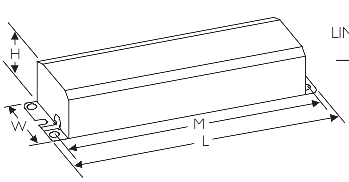
Case R



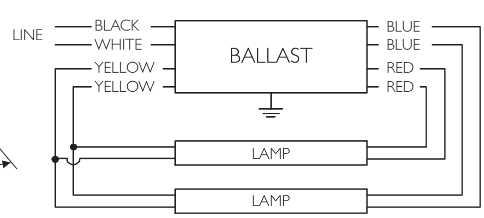
Diag. 16



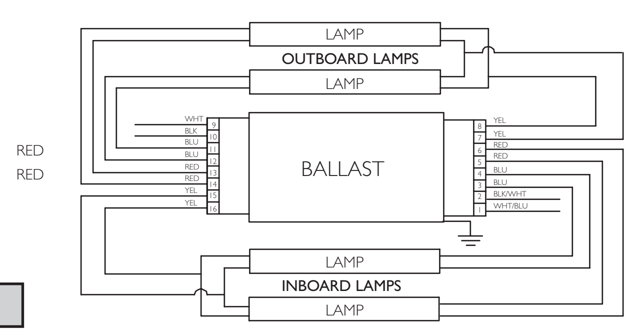
Diag. 20



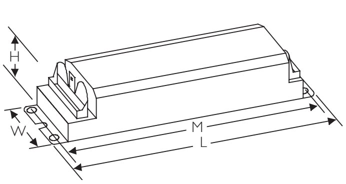
Case T



Diag. 21



Diag. 25



Case D2

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

High Output

HIGH POWER FACTOR   SOUND RATED C

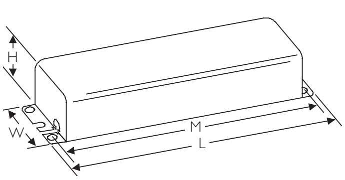
Rapid Start Lamps

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Cert. UL	Cert. CSA	Cert. E	Cert.	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F24T12/HO (800mA)															
1	35	-20	120	RS-110-TP ●	✓	✓			0.58	63	0.93	<50	0.90	R-9	20
			277	VS-110-TP ●	✓	✓			0.30	66	0.93	<50	0.80		
2	35	-20	120	RC-2S85-TP	✓	✓			1.01	95	0.80	<45	0.78	R-9	21
			277	VC-2S85-TP	✓	✓			0.48	94	0.80	<50	0.71		21
3	35	-20	120	RC-4S60-TP ■	✓	✓			1.60	148	0.94	<35	0.77	R-9	8
4	35	-20	120	RC-4S60-TP ■	✓	✓			1.80	183	1.00	<30	0.85	R-9	13
F30T12/HO (800mA)															
1	50	-20	120	RS-110-TP ●	✓	✓			0.61	67	0.93	<45	0.91	R-9	20
			277	VS-110-TP ●	✓	✓			0.30	70	0.93	<45	0.84		
2	50	-20	120	RC-2S85-TP	✓	✓			0.96	98	0.80	<35	0.85	R-9	21
			277	VC-2S85-TP	✓	✓			0.45	96	0.80	<35	0.77		
F36T12/HO (800mA)															
1	50	-20	120	RS-110-TP ●	✓	✓			0.62	71	0.94	<40	0.95	R-9	20
			277	VS-110-TP ●	✓	✓			0.31	74	0.94	<45	0.86		
2	50	-20	120	RC-2S85-TP	✓	✓			1.00	107	0.82	<35	0.90	R-9	21
			277	VC-2S85-TP	✓	✓			0.47	105	0.82	<35	0.80		21
3	50	-20	120	RC-4S60-TP ■	✓	✓			1.60	166	0.93	<30	0.86	R-9	8
4	50	-20	120	RC-4S60-TP ■	✓	✓			1.90	212	0.98	<20	0.93	R-9	13

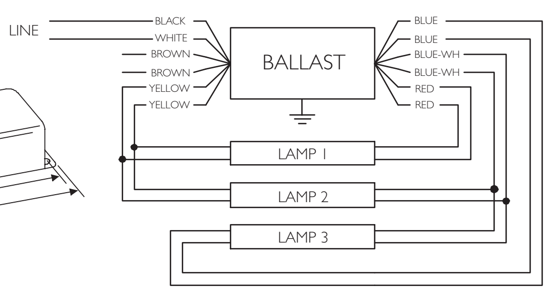
● Sound Rated B
■ Sound Rated D

DIMENSIONS

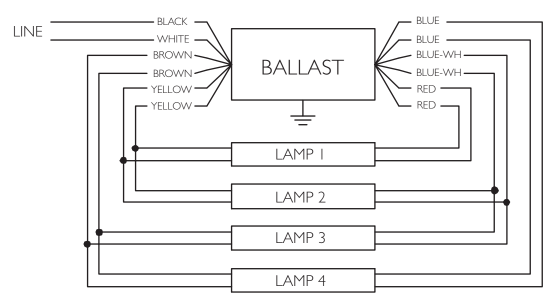
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11¾	3 3/16	2 5/8	11 9/64



Case R

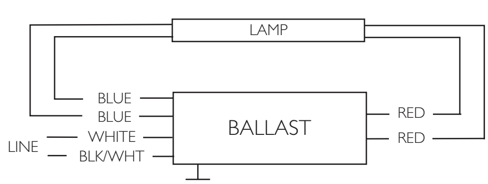


Diag. 8

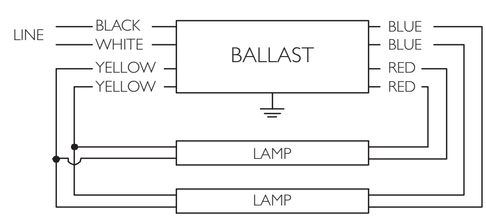


Diag. 13

Note: Insulate unused leads individually as shown on a ballast label



Diag. 20



Diag. 21

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

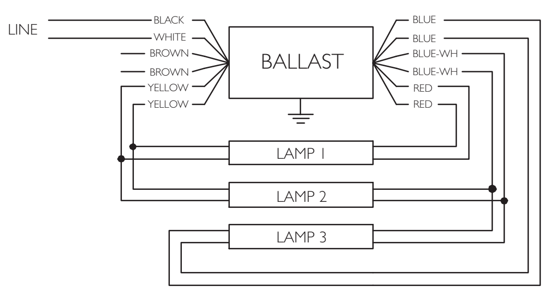
High Output

HIGH POWER FACTOR   SOUND RATED C

Rapid Start Lamps

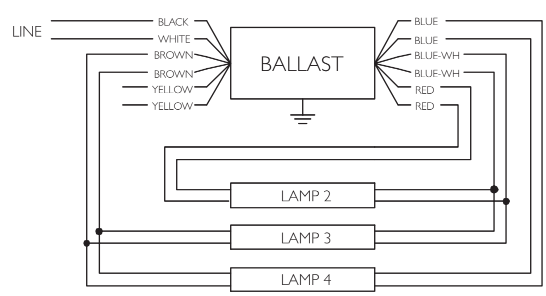
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F42T12/HO (800mA)															
1	55	-20	120	RS-110-TP ●	✓	✓			0.69	80	0.96	<40	0.97	R-9	20
			277	VS-110-TP ●	✓	✓			0.33	81	0.96	<40	0.88		
2	55	-20	120	RC-2S85-TP	✓	✓			1.12	126	0.85	<30	0.94	R-9	21
			277	VC-2S85-TP	✓	✓			0.51	124	0.85	<30	0.88		21
F48T12/HO (800mA)															
1	60	-20	120	RS-110-TP ●	✓	✓			0.72	84	0.94	<35	0.97	R-9	20
				RC-2S85-TP	✓	✓			0.91	79	0.78	<50	0.72		39
			277	VS-110-TP ●	✓	✓			0.34	86	0.96	<35	0.91		20
				VC-2S85-TP	✓	✓			0.46	80	0.78	<50	0.63		39
2	60	-20	120	RC-2S85-TP	✓	✓			1.16	133	0.85	<20	0.96	R-9	21
			277	VC-2S85-TP	✓	✓			0.53	131	0.85	<20	0.90		21
3	60	-20	120	RC-4S60-TP ■	✓	✓			1.90	217	0.92	<20	0.95	R-9	8
				RC-4S85-TP ■	✓	✓			1.70	190	0.86	<10	0.93	R-11	9
4	60	-20	120	RC-4S60-TP ■	✓	✓			2.40	288	0.92	<15	0.99	R-9	13
				RC-4S85-TP ■	✓	✓			1.99	237	0.81	<15	0.99	R-11	13

● Sound Rated B
■ Sound Rated D



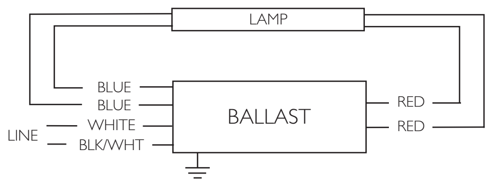
Diag. 8

Note: Insulate unused leads individually as shown on a ballast label

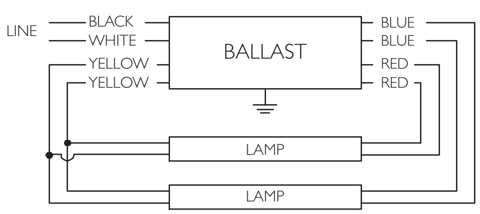


Diag. 9

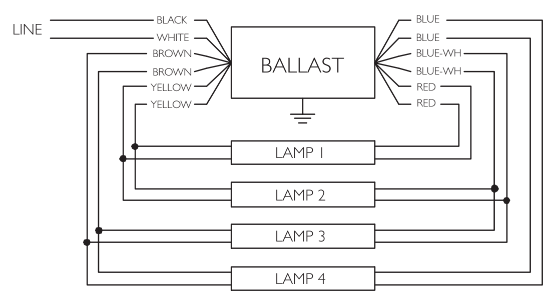
Note: Insulate unused leads individually as shown on a ballast label



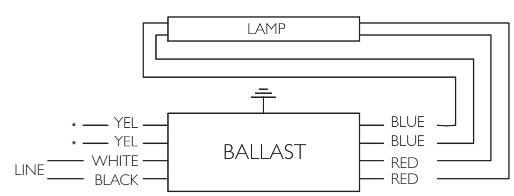
Diag. 20



Diag. 21



Diag. 13



Diag. 39

Note: For a single lamp, insulate yellow leads individually for 600V

Refer to pages 3-9 for ballast dimensions
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

High Output

HIGH POWER FACTOR   SOUND RATED C

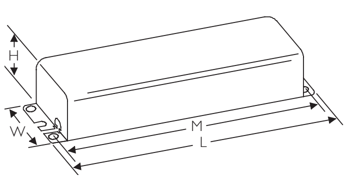
Rapid Start Lamps

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	CSA	E		Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F60T12/HO (800mA)															
1	75	-20	120	RS-110-TP ●	✓	✓			0.83	97	0.93	<35	0.97	R-9	20
				RC-2S85-TP	✓	✓			0.94	90	0.77	<40	0.80		39
			277	VS-110-TP ●	✓	✓			0.38	98	0.96	<35	0.93		20
				VC-2S85-TP	✓	✓			0.48	87	0.80	<40	0.66		39
2	75	-20	120	RC-2S85-TP	✓	✓			1.50	178	0.90	<15	0.99	R-9	21
			277	VC-2S85-TP	✓	✓			0.65	170	0.86	<20	0.94		21
3	75	-20	120	RC-4S85-TP ■	✓	✓			1.90	223	0.83	<20	0.98	R-11	9
4	75	-20	120	RC-4S85-TP ■	✓	✓			2.35	278	0.80	<15	0.99	R-11	13
F64T12/HO (800mA)															
1	80	-20	120	RS-110-TP ●	✓	✓			0.88	104	0.96	<35	0.98	R-9	20
				RC-2S85-TP	✓	✓			0.94	90	0.77	<40	0.80		39
			277	VS-110-TP ●	✓	✓			0.42	106	0.96	<35	0.91		20
				VC-2S85-TP	✓	✓			0.47	95	0.78	<40	0.73		39
2	80	-20	120	RC-2S85-TP	✓	✓			1.50	178	0.90	<15	0.99	R-9	21
			277	VC-2S85-TP	✓	✓			0.65	170	0.86	<20	0.94		21
3	80	-20	120	RC-4S85-TP ■	✓	✓			2.09	246	0.84	<15	0.98	R-11	9
4	80	-20	120	RC-4S85-TP ■	✓	✓			2.64	312	0.78	<10	0.98	R-11	13

● Sound Rated B
■ Sound Rated D

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11¾	3 3/16	2 5/8	11 9/64
R-11	14 5/16	3 3/16	2 5/8	13¾



Case R

Refer to pages 3-8 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

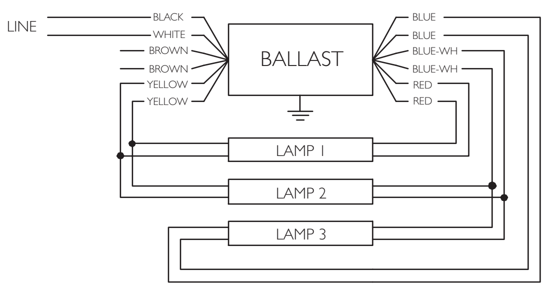
High Output

HIGH POWER FACTOR SOUND RATED C

Rapid Start Lamps

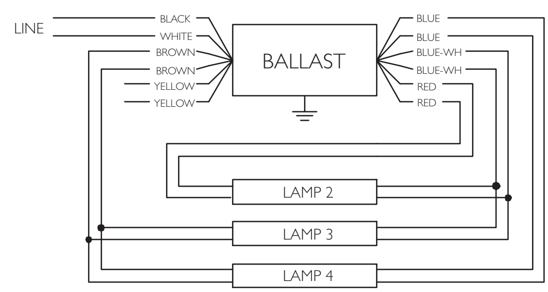
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	UL	CSA	E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F72T12/HO (800mA)															
1	85	-20	120	RC-2S85-TP	✓	✓			0.98	100	0.82	<35	0.85	R-9	39
				RS-110-TP ●	✓	✓			0.96	113	0.98	<30	0.98		20
			277	VC-2S85-TP	✓	✓			0.47	99	0.81	<35	0.76		39
				VS-110-TP ●	✓	✓			0.44	116	0.99	<30	0.95		20
2	85	-20	120	RC-2S85-TP	✓	✓			1.54	184	0.91	<15	0.99	R-9	21
				R-2S110-TP Mark III	✓	✓			1.60	193	0.95	<15	0.99		
			277	VC-2S85-TP	✓	✓			0.67	180	0.90	<20	0.97		
				V-2S110-TP Mark III	✓	✓			0.75	201	0.98	<20	0.97		
			347	G-2S110-TP Mark III		✓			0.57	193	0.94	<20	0.98		
3	85	-20	120	RC-4S60-TP ■	✓	✓			2.40	291	0.90	<15	0.99	R-9	8
				RC-4S85-TP ■	✓	✓			2.17	256	0.81	<15	0.98	R-11	9
4	85	-20	120	RC-4S85-TP ■	✓	✓			2.73	323	0.75	<10	0.99	R-11	13
F84T12/HO (800mA)															
1	100	-20	120	RC-2S85-TP	✓	✓			1.03	113	0.83	<30	0.91	R-9	39
			277	VC-2S85-TP	✓	✓			0.47	104	0.81	<35	0.80		
2	100	50	120	RC-2S85-TP	✓	✓			1.76	209	0.90	<15	0.99	R-9	21
			277	VC-2S85-TP	✓	✓			0.73	198	0.89	<20	0.98		

● Sound Rated B
■ Sound Rated D



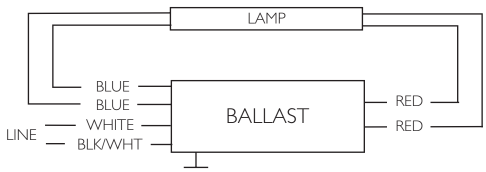
Diag. 8

Note: Insulate unused leads individually as shown on a ballast label

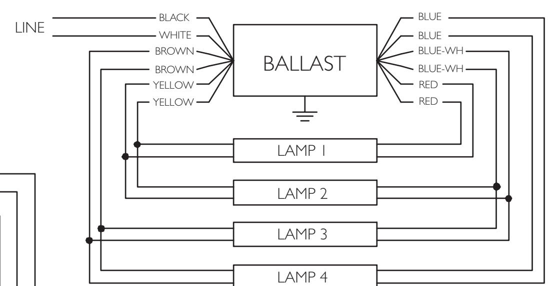


Diag. 9

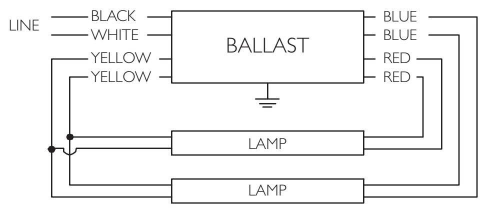
Note: Insulate unused leads individually as shown on a ballast label



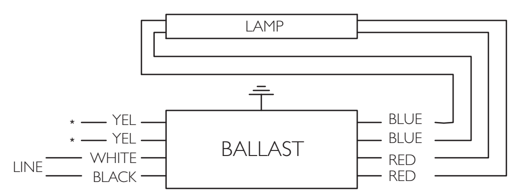
Diag. 20



Diag. 13



Diag. 21



Diag. 39

Note: For a single lamp, insulate yellow leads individually for 600V

Refer to pages 3-11 for dimensions
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

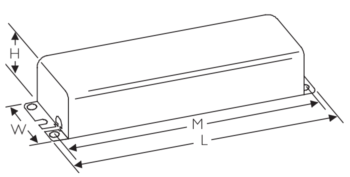
High Output

HIGH POWER FACTOR SOUND RATED C

Rapid Start Lamps

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F96T12/HO Energy Saver (840mA)															
1	95	60	120	RS-110-TP ●	✓	✓			1.00	121	0.94	<35	0.99	R-9	20
			277	VS-110-TP ●	✓	✓			0.47	125	0.95	<35	0.96		
2	95	60	120	R-2S110-TP Mark III	✓	✓	✓	✓	1.70	203	0.91	<20	0.99	R-9	21
			277	V-2S110-TP Mark III	✓	✓	✓	✓	0.79	210	0.93	<25	0.96		
F96T12/HO (800mA)															
1	110	-20	120	RC-2S85-TP	✓	✓			1.07	121	0.84	<25	0.94	R-9	39
				RS-110-TP ●	✓	✓			1.20	140	0.98	<35	0.97		20
			277	VC-2S85-TP	✓	✓			0.48	114	0.83	<30	0.85		39
				VS-110-TP ●	✓	✓			0.54	145	1.00	<30	0.97		20
2	110	-20	120	R-2S110-TP Mark III	✓	✓	✓	✓	2.00	237	0.95	<15	0.99	R-9	21
			277	V-2S110-TP Mark III	✓	✓	✓	✓	0.90	245	0.98	<20	0.98		
3	110	-20	120	RC-4S85-TP ■	✓	✓			2.50	292	0.75	<15	0.97	R-11	9

● Sound Rated B
■ Sound Rated D



Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11¾	$3\frac{3}{16}$	$2\frac{5}{8}$	$11\frac{9}{64}$
R-11	$14\frac{5}{16}$	$3\frac{3}{16}$	$2\frac{5}{8}$	13¾

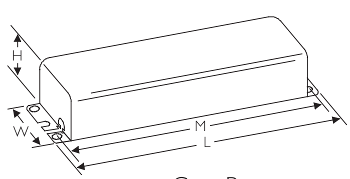
Refer to pages 3-10 for wiring diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Very High Output

HIGH POWER FACTOR   SOUND RATED D

VHO & Powergroove Rapid Start Lamps

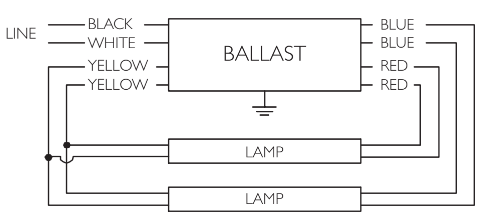
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F48T10/VHO (1500mA), F48T12/VHO (1500mA), F48PG17/VHO (1500mA)															
1	116	-20	120	RC-2S102-TP	✓	✓			1.70	130	0.87	<30	0.64	R-11	39
			277	VC-2S102-TP	✓	✓			0.59	137	0.85	<35	0.84		
2	116	-20	120	RC-2S102-TP	✓	✓			2.20	230	0.89	<35	0.87	R-11	21
			277	VC-2S102-TP	✓	✓			0.94	241	0.87	<35	0.93		
F60T10/VHO (1500mA), F60T12/VHO (1500mA)															
1	138	-20	120	RC-2S102-TP	✓	✓			1.75	140	0.90	<30	0.67	R-11	39
			277	VC-2S102-TP	✓	✓			0.65	157	0.86	<35	0.87		
2	138	-20	120	RC-2S200-TP	✓	✓			2.34	241	0.90	<20	0.86	R-11	21
F72T10/VHO (1500mA), F72T12/VHO (1500mA), F72PG17/VHO (1500mA)															
1	168	-20	120	RC-2S102-TP	✓	✓			1.90	173	0.87	<30	0.76	R-11	39
			277	VC-2S102-TP	✓	✓			0.69	168	0.87	<35	0.88		
2	168	-20	120	RC-2S200-TP	✓	✓			2.51	270	0.89	<20	0.90	R-11	21
				RS-2S200-TP	✓	✓			2.90	314	0.85	<15	0.90		
			277	VS-2S200-TP	✓	✓			1.40	376	0.99	<15	0.97		



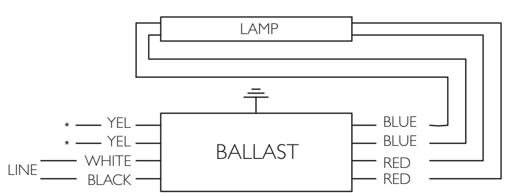
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-11	$14^{5}/_{16}$	$3^{3}/_{16}$	$2^{5}/_{8}$	13¾



Diag. 21



Diag. 39

Note: For a single lamp, insulate yellow leads individually for 600V

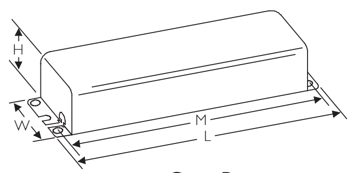
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Very High Output

HIGH POWER FACTOR   SOUND RATED D

VHO & Powergroove Rapid Start Lamps

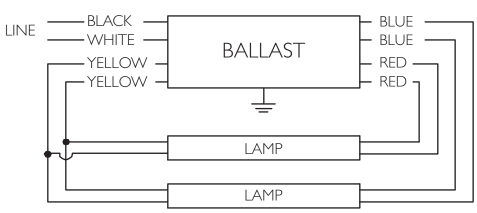
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	CSA	E		Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F96T12/VHO Energy Saver (1580mA), F96PG17/VHO Energy Saver (1580mA)															
1	185	60	120	RC-2S102-TP	✓	✓			2.00	198	0.87	<35	0.83	R-11	39
			277	VC-2S102-TP	✓	✓			0.73	190	0.83	<35	0.94		
2	185	60	120	RC-2S200-TP	✓	✓			2.67	304	0.85	<15	0.95	R-11	21
				RS-2S200-TP	✓	✓			2.95	320	0.80	<15	0.90		
			277	VS-2S200-TP	✓	✓			1.50	398	0.96	<15	0.96		
F96T10/VHO (1500mA), F96T12/VHO (1500mA), F96PG17/VHO (1500mA)															
1	215	0	120	RC-2S102-TP	✓	✓			2.10	213	0.87	<35	0.85	R-11	39
		-20		RC-2S200-TP	✓	✓			2.03	170	0.78	<25	0.70		
		0	277	VC-2S102-TP	✓	✓			0.89	216	0.88	<35	0.88		
2	215	-20	120	RC-2S200-TP	✓	✓			2.72	320	0.80	<15	0.98	R-11	21
				RS-2S200-TP	✓	✓			3.31	358	0.85	<10	0.90		
			277	VS-2S200-TP	✓	✓			1.65	442	0.90	<15	0.97		



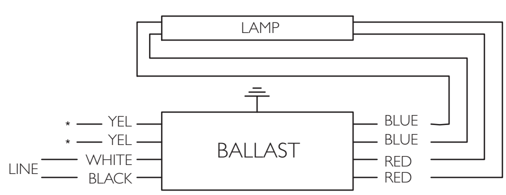
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-11	$14\frac{5}{16}$	$3\frac{3}{16}$	$2\frac{5}{8}$	$13\frac{3}{4}$



Diag. 21



Diag. 39

Note: For a single lamp, insulate yellow leads individually for 600V

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Slimline

HIGH POWER FACTOR   SOUND RATED C

Instant Start Lamps

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F24T12 (425mA)															
1	20	0	120	SM-140-S-TP	✓	✓			0.45	45	0.93	<35	0.90	R-8	10
2	20	0	120	SM-2E40-S-TP ●	✓	✓			0.68	65	0.99	<30	0.80	R-6	12
F36T12 (425mA)															
1	30	0	120	SM-140-S-TP	✓	✓			0.50	57	0.92	<35	0.95	R-8	10
2	30	0	120	SM-2E40-S-TP ●	✓	✓			0.73	83	0.97	<30	0.95	R-6	12
F42T12 (425mA)															
1	35	0	120	SM-140-S-TP	✓	✓			0.51	57	0.90	<35	0.93	R-8	10
2	35	0	120	SM-2E4O-S-TP ●	✓	✓			0.74	87	0.95	<25	0.98	R-6	12
			277	VSM-2E40-S-TP ●	✓	✓			0.34	91	0.93	<25	0.97	R-6	36
F48T12 (425mA)															
1	40	0	120	SM-140-S-TP	✓	✓			0.54	62	0.90	<30	0.96	R-8	10
2	40	0	120	SM-2E40-S-TP ●	✓	✓			0.82	96	0.90	<30	0.98	R-6	12
			277	VSM-2E40-S-TP ●	✓	✓			0.36	98	0.96	<25	0.98	R-6	36
F48T12/ES (440mA)															
2	30	60	120	SM-2E40-S-TP ●	✓	✓			0.72	80	0.90	<35	0.93	R-6	12
			277	VSM-2E40-S-TP ●	✓	✓			0.33	85	0.85	<30	0.93	R-6	36
F60T12 (425mA)															
1	50	0	120	RSM-175-S-TP	✓	✓			0.74	73	0.93	<50	0.90	R-6	10
			277	VSM-175-S-TP	✓	✓			0.31	72	0.93	<50	0.90		
2	50	0	120	R-2E75-S-TP Mark III [R]	✓	✓			1.03	111	0.94	<30	0.90	R-8	12
			277	V-2E75-S-TP Mark III [R]	✓	✓			0.47	118	0.93	<30	0.91		36
F64T12 (425mA)															
1	52	0	120	RSM-175-S-TP	✓	✓			0.72	74	0.94	<50	0.90	R-6	10
			277	VSM-175-S-TP	✓	✓			0.31	74	0.93	<50	0.90		
2	52	0	120	R-2E75-S-TP Mark III [R]	✓	✓			1.07	117	0.95	<30	0.91	R-8	12
			277	V-2E75-S-TP Mark III [R]	✓	✓			0.47	120	0.93	<30	0.92		36
F72T12 (425mA)															
1	57	0	120	RSM-175-S-TP	✓	✓			0.73	80	0.95	<35	0.91	R-6	10
			277	VSM-175-S-TP	✓	✓			0.32	81	0.94	<35	0.91		
2	57	0	120	R-2E75-S-TP Mark III [R]	✓	✓			1.18	132	0.94	<30	0.93	R-8	12
			277	V-2E75-S-TP Mark III [R]	✓	✓			0.51	132	0.94	<25	0.93		36
F84T12 (425mA)															
2	65	50	120	R-2E75-S-TP Mark III [R]	✓	✓			1.28	147	0.95	<30	0.96	R-8	12
			277	V-2E75-S-TP Mark III [R]	✓	✓			0.57	151	0.94	<25	0.96		36

● Sound Rated B

R For Replacement Use Only - not available after July 1, 2010

Refer to pages 3-15 for wiring diagrams and dimensions

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Slimline

HIGH POWER FACTOR SOUND RATED C

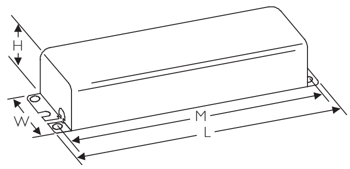
Instant Start Lamps

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F96T12 Energy Saver (440mA)															
1	60	60	120	RSM-175-S-TP	✓	✓			0.68	74	0.88	<35	0.91	R-6	10
			277	VSM-175-S-TP	✓	✓			0.30	76	0.88	<35	0.91		
2	60	60	120	R-2E60-S-TP E-Pak [R]	✓	✓	✓	✓	1.03	112	0.88	<35	0.91	R-8	12
				R-2E75-S-TP Mark III [R]	✓	✓	✓	✓	1.10	126	0.88	<35	0.95		
			277	V-2E60-S-TP E-Pak [R]	✓	✓	✓	✓	0.44	112	0.88	<35	0.92		36
				V-2E75-S-TP Mark III [R]	✓	✓	✓	✓	0.47	126	0.88	<25	0.97		
F96T12 (425mA)															
1	75	0	120	RSM-175-S-TP	✓	✓			0.82	92	0.94	<25	0.93	R-6	10
			277	VSM-175-S-TP	✓	✓			0.35	94	0.94	<25	0.97		
2	75	50	120	R-2E60-S-TP E-Pak [R]	✓	✓	✓	✓	1.24	144	0.86	<30	0.98	R-8	12
				R-2E75-S-TP Mark III [R]	✓	✓	✓	✓	1.35	158	0.94	<30	0.98		
			277	V-2E60-S-TP E-Pak [R]	✓	✓	✓	✓	0.54	144	0.86	<30	0.96		36
				V-2E75-S-TP Mark III [R]	✓	✓	✓	✓	0.60	158	0.94	<25	0.95		

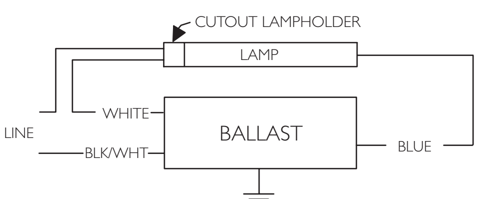
R For Replacement Use Only - not available after July 1, 2010

DIMENSIONS

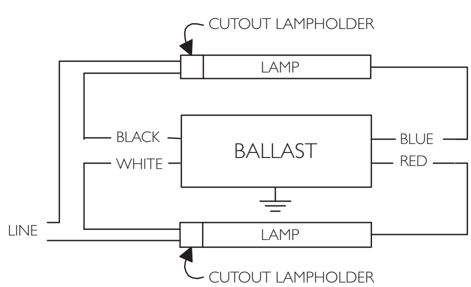
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-6	9½	$3\frac{7}{64}$	$1\frac{25}{32}$	$8\frac{29}{32}$
R-8	11¾	$3\frac{7}{64}$	$1\frac{25}{32}$	$11\frac{9}{64}$



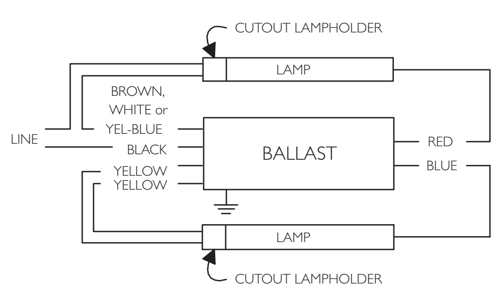
Case R



Diag. 10



Diag. 12



Diag. 36

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Electromagnetic Fluorescent Ballasts

Preheat Lamps

CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

Preheat Ballasts (Starter Required) ☆

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F4T5															
1	4	50	120	LPL-5-9 ✖	✓	✓			0.19	9	1.01	<10	0.39	X-1	116
				LC-4-9-C ★✖	✓	✓			0.20	9	1.07	<10	0.38	C-2	116
F6T5															
1	6	50	120	LPL-5-9 ✖	✓	✓			0.17	9	1.02	<10	0.44	X-1	116
				LC-4-9-C ★✖	✓	✓			0.19	10	1.07	<10	0.44	C-2	116
F8T5															
1	8	50	120	LPL-5-9 ✖	✓	✓			0.14	9	1.00	<10	0.54	X-1	116
				LC-4-9-C ★✖	✓	✓			0.17	11	1.08	<10	0.54	C-2	116
F13T8															
1	13	50	120	LO-13-22 ✖	✓	✓			0.34	17	0.91	<10	0.42	X-3	116
F14T8															
1	14	50	120	LO-13-22 ✖	✓	✓			0.32	18	0.90	<20	0.47	X-3	116
				LC-14-20-C ★✖	✓	✓			0.37	20	0.97	<10	0.45	C-2	116
F15T8															
1	15	50	120	LO-13-22 ✖	✓	✓			0.29	18	0.96	<10	0.52	X-3	116
				LC-14-20-C ★✖	✓	✓			0.34	20	1.08	<10	0.49	C-2	116
F18T8															
1	18	50	120	LO-13-22 ✖	✓	✓			0.29	17	0.80	<15	0.49	X-3	116
				LC-14-20-C ★✖	✓	✓			0.33	20	0.92	<10	0.51	C-2	116
F19T8															
1	19	50	120	LO-13-22 ✖	✓	✓			0.28	17	0.90	<15	0.51	X-3	116
				LC-14-20-C ★✖	✓	✓			0.33	20	0.92	<15	0.51	C-2	116
F30T8															
1	30	50	120	L-140F-TP ✝	✓	✓			0.67	40	0.96	<15	0.50	R-4	2
				LX-140F-TP ☆✝	✓	✓			0.64	40	1.00	<10	0.52	R-4	4

✖ Available with Class P Thermal Protection–
Add Suffix -TP to Catalog Number.
★ Core & Coil with Cover, painted white
☆ Ballast Includes Built-in Starter.
✝ Class A Insulation
+ Mounting dimensions refer to slots only

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)		Height (H) (inches)	Mounting (M) (inches)
		Standard	With TP		
C-2	$3\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{19}{32}$	$1\frac{13}{16}$	$2\frac{3}{4}$
X-1	$2\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	2
X-3	$3\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{13}{16}$	$2\frac{3}{4}$
R-4	$6\frac{1}{2}$	–	$1\frac{15}{16}$	$1\frac{3}{8}$	6+

Refer to pages 3-17 for wiring and dimension diagrams
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

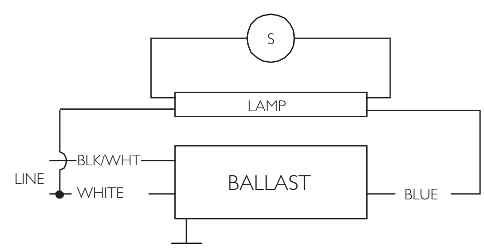
Preheat Lamps

CLASS B INSULATION   NORMAL POWER FACTOR   SOUND RATED A

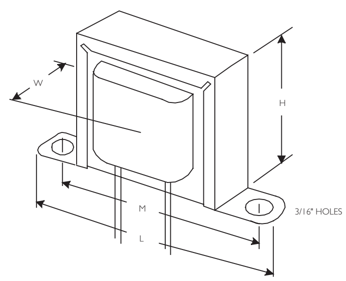
Preheat Ballasts (Starter Required) ☆

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F14T12															
1	14	50	120	LO-13-22 ✖	✓	✓			0.34	18	0.92	<10	0.44	X-3	116
				LC-14-20-C ✖★	✓	✓			0.39	21	1.01	<10	0.45	C-2	116
F15T12															
1	15	50	120	LO-13-22 ✖	✓	✓			0.32	18	0.97	<10	0.47	X-3	116
				LC-14-20-C ✖★	✓	✓			0.38	21	1.10	<15	0.46	C-2	116
F20T12															
1	20	50	120	LO-13-22 ✖	✓	✓			0.28	18	0.77	<10	0.54	X-3	116
				LC-14-20-C ✖★	✓	✓			0.33	21	0.93	<10	0.53	C-2	116
F25T12															
1	25	50	120	LC-25-TP ★	✓	✓			0.36	24	0.90	<10	0.56	C-2	116
F30T12															
1	30	50	120	L-140F-TP ✝	✓	✓			0.73	41	0.95	<10	0.47	R-4	2
				LX-140F-TP ✝☆	✓	✓			0.73	40	0.95	<10	0.46	R-4	4
F40T12															
1	40	50	120	L-140F-TP ✝	✓	✓			0.65	41	0.79	<15	0.53	R-4	2
				LX-140F-TP ✝☆	✓	✓			0.63	40	0.83	<10	0.53	R-4	4

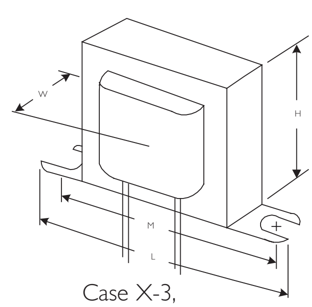
✖ Available with Class P Thermal Protection– Add Suffix -TP to Catalog Number.
★ Core & Coil with Cover, painted white
☆ Ballast Includes Built-in Starter.
✝ Class A Insulation
\+ Mounting dimensions refer to slots only



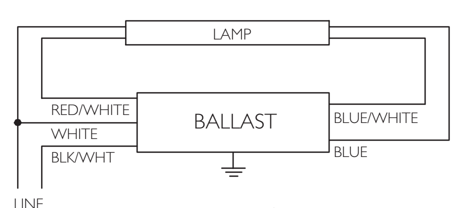
Diag. 2



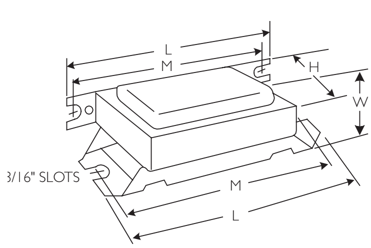
Case X-1



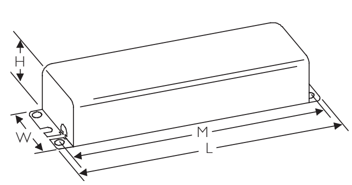
Case X-3, X-5, X-8



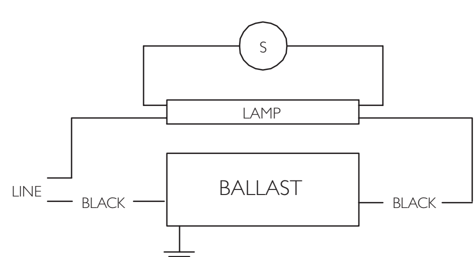
Diag. 4



Case C



Case R



Diag. 116

Refer to pages 3-16 for dimensions
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Electromagnetic Fluorescent Ballasts

Preheat Lamps

HIGH POWER FACTOR SOUND RATED A

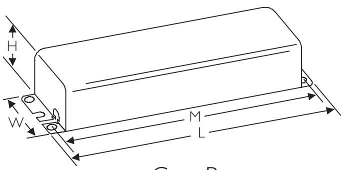
Trigger Start Ballasts

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications: UL	Certifications: CSA	Certifications: E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F13T8															
1	13	20	120	RLQ-120-TP ❖❇	✓	✓			0.54	23	1.00	<10	0.35	R-4	16
2	13	30	120	RL-2SP20-TP❇	✓	✓			0.58	36	1.00	<10	0.52	T-1	21
F15T8															
1	15	50	120	RLQ-120-TP ❖❇	✓	✓			0.56	28	1.01	<10	0.42	R-4	16
		0		HM-1P20-TP	✓	✓			0.24	27	0.90	<15	0.94	T-2	20
2	15	50	120	RL-2SP20-TP❇	✓	✓			0.51	36	0.78	<15	0.59	T-1	21
		20		HM-2SP20-TP	✓	✓			0.47	51	0.99	<20	0.90	T-2	21
F14T12															
1	14	50	120	RLQ-120-TP ❖❇	✓	✓			0.58	28	0.92	<10	0.40	R-4	16
		0		HM-1P20-TP	✓	✓			0.21	24	0.82	<10	0.95	T-2	20
2	14	0	120	HM-2SP20-TP	✓	✓			0.43	46	0.85	<10	0.90	T-2	21
F15T12															
1	15	50	120	RLQ-120-TP ❖❇	✓	✓			0.58	29	0.99	<10	0.42	R-4	16
		0		HM-1P20-TP	✓	✓			0.23	27	0.89	<15	0.98	T-2	20
2	15	50	120	RL-2SP20-TP ❇	✓	✓			0.57	41	0.83	<10	0.60	T-1	21
		10		HM-2SP20-TP	✓	✓			0.44	47	0.92	<15	0.90	T-2	21
F20T12															
1	20	50	120	RLQ-120-TP ❖❇	✓	✓			0.55	28	0.83	<10	0.42	R-4	16
		0		HM-1P20-TP	✓	✓			0.24	29	0.83	<20	0.99	T-2	20
2	20	50	120	RL-2SP20-TP ❇	✓	✓			0.49	36	0.61	<15	0.61	T-1	21
		10		HM-2SP20-TP	✓	✓			0.48	53	0.90	<20	0.92	T-2	21

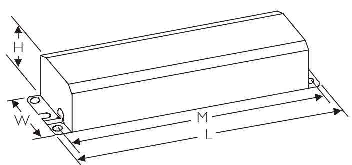
❖ Requires Circuit-Interrupting Lamp Holders
❇ Normal Power Factor
\+ Mounting dimensions refer to slots only

DIMENSIONS

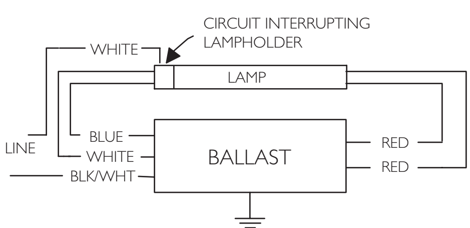
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	1 15/16	1 3/8	6+
T-1	6½	2 3/8	1½	6+
T-2	9½	2 3/8	6½	8 29/32



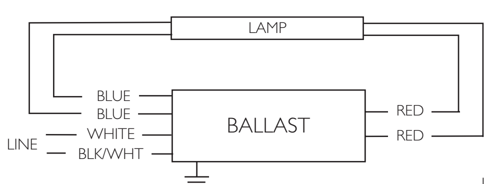
Case R



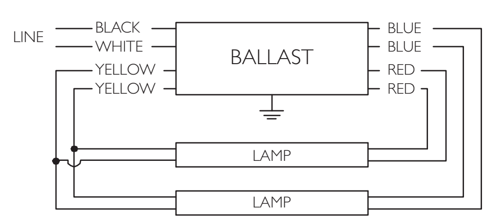
Case T



Diag. 16



Diag. 20



Diag. 21

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Electromagnetic
Fluorescent Ballasts

Circline Lamps

NORMAL POWER FACTOR   SOUND RATED A

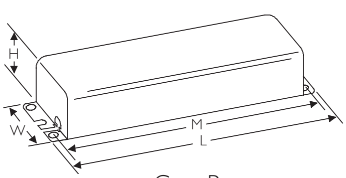
Rapid Start Ballasts

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
FC6T9 (20W Circline)															
1	20	50	120	RLQS-122-TP-W	✓	✓			0.56	24	0.76	<10	0.36	R-4	32
FC8T9 (22W Circline)															
1	22	50	120	RLQS-122-TP-W	✓	✓			0.53	25	0.75	<10	0.39	R-4	32
FC12T9 (32W Circline)															
1	32	50	120	RL-140-TP	✓	✓			0.59	32	0.68	<15	0.45	R-4	31
				RLCS-140-TP-W	✓	✓			0.57	31	0.63	<10	0.45	R-4	32
FC16T9 (40W Circline)															
1	40	50	120	RL-140-TP	✓	✓			0.46	29	0.55	<15	0.53	R-4	31
				RLCS-140-TP-W	✓	✓			0.44	28	0.50	<15	0.53	R-4	32
(1)FC8T9 & (1)FC12T9 ((1)22W & (1)32W Circline)															
2	22 & 32	50	120	RS-22-32-TP-W	✓	✓			0.40	46	0.70	<15	0.96	T-1	105
(1)FC12T9 & (1)FC16T9 ((1)32W & (1)40W Circline)															
2	32 & 40	50	120	RS-32-40-TP-W	✓	✓			0.76	56	0.60	<20	0.61	T-1	105

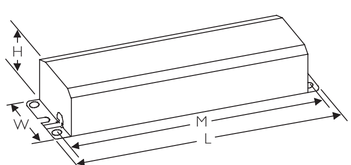
+ Mounting dimensions refer to slots only
Note: All Ballasts supplied with Circline sockets in white can except RL-140-TP

DIMENSIONS

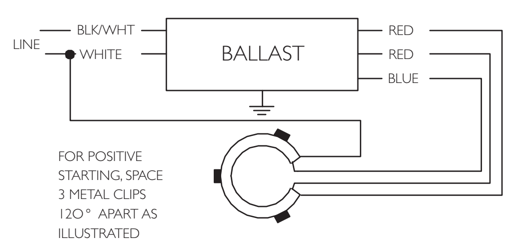
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	1 15/16	1 3/8	6+
T-1	6½	2 3/8	1½	6+



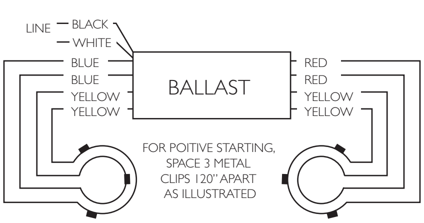
Case R



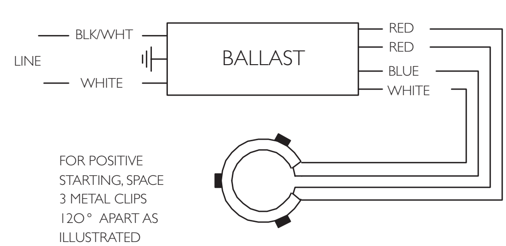
Case T



Diag. 31



Diag. 105



Diag. 32

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

2-Pin Compact & 4-Pin Long Twin Tube Lamps

CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

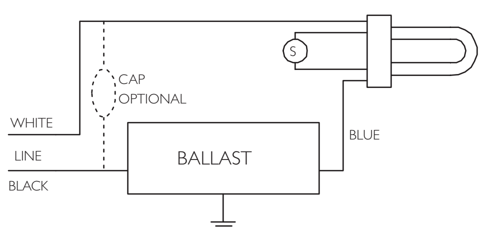
Preheat Ballasts

Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	CSA	E		Line Current (Amps) Operating	Starting	Open Circuit	Input Power ANSI (Watts)	Ballast Factor	THD %	Dim.	Wiring Dia.
CFT5W/G23 - 5W Twin Tube Lamp (PL-S5W, F5BX, CF5DS)																
1	5	0	120	LPL-5-9-TP	✓	✓			0.19	0.19	–	9	1.06	<10	X-1	140
CFT7W/G23 - 7W Twin Tube Lamp (PL-S7W, F7BX, CF7DS)																
1	7	0	120	LPL-5-9-TP	✓	✓			0.17	0.19	–	9	0.96	<10	X-1	140
				LC-4-9-C-TP ★	✓	✓			0.19	0.20	–	10	1.06	<10	C-2	140
CFT9W/G23 - 9W Twin Tube Lamp (PL-S9W, F9BX, CF9DS) CFQ9W/G23 - 9W Quad Tube Lamp (F9DBX23T4, CF9DD)																
1	9	25	120	LPL-5-9-TP	✓	✓			0.14	0.19	–	10	0.89	<10	X-1	140
				LC-4-9-C-TP ★	✓	✓			0.16	0.20	–	11	1.00	<10	C-2	140
CFT13W/GX23 - 13W Twin Tube Lamp (PL-S13W, F13BX, CF13DS) CFQ13W/GX23 - 13W Quad Tube Lamp (PL-C13W/USA, F13DBX23T4, CF13DD)																
1	13	32	120	LC-13-TP ★	✓	✓			0.27	0.37	–	16	0.93	<15	C-2	140
				LO-13-22-TP	✓	✓			0.29	0.44	–	17	1.00	<15	X-3	140
			277	VLO-13-TP	✓	✓			0.30	0.35	–	22	1.00	<10	X-5	140
2	13	32	277	VLO-2S13-TP	✓				0.31	0.38	–	34	0.95	<15	X-8	46
FT18W/2G11 - 18W Long Twin Tube Lamp (PL-L18, F18BX, FT18DL) - Separate Starter Required																
1	18	50	120	LC-25-TP ★	✓	✓			0.39	0.59	–	22	1.05	<15	C-2	44
				LO-13-22-TP	✓	✓			0.21	0.44	–	16	0.89	<20	X-3	44
CFQ26W/G24d - 26W Quad Tube Lamp (PL-C26W, F26DBXT4, CF26DD)																
1	26	50	277	VLO-13-TP	✓	✓			0.27	0.35	–	29	0.80	<10	X-5	140
CFQ27W/GX32d - 28W Quad Tube Lamp (PL-C 15mm/28W, FDL-28)																
1	28	-20	120	LOS-1Q28 *f*	✓	✓			0.61	0.74	–	32	0.97	<15	X-6	107

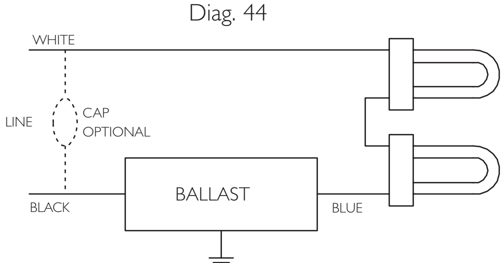
★ Core & Coil with Cover, painted white
f For Outdoor Use Only

DIMENSIONS *(refer to page 3-17 for dimension diagrams)*

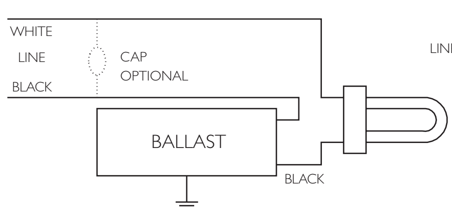
Designation	Length (L) (inches)	Width (W) (inches) Standard	Width (W) (inches) With TP	Height (H) (inches)	Mounting (M) (inches)
C-2	3 1/16	1 3/8	1 19/32	1 13/16	2¾
X-1	2 3/8	1 1/8	1 3/8	1 3/8	2
X-3	3 1/16	1¼	1 7/16	1 13/16	2¾
X-5	3¼	1½	1¾	2	2 3/16
X-6	3 1/16	1½	–	1 13/16	2¾
X-8	4	1 9/16	1 13/16	2¼	3½



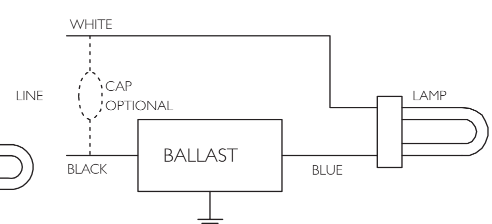
Diag. 44



Diag. 46



Diag. 107



Diag. 140

Refer to page 3-17 for dimension diagrams.
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

2-Pin Compact Lamps

HIGH POWER FACTOR   SOUND RATED A

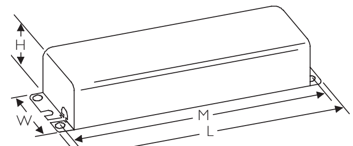
Preheat Ballasts

Lamp Data: Number	Lamp Data: Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications: UL	Certifications: CSA	Certifications: E	Certifications	Line Current (Amps): Operating	Line Current (Amps): Starting	Line Current (Amps): Open Circuit	Input Power ANSI (Watts)	Ballast Factor	THD %	Dim.	Wiring Dia.
CFT5W/G23 - 5W Twin Tube Lamp (PL-S5W, F5BX, CF5DS)																
1	5	25	120	H-1B9-TP-W	✓	✓			0.10	0.20	0.13	11	1.06	<20	R-1	47
		0	277	VH-1B9-TP-W	✓	✓			0.05	0.18	0.17	11	0.95	<35	R-2	47
CFT7W/G23 - 7W Twin Tube Lamp (PL-S7W, F7BX, CF7DS)																
1	7	0	120	H-1B9-TP-W	✓	✓			0.10	0.20	0.13	11	1.00	<20	R-1	47
			277	VH-1B9-TP-W	✓	✓			0.05	0.18	0.17	12	0.93	<30	R-2	47
CFT9W/G23 - 9W Twin Tube Lamp (PL-S9W, F9BX, CF9DS) CFQ9W/G23 - 9W Quad Tube Lamp (F9DBX23T4, CF9DD)																
1	9	25	120	H-1B9-TP-W	✓	✓			0.10	0.20	0.13	11	0.92	<20	R-1	47
		0	277	VH-1B9-TP-W	✓	✓			0.05	0.18	0.17	13	0.95	<35	R-2	47
CFT13W/GX23 - 13W Twin Tube Lamp (PL-S13W, F13BX, CF13DS) CFQ13W/GX23 - 13W Quad Tube Lamp (PL-C13W/USA, F13DBX23T4, CF13DD)																
1	13	32	120	H-1B13-TP-W	✓	✓			0.14	0.36	0.22	16	0.90	<25	R-1	47
		0	277	VH-1B13-TP-W	✓	✓			0.10	0.30	0.26	24	0.99	<30	R-2	47
2	13	32	120	H-2B13-TP-BLS H-2B13-TP-W	✓	✓			0.30	0.44	–	35	1.02	<30	T-1	51
		0	277	VH-2B13-TP-BLS VH-2B13-TP-W	✓	✓			0.10	0.35	0.21	27	0.92	<30	R-2	50
CFQ26W/G24d - 26W Quad Tube Lamp (PL-C26W, F26DBXT4, CF26DD) CFTR26W/GX24d - 26W Triple Tube Lamp (CF26DT)																
1	26	50	120	H-1Q26-TP-W	✓	✓			0.24	0.33	0.41	28	0.83	<20	T-1	47
			277	VH-1Q26-TP-W	✓	✓			0.11	0.38	0.24	32	0.90	<20	R-2	47
2	26	50	120	H-2Q26-TP-BLS H-2Q26-TP-W	✓	✓			0.42	0.34	–	50	0.82	<15	R-5	50
			277	VH-2Q26-TP-BLS VH-2Q26-TP-W	✓	✓			0.21	0.32	–	58	0.87	<25	R-5	51

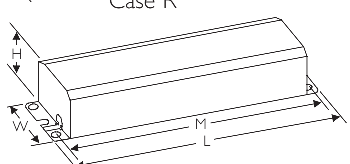
+ Mounting dimensions refer to slots only

DIMENSIONS

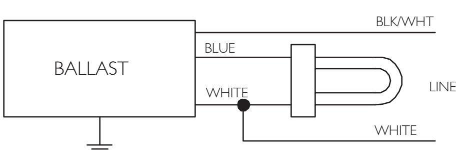
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-1	$4\frac{1}{4}$	2	$1\frac{7}{16}$	$3\frac{9}{16}$
R-2	$4\frac{3}{4}$	$2\frac{7}{32}$	$1\frac{5}{6}$	$4\frac{3}{8}$+
R-5	$9\frac{1}{2}$	$2\frac{3}{8}$	$1\frac{11}{16}$	$8\frac{29}{32}$
T-1	$6\frac{1}{2}$	$2\frac{3}{8}$	$1\frac{1}{2}$	6+



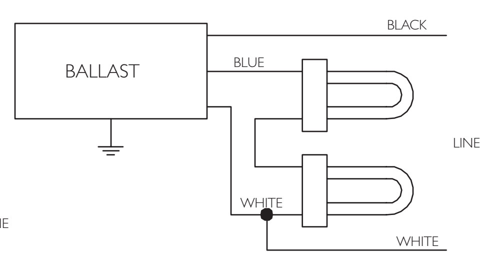
Case R



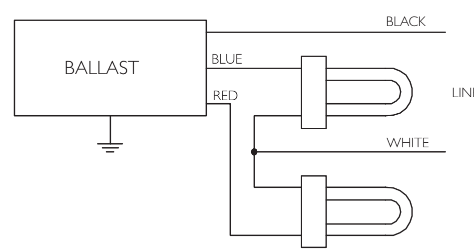
Case T



Diag. 47



Diag. 50



Diag. 51

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

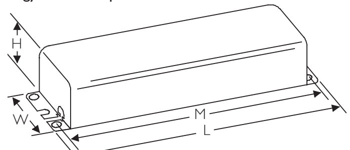
Straight & U-Shaped Lamps

HIGH POWER FACTOR SOUND RATED A

Dimming Ballasts

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F40T12 (430mA) **F40T12/U (430mA)**															
1	40	50	120	DIM-140-H-TP	✓	✓			0.52	58	1.00	<15	0.93	R-5	17
2	40	50	120	DIM-240-H-TP	✓	✓			0.94	103	0.92	<15	0.91	R-12	84

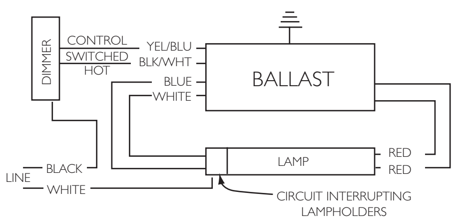
Data listed is for full light output
Line Current Controlled by Control Setting
Dimming Range-100%–5%
All Require Circuit Interrupting Lampholders
Note: Will NOT Operate 34W Energy Saver Lamps



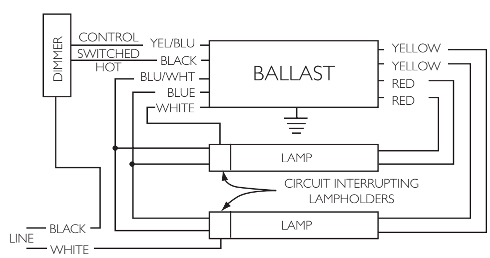
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-5	9½	$2\frac{3}{8}$	$1\frac{11}{16}$	$8\frac{29}{32}$
R-12	15¾	$2\frac{3}{8}$	1½	$14\frac{7}{16}$



Diag. 17



Diag. 84

NOTE: YELLOW/BLACK lead from ballast connects to control lead on dimmer and BLACK lead from ballast connects to switched-hot lead on dimmer.

Radio Interference Filter

Radio interface is caused by the action of the arc at the lamp electrodes which creates a series of radio waves. This energy may interfere with radio reception by:

1. Direct radiation from the fluorescent lamp to the aerial circuit.
2. Line feedback from the lamp through the power line to the radio.
3. Direct radiation from the electrical supply line to the aerial circuit.

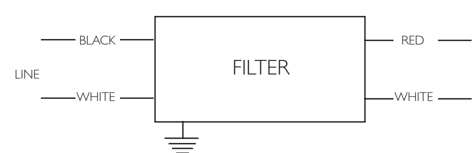
To correct the first cause, it is recommended the radio and aerial circuit be separated at least 10 feet from the fluorescent lamp and the radio provided with a positive ground.

The second and third causes can generally be corrected by the addition of an external capacitor-reactor filter. It is also desirable that the radio and fluorescent lamp fixture be provided a supply voltage from separate branch circuits.

SOUND RATED A

Input Volts	Catalog Number	Certifications		Line Current (Amps)	Dimensions (inches)				Wiring Diagram
		UL	CSA		Length	Width	Height	Mounting	
120-277	RIF-1	✓	✓	4.25 max.	4¾	$2\frac{7}{32}$	$1\frac{5}{8}$	$4\frac{3}{8}$	118

For bottom leads with studs, add suffix -BLS



Diag. 118

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

High Output Lamps

HIGH POWER FACTOR SOUND RATED C

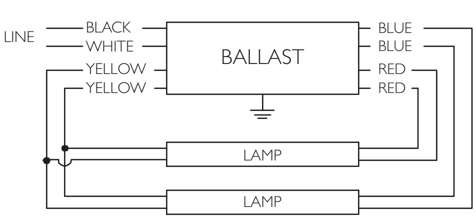
Weatherproof Ballasts

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F24T12/HO (800mA)															
2	35	-20	120	RC-2S85-FO	✓				1.01	95	0.78	<45	0.80	FO	21
F36T12/HO (800mA)															
2	50	-20	120	RC-2S85-FO	✓				1.00	107	0.82	<35	0.90	FO	21
F42T12/HO (800mA)															
2	55	-20	120	RC-2S85-FO	✓				1.10	126	0.82	<35	0.95	FO	21
F48T12/HO (800mA)															
1	60	-20	120	RC-2S85-FO	✓				0.91	79	0.78	<50	0.75	FO	39
2	60	-20	120	RC-2S85-FO	✓				1.16	133	0.85	<20	0.95	FO	21
F60T12/HO (800mA)															
1	75	-20	120	RC-2S85-FO	✓				0.94	90	0.77	<40	0.80	FO	39
F64T12/HO (800mA)															
1	80	-20	120	RC-2S85-FO	✓				0.99	99	0.82	<40	0.85	FO	39
2	80	-20	120	RC-2S85-FO	✓				1.50	178	0.92	<15	0.99	FO	21
F72T12/HO (800mA)															
1	85	-20	120	RC-2S85-FO	✓				0.98	100	0.82	<35	0.85	FO	39
2	85	-20	120	RC-2S85-FO	✓				1.54	184	0.91	<15	0.99	FO	21
				RC-2S110-FO	✓				1.80	203	0.99	<20	0.94		
F96T12/HO (800mA)															
1	110	-20	120	RC-2S85-FO	✓				1.07	121	0.84	<25	0.94	FO	39
2	110	-20	120	RC-2S110-FO	✓				2.10	248	0.98	<15	0.98	FO	21

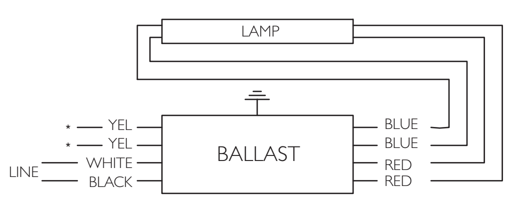
DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
FO	21 1/16	3¾	3	20 5/16

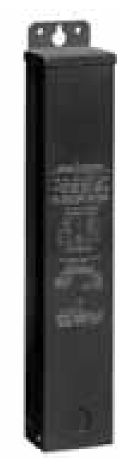
Note: Can must be mounted vertically



Diag. 21



Diag. 39



Rectangular Can (FO)

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

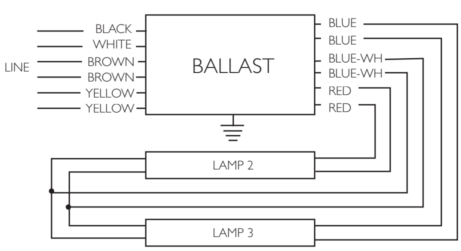
High Output Lamps

CLASS P BALLAST IN WHITE CAN

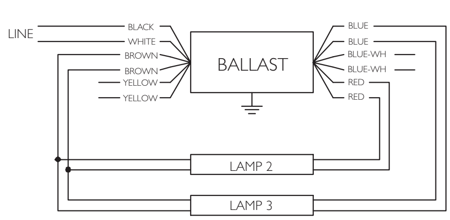
Sign Ballasts

Lamp Data: No. of Lamps	Lamp Footage: Min	Lamp Footage: Max	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications: UL	Certifications: CSA	Certifications: E	Certifications: (4th)	Max. Line Current (Amps)	Max. Input Power (Watts)	Open Circuit Volts	Dim.	Wiring Dia.
T12/HO (800mA)														
1,2	4	12	-20°F	120	ASB-0412-12-BL-TP	✓	✓			1.48	175	480	BL-1	21, 39
				277	VSB-0412-12-BL-TP	✓	✓			0.65				
2, 3, 4	6	20		120	ASB-0620-24-BL-TP	✓	✓			2.56	304	720	BL-1	5, 8, 13
				277	VSB-0620-24-BL-TP	✓	✓			1.12				
2, 3, 4	12	24		120	ASB-1224-24-BL-TP	✓	✓			2.70	312	785	BL-2	7, 9, 13
				277	VSB-1224-24-BL-TP	✓	✓			1.15				
2, 3, 4	20●	40●		120	ASB-2040-24-BL-TP	✓	✓			4.00	472	720	BL-3	5, 9, 13
				277	VSB-2040-24-BL-TP	✓	✓			1.75				
3, 4	24	32		120	ASB-2432-34-BL-TP	✓	✓			3.30	370	975	BL-4	8, 13
4, 5, 6	12▼	40▼		120	ASB-1240-46-BL-TP	✓	✓			3.90	462	720	BL-3	14, 15, 19
				277	VSB-1240-46-BL-TP	✓	✓			1.70				
4, 5, 6	24■	48■		120	ASB-2448-46-BL-TP	✓	✓			5.19	604	720	BL-3	14, 15, 19
				277	VSB-2448-46-BL-TP	✓	✓			2.25				

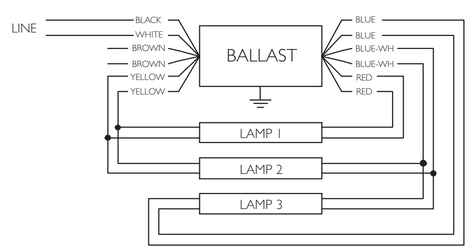
● Total lamp length of each circuit (A) and (B) must not be less than 10 ft. nor more than 20 ft. Circuit (A) is comprised of lamps 1,2. Circuit (B) is comprised of lamps 3,4. (See wiring diagrams).
▼ Total lamp length of each circuit (A) and (B) must not be less than 6 ft. nor more than 20 ft. Circuit (A) is comprised of lamps 1,2,3. Circuit (B) is comprised of lamps 4,5,6. (See wiring diagrams).
■ Total lamp length of each circuit (A) and (B) must not be less than 12 ft. nor more than 24 ft. Circuit (A) is comprised of lamps 1,2,3. Circuit (B) is comprised of lamps 4,5,6. (See wiring diagrams).



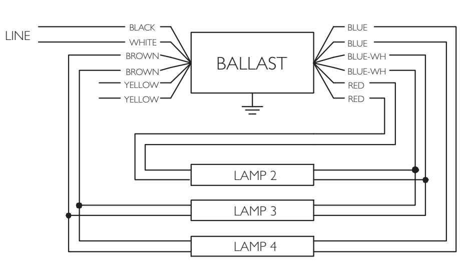
Diag. 5
Note: Insulate unused leads individually as shown on a ballast label



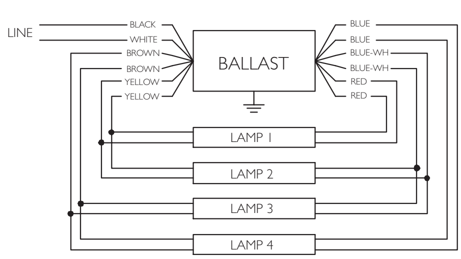
Diag. 7
Note: Insulate unused leads individually as shown on a ballast label



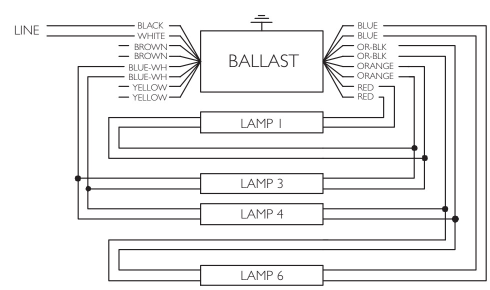
Diag. 8
Note: Insulate unused leads individually as shown on a ballast label



Diag. 9
Note: Insulate unused leads individually as shown on a ballast label



Diag. 13



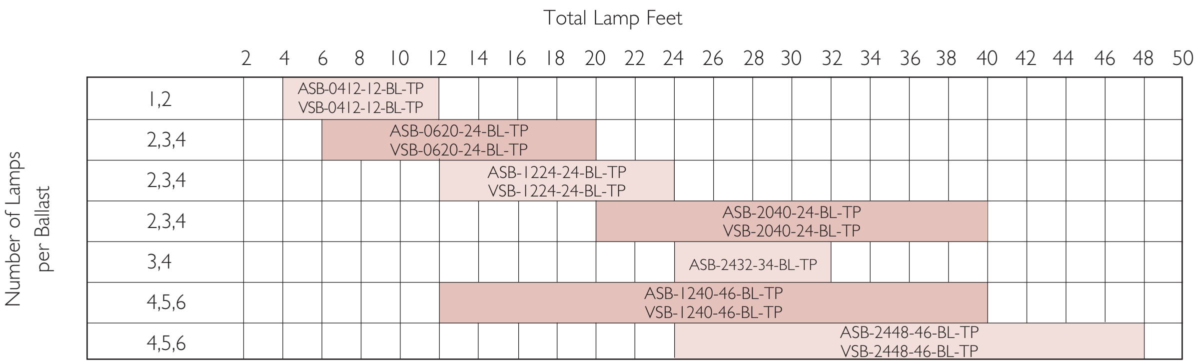
Diag. 14
Note: Insulate unused leads individually as shown on a ballast label

Wiring diagrams continued on page 3-25
Refer to pages 9-24 to 9-28 for lead lengths and shipping data

High Output Lamps

CLASS P BALLAST IN WHITE CAN

Sign Ballasts



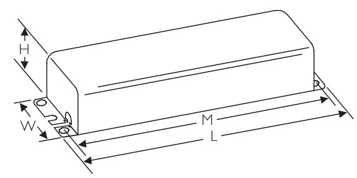
To select the ballast for your particular plastic sign application:

1) Determine the total number of lamp feet required (from 4 to 48 feet) and read down to select the proper Philips Lighting Electronics Catalog Number. Note that the first ballast you come to, reading down the chart, will be the most economical for your application.

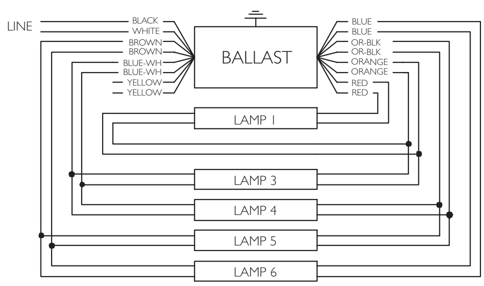
2) The number of lamps per ballast is shown in the left column.

DIMENSIONS

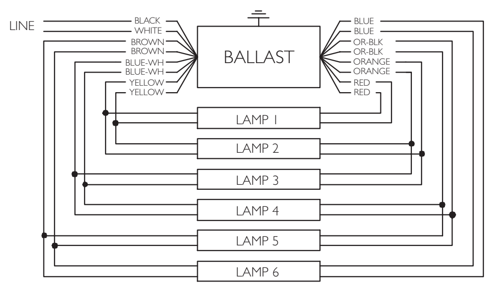
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
BL-1	11¾	3 3/16	2 5/8	11 9/64
BL-2	14 5/16	3 3/16	2 5/8	13¾
BL-3	19 3/16	3 3/16	2 11/16	18 5/8
BL-4	16 11/16	3 3/16	2 5/8	16 9/64



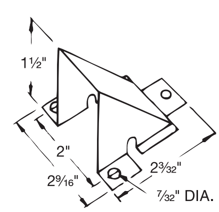
Case BL-1, BL-2, BL-3, BL-4



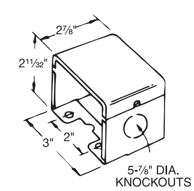
Diag. 15
Note: Insulate unused leads individually as shown on a ballast label



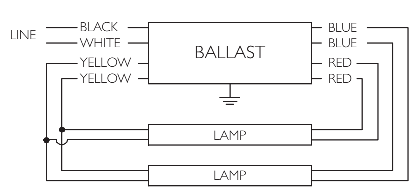
Diag. 19



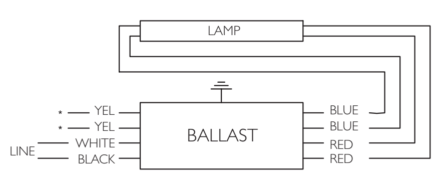
PC-161W



PC-857W



Diag. 21

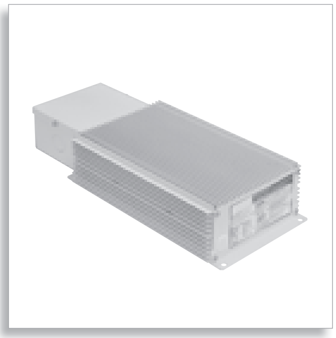


Diag. 39

Refer to pages 9-24 to 9-28 for lead lengths and shipping data

Electromagnetic Fluorescent Ballasts

e-Vision®



DynaVision®

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MasterColor CDM™ Elite MV

ELECTRONIC HID BALLASTS

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ELECTRONIC HID BALLASTS

Electronic HID Overview

Just as electronic ballast technology enhanced fluorescent lighting systems, electronic HID ballasts bring significant performance improvements to HID lighting systems:

- Higher efficiency
- Longer lamp life
- Greater lumen maintenance
- Enhanced color control

e-Vision®

Low frequency electronic ballasts are recommended by lamp manufacturers to drive the new generation of ceramic, low wattage metal halide lamps. These ceramic lamps have superior color rendition and can potentially maintain that color over the life of the lamps when operated with electronic ballasts. Since color is dependent on proper lamp wattage, the electronic ballast must be able to maintain lamp wattage precisely at its rated point throughout the rated average life of the lamp. Low frequency electronic HID ballasts such as the Philips Advance e-Vision® line constantly measure and adjust the wattage, optimizing delivery of the ceramic lamps' superior color properties. This makes metal ceramic halide operated by e-vision ballasts the premier choice for many applications previously lit by either tungsten halogen or incandescent sources, such as retail lighting.

Operational improvements are gained as greater efficiency and cooler running electronic ballasts lead to energy savings. In addition, ballasts run quieter, weigh less and have compact footprints.

DynaVision®

Improved lumen maintenance — the lamp/ballast system's ability to minimize light output depreciation over the life of the lamp — is the most fundamental and significant benefit of electronic HID ballasts, especially medium wattage, high frequency ballasts such as the Philips Advance DynaVision® ballast. DynaVision delivers a 30-50% improvement in lumen maintenance over conventional HID systems (magnetic ballasts driving probe-start metal halide lamps) and a 19% improvement over pulse-start systems. Conventional HID systems typically experience a 50-60% fall-off in light output over the published life of the lamp. By maintaining higher light levels across the rated average life of the lamp, electronic HID ballasts reduce the need for frequent re-lamping.

With more maintained lumens the overall fixture count can be significantly reduced. For example, a 400W DynaVision system produces up to 56% more mean lumens over a 400W probe-start system with magnetic ballasts. Taking advantage of this performance benefit, the fixture count can be reduced by up to 36% without sacrificing light levels. Fewer fixtures also lead to much lower operating costs in terms of both energy savings and maintenance.

The DynaVision ballast provides dimming (to 50% power) using lighting controls such as relays, occupancy sensors, building management systems (BMS) and, other 0-10V controls. Also included is a 120V output for quartz auxiliary lighting during restrike. The microprocessor-based technology incorporated in this ballast provides comprehensive lamp and ballast parameter control and is a solid platform for the future.

CosmoPolis™

CosmoPolis presents a major step forward in outdoor lighting and was developed specifically to meet the challenges of the 21st century. The CosmoPolis system simplifies outdoor lighting with the combination of a compact lamp and an optimized, rugged electronic ballast system. This highly efficient system provides end users the ability to convert to a warm white light without sacrificing color rendering or system lifetime.

MasterColor Elite

The MasterColor CDM Elite MW system offers an unrivalled level of light quality and performance. The lamp's sparkling white light creates a natural ambiance and brings out the best in all different types of colors. The high efficiency of the lamp and ballast together means reduced energy use and a lower cost of ownership compared to traditional 400W Metal Halide HID systems. This new system is ideal for indoor lighting in both high-bay and recessed applications, as well as outdoor lighting for street and area installations.

e-Vision® Low Frequency Electronic HID Ballasts

For Low Wattage HID Lamps

E-HID Lead Wire Information

Wire Color	Function	Lengths Lead (-LF model)	Lengths (-BLS model)	Length Strip
Black	Input Power	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
White	Input Power	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Black/White	Lamp Power Selection (IMH50A and IMH175C models only)	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Red	Lamp Base	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Blue	Lamp Screwshell	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Green	Ground	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Orange	Lamp Base	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Brown	Lamp Screwshell	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Yellow	Output for 120V Self Heating Thermal protector	N/A	9.0" +3.0"/-2.0"	0.5"
Gray with Red Stripe	Output for 120V Self Heating Thermal protector	N/A	9.0" +3.0"/-2.0"	0.5"

Key Features	Key Benefits
IntelliVolt® • Operates on either 120 or 277V, or any voltage in between, 50 or 60Hz	• Fewer SKUs required in inventory • Broadens the range of applications
Smaller and lighter weight than magnetic HID F-Can ballasts	• Compact electronic HID footprints • Provides greater design flexibility
Reduced input watts compared to magnetic systems	• Energy Savings; Lower cost of ownership
Low frequency lamp operation	• Prevents acoustic resonance in the lamp arc tube • Recommended by lamp manufacturers
Square wave output waveform	• Maximizes lamp life
Lamp EOL detection; Shuts down system at lamp end of life	• Enhanced safeguard
Thermally protected, internally fused, and output short circuit protected	• Shuts system down upon abnormal failure or conditions
Excellent lamp wattage regulation • Lamp wattage will change less than .5% with a +/-10% change in line voltage	Better light quality • Optimizes lamp color stability over rated average life • Reduces lamp-to-lamp color variations both initially and during lamp life
Metallic enclosure	• Provides enhanced capability for high ambient temperatures by transferring heat away from sensitive internal components
1.0 Ballast Factor	• Lamp produces maximum light output over its rated average life.

Catalog Number Explanation

I	ZT	—	MH	—	—	100	—	A	—	BLS	—	ID

Additional Options:
Blank = None 6 = 6 hours* 8 = 8 hours* 10 = 10 hours*
ID = Integral 120V output to supply power to a Self Heating Thermal Protector (39W, 70W, 100W)

Lead Exit / Mounting Options:
BLS = Bottom Leads with Studs
LF = Leads (side exit) with mounting Feet
LFS = Leads (side exit, lead exit from same end) with mounting Feet (RMH-G20-K, RMH-20-K and RMH-39-K Only)
LS = Connector (side exit) with mounting Feet

Can Material / Size: (Dimensions include mounting feet)
A/B = Metal case with dim. 5.5" L x 3.6" W x 1.5" H
C = Metal case with dim. 8.0" L x 3.6" W x 1.5" H
D = Metal case with dim. 5.0" L x 3.0" W x 1.5" H
E = Metal case with dim. 5.5" L x 1.75" W x 1.2" H
G = Metal case with dim. 3.9" L x 3.0" W x 1.2" H
H = Metal case with dim. 6.4" L x 3.7" W x 1.5" H
K = Metal case with dim. 4.75" L x 1.3" W x 1.2" H
M = Plastic case with dim. 5.9" L x 2.6" W x 2.6" H
N = Plastic case with dim. 5.3" L x 2.6" W x 2.6" H
R = Metal case with dim. 8.2" L x 4.9" W x 2.2" H
T = Plastic case with dim. 6.3" L x 3.9" W x 2.4" H

Max Lamp Wattage: :
G20 = 20W Lamp
20= 22 W Lamp^
39 = 39 W Lamp
P39 = 39W Lamp+
50 = 50W Lamp
60 = 60W CW Lamp
70 = 70W Lamp
90 = 90W CW Lamp
100 = 100W Lamp
140 = 140W CW Lamp
150 = 150W Lamp
175 = 175W Lamp
210315 = 210 W/315W MCE

Number of Lamps: Blank = 1 Lamp Operation 2 = (2) Lamp Operation

Primary Lamp Type:
MH = Metal Halide
WSN = Mini white SON (100 W Only)
SN = High Pressure Sodium
CW = CosmoWhite

Dimming Scheme: Blank = Fixed Light Output ZT = 0-10V Dimming L = LumiStep

Input Voltage:
I = Intellivolt (accepts input of 120 thru 277V, 50/60 Hz nominal) R = 120V, 50/60 Hz nominal)

^ Philips 20W MiniMaster Color Lamp
+ Philips 39W MiniMaster Color Lamp
* Dimming time with LumiStep

e-Vision® Electronic Ballast Specifications

Section I - Physical Characteristics

1.0 The electronic ballast shall be furnished with integral, color-coded leads.

Section II - Performance Requirements

2.0 The electronic ballast shall be IntelliVolt® and operate from a nominal line voltage range of 120-27V, +/-10%, 50/60Hz unless stated otherwise.

2.1 The electronic ballast input current shall have Total Harmonic Distortion (THD) of less than 15%.

2.2 The electronic ballast shall have a Power Factor greater than 90%.

2.3 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit.

2.4 The electronic ballast shall be Sound Rated A.

2.5 The electronic ballast output frequency to the lamps shall be less than 200Hz to prevent acoustic resonance inside the lamp arc tube and to minimize visible flicker.

2.6 The electronic ballast shall provide a "Lamp Current Crest Factor" of less than 1.5.

2.7 The electronic ballast shall be thermally protected to shut off when operating temperatures reach unacceptable levels.

Section III - Regulatory Requirements

3.0 The electronic ballast shall meet the requirements of the Federal Communications Commission rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.1 The electronic ballast shall be Underwriters Laboratories (UL) Listed and CSA Certified where applicable.

Section IV - Other

4.0 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB's).

4.1 The electronic ballast shall carry a three-year limited warranty from the date of manufacture for operation at marked maximum case temperature or less (See www.philips.com/advancewarranty for futher information).

4.2 The manufacturer shall have a twenty-five year history of producing HID lamp ballasts for the North American market.

4.3 The electronic ballast shall be produced in a factory certified to ISO 9002 Quality System Standards

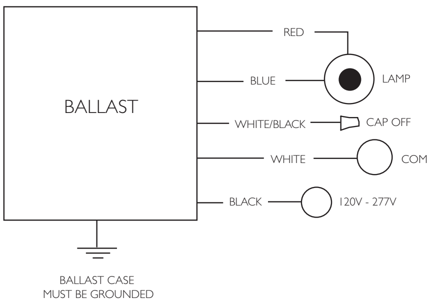
Installation Notes

1. Red lead must be connected to center terminal of lamp (for Edison, screw base lamps). Do not connect red or blue lead to neutral or ground.
2. Use appropriately rated lampholder.
3. Maximum ballast-to-lamp distance is 5ft. using typical wiring methods and materials. Additional distance up to 15ft. may be possible using wire between lamp and ballast with a total measured capacitance of 100 picofarads or less. Consult Philips Lighting Electronics for application assistance.
4. Power mains must be cycled off and then on to reset ballast after failed lamps are replaced.

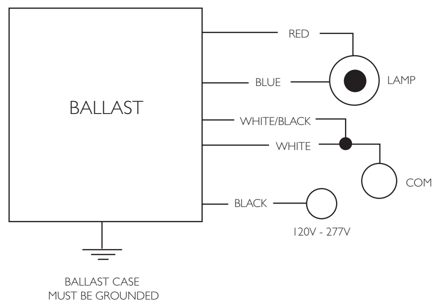
Ballast Hot Spot Location

Hot spot locations differ with each ballast model and are designated on the individual ballast labels. Consult ballast labels and ballast specification sheets for Hot Spot locations.

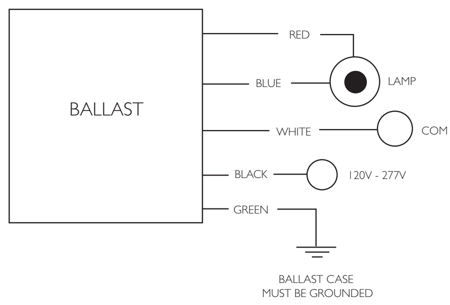
Enclosure Dimensions, Lead Lengths and Wiring Diagrams



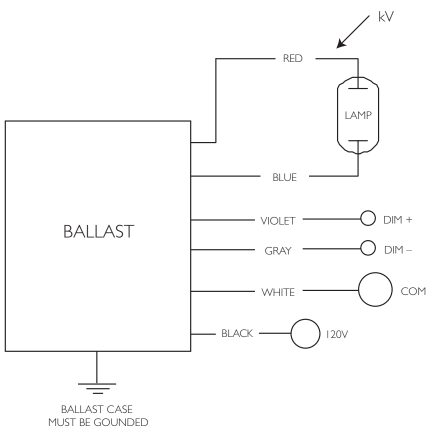
Wiring Diag. 1



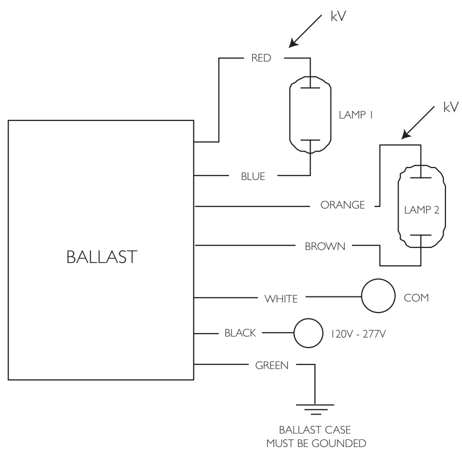
Wiring Diag. 2



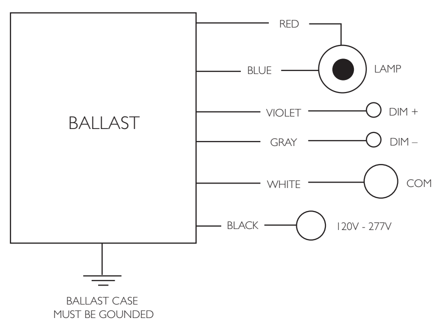
Wiring Diag. 3



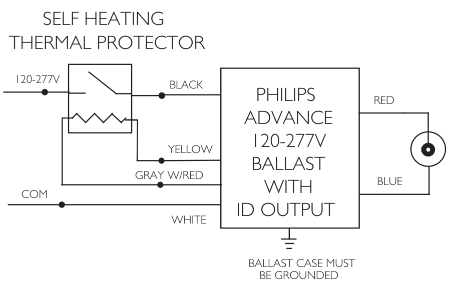
Wiring Diag. 4



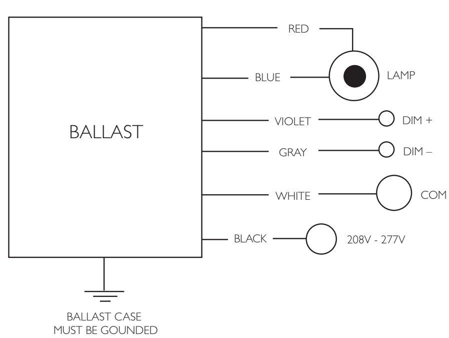
Wiring Diag. 5



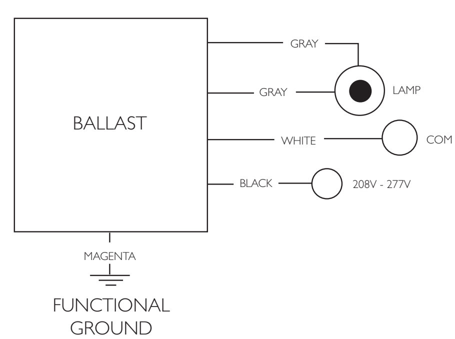
Wiring Diag. 6



Wiring Diag. 8



Wiring Diag. 9



Wiring Diag. 10

Electronic HID

Metal Halide and High Pressure Sodium

Lamp Data		Input Volts	Catalog Number* *Note 1*	Certifications		Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp. *Note 5*	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)	
Number	Watts			UL	CSA								
20W Lamp, ANSI Code M156 Minimum Starting Temp -20°C/-4°F													
1	20	120	RMH-G20-K-LF RMH-G20-K-LFS *Note 2*	✓	✓	0.23	26	90°C	4	K	0.4	6	New
1	20	120 277	IMH-G20-G-LF IMH-G20-G-BLS	✓	✓	0.2 0.09	24	90°C	3	G	0.9	5	New
1	20	120 277	IMH-G20-E-LF	✓	✓	0.21 0.09	24	90°C	3	E	0.55	5	New
22W Lamp, Philips Mini MasterColor, ANSI Code M175, Minimum Starting Temp. -20°C/-4°F													
1	22	120	RMH-20-K-LF or RMH-20-K-LFS *Note 2,7*	✓	✓	0.23	26	90°C	4	K	0.5	6	
1	22	120	RMH-20-E-LF RMH-20-E-BLS	✓	✓	0.23	26	70°C	4	E	0.4	6	
39W Lamp, ANSI Code M130/C130, Minimum Starting Temp. -20°C/-4°F													
1	39	120	RMH-39-K-LF, RMH-39-K-BLS or RMH-39-K-LFS *Note 2,7,8*	✓	✓	0.40	45	90°C	4	K	0.5	6	
1	39	120 277	IMH-39-G-LF or IMH-39-G-BLS	✓ ✓	✓ ✓	0.39 0.18	46 45	90°C	3	G	0.9	5	
1	39	120 277	IMH-39-E-LF	✓ ✓	✓ ✓	0.39 0.18	46 45	90°C	3	E	0.6	5	New
1	39	120 277	IMH-39-A-BLS-ID×	✓ ✓	✓ ✓	0.45 0.18	48 47	90°C	8	A	1.5	5	New
1	39	120 277	IMH-50-A-LF or IMH-50-A-BLS *Note 3*	✓ ✓	✓ ✓	0.38 0.16	45 44	85°C	1	A	1.4	5	
2	39	120 277	IMH-239-A-LF or IMH-239-A-BLS	✓ ✓	✓ ✓	0.74 0.31	89 89	85°C	5	A	1.7	6	
39W Mini MasterColor Lamp, CDM-Tm 35W/930, ANSI Code M179 Minimum Starting Temp -20°C/-4°F													
1	39	120 277	IMH-P39-G-LF IMH-P39-G-BLS	✓ ✓	✓ ✓	0.39 0.17	46 45	90°C	3	G	0.9	5	New
1	39	120	RMH-39-K-LF, RMH-39-K-BLS or RMH-39-K-LFS *Note 2,7,8*	✓	✓	0.40	45	90°C	4	K	0.5	6	
50W Lamp, ANSI Code M110 or M148, Minimum Starting Temp. -20°C/-4°F													
1	50	120 277	IMH-50-A-LF or IMH-50-A-BLS *Note 3*	✓ ✓	✓ ✓	0.47 0.20	56 55	85°C	2	A	1.4	5	

1. All ballasts are sound rated A, and feature high power factor (>0.9, a ballast factor of 1.0 resettable thermal protection, and a maximum Harmonic Distortion of 15%.
2. For RMH-39-K-LF, RMH-20-K-LF and RMH-G20-KLF input and output lead wires exit on opposite sides of ballast. For RMH-39-K-LFS, RMH-20-K-LFS and RMH-G20-KLFS all lead wires exit the same side of the ballast.
3. A dual-wattage ballast for 39W or 50W MH
4. A dual-wattage ballast for 150W or 175W MH
5. Maximum case temperature should not be exceeded in the application, as life will be affected and the integral re-settable thermal protector may activate. A lower maximum temperature rating does not imply lesser thermal performance, and can be indicative of a cooler running ballast design. Consult factory for further application assistance.
6. Also operates (1) 150W HPS S56 (100V) Lamp
7. Also operates the ES16 and ES36 SLi Brightspot lamps
8. Also operates the 39W Philips miniMastercolor lamp (ANSI Code C179)

* Ordering information:
—LF Side exit leads with mounting feet
—BLS Bottom exit leads with mounting studs

× Use with any Self Heating Thermal Protector (Insulation Detector) having equivalent resistive value 5k to 25k ohm (4 wire versions only)

Refer to pages 4-9 for ballast dimensions
Refer to pages 4-3 for lead wire information

Metal Halide and High Pressure Sodium

	Lamp Data		Input Volts	Catalog Number* *Note 1*	Certifications			Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp. *Note 5*	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
	Number	Watts			E	UL	CSA							
	70W Lamp, ANSI Code M98 or M143 or M139, Minimum Starting Temp. -20°C/-4°F													
	1	70	120	IMH-70-G-LF or		✓	✓	0.67	80	90°C	3	G	0.9	5
			277	IMH-70-G-BLS		✓	✓	0.30	79					
New	1	70	120	IMH-70-E-LF		✓	✓	0.67	80	90°C	3	E	0.6	5
			277			✓	✓	0.30	79					
	1	70	120	IMH-70-D-LF or		✓	✓	0.67	80	85°C	3	D	1.6	5
			277	IMH-70-D-BLS		✓	✓	0.29	79					
	1	70	120	IMH-70-A-BLS-ID[x]		✓	✓	0.72	86	90°C	8	A	1.6	6
			277			✓	✓	0.31	84					
New	1	70	120	IMH-70-A-LF		✓	✓	0.67	80	85°C	3	A	1.5	5
			277			✓	✓	0.29	79					
	100W Lamp, ANSI Code M90 or M140, Minimum Starting Temp. -20°C/-4°F													
	1	100	120	IMH-100-D-LF or		✓	✓	0.92	110	85°C	3	D	1.6	5
			277	IMH-100-D-BLS		✓	✓	0.40	109					
New	1	100	120	IMH-100-B-LF		✓	✓	0.92	110	85°C	3	A/B	1.5	5
			277			✓	✓	0.40	109					
	1	100	120	IMH-100-A-BLS-ID[x]		✓	✓	0.96	115	90°C	8	A	1.4	6
			277					0.42	113					
	150W Lamp, ANSI Code M102 or M142, Minimum Starting Temp. -20°C/-4°F													
	1	150	120	IMH-150-H-LF or	✓	✓	✓	1.4	165	85°C	3	H	1.9	5
			277	IMH-150-H-BLS *Note 9*	✓	✓	✓	0.6	161					
	1	150	120	IMH-175-C-LF or	✓	✓	✓	1.4	169	85°C	1	C	2.5	5
			277	IMH-175-C-BLS *Note 5,6,9*	✓	✓	✓	0.6	166					
	175W Pulse Start Lamp, ANSI Code M137 or M152 (Pulse Start), Minimum Starting Temp. -20°C/-4°F													
	1	175	120	IMH-175-C-LF or	✓	✓	✓	1.7	194	85°C	2	C	2.5	5
			277	IMH-175-C-BLS *Note 4,9*	✓	✓	✓	0.7	191					
	100W Lamp, Philips Mini whiteSON (SDW-TG), ANSI Code S167 (Pulse Start), Min. Starting Temp. -20°C/-4°F													
	1	100	120	IWSN-100-C-LF		✓	✓	0.9	165	85°C	3	C	1.9	5
			277			✓	✓	0.5	161					

Controllable Ballasts with 0-10V Dimming Interface

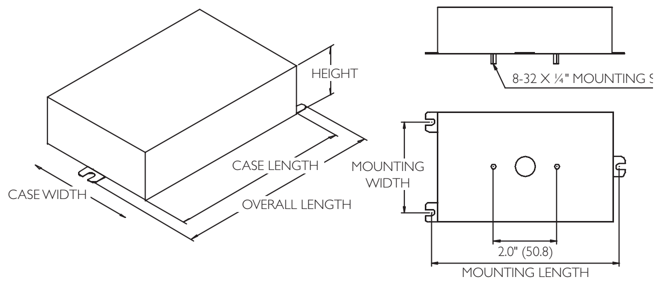
Lamp Data		Input Volts	Catalog Number* *Note 1*	Certifications			Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp. *Note 5*	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
Number	Watts			E	UL	CSA							
150W Lamp, ANSI Code M102 or M142, Minimum Starting Temp. -20°C/-4°F													
1	150	120	IZTMH-150C-LF *Note 9*	✓	✓	✓	1.4	169	85°C	6	C	2.5	5
		277		✓	✓	✓	0.6	166					

1. All ballasts are sound rated A, and feature high power factor (>0.9, a ballast factor of 1.0 resettable thermal protection, and a maximum Harmonic Distortion of 15%.
2. For RMH-39-K-LF and RMH-20-K-LF input and output lead wires exit on opposite sides of ballast. For RMH-39-K-LFS and RMH-20-K-LFS all lead wires exit the same side of the ballast.
3. A dual-wattage ballast for 39W or 50W MH
4. A dual-wattage ballast for 150W or 175W MH
5. Maximum case temperature should not be exceeded in the application, as life will be affected and the integral re-settable thermal protector may activate. A lower maximum temperature rating does not imply lesser thermal performance, and can be indicative of a cooler running ballast design. Consult factory for further application assistance.
6. Also operates (1) 150W HPS S56 (100V) Lamp
7. Also operates the ES16 and ES36 SLi Brightspot lamps
8. Also operates the 39W Philips miniMastercolor lamp (ANSI Code C179)
9. "Circle E" denotes EISA compliance

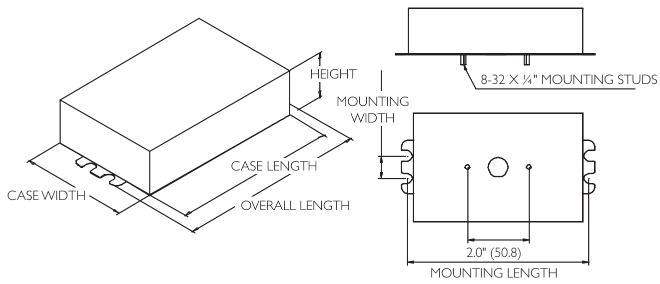
* Ordering information:
—LF Side exit leads with mounting feet
—BLS Bottom exit leads with mounting studs

x Use with any Self Heating Thermal Protector (Insulation Detector) having equivalent resistive value 5k to 25k ohm (4 wire versions only)

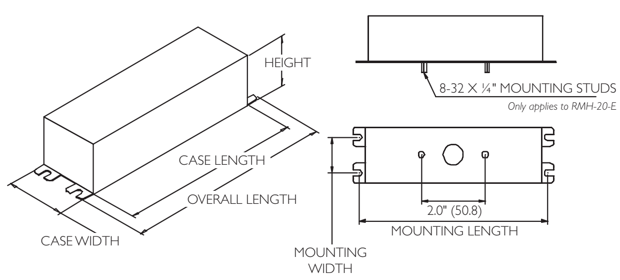
Refer to pages 4-9 for ballast dimensions
Refer to pages 4-3 for lead wire information



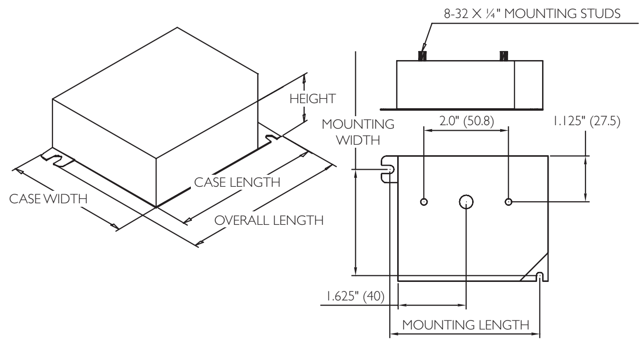
Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
A/B	140mm [5.5"]	120mm [4.7"]	92mm [3.6"]	38mm [1.5"]	132mm [5.2"]	73mm [2.9"]
C	204mm [8.0"]	184mm [7.2"]	92mm [3.6"]	38mm [1.5"]	195mm [7.7"]	73mm [2.9"]
H	161mm [6.3"]	144mm [5.7"]	92mm [3.6"]	38mm [1.5"]	152mm [6.0"]	73mm [2.9"]



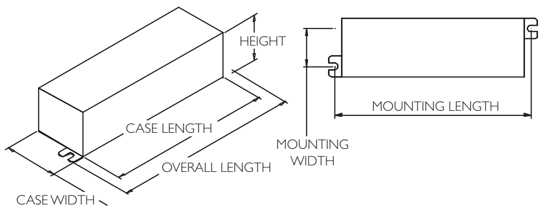
Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
D	128mm [5.0"]	108mm [4.3"]	77mm [3.0"]	38mm [1.5"]	118mm [4.6"]	19mm [0.7"]



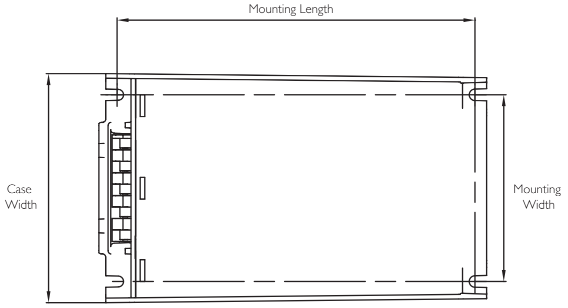
Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
E	140mm [5.5"]	127mm [5.0"]	44mm [1.7"]	30mm [1.2"]	135mm [5.3"]	26mm [1.0"]

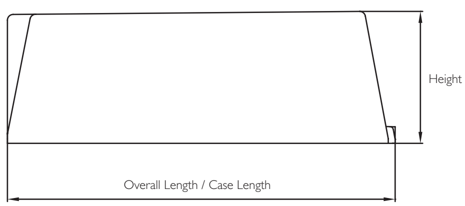


Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
G	97mm [3.8"]	90mm [3.5"]	77mm [3.0"]	30mm [1.2"]	87mm [3.4"]	67mm [2.6"]

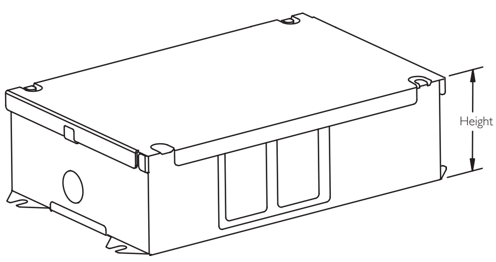


Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
K	119mm [4.4"]	104mm [4.1"]	33mm [1.1"]	30mm [1.2"]	114mm [4.5"]	13.5mm [0.5"]

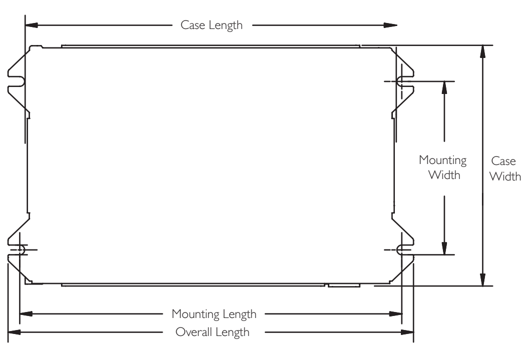




Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
M	150mm [5.9"]	150mm [5.9"]	65mm [2.6"]	65mm [2.6"]	136mm [5.4"]	47mm [1.8"]
N	135mm [5.3"]	135mm [5.3"]	65mm [2.6"]	65mm [2.6"]	126mm [4.9"]	47mm [1.8"]
T	166mm [6.3"]	166mm [6.3"]	100mm [3.9"]	60mm [2.4"]	156mm [6.1"]	81.5mm [3.2"]



Case Figure	Overall Length	Case Length	Case Width	Height	Mounting Length	Mounting Width
R	208mm [8.2"]	191mm [7.5"]	124mm [4.9"]	56mm [2.2"]	192mm [7.6"]	86.5mm [3.4"]



DynaVision extends the key benefits of magnetic pulse-start metal halide systems – energy efficiency and white light. With its very-high frequency operation, as well as its on-board microprocessor and standard features, DynaVision provides numerous ***additional*** benefits and advantages.

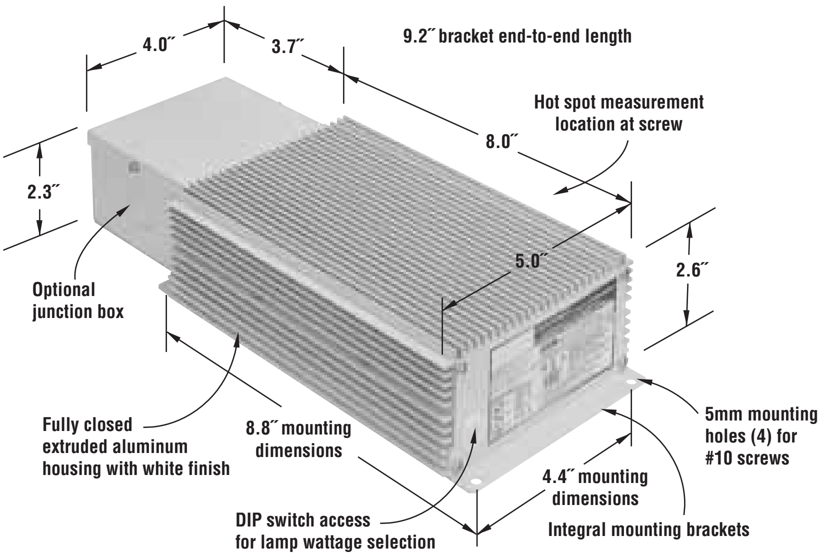
DynaVision Feature	Benefits and Advantages
Microprocessor technology High frequency operation True constant wattage	Lower operating and maintenance costs Fewer fixtures Energy savings
320/350/400 Tri-Wattage IntelliVolt 200-277V 50/60 Hz	Fewer SKU's Less chance for ordering error Ease of change over to different wattage lamps
Integral 120V quartz tap and relay, 250W	Standby-lighting ready No special orders No special relay or control required
0-10V dimming with automatic 15-minute warm up	Continuous dimming down to 50% power Additional energy savings through daylight harvesting and occupancy sensing
0° to 55°C ambient rating standard -30° to +40°C ambient rating optional	Greater reliability, flexibility and and applications opportunities
Lamp End-of-Life Protection (EOL)	Safeguard

More about...

Standby Lighting Versatility	Controllability
DynaVision's 120V output is designed to operate one quartz (incandescent) standby lamp up to 250W. The quartz lamp on or off modes are determined by the HID lamp's specific operating conditions. Once the HID lamp strikes, the quartz lamp automatically switches off when the HID lamp reaches 50% power.	DynaVision is dimmable — down to 50% of nominal lamp power, with no noticeable loss in color characteristics. With 0-10V dimming, and compatible with a host of products from most control manufacturers, DynaVision brings new flexibility and energy-saving strategies, such as daylight harvesting and occupancy sensing, to applications in the industrial, educational, government, hospitality, commercial and retail sectors.

Electronic HID

Physical Characteristics



DynaVision™ Electronic Ballast Catalog Number Breakdown

IZTEMH4003PS - XJ

Basic Model Number

Options

I	=	IntelliVolt (200-277 50/60 Hz)
ZT	=	Zero-to-ten volt dimming
E	=	Electronic
MH	=	Metal Halide
400	=	400W maximum
3	=	3 wattage capability (320/350/400W)
PS	=	Pulse-Start
-XJ	=	Without junction box (i.e. junction box is included if this suffix is omitted).
-XJF	=	Low temperature, without junction box

DynaVision Electronic Ballast Specification

Section I — Physical Characteristics

1.1 The electronic ballast shall be fully enclosed in an aluminum housing painted white.

1.2 The aluminum housing shall include a divided wiring compartment to separate the power leads from the control leads. All leads to be color-coded.

Section II — Performance Requirements

2.1 The electronic ballast shall be multivoltage capable and operate from a line voltage range of 180 — 305V, 50/60 Hz.

2.2 The electronic ballast shall incorporate a microprocessor controller to provide for optimum starting and operation of the HID lamp.

2.3 The electronic ballast input current shall have Total Harmonic Distortion (THD) of less than 15% when operated at nominal line voltage (200V, 208V, 230V, 240V, 277V).

2.4 The ballast shall incorporate a 0-10V dimming interface and control the dimming function such that the HID lamp is allowed to warm up for fifteen minutes at full power before the lamp will be allowed to dim, regardless of the level of the 0-10V signal. 10V applied to the dimming control leads, shall result in full light output. 0V applied, or shorting the control leads together, shall result in dimming to 50% of nominal lamp power.

2.5 The ballast shall include a 120V/250W auxiliary output for standby incandescent lighting that shall include an integral control to turn the auxiliary lamp on and off. The integral control shall include a time-delay feature to keep the auxiliary lamp on until the HID lamp reaches 50% power.

2.6 The electronic ballast shall have a Power Factor greater than 90%.

2.7 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit.

2.8 The electronic ballast shall be Sound Rated A.

2.9 The electronic ballast output frequency to the lamps shall be higher than 100 kHz to prevent acoustic resonance inside the lamp arc tube and to minimize visible flicker.

2.10 The electronic ballast shall be thermally protected to shut off when operating temperatures reach unacceptable levels.

Section III — Regulatory Requirements

3.1 The electronic ballast shall meet the requirements of the Federal Communications Commission rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.2 The electronic ballast shall be Underwriters Laboratories (UL) Listed and CSA Certified where applicable.

Section VI — Other

4.1 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB's).

4.2 The electronic ballast shall carry a three-year warranty from the date of manufacture for operation at an ambient temperature of 55° C or less and when operated as a stand alone product (i.e.remotely from a lighting fixture housing). When operated within a lighting fixture housing, the same three-year warranty shall apply for a maximum ballast case hot spot temperature of 76° C or less.

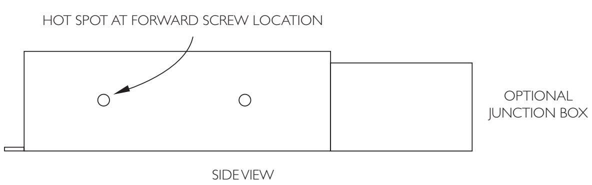
4.3 The manufacturer shall have a twenty-five year history of producing HID lamp ballasts for the North American market.

4.4 The electronic ballast shall be produced in a factory certified to ISO 9002 Quality System Standards.

Installation and Application Notes

1. Red lead must be connected to center terminal of lamp. Do not connect red or blue lead to line neutral.
2. Setting precaution with triple-wattage feature: Do not operate lower wattage lamp on a ballast which has been set for operation of higher wattage lamp. Short lamp life may result.
3. Ballast output will shut off after 40 minutes maximum if lamp does not successfully ignite. Replace lamp and cycle mains to restore output.
4. Use appropriately rated lampholder.
5. Connect red lamp lead to 600Vrms, 3.5kV or UL style 1452 wire.
6. Remote mounting distances not exceeding 15ft. are possible with normal wiring methods. For distances greater than 15ft., power losses in the wire can result in appreciable decline in actual lamp operating power. Consult Philips Lighting Electronics for application assistance.
7. Power mains must be cycled off and then on to reset ballast after failed lamps are replaced.
8. Ballast output exceeds 100kHz. Suitable test equipment is required for measurement.
9. Ballast is suitable for recessed use. Do not install insulation above or within 3" of ballast sides.

Where to Measure the Ballast Hot Spot



Electronic HID

Breaks New Ground in HID Performance

Application Specifications

Pulse-Start Metal Halide

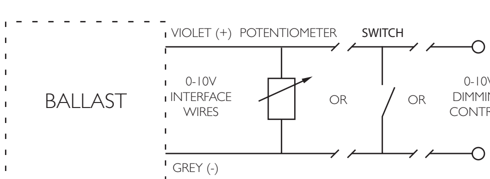
Lamp Data No.	Lamp Data Watts	Min Start Temp. (F/C)	Input Volts	Catalog Number	Listings	Line Current (A)	Input Power ANSI (W)	Ballast Factor	Max. THD %	Max. PF %	DIP Switch Settings
320W Lamp, ANSI Code M132/M154											
1	320	32/0 -20/-30	200 to 277	IZTEMH4003PS IZTEMH4003PS-F		1.8 @ 200V 1.3 @ 277V	345	1.0	15	90	ON
350W Lamp, ANSI Code M131											
1	350	32/0 -20/-30	200 to 277	IZTEMH4003PS IZTEMH4003PS-F		1.9 @ 200V 1.4 @ 277V	375	1.0	15	90	ON
400W Lamp, ANSI Code M135/M155											
1	430	32/0 -20/-30	200 to 277	IZTEMH4003PS IZTEMH4003PS-F		2.2 @ 200V 1.6 @ 277V	430	1.0	15	90	Preset at Factory ON

NOTE: These specifications apply to operation of pulse-start metal halide lamps with quartz arc-tube construction only. For operating compatibility with ceramic arc-tube lamps, consult Phililps Lighting Electronics.

DIP switches are "on" in the down position

Dimming Feature

With an integral, industry-standard 0-10V interface, the DynaVision electronic ballasts offer the capability to dim the lamp by lowering the wattage lamp, reducing energy consumption of the light fixture by up to 50%. Access to this interface is via the violet (+) and grey (-) dimming control leads. These leads can be connected to either a 0-10V dimming control, (DynaVision ballast are compatible with standard 0-10V control devices available from many manufacturers) a 0-10V DC power supply, or with a switch. An open switch provides full lamp power, and a closed switch, short-circuiting the 0-10V wires, yields 50% lamp power. Control devices such as relays and occupancy sensors may also be used.



A potentiometer may also be used. However, the value of the potentiometer is dependent on the number of ballasts connected. Consult Philips Lighting Electronics for guidance.

In accordance with the requirements of the HID lamp manufacturers and NEMA, the dimming feature includes a time delay to allow the HID lamp to warm up for 15 minutes at full power before the lamps will be allowed to dim, regardless of the level of the 0-10V signal.

Lead Wire Information

Wire Color	Function
Black	Input Power
White	Input Power
Green	Ground
Red	Lamp Eyelet
Blue	Lamp Eyelet
Yellow (2)	120V Lamp Output
Violet (+)	0-10V Dimming
Grey	0-10V Dimming (–)

All lead lengths are 11" +/- 1". The black & white (input power), green (ground), and red & blue (lamp) leads are pre-stripped 1/2". The two yellow 120v (output) and violet & grey (dimming control) leads have insulated ends.

Fixed Output and LumiStep™

The invention of the low-pressure sodium lamp and linear fluorescent lamp in the 1930s created a foundation for today's outdoor lighting. Then, in the 1960s, the light sources of choice became high pressure sodium and mercury vapor.

With CosmoPolis, Philips presents to you another major step forward in urban outdoor lighting, developed specifically to meet the challenges you face in the 21st century. The CosmoPolis system simplifies outdoor lighting with the combination of a miniature lamp and an optimized electronic ballast system.

The Six Performance Features of the CosmoPolis System are Impressive:

1. Quality of Light
2. System Efficiency
3. Optical Efficiency
4. Dependable Service
5. Compact System
6. Sustainability

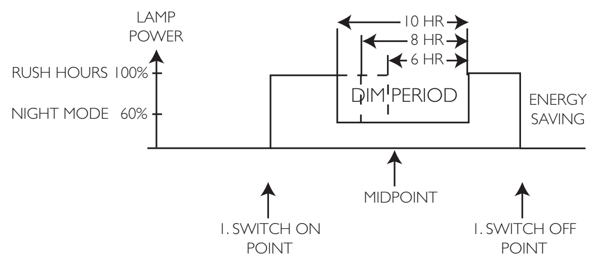
With CosmoPolis, the benefits you experience from using Philips advanced outdoor HID lamps are more impressive than ever.

CosmoPolis is not a retrofit for existing lamps, but offers you impressive benefits for new or renewed installations. Consider:

- CosmoWhite 60W instead of HPS 70W, MV/QMH 100W
- CosmoWhite 90W instead of HPS 100W, MV/QMH 175W.
- CosmoWhite 140W instead of HPS 150W, MV/QMH 250W.

LumiStep

The CosmoPolis system offers a step dimming capability with three possible dimming times of 6, 8 or 10 hours with the LumiStep feature. The ballast will dim the 60W lamp to 75% of lamp power and the 90 and 140W lamps to 60% lamp power. The ballast calculates the mid-point of the evening, which is the starting point for 6 hour LumiStep and will dim the lamp for 6 hours before returning to full light output. The 8 and 10 hour LumiStep models will begin their dimming at 2 and 4 hours before the mid-point respectively.



Applications

- Outdoor: Architectural façade lighting, illumination of roads and pedestrian areas, public spaces, and parking garages

	Lamp Data		Input Volts	Catalog Number	Certifications		Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp.	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
	Number	Watts			UL	CSA							
60W Cosmo White Lamp, ANSI Code TBD Minimum Starting Temp -30°C/-20°F													
New	1	60	208 277	ICW-60-N-LS[1] ILCW-60-N-LS, -6, 8, 10[2]	✓	✓	0.33 0.24	67 67	80°C	10	N	1.9	30
New	1	60	120	RCW-60-M-LS RLCW-60-M-LS, -6, -8, 10[2]	✓	✓	0.58	68	80°C	10	M	2.1	30
90W Cosmo White Lamp, ANSI Code TBD Minimum Starting Temp -30°C/-20°F													
New	1	90	208 277	ICW-90-M-LS[1] ILCW-90-M-LS, -6, 8, 10[2]	✓	✓	0.49 0.37	99 99	80°C	10	M	2.1	30
New	1	90	120	RCW-90-T-LS RLCW-90-T-LS, -6, -8, 10[2]	✓	✓	0.83	99	70°C	10	T	3.1	30
140W Cosmo White Lamp, ANSI Code TBD Minimum Starting Temp -30°C/-20°F													
New	1	140	208 277	ICW-140-M-LS[1] ILCW-140-M-LS, -6, 8, 10[2]	✓	✓	0.75 0.57	153 153	80°C	10	M	2.1	30
New	1	140	120	RCW-140-T-LS RLCW-140-T-LS, -6, -8, 10[2]	✓	✓	1.3	154	70°C	10	T	3.1	30

1 208-277V
2 ILCW and RLCW indicate LumiStep ballasts

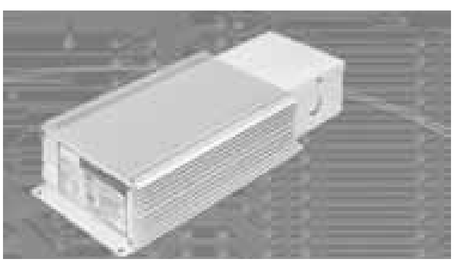
The Philips MasterColor Elite MW system offers an unrivalled level of light quality and performance. The lamp's sparkling white light creates a natural ambiance and brings out the best in all different types of colors. Additionally the high efficiency of the lamp and ballast together means reduced energy use and a lower cost of ownership compared to a 400W Metal Halide HID system.

Philips "Green Flagship Product"

- Low mercury, no lead
- Up to 120 lm/W
- 92% ballast efficacy

Light quality

- Excellent color rendering of CRI 90+
- Crisp, white light in 3000K and 4200K CCT
- Stable color performance over the rated average life of the lamp
- New socket design enhances higher optical efficiency



Product Benefits

- Significant upgrade opportunity over traditional HID systems.
- Viable alternative to fluorescent options.
- Excellent color quality and consistent light output from beginning to end.
- Being 50% smaller than traditional metal halide lamps gives freedom in optic and luminaire design.
- Greater harmony in lighting design due to availability of Elite lamps in various wattages and two color temperatures.
- Sparkling properties of white light create a more natural and inviting ambience.
- High system energy efficacy: sound TCO.
- A Green Flagship product to minimize environmental impact and CO^2 emission.
- Long life for low maintenance cost.
- True universal operation with no effect on life and color.

Applications

- **Outdoor:** Architectural façade lighting, illumination of roads and pedestrian areas, public spaces, and parking garages
- **Indoor:** High-Bay retail, Grocery stores, warehouses, manufacturing facilities

Lamp Data		Input Volts	Catalog Number	Certifications			Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp.	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)	Dip Switch Settings
Number	Watts			E	UL	CSA								
210W MasterColor CDM Elite MW Lamp, ANSI Code C183 Minimum Starting Temp -20°C/-4°F														
1	210	200 277	IZTMH-210315-R-LF[1]	✓	✓	✓	1.2 0.82	229 227	85°C	9	R	4.5	30	
315W MasterColor CDM Elite MW Lamp, ANSI Code C182 Minimum Starting Temp -20°C/-4°F														Preset at Factory
1	315	200 277	IZTMH-210315-R-LF[1]	✓	✓	✓	1.8 1.25	343 341	85°C	9	R	4.5	30	

New ON

New ON

1 200-277V

DIP switches are "on" in the down position

Core & Coil

Val-U-Pak Plus

Capacitors

Ignitors

Transformers

F-Can Ballasts

Encapsulated Core & Coil

Postline

Indoor Enclosed

OutDoor Weatherproof

HIGH INTENSITY DISCHARGE BALLASTS

Contents

Note:
For International HID Ballasts (50Hz and 60Hz),
See International Section, pages 6-14 to 6-19

For Electronic HID Ballasts, See Section 4

Corporate Offices
(800) 322-2086

Customer Support/Technical Service
(800) 372-3331 • (+) 1 847 390-5000 (International)

Visit our web site at www.philips.com/advance

HID

HIGH INTENSITY DISCHARGE BALLASTS

Philips Advance HID ballasts are available to operate the wide variety of metal halide, high pressure sodium and low pressure sodium lamps available in today's marketplace.

Like fluorescent, HID lamps are gas discharge lamps. Light is produced by an arc discharge between two electrodes located at opposite ends of an arc tube within the lamp's outer glass envelope. The ballast is the lamp's power supply; its purpose is to provide proper starting and operating voltage and current to initiate and sustain this arc.

Lamp Starting

Probe-Start Metal Halide Lamps

The "traditional" probe-start metal halide lamps (175 through 1500W) have an additional electrode located at one end of the arc tube to assist in lamp starting. These types of lamps require an open circuit voltage (OCV) approximately two times the lamp's operating voltage to initiate the arc.

High Pressure Sodium and Pulse-Start Metal Halide Lamps

High pressure sodium and modern metal halide lamps which include existing lamps, 150W and less, as well as the new generation of pulse-start metal halide lamps, 150W and greater, have no starting electrodes. In addition to an OCV of approximately two times the lamp voltage, these lamps utilize an "ignitor" to provide a high voltage starting pulse directly across the main electrodes. Once the lamp's arc is established, the ignitor automatically stops delivering pulses, and the lamp comes up to full brightness on its own.

Low Pressure Sodium

Because they have neither a starting electrode nor an ignitor, low pressure sodium lamps require an open circuit voltage approximately three to seven times the lamp voltage to start and sustain the lamp.

Lamp Operations

Gas discharge lamps have a negative resistance characteristic which causes them to draw an increasing amount of current leading to immediate lamp failure if operated directly from the power line. The ballast, therefore, is utilized to limit the current to the correct level for proper operation of the lamp.

Ballast factor is defined as the ratio of light output produced by a lamp operating on a commercial ballast versus the lamp's rated light output. Philips Advance HID ballasts have a nominal ballast factor of 1.0, thus providing full light output.

HID lamps take several minutes to warm-up and reach full lumen output. Additionally, an interruption in the input power or a sudden voltage drop may cause the arc to extinguish. A lamp that is hot will not restart immediately. Before the lamp will relight, it must cool sufficiently to reduce the vapor pressure within the arc tube to a point where the arc will restrike. The approximate warmup and restriking times of the HID lamp groups are as follows:

Light Source	Warm-Up Time	Restrike Time
Metal Halide (Probe-Start)	5-4 minutes	10-20 minutes
Metal Halide (Pulse-Start)	2 minutes	3-4 minutes
High Pressure Sodium	3-4 minutes	½-1 minute
Low Pressure Sodium	7-10 minutes	3-12 seconds

Ballast Input Voltages

Unlike fluorescent lighting which is operated on either 120V or 277V circuits, power for HID lighting in the U.S. is delivered at any one of five voltages: 120V, 208V, 240V, 277V or 480V. While 120V and 277V are the most popular, because of the heavier loads and sometimes longer runs associated with HID lighting (such as shopping mall parking lots), 208V and 240V power is often used instead of 120V, and 480V instead of 277V.

To address this multiplicity of voltages, the HID ballast industry offers ballasts with multiple input voltage taps on the primary coil. Our 4-tap design is called a Quadri-Volt® ballast and operates on either 120V, 208V, 240V or 277V line voltage. There is a Philips Advance Quadri-Volt ballast for virtually every HID lamp on the market. New 5-TAP designs, which feature the same input voltages as Quadri-Volt ballasts plus 480V, are available for 250W, 400W, and 1000W metal halide and high pressure sodium applications.

Luminaires Fusing

Many HID lighting luminaires are sold with protective fuses. The purpose of the fuse is to isolate a luminaire from the lighting circuit in the event of excessive current draw, such as might be caused by a failed ballast. Unfortunately, the fuse will not protect the ballast from failure.

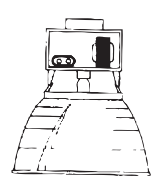
With many luminaires the fuse is physically located in the ballast compartment of the luminaire. The air temperature within this compartment can easily reach 80°C and still be within the design limitations of the luminaire.

Many fuses are temperature sensitive, meaning that the current rating goes down as the ambient temperature goes up. Fuse current ratings are based on the fuse's performance in a 25°C ambient (77°F). In an 80°C ambient, some fuses will open at half their rating.

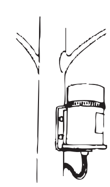
As a result, the fuse rating shown in the HID ballast tables is calculated at 2½ to 3 times the highest current draw of the ballast: lamp operating, starting or open circuit conditions. Fast-blow fuses should be used. It is not necessary to use current limiting fuses.

Ballast Design Applications

HID lamp ballasts are available in a variety of shapes and sizes for the most popular lighting applications. Six basic designs are in widest use today.

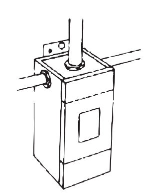


Cove & Coil
(71A Series)

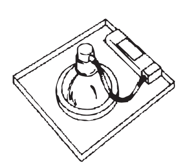


Outdoor Weatherproof
(79W Series)

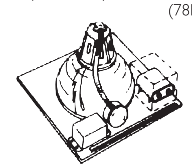
Postline
(74P Series)



Indoor Enclosed
Rectangular Can
(78E Series)



Fluorescent Can
(72C Series)



Encapsulated Core & Coil
(73B Series)

Core & Coil

The basic ballast is the open core & coil which is most often used as a component within a lighting luminaire. The core & coil also forms the nucleus of the five other ballast configurations detailed in this section. It consists of either one or two copper coils on a core (or "stack") of electrical-grade steel laminations. The coils are assembled to core sections which are then surface-welded together. At Philips Lighting Electronics the assembled ballast is vacuum-pressure impregnated with a silica-filled polyester varnish to re-enforce the electrical insulation, preclude moisture, inhibit noise, and dissipate heat. Most other HID ballast manufacturers apply varnish via a preheat-and-dip process which only puts a thin coat of varnish on the outer surface of the ballast. Philips Advance Core & Coil ballasts feature as standard an insulation system rated class H (180°C maximum coil hot spot temp.) for ballasts below 600W, and Class N (200°C maximum coil hot spot temp.) for ballasts 600W and higher. When performing in-fixture testing, the maximum allowable average coil temperature (measured by the rise-of-resistance method) is 165°C for class H ballasts or 185°C for Class N ballasts. The maximum allowable coil face or lead wire temperature (measured by thermocouple) is 150°C for both class H and Philips Advance Class N ballasts.

Encapsulated Core & Coil

Where quiet performance is required, the standard open core & coil ballasts are encapsulated (potted) in a cube-shaped steel can utilizing Class H (180°C) polyester compound. These ballasts carry a Class A noise rating up through 175W and Class B for 250 and 400W. As with the open core & coil, the capacitor (and ignitor where included) are mounted separately within the fixture.

Ballasts with Aluminum Secondary Coil

Philips Lighting Electronics offers a wide range of ballasts that have primary coil made out of copper and secondary coil made out of aluminum. All Philips Advance ballasts including ballasts with aluminum secondary coil adhere to ANSI specifications and are certified by respective agencies (UL, CSA, etc.). Aluminum ballasts are designated by -A after ballast Catalog number and/or "AL" on wiring diagram.

Fluorescent Can (F-Can)

For indoor commercial applications of HID lighting such as offices, schools and retail stores, ballast noise must be minimized. Ballasts for these luminaires are most often encased and potted in fluorescent ballast type cans and utilize Class A (90°C) asphalt insulating materials (the same as used in fluorescent lamp ballasts).

The Philips Advance line of F-can ballasts comes in two dual-voltage configurations: 120/277V for the US market, and 120/347V for the Canadian market. Each unit has built-in, automatically resetting, thermal protectors which disconnect the ballast from the power line in the event of overheating. All units are high power factor and include the capacitor within the can. All models for high pressure sodium, low-wattage metal halide, and pulse-start metal halide lamps also include the ignitor in the can.

Spacing between ballasts and the mounting surface must be considered when the ballasts are remote-mounted. Twelve inches between ballasts must be maintained and if multiple rows vertically are used, there should be at least 12 inches between rows. In addition to ballast and row spacing, the ballast must not be directly mounted to a non-metallic surface. They must be spaced with mounting brackets (available from Philips Lighting Electronics) to allow airflow under the ballast base.

Indoor Enclosed

These units are designed for use indoors where the ballast must be mounted remotely from the luminaire. They are most typically used in factories where the luminaire may be mounted in a high-bay where very high ambient temperatures may be experienced. In these instances, the remotely-mounted ballast operates cooler, subsequently providing longer life because it is away from both the heat of the ceiling ambient and lamp heat within the fixture.

The case contains the core & coil potted in a Class H (180°C) heat-dissipating resin. The capacitor(s) and ignitor are contained within a separate compartment. Knockouts in both ends of the case facilitate hook-up in the most convenient manner. Wall mounting is accomplished through flanges on the top and bottom of the case. The ballast is a UL Listed product.

Outdoor Weatherproof

Weatherproof ballasts are designed for remote, pole-mounting outdoor applications under all weather conditions. They may also be placed inside of a transformer pole base, but care must be taken to avoid areas prone to flooding because weatherproof ballasts are not water-submersible.

The core & coil with its capacitor and ignitor (where required) are firmly mounted to the heat-sink base. An aluminum cover is placed over the core-&-coil assembly and is bolted with a weather-tight gasket to the base. An integral 1" threaded nipple with locknut facilities hook-up to electrical conduit or to the mounting bracket when used on a pole. The weatherproof ballast may also be placed nipple-up, with a drip loop in the leads, inside a pole base.

Postline

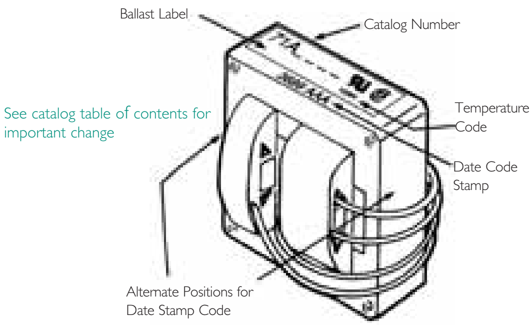
Lantern-type fixtures mounted on slender poles often require ballasts which will fit into these poles. Special, elongated core & coil ballasts are potted in resin in cylindrical cans having a 2.55" outside diameter. All include leads necessary for direct connection to a photocell.

The capacitor and ignitor (where required) are included within this can. A ½" threaded nipple is used for vertical mounting, and leads extend from both ends of the can for ease of installation. The input leads to the ballast also provide for proper connection to the photocell if such is included within the luminaire.

To help prevent overheating, one to three feet of air space should be allowed in the pole above the ballast, and the ballast should be positioned against the post interior wall to provide a heat-sink. All units rated 100W and above now include a mounting kit consisting of an 18" chain to hang the ballast within the pole and a spring clip to force the ballast's cylindrical can to make line contact with the pole's interior surface to maximize heat transfer, thus prolonging the ballast life.

HIGH INTENSITY DISCHARGE BALLASTS

Ballast Date and Tempterature Codes



Philips Advance HID Core & Coil ballasts are date stamped on either the top surface or the side surface of the ballast core. The four-digit number represents the week and year of manufacture. The first two numbers indicate the week and the last two indicate the year the ballast was manufactured. The example shows a ballast manufactured during the 36th week of 1989. The three letters are a Philips Lighting Electronics. factory code.

The ballast's UL Bench Top Rise Temperature Code is shown on the label (see below).

UL Bench Top Rise Temperature Code

To facilitate UL inspection, each ballast's UL Bench Top Rise Temperature Code is shown on the Philips Advance Core & Coil ballast label as 1029X, where 1029 is the UL Standard for HID Ballasts, and the X is the temperature code: A, B, C, etc. If a fixture is UL listed for 1029C, then automatically, all ballasts with an A, B, or C temperature classification are acceptable for use within that same fixture.

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

Certifications

Indicates ballast is listed by Underwriters Laboratories, Inc. in accordance with UL 1029 Standard for HID Ballasts. Each ballast is marked appropriately.

Indicates ballast is component recognized by Underwriters Laboratories, Inc. in accordance with UL 1029 Standard for HID Ballasts. Each ballast is marked appropriately.

Indicates ballast is certified by Canadian Standards Association in accordance with CAN/CSA-22.2 No. 74-92. Each ballast is marked appropriately.

All HID Ballasts are designed and manufactured in accordance with the American National Standards Institute Standard for HID Ballasts, ANSI C82.4.

NOM

Indicates ballast is certified and compliant with "Norma Obligatorio Mexicana" (NOM) requiements

Indicates ballast meets the 88% efficiency requirements of EISA (Energy Independence and Security Act of 2007).

EISA requires all 150W-500W metal halide luminaires manufactured on or after January 1, 2009, to contain a ballast meeting the following levels of efficiency:

- 88% for magnetic or electronic pulse start ballasts
- 94% for magnetic probe start ballasts
- 92% for non-pulse start electronic ballasts for wattages greater than 250W, and
- 90% for non-pulse start electronic ballasts for wattages up to 250W

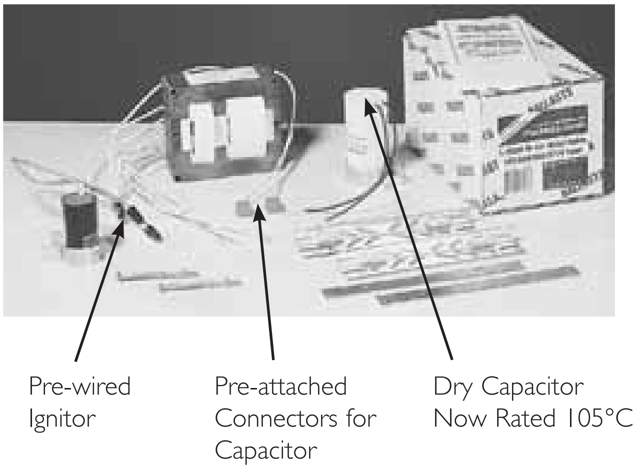
Please refer to the EISA brochure found on the www.philips.com/advance website for additional info on EISA-Compliant Pulse Start ballasts.

Core & Coil Replacement Kits

Distributor Kits and Replacement Ignitors

Philips Lighting Electronics furnishes 120/208/240/277 Quadri-Volt® core & coil ballasts to allow the stocking distributor to conveniently meet the replacement and retrofit needs of customers. In addition, Philips Lighting Electronics now offers 120/208/240/277/480V 5-TAP™ core & coil ballasts for the most popular applications. 5-TAP ballasts add the 480V input lead to the Quadri-Volt designs. A Quadri-Volt or 5-TAP core & coil, along with the appropriate capacitor, ignitor (where required), mounting bracket & hardware and installation instructions are packed in a space-saving shipping carton. These "kits" eliminate the need for distributors or end-users to stock loose components of single voltage ballasts for 120, 208, 240, 277, and even some 480V applications, though single voltage kits for 480V applications will also be available.

Ignitors are also packaged in individual cartons for replacement needs. There are several different ignitors to meet the needs of the many different lamps. The appropriate ignitor for each ballast is shown in the far right column on the page in this Atlas where the ballast is listed. Additionally, this information is summarized in the tables on pages 5-40 through 5-44.



Dry Capacitors

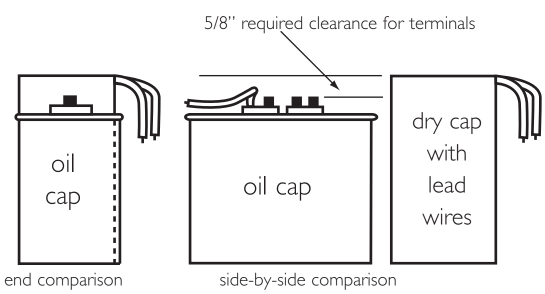
We have extended the operating voltage range of our dry capacitors from 330 to 400V. This means that our most popular HID replacement kits for 175, 250, and 400W metal halide lamps now contain dry capacitors and offer the additional benefits available only with a dry capacitor.

Those benefits are:

- Dry capacitors are typically 25 to 50% smaller than their oil-filled counterparts, assuring that the Philips Advance ballast kit will fit existing fixtures.
- Dry capacitors are rated 105°C, 15°C higher than 90°C oil-filled capacitors, thus providing longer component life.
- Dry capacitors are built using a thermoplastic case, thus eliminating the need for grounding and insuring a faster, easier replacement.
- Unlike oil-filled capacitors with exposed tab terminals, dry capacitors have no exposed live parts and thus protect end-users from hazardous voltages.

The bottom line is that our expanded use of dry capacitors makes the contractor's job faster and easier. Look for the "D" at the end of our catalog number, it identifies the ballast kit as one that contains a dry capacitor.

Capacitor Size Comparison
Oil-Filled vs. Advance Dry Type



Core & Coil Replacement Kits

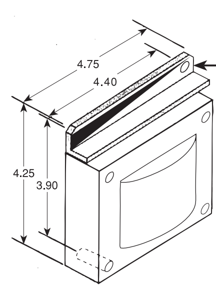
Pulse Start Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	E
50W Lamp, ANSI Code M110 or M148 (Pulse-Start)						
120/208/ 240/277	71A5191-001D	HX-HPF	4.0	✓	✓	
70W Lamp, ANSI Code M110 or M148 (Pulse-Start)						
120/208/ 240/277	71A5292-001D	HX-HPF	5.0	✓	✓	
100W Lamp, ANSI Code M110 or M148 (Pulse-Start)						
120/208/ 240/277	71A5390-001D	HX-HPF	5.5	✓	✓	
150W Lamp, ANSI Code M102 or M142 (Pulse-Start)						
120/208/ 240/277	71A5492-001D	HX-HPF	7.0	✓	✓	
175W Lamp, ANSI Code M137 or M152 (Pulse-Start)						
120/208/ 240/277	71A5593-001D	Super CWA	7.0	✓	✓	
200W Lamp, ANSI Code M136 (Pulse-Start)						
277	71A5637-001DEE*	Linear Reactor HPF	6.0	✓	✓	✓
120/208/ 240/277	71A5692-001D	Super CWA	8.0	✓	✓	
250W Lamp,ANSI Code M138 or M153 (Pulse-Start)						
277	71A5737-001DEE*	Linear Reactor HPF	8.0	✓	✓	✓
120/208/ 240/277	71A5792-001D	Super CWA	9.5	✓	✓	
320W Lamp, ANSI Code M132, M154 or M170 (Pulse-Start)						
277	71A5837-001DEE*	Linear Reactor HPF	9.5	✓	✓	✓
120/208/ 240/277	71A5892-001D	Super CWA	11.0	✓	✓	
480/120T	71A5842-001DT	Super CWA	11.0	✓	✓	
350W Lamp, ANSI Code M131 or M171 (Pulse-Start)						
277	71A5937-001DEE*	Linear Reactor HPF	10.0	✓	✓	✓
120/208/ 240/277	71A5993-001D	Super CWA	11.0	✓	✓	
400W Lamp, ANSI Code M135 or M155 or M172 (Pulse-Start)						
277	71A6137-001DEE*	Linear Reactor HPF	9.0	✓		✓
120/208/ 240/277	71A6092-001D	Super CWA	11.0	✓	✓	
750W Lamp, ANSI Code M149 (Pulse-Start)						
277/ 347/ 480/120T	71A64F2-001D	Super CWA	17.0	✓	✓	
120/208/ 240/277/ 480	71A6452-001D	Super CWA	19.5	✓	✓	
1000W Lamp, ANSI Code M141 (Pulse-Start)						
120/208/ 240/277	71A6593-001	Super CWA	21.0	✓		

* Includes -540 bracket.

Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	E
175/150W Lamp, ANSI Code M57/M107						
120/208/ 240/277	71A5570-001D	CWA	6.8	✓	✓	
480/120T	71A5540-001D	CWA	8.5	✓	✓	
250W Lamp, ANSI Code M58						
120/208/ 240/277	71A5770-001D	CWA 4x 4 Core	9.0	✓	✓	
120/208/ 240/277/ 480	71A5750-001D		10.0	✓	✓	
480/120T	71A5740-001D		10.0	✓	✓	
120/208/ 240/277	71A5771-001D	CWA 3x 3 Core	9.0	✓	✓	
480/120T	71A5741-001D		9.0	✓	✓	
400W Lamp, ANSI Code M59						
120/208/ 240/277	71A6071-001D	CWA	11.5	✓	✓	
120/208/ 240/277/ 480	71A6051-001D	CWA	14.0	✓	✓	
480/120T	71A6041-001D	CWA	12.0	✓	✓	
1000W Lamp, ANSI Code M47						
120/208/ 240/277	71A6572-001	CWA	21.0	✓	✓	
120/208/ 240/277/ 480	71A6552-001	CWA	22.0	✓	✓	
480/120T	71A6542-001	CWA	21.0	✓	✓	
1500W Lamp, ANSI Code M48						
120/208/ 240/277	71A6772-001	CWA	30.0	✓	✓	
480/120T	71A6742-001	CWA	31.0	✓	✓	



Suffix -540D denotes a welded angle bracket to allow linear reactors to mount in 400W fixtures designed for standard CWA ballasts without brackets. This bracket is standard on -001DEE.

-540 Bracket Detail

Core & Coil Replacement Kits

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications UL	Certifications CSA
35W Lamp, ANSI Code S76					
120	71A7707-001DB	R-HPF	1.5	✓	✓
50W Lamp, ANSI Code S68					
120	71A7807-001DB	R-HPF	1.9	✓	✓
120/277	71A7801-001D	HX-HPF	3.5	✓	✓
70W Lamp, ANSI Code S62					
120	71A7907-001DB	R-HPF	2.5	✓	✓
120/208/ 240/277	71A7971-001D	HX-HPF	5.5	✓	✓
100W Lamp, ANSI Code S54					
120	71A8007-001DB	R-HPF	3.1	✓	✓
120/208/ 240/277	71A8071-001D	HX-HPF	7.3	✓	✓
120/208/ 240/277	71A8091-001DC	HX-HPF	7.3	✓	✓
480	71A8041-001D	HX-HPF	7.0	✓	✓
150W Lamp, ANSI Code S55					
120	71A8107-001DB	R-HPF	4.0	✓	✓
120/208/ 240/277	71A8172-001D	HX-HPF	8.0	✓	✓
120/208/ 240/277	71A8192-001DC	HX-HPF	8.0	✓	✓
480	71A8142-001D	HX-HPF	9.5	✓	✓
150W Lamp, ANSI Code S56					
120/208/ 240/277	71A8176-001D	CWA	8.5	✓	✓
480	71A8146-001D	CWA	8.5	✓	✓

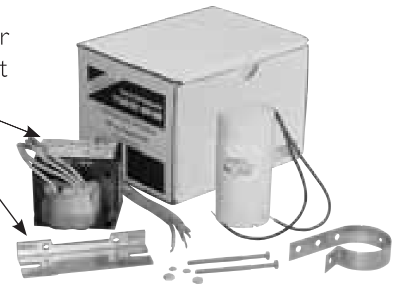
HPS Kit Options

In addition to the standard kits, this and the following page include two HPS kits with special features:

HPS Reactor Kits with Integral Ignitors

"B" Suffix denotes 120V reactor circuit kits featuring single-coil reactor ballasts with integral ignitors. The kit includes a mounting bracket (PC848S) sized specifically for the small reactor ballasts.

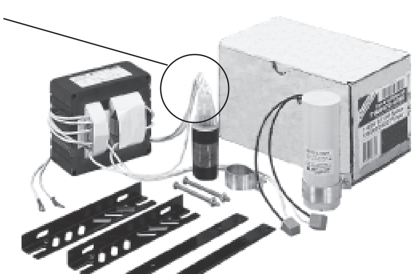
Compact Reactor Core and Bracket



HPS Kits with Plug-In Ignitors

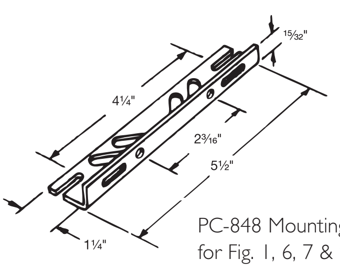
"C" Suffix (p.5-8) denotes standard HPS kit except with plug-in ignitor. A mating receptacle is attached to the core and coil lead wires, ready for immediate connection.

Connectorized ignitor and mating receptable

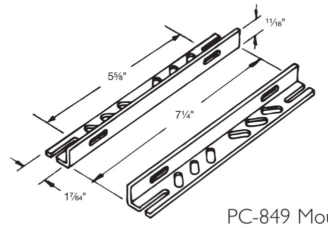


Core & Coil Mounting Brackets

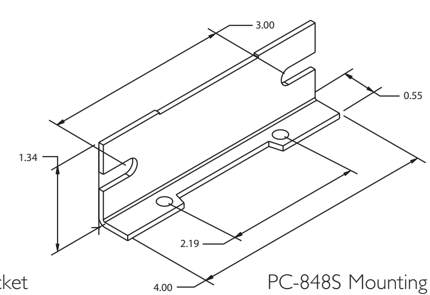
Included with all Replacement Kits



PC-848 Mounting bracket for Fig. 1, 6, 7 & 9

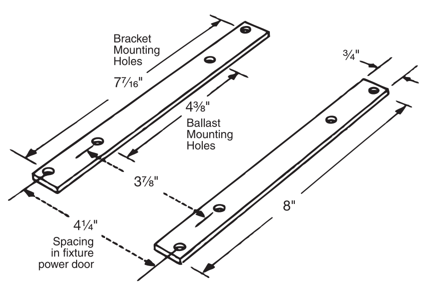


PC-849 Mounting bracket for Fig. 2, 3, 8, 8a &10.



PC-848S Mounting bracket for Fig. 9.

PC-848: To order individual packaged kits, specify PKG 848 (1 brackets with thru bolts).
PC-849: To order individual packaged kits, specify PKG 849-2 (2 brackets with thru bolts).
PC-848S: Bracket and thru bolts are included in 120V HPS Reactor Kits.



PC-909 Mounting bracket for Fig. 2, 3 & 8 when used with power-door roadway fixtures

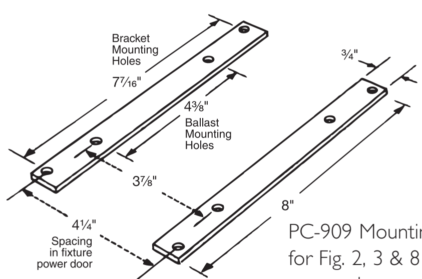
Core & Coil Replacement Kits

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications	
				UL	CSA
200W Lamp, ANSI Code S66					
120/208/ 240/277	71A8970-001D	CWA	8.5	✓	✓
480	71A8940-001D	CWA	8.5	✓	✓
250W Lamp, ANSI Code S50					
120/208/ 240/277	71A8271-001D	CWA	11.5	✓	✓
120/208/ 240/277/ 480	71A8251-001D	CWA	12.0	✓	✓
120/208/ 240/277	71A8291-001DC	CWA	11.5	✓	✓
480	71A8241-001D	CWA	11.0	✓	✓
310W Lamp, ANSI Code S67					
120/208/ 240/277	71A8371-001D	CWA	13.8	✓	✓
400W Lamp, ANSI Code S51					
120/208/ 240/277	71A8473-001D	CWA	15.0	✓	✓
120/208/ 240/277/ 480	71A8453-001D	CWA	16.0	✓	✓
120/208/ 240/277	71A8493-001DC	CWA	15.0	✓	✓
480	71A8443-001D	CWA	15.5	✓	✓
1000W Lamp, ANSI Code S52					
120/208/ 240/277	71A8773-001	CWA	31.0	✓	✓
120/208/ 240/277/ 480	71A8753-001	CWA	29.0	✓	✓
480	71A8743-001	CWA	31.0	✓	✓

Low Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications	
				UL	CSA
35 or 55W Lamp, ANSI Code L70 or L71					
120/208/ 240/277	71A0490-001D	HX-PFC	7.5	✓	✓

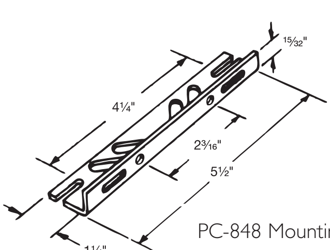


PC-909 Mounting bracket for Fig. 2, 3 & 8 when used with power-door roadway fixtures

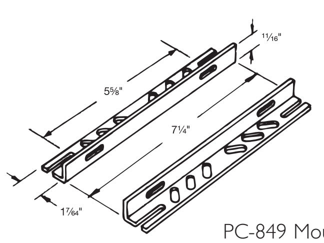
Core & Coil Mounting Brackets

Included with all Replacement Kits

(See Page 5-7 for addional bracket diagram)



PC-848 Mounting bracket for Fig. 1, 6, 7 & 9



PC-849 Mounting bracket for Fig. 2, 3, 8, 8a &10.

PC-848: To order individual packaged kits, specify PKG 848 (1 brackets with thru bolts).
PC-849: To order individual packaged kits, specify PKG 849-2 (2 brackets with thru bolts).
PC-848S: Bracket and thru bolts are included in 120V HPS Reactor Kits.

Tri-Tap Replacement Core & Coil Kits for Canada

Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications	
70W Lamp, ANSI Code M98					
120/ 277/347	71A52A2-001D	HX-HPF	5.0	✓	✓
100W Lamp, ANSI Code M90					
120/ 277/347	71A53A0-001D	HX-HPF	5.5	✓	✓
175/150W Lamp, ANSI Code M57/M107					
120/ 277/347	71A55A0-001D	CWA	7.0	✓	✓
250W Lamp, ANSI Code M58					
120/ 277/347	71A57A0-001D	CWA	10.0	✓	✓
400W Lamp, ANSI Code M59					
120/ 277/347	71A60A1-001D	CWA	12.0	✓	✓
1000W Lamp, ANSI Code M47					
120/ 277/347	71A65A2-001	CWA	21.0	✓	✓
1500W Lamp, ANSI Code M48					
120/ 277/347	71A67A2-001	CWA	30.0	✓	✓

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications	
70W Lamp, ANSI Code S62					
120/ 277/347	71A79A1-001D	HX-HPF	5.5	✓	✓
100W Lamp, ANSI Code S54					
120/ 277/347	71A80A1-001D	HX-HPF	7.5	✓	✓
150W Lamp, ANSI Code S55					
120/ 277/347	71A81A2-001D	HX-HPF	7.5	✓	✓
250W Lamp, ANSI Code S50					
120/ 277/347	71A82A1-001D	CWA	11.5	✓	✓
400W Lamp, ANSI Code S51					
120/ 277/347	71A84A3-001D	CWA	13.5	✓	✓
1000W Lamp, ANSI Code S52					
120/ 277/347	71A87A3-001	CWA	28.0	✓	✓

Pulse Start Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications	
250W Lamp, ANSI Code M138 or M153 (Pulse-Start)					
120/ 277/347	71A57A2-001D	Super CWA	9.5	✓	✓
320W Lamp, ANSI Code M132, M154 or M170 (Pulse-Start)					
120/ 277/347	71A58A2-001D	Super CWA	11.0	✓	✓
400W Lamp, ANSI Code M135, M155 or M172 (Pulse-Start)					
120/ 277/347	71A60A2-001D	Super CWA	11.0	✓	✓

HID Val-U-Pak™ Plus Replacement Kits

Val-U Pak Plus

HID installations just got simpler, more convenient - and significantly faster, with the new Val-U-Pak Plus kits from Philips Lighting Electronics.

Why Should You Change All the Components?

HID fixtures are generally difficult to reach and to service. Subsequently, the cost of labor can often exceed the cost of the ballast and/or lamp. When the ballast, capacitor or ignitor reach end-of-life, it is recommended that all of these components in the fixture be replaced at the same time. It is equally suggested that the lamp also be replaced, assuring optimal performance of the system and eliminating the need to re-service the fixture during the entire life-cycle of the lamp.

Features of Val-U-Pak Plus:

- **Added Versatility** – 5-Tap core and coil ballast for the six most popular applications
  *Adds the 480V input lead to the Quadri-Volt design
- **All Inclusive** – Premium grade clear lamp supplied in kit
  *Manufactured by major lamp company and warranteed by Philips Lighting Electronics
- **Higher Wattage Options** – Philips Advance Class N (200°C) insulation system on 1000W units provides an additional 20°C margin for high ambient applications

HID VAL-U-PAK Plus kits are available for the 12 most popular applications

Metal Halide

	Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications UL	Certifications CSA
	70W Lamp, ANSI Code M98 (Med) or M143 (Pulse-Start)					
New	120/208/ 240/277	77L5292-001D	HX-HPF	5.0	✓	✓
	100W Lamp, ANSI Code M90 or M140 (Pulse-Start)					
New	120/208/ 240/277	77L5390-001D	HX-HPF	5.5	✓	✓
	150W Lamp, ANSI Code M102 or M142 (Pulse-Start)					
New	120/208/ 240/277	77L5492-001D	HX-HPF	7.0	✓	✓
	175/150W Lamp, ANSI Code M57/M107					
	120/208/ 240/277	77L5570-001D	CWA	9.5	✓	✓
	250W Lamp, ANSI Code M58					
	120/208/ 240/277/ 480	77L5750-001D	CWA	14.0	✓	✓
	400W Lamp, ANSI Code M59					
	120/208/ 240/277/ 480	77L6051-001D	CWA	17.0	✓	✓
	1000W Lamp, ANSI Code M47					
	120/208/ 240/277/ 480	77L6552-001	CWA	29.0	✓	✓

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications UL	Certifications CSA
100W Lamp, ANSI Code S54					
120/208/ 240/277	77L8071-001D-MED	HX-HPF	8.5	✓	✓
150W Lamp, ANSI Code S55					
120/208/ 240/277	77L8172-001D-MOG	HX-HPF	9.5	✓	✓
250W Lamp, ANSI Code S50					
120/208/ 240/277/ 480	77L8251-001D	CWA	15.0	✓	✓
400W Lamp, ANSI Code S51					
120/208/ 240/277/ 480	77L8453-001D	CWA	16.0	✓	✓
1000W Lamp, ANSI Code S52					
120/208/ 240/277/ 480	77L8753-001	CWA	31.0	✓	✓

Ordering Information

Philips Lighting Electronics has developed the industry's broadest selection of HID ballasts. More than 3000 stocking distributors nationwide. For information on the distributor best able to serve your needs, please call 800-372-3331.

Philips Advance HID Ballast Part Number Explanation

71A	60	9	2	-500DAEE

Suffix Code* (as applicable)

-001DB	ballast replacement kit with dry capacitor and integral ignitor
-001D	ballast replacement kit with dry film capacitor
-001	ballast replacement kit with oil filled capacitor
-500D	core & coil ballast with dry film capacitor
-500	core & coil ballast with oil filled capacitor
-510D	core & coil ballast with welded bracket and dry film capacitor
-510	core & coil ballast with welded bracket and oil filled capacitor
-540D	core & coil ballast with welded angle bracket and dry film capacitor
-600	core & coil ballast (no capacitor)
-610	core & coil ballast with welded bracket (no capacitor)

* Add additional feature codes to the end of suffix where applicable.
i.e. -B = Integral Ignitor, -P = Thermally Protected, -J = J-Box Mounting,
-A = Aluminum Coil, -M = "NOM" (with capacitor), -T = 120V Tap
-EE = EISA Compliant Ballast

Design Code

Input Voltage Code

60 Hz Voltages

0 = 120V
1 = 208V
2 = 240V
3 = 277V
4 = 480V
5 = 120/240V or 120/208/240/277/480V
6 = 240/480V
7 = 120/208/240/277V
8 = 120/277V
9 = 120/208/240/277V

A = 120/277/347V
B = 347V
C = 120/347V
D = 120/240/347V
E = 120/208/240V or 208/240V
F = 277/480V, 277/347V, 277/347/480V or 347/480V
H = 127/220V
J = 220V or 220/240V
Y = 100V or 100/200V

50 Hz Voltages

M = 100/200V
N = 120/220-240V
R = 220/240V

Lamp Type/Wattage/Ballast Circuit Code

Ballast Type

71A = Core and Coil Ballast
72C = F-Can Ballast
73B = Encapsulated Core and Coil Ballast
74P = Postline Ballast
77L = Val-U-Pak Plus Replacement Ballast kit (includes lamp)
78E = Indoor Enclosed Ballast
79W = Outdoor Weatherproof Ballast

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	A	B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
35/39W Lamp, ANSI Code M130 (Pulse-Start)																			
✣	120	71A5005-500DP	HX-HPF	55	1.1	230	3	F	6	.9	1.8	28	120	7C280M12RA	D	2.2	LI533-H4	15	A
NOM	120/277	71A5081-500D	HX-HPF	56	.9/.4	230	3/1	K	1	.8	2.1	5	280	7C050L30A	D	3.5	LI533-H4	15	B/A
✣	277	71A5037-500DP	HX-HPF	48	.6	277	2	G	9	.8	1.9	5	280	7C050L30A	D	1.8	LI533-H4	7	A
✣	277	71A5037-500DBP	R-HPF	48	.6	277	2	H	9	1.0	2.7	5	280	7C050L30A	D	1.9	Integral Ignitor	2	A
50W Lamp, ANSI Code M110 or M148 (Pulse-Start)																			
✣	120	71A5105-600P 71A5105-500DP	HX-NPF HX-PFC	69	2.0 1.1	260	5 3	F	6	1.0	1.9	28	120	7C280M12RA	D	2.1 2.3	LI533-H4	15	A
	120/277	**71A5181-001D**	HX-HPF	72	1.0/.5	260	3/2	K	1	1.2	2.1	6	280	7C060L30RA	D	4.0	LI533-H4	10	A/A
	120/208/ 240/277	71A5191-500D **71A5191-001D**	HX-HPF	67	1.2/.68/ .59/.51	254	3/3/ 2/2	K	1	1.2	2.3	6	280	7C060L30RA	D	4.0	LI533-H4	10	A/A A/A
✣	277	71A5137-510DP	R-HPF	62	.6	277	2	G	9	1.1	2.2	5	280	7C050L30A	D	2.2	LI533-H4	2	A
✣	277	71A5137-500DBP	R-HPF	62	.6	277	2	H	9	1.1	2.2	5	280	7C050L30A	D	2.2	Integral Ignitor	2	A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

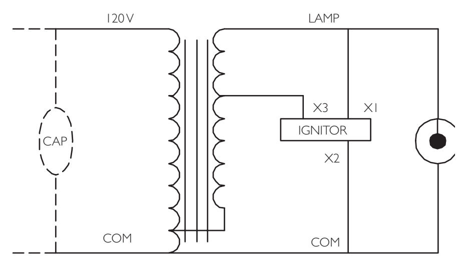


Fig. F

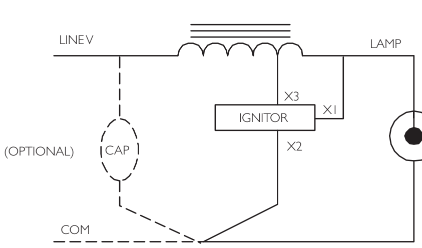


Fig. G

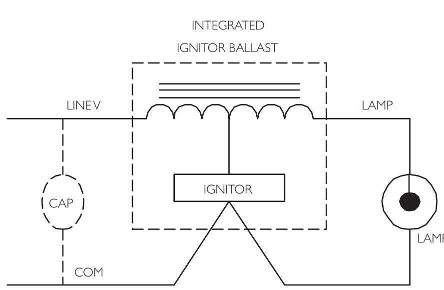


Fig. H

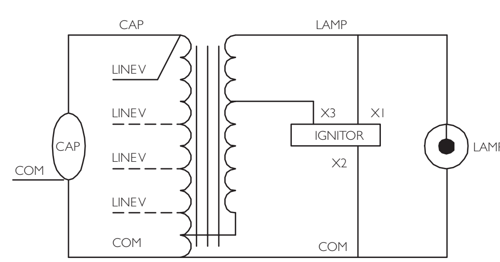


Fig. K

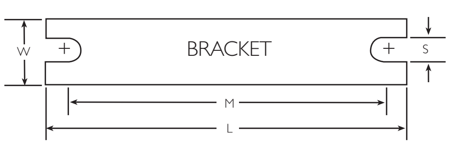
60 Hz Core & Coil Ballasts

Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)	
70W Lamp, ANSI Code M98 (Medium Base) or M143 (Pulse-Start)																			
120	71A5205-600P 71A5205-500DP	HX-NPF HX-PFC	94	2.6 1.4	255	6 4	F	6	1.6	2.7	36	120	7C360M12RA	D	3.5 3.7	LI533-H4	10	B	✣
127/220	71A52H2-500DM	HX-HPF	90	1.9/.9	255	4/2	K	1	1.5	2.8	8	280	7C080L30RA	D	5.0	LI533-H4	15	A/A	NOM
120/208/ 240/277	71A5292-500D **71A5292-001D**	HX-HPF	90	1.9/1.0/ .9/.8	255	4/3/ 2/2	K	1	1.5	2.8	8	280	7C080L30RA	D	5.0	LI533-H4	15	A/A/ A/A	NOM
120/ 277/347	71A52A2-500D **71A52A2-001D**	HX-HPF	90	1.9/ .8/.7	255	4/ 2/2	K	1	1.5	2.8	8	280	7C080L30RA	D	5.0	LI533-H4	15	A/ A/A	
277	71A5237-500DP	R-HPF	85	.8	277	2	G	9	1.6	2.7	8	280	7C080L30RA	D	2.9	LI533-H4	10	A	✣
277	71A5237-500DBP	R-HPF	85	.8	277	2	H	9	1.5	2.9	8	280	7C080L30RA	D	2.9	Integral Ignitor	2	A	✣
70W Lamp, ANSI Code M139 (Philips CDM70/T6, CDM70/TD) (Pulse-Start)																			
120/ 277/347	71A52A1-500D	HX-HPF	94	1.9/ .8/.65	255	4/ 2/2	K	1	1.5	2.8	8	280	7C080L30RA	D	5.0	LI533-H4	5	A/ A/A	
70W Double-ended Lamp, ANSI Code M85 (OSI Briteline/HQI, GE MQI ARC70/TD, Philips MHN70/TD) (Pulse-Start)																			
120/277	71A5280-500D	HX-HPF	94	1.6/.7	245	4/2	K	1	1.5	2.7	8	280	7C080L30RA	D	5.5	LI522-H5	30	A/A	

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1, 6	5.1	1.00	4.50	0.25
9	4.0	0.75	3.50	0.28



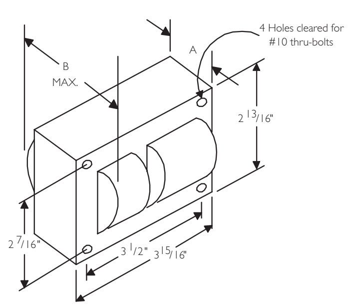


Fig. 1
(3" x 4" Core)

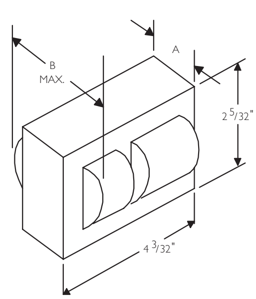


Fig. 6
(2" x 4" Core)

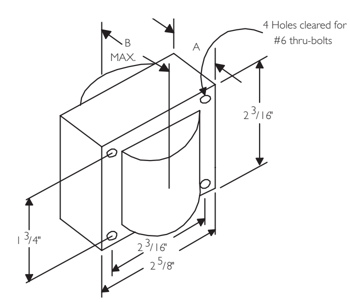


Fig. 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
	100W Lamp, ANSI Code M90 or M140 (Pulse-Start)																		
NOM	127/220	71A53H0-500D	HX-HPF	129	2.2/1.3	280	5/3	K	1	1.7	2.9	12	280	7C120M30RA	D	5.5	LI533-H4	20	A/B
NOM	120/208 240/347	71A5390-500D **71A5390-001D**	HX-HPF	129	2.3/1.4/ 1.2/1.0	265	6/4/ 3/3	K	1	1.5	2.8	12	280	7C120M30RA	D	5.5	LI533-H4	20	B/C/ A/A
🍁	120/ 277/347	71A53A0-500D **71A53A0-001D**	HX-HPF	129	2.6/ 1.2/1.0	280	6/ 3/2	K	1	1.7	2.9	12	280	7C120M30RA	D	5.5	LI533-H4	25	B/ B/B
	480/ 120T	71A5340-500DT	HX-HPF	132	.6	260	2	K	1	1.7	2.9	10	300	7C100M33-R	D	5.5	LI533-H4	25	C
	120/277	71A5383-500D	SUPER CWA	128	1.1/.5	222	3/2	M	1	1.6	2.8	10	330	7C100M40R	D	5.5	LI533-H4	2	C/C
✣	277	71A5337-500DP	R-HPF	118	1.1	277	3	G	9	1.7	2.8	10	280	7C100M33-R	D	3.2	LI533-H4	2	A
✣	277	71A5337-500DBP	R-HPF	118	1.1	277	3	H	9	1.8	3.1	10	280	7C100M33-R	D	3.2	Integral Ignitor	2	A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix.
Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

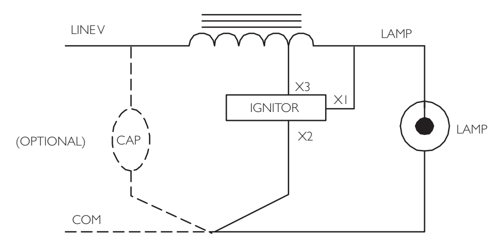


Fig. G

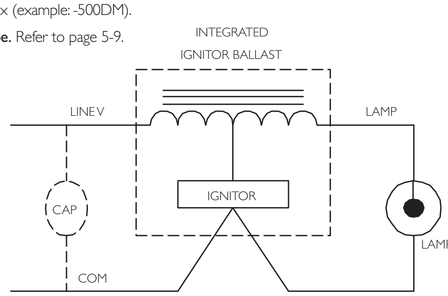


Fig. H

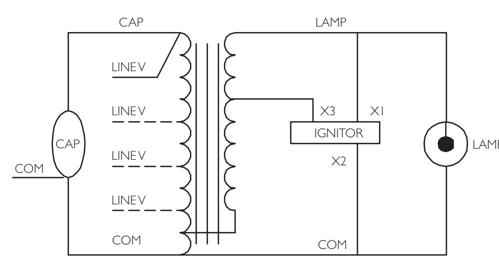


Fig. K

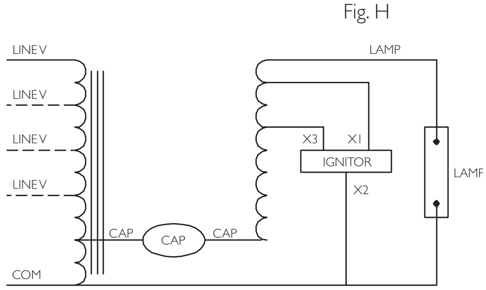


Fig. L

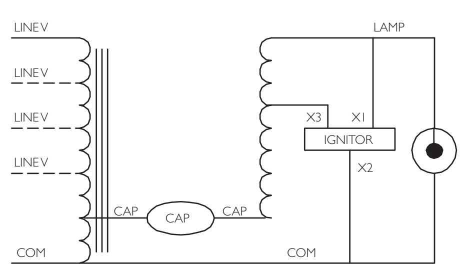


Fig. M

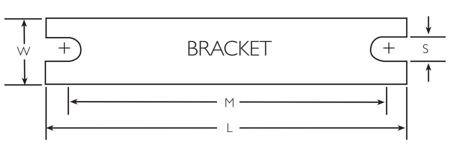
60 Hz Core & Coil Ballasts

Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)		
150W Lamp, ANSI Code M102 or M142 (Pulse-Start)																			
120/208 240/277	71A5492-500D **71A5492-001D**	HX-HPF	185	3.7/2.1/ 1.8/1.6	265	10/5/ 5/4	K	1	2.3	3.9	16	280	7C160M30RA	D	7.0	LI533-H4	10	C/C/ C/C	NOM
480/ 120T	71A5442-500DT	HX-HPF	185	.9	270	3	K	1	2.8	4.0	16	280	7C160M30RA	D	9.0	LI533-H4	10	B	
120/ 277/347	71A54A2-500D	HX-HPF	185	3.7/ 1.6/1.3	265	10/ 4/3	K	1	2.3	3.9	16	280	7C160M30RA	D	7.0	LI533-H4	10	E/ E/E	
480/ 120T	71A5443-500DT	Super CWA	185	0.4	215	5	M	1	2.4	3.75	16	300	7C160M30RA	D	7.5	LI501-J4	5	C	New
120/208 240/277	71A5493-500D	Super CWA	190	1.9/1/ .95/.8	215	5/2.5/ 2/2	M	1	2.4	3.75	16	300	7C160M30RA	D	8.3	LI501-J4	5	D/C/ C/C	New
120/ 277/347	71A54A3-500D	Super CWA	189	1.7/ .8/.7	187	5/ 2/2	L	1	2.7	4.0	22	240	7C220M24-RA	D	9.0	LI501-J4	15	C/ B/A	
277	71A5437-500DBP	Linear Reactor HPF	173	1.5	277	4	H	9	2.5	4.0	14	280	7C140M30RA	D	4.2	Integral Ignitor	2	B	✣
150W Lamp, ANSI Code M81 (OSI Briteline/HQI, GE Arcstream MQI, Philips MHN-TD) (Pulse-Start)																			
120/208/ 240/277	71A5490-500D	HX-HPF	185	3.6/2.1/ 1.8/1.6	240	9/6/ 5/4	K	1	2.5	3.8	16	300	7C160M30RA	D	8.5	LI522-H5	20	C/C/ A/A	NOM

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
9	4.0	0.75	3.50	0.28



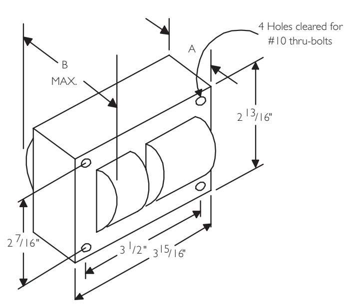


Fig. 1
(3" x 4" Core)

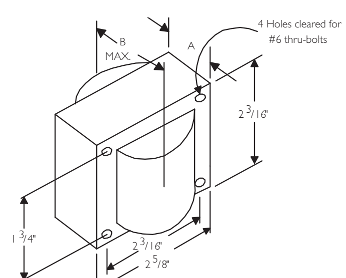


Fig. 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

HID • Core & Coil
Metal Halide

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
	175W Lamp, ANSI Code M57 or 150 Watt Lamp, ANSI Code M107																		
	480/120T	**71A5540-001D**	CWA	210	0.5	305	2	A	1	2.5	4.0	10	400	7C100M40R	D	8.5	–	–	D
	480/120T	71A5540-500DT	CWA	210	0.5	305	2	A	1	2.8	4.0	10	400	7C100M40R	D	8.5	–	–	D
NOM	127/220	71A55H0-500D	CWA	210	1.8/1.1	305	5/3	A	1	2.5	3.8	10	400	7C100M40R	D	6.8	–	–	B/B
NOM	120/208 240/277	71A5590-500D	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	A	1	2.5	3.7	10	400	7C100M40R	D	6.8	–	–	C/D/ D/D
	120/208 240/277	**71A5570-001D**	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	A	1	2.5	3.7	10	400	7C100M40R	D	6.8	–	–	C/D/ D/D
🍁	120/ 277/347	71A55A0-500D **71A55A0-001D**	CWA	210	1.8/ .8/.7	305	5/ 2/2	A	1	2.5	3.7	10	400	7C100M40R	D	7.0	–	–	C/ C/D
	175W Lamp, ANSI Code M137 or M152 (Pulse-Start)																		
Ⓔ	480/120T	71A5541-500DTEE	Super CWA	198	.04	285	2	M	2	1.8	3.4	11	370	7C110M40	D	10.0	LI533-H4	2	A
Ⓔ	120/208 240/277	71A5591-500DEE	Super CWA	198	1.7/1.0/ .8/.7	285	5/3/ 3/2	M	2	1.7	3.3	11	370	7C110M40	D	10.5	LI533-H4	2	A/A/ A/A
Ⓔ ◆	480/120T	71A5543-500DTEE	Super CWA	198	.04	278	2	M	1	3.1	4.2	11	370	7C110M40	D	9.4	LI533-H4	2	A
Ⓔ ◆	120/208 240/277	71A5593-500DEE	Super CWA	198	1.7/1.0/ .9/.8	285	5/3/ 3/2	M	1	3.2	4.4	11	370	7C110M40	D	9.7	LI533-H4	2	A/A/ A/A
NOM	120/208 240/277	**71A5593-001D**	Super CWA	208	1.9/1.1/ .9/.8	275	5/3/ 3/3	M	1	2.3	3.5	11	370	7C110M40	D	7.0	LI533-H4	2	C/C/ C/C
🍁	120/ 277/347	71A55A3-500D	Super CWA	208	1.9/ .9/.7	275	5/ 3/2	M	1	2.3	3.5	11	370	7C110M40	D	7.0	LI533-H4	2	C/ C/C

† Ordering information:

Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

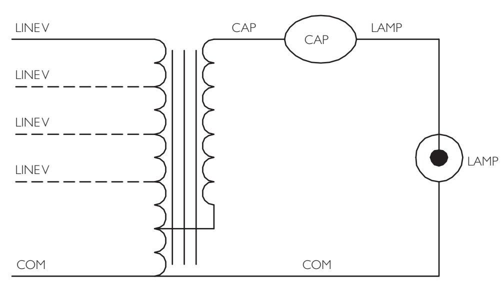


Fig. A

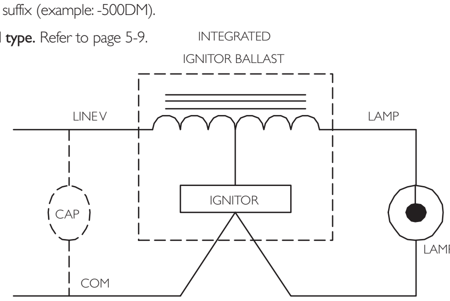


Fig. H

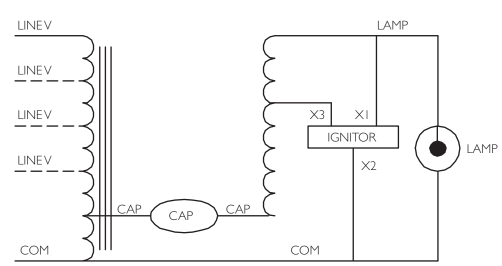


Fig. M

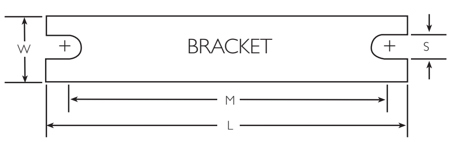
60 Hz Core & Coil Ballasts

Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max • Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)		
200W Lamp, ANSI Code M136 (Pulse-Start)																			
277	71A5637-500DBPEE **71A5637-001DEE**	Linear Reactor HPF	218	1.3	277	4	H	10	1.0	3.1	12	280	7C120M30RA	D	6.0	Integral Ignitor	2	A	Ⓔ ✣
480/ 120T	71A5642-500DTEE	Super CWA	227	0.5	242	2	M	1	2.9	4.2	15	330	7C150M33	D	8.7	LI533-H4	2	A	Ⓔ ◆
120/208/ 240/277	71A5692-500DEE	Super CWA	227	2.2/1.3/ 1.1/1.0	242	6/4/ 3/3	M	1	3.0	4.2	15	33	7C150M33	D	8.8	LI533-H4	2	A/A/ A/A	Ⓔ ◆
120/208/ 240/277	**71A5692-001D**	Super CWA	232	2.0/1.2/ 1.0/.9	240	6/4/ 3/3	M	1	2.5	3.6	15	330	7C150M33	D	8.0	LI533-H4	2	A/B/ A/A	◆
120/ 277/347	71A56A2-500D	Super CWA	232	2.1/ .9/.7	235	6/ 3/2	M	1	2.5	3.6	15	330	7C150M33	D	8.0	LI533-H4	2	C/ A/A	◆
120/208/ 240/277	71A5693-500DM	Super CWA	240	2.1/1.2/ 1.1/.9	252	6/4/ 3/3	M	2	1.4	3.0	15	330	7C150M33	D	8.5	LI533-H4	2	A/A/ A/A	NOM

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2, 10	6.5	1.25	5.75	0.28



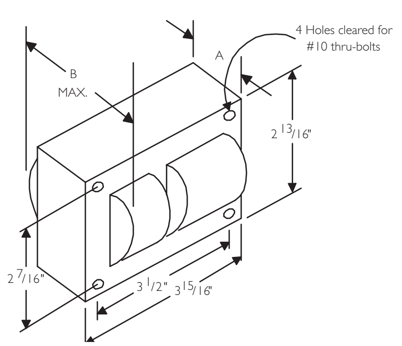


Fig. 1
(3" x 4" Core)

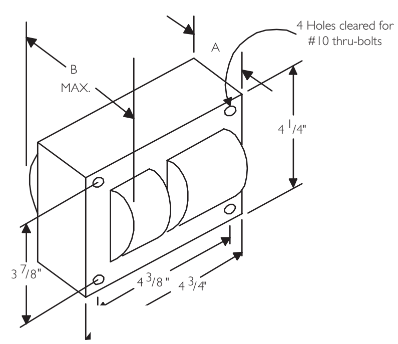


Fig. 2
(4¼" x 4¾" Core)

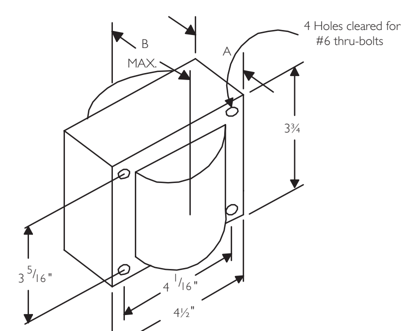


Fig. 10
(4½" x 3¾" Reactor Core)

HID • Core & Coil
Metal Halide

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
	250W Lamp, ANSI Code M58																		
	480/120T	**71A5740-001D**	CWA	295	.7	315	2	A	2	1.7	3.1	15	400	7C150P40R	D	10.0	–	–	B
	480/120T	71A5740-500DT	CWA	295	.7	315	2	A	2	1.7	3.1	15	400	7C150P40R	D	10.0	–	–	B
	120/208/ 240/277/ 480	**71A5750-001D**	CWA	290	2.6/1.5/ 1.4/1.1/ .7	315	8/5/ 5/3/ 2	A	2	1.6	3.1	15	400	7C150P40R	D	10.0	–	–	A/A/ B/A/ B
	120/208/ 240/277/ 480	**71A5750-500DA**	CWA	290	2.6/1.5/ 1.4/1.1/ .7	310	8/5/ 5/3/ 2	A	2	1.6	3.1	15	400	7C150P40R	D	9.0	–	–	A/A/ B/A/ B
	120/208 240/277	**71A5770-001**	CWA	295	2.5/1.4 1.3/1.1	300	8/5/ 5/3	A	2	1.5	3.0	15	400	7C150P40R	D	9.0	–	–	A/A B/A
NOM	120/208 240/277	71A5790-500DM	CWA	295	2.5/1.4 1.3/1.1	300	8/5/ 5/3	A	2	1.5	3.0	15	400	7C150P40R	D	9.0	–	–	A/A/ B/A
NOM	120/208 240/277	71A5790-500DA	CWA	298	2.5/1.5 1.3/1.1	300	8/5/ 5/3	A	2	1.5	3.15	15	400	7C150P40R	D	8.0	–	–	B/B/ B/B
🍁	120/ 277/347	71A57A0-500D **71A57A0-001D**	CWA	295	2.5/ 1.1/.9	315	8/ 3/3	A	2	1.7	3.1	15	400	7C150P40R	D	10.0	–	–	A/ A/A
	120/ 277/347	71A57A0-500DA	CWA	295	2.5/ 1.1/.9	315	8/ 3/3	A	2	1.7	3.1	15	400	7C150P40R	D	9.0	–	–	A/A A/A
NOM	127/220	71A57H0-500DM	CWA	295	2.6/1.5	300	8/5	A	2	1.5	3.0	15	400	7C150P40R	D	9.0	–	–	A/B
◆	480/120T	71A5741-500DT **71A5741-001D**	CWA	298	.7	300	2	A	1	3.0	4.2	15	400	7C150P40R	D	9.0	–	–	H
◆	120/208 240/277	**71A5771-001D**	CWA	294	2.6/1.5/ 1.3/1.1	300	8/5/ 5/3	A	1	3.0	4.2	15	400	7C150P40R	D	9.0	–	–	C/C/ D/D
◆	120/208 240/277	71A5791-500D	CWA	294	2.6/1.5/ 1.3/1.1	300	8/5/ 5/3	A	1	3.0	4.2	15	400	7C150P40R	D	9.0	–	–	C/C/ D/D

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

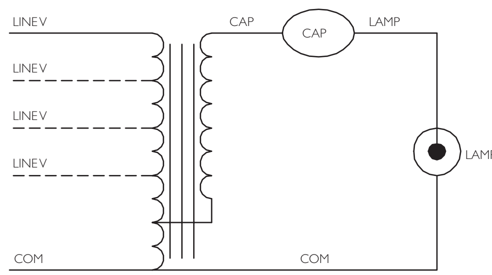


Fig. A

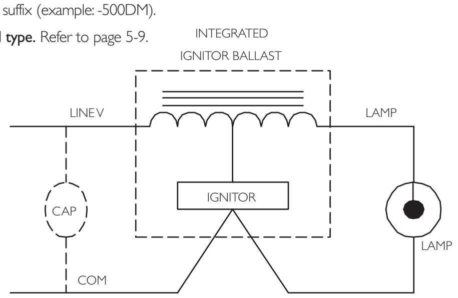


Fig. H

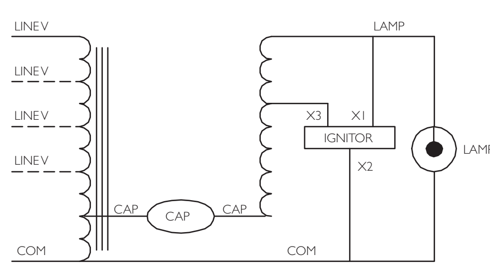


Fig. M

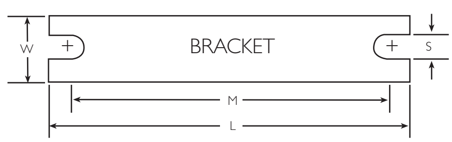
60 Hz Core & Coil Ballasts

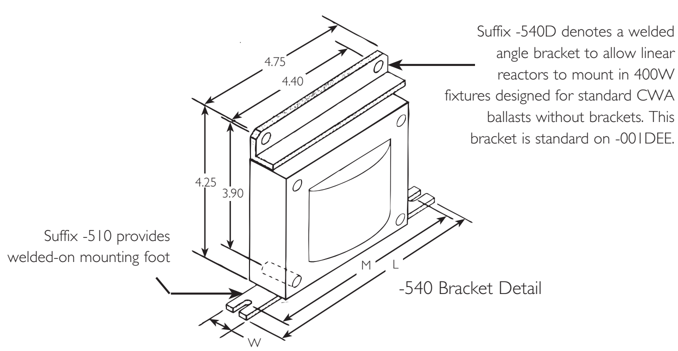
Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)	
250W Lamp, ANSI Code M138 or M153 (Pulse Start)																			
277	71A5737-500DBPEE **71A5737-001DEE**	Linear Reactor HPF	272	1.5	277	4	H	10	1.3	3.2	14	280	7C140M30RA	D	6.5	Integral Ignitor	5	A	Ⓔ ✣
480/ 120T	71A5742-500DTEE	Super CWA	283	0.7	290	2	M	2	2.2	4.0	17	340	7C170P40R	D	11.0	LI533-H4	2	A	Ⓔ
120/208/ 240/277/ 480	71A5752-500DAEE	Super CWA	275	2.4/1.4/ 1.2/1.1/ 0.6	280	8/5/ 5/3/ 2	M	2	2.2	4.0	17	340	7C170P40R	D	11.5	LI533-H4	2	A/A/ A/A A	Ⓔ
120/208/ 240/277	71A5792-500DEE	Super CWA	283	2.6/1.5/ 1.3/1.1	280	8/5/ 5/3	M	2	1.7	3.4	17	340	7C170P40R	D	9.5	LI533-H4	2	A/A/ A/A	Ⓔ
120/208/ 240/277	71A5792-500DA **71A5792-001D**	Super CWA	291	2.5/1.4/ 1.3/1.1	275	8/5/ 5/3	M	2	1.5	3.1	17	340	7C170P40R	D	9.5	LI533-H4	5	A/A/ A/B	
120/208/ 240/278	71A5792-500DMA	Super CWA	291	2.5/1.5/ 1.3/1.1	275	8/5/ 5/3	M	2	1.5	3.1	17	340	7C170P40R	D	9.5	LI533-H4	2	A/A/ A/B	NOM
120/ 277/347	71A57A2-500D **71A57A2-001D**	Super CWA	291	2.5/ 1.1/.9	272	8/ 3/3	M	2	1.5	3.1	17	340	7C170P40R	D	9.5	LI533-H4	5	A/ A/A	

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2, 10	6.5	1.25	5.75	0.28





-540 Bracket Detail

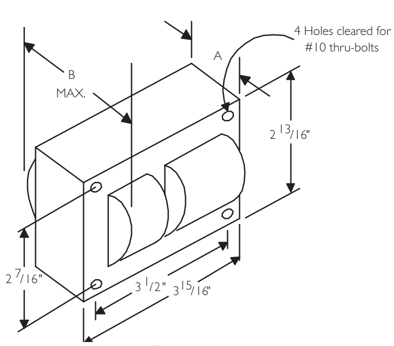


Fig. 1
(3" x 4" Core)

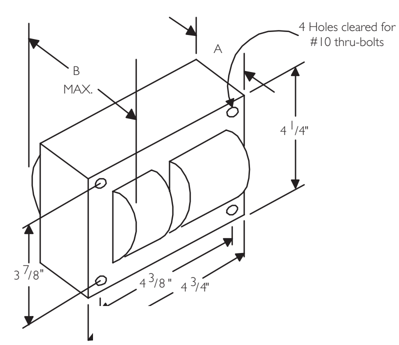


Fig. 2
(4¼" x 4¾" Core)

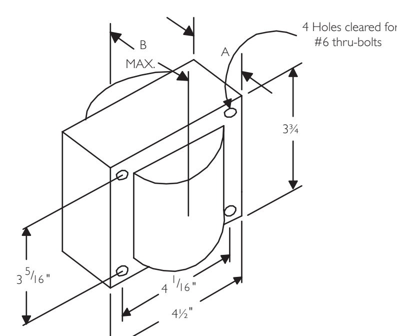


Fig. 10
(4½" x 3¾" Reactor Core)

HID • Core & Coil
Metal Halide

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current•	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
320W Lamp, ANSI Code M132 or M154 or M170 (Pulse-Start)																			
Ⓔ ✣	277	71A5837-500DBPEE **71A5837-001DEE**	Linear Reactor HPF	342	1.9	277	5	H	10	1.7	3.8	17.5	300	7C175M30RA	D	9.5	Integral Ignitor	15	A
Ⓔ	480/120T	71A5842-500DTAEE	Super CWA	363	0.8	275	5	M	2	2.2	4.0	21	345	7C210P40R	D	11.0	LI533-H4	2	D
Ⓔ	120/208/240/277/480	71A5852-500DAEE	Super CWA	363	3.3/1.9/1.7/1.4/0.8	290	10/7/5/5/5	M	2	2.2	4.2	21	345	7C210P40R	D	11.8	LI533-H4	15	A/B/A/A/A
Ⓔ	120/208/240/277	71A5892-500DAEE	Super CWA	363	3.3/1.9/1.7/1.4	285	8/6/5/3	M	2	2.2	4.2	21	345	7C210P40R	D	11.0	LI533-H4	2	A/A/A/A
	480/120T	**71A5842-001DT**	Super CWA	368	0.8	270	5	M	2	1.8	3.7	21	345	7C210P40R	D	11.0	LI533-H4	2	D
NOM	120/208/240/277	71A5892-500DMA **71A5892-001D**	Super CWA	368	3.3/1.9/1.7/1.4	270	8/6/5/3	M	2	1.8	3.7	21	345	7C210P40R	D	11.0	LI533-H4	2	B/B/B/B
🍁	120/277/347	71A58A2-500DA	Super CWA	368	3.3/1.4/1.1	280	8/4/3	M	2	1.8	3.7	21	345	7C210P40R	D	10.0	LI533-H4	2	C/C/C
350W Lamp, ANSI Code M131 or M171 (Pulse-Start)																			
Ⓔ ✣	277	71A5937-500DBPEE **71A5937-001DEE**	Linear Reactor HPF	375	2.1	277	5	H	10	1.9	4.0	20	280	7C200P30RA	D	10.0	Integral Ignitor	2	A
Ⓔ	480/120T	71A5942-500DTAEE	Super CWA	397	0.9	280	3	M	2	2.2	4.1	22.5	345	7C225P40	D	11.0	LI533-H4	2	B
Ⓔ	120/208/240/277/480	71A5953-500DAEE	Super CWA	397	3.4/2.0/1.7/1.5/0.9	285	10/7/5/5/5	M	2	2.2	4.1	22.5	345	7C225P40	D	11.2	LI533-H4	2	B/C/B/B/B
Ⓔ	120/208/240/277	71A5993-500DAEE	Super CWA	397	3.4/2.0/1.7/1.5	270	10/7/5/5	M	2	2.2	4.1	22.5	345	7C225P40	D	11.6	LI533-H4	2	D/C/C/C
NOM	120/208/240/277	71A5993-500DMA **71A5993-001D**	Super CWA	400	3.4/2.0/1.7/1.5	270	10/7/5/5	M	2	1.8	3.7	22.5	345	7C225P40	D	11.0	LI533-H4	2	D/C/C/C
	120/277/347	71A59A3-500D	Super CWA	400	3.4/1.5/1.2	280	10/5/3	M	2	1.8	3.7	22.5	345	7C225P40	D	10.5	LI533-H4	2	D/C/C

† Ordering information:

Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

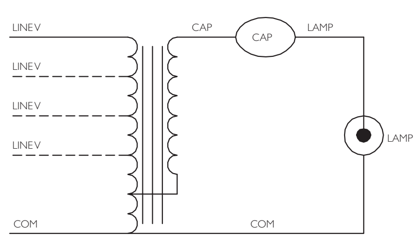


Fig. A

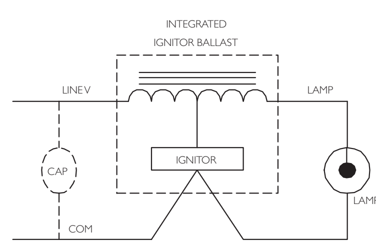


Fig. H

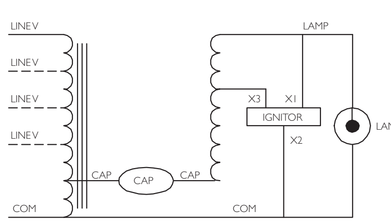


Fig. M

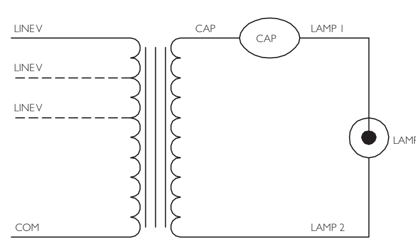


Fig. P

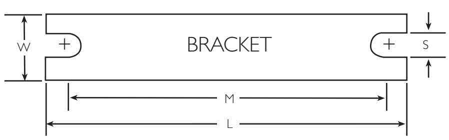
60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
	400W Lamp, ANSI Code M59																		
	480/120T	71A6041-500DT	CWA	462	1.0	300	4	A	2	2.0	4.0	24	400	7C240P40R	D	12.0	–	–	E
NOM	480/120T	71A6041-500DT 71A6041-500DTA	CWA	462	1.0	300	4	A	2	2.0 2.2	4.0	24	400	7C240P40R	D	12.0 11.0	–	–	E E
	120/208/240/277/480	**71A6051-001D**	CWA	460	4.1/2.3/2.0/1.7/1.0	300	10/7/5/5/3	A	2	2.3	4.0	24	400	7C240P40R	D	14.0	–	–	D/C/D/C/D
	120/208/240/277	**71A6071-001D**	CWA	458	4.0/2.3/2.0/1.7	300	10/7/5/5	A	2	2.2	4.0	24	400	7C240P40R	D	11.5	–	–	D/E/D/E
NOM	120/208/240/277	71A6091-500DA	CWA	458	4.0/2.3/2.0/1.7	300	10/7/5/5	A	2	2.0	3.9	24	400	7C240P40R	D	11.5	–	–	D/E/D/E
	120/277/347	71A60A1-500D **71A60A1-001D**	CWA	460	4.0/1.7/1.4	300	10/5/4	A	2	2.0	4.0	24	400	7C240P40R	D	12.0	–	–	D/D/D
NOM	127/220	71A60H1-500DM	CWA	458	3.9/2.2	300	10/7	A	2	2.0	3.8	24	400	7C240P40R	D	11.5	–	–	D/D
	120/208/240	71A60E6-500DM	CWI	465	4.2/2.5/2.1	320	10/7/5	P	2	2.4	4.0	20	425	MD2006-100	O	14.0	–	–	E/D/D

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
2, 10	6.5	1.25	5.75	0.28



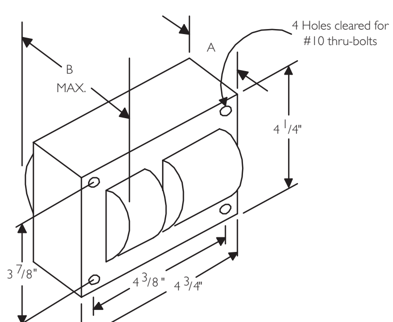


Fig. 2
(4¼" x 4¾" Core)

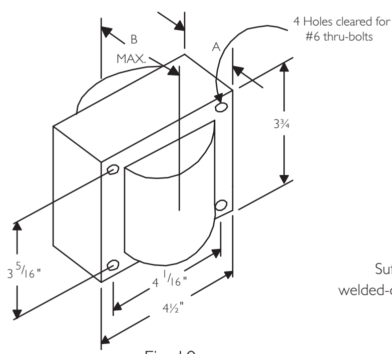
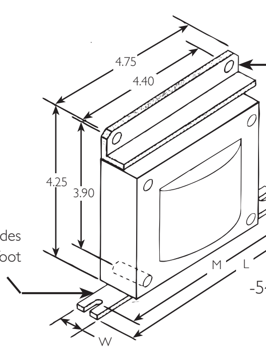


Fig. 10
(4½" x 3¾" Reactor Core)

Suffix -540D denotes a welded angle bracket to allow linear reactors to mount in 400W fixtures designed for standard CWA ballasts without brackets. This bracket is standard on -001DEE.

Suffix -510 provides welded-on mounting foot



-540 Bracket Detail

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
400W Lamp, ANSI Code M135 or M155 or M172 (Pulse-Start)																			
Ⓔ ✣	277	71A6037-500DBPEE✣ **71A6137-001DEE✣**	Linear Reactor HPF	425	2.1	277	5	H	10	1.6	3.8	20	280	7C200P30RA	D	9.0	Integral Ignitor	2	A
Ⓔ	480/ 120T	71A6042-500DTAEE	Super CWA	452	1.0	270	3	M	2	2.1	3.9	26	330	7C260P33R	D	14.5	LI533-H4	10	D
Ⓔ	120/208/ 240/277/ 480	71A6052-500DAEE	Super CWA	454	3.8/2.2/ 1.9/1.7/ 1.0	275	10/7/ 5/5/ 3	M	2	2.2	4.3	26	330	7C260P33R	D	14.0	LI533-H4	10	B/D/ D/B/ D
Ⓔ	120/208/ 240/277	71A6092-500DAEE **71A6092-001DEE**	Super CWA	452	3.8/2.2/ 1.9/1.7	270	10/7/ 5/5	M	2	2.1	4.1	26	330	7C260P33R	D	13.2	LI533-H4	10	C/D/ D/D
	480/ 120T	**71A6042-001D**	Super CWA	452	1.0	270	3	M	2	2.1	3.9	26	330	7C260P33R	D	14.5	LI533-H4	10	D
NOM	120/208/ 240/277	71A6092-500DM **71A6092-001D**	Super CWA	452	3.8/2.2/ 1.9/1.7	265	10/7/ 5/5	M	2	1.8	3.7	26	330	7C260P33R	D	11.0	LI533-H4	10	D/C/ D/D
	120/ 277/347	71A60A2-500DA	Super CWA	450	3.8/ 1.7/1.4	270	10/ 5/4	M	2	1.8	3.7	26	330	7C260P33R	D	11.0	LI533-H4	10	C/ C/C
450W Lamp, ANSI Code M144 (Pulse-Start)																			
Ⓔ ✣	277	71A6337-500DBPEE	Linear Reactor HPF	480	2.4	277	7	H	10	1.9	4.0	22.5	280	7C225P30RA	D	9.5	Integral Ignitor	2	A
Ⓔ	480/ 120T	71A6343-500DTEE	Super CWA	514	1.1	267	3	M	2	2.4	4.2	26.5	360	7C265P40R	D	14.0	LI533-H4	5	D
Ⓔ	120/208/ 240/277	71A6393-500DEE	Super CWA	508	4.3/2.5/ 2.2/1.9	257	10/8/ 5/5	M	2	2.3	3.9	26.5	360	7C265P40R	D	13.5	LI533-H4	5	C/C/ C/C
	120/ 277/347	71A63A3-500D	Super CWA	505	4.3/ 1.9/1.5	268	10/ 5/4	M	2	2.4	4.2	26.5	360	7C265P40R	D	14.0	LI533-H4	5	D/ D/D

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
-500D includes core & coil with dry-film capacitor.
-500 includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
-510D includes core & coil with welded bracket and dry-film capacitor.
-510 includes core & coil with welded bracket and oil-filled capacitor.
-600 core & coil only (no capacitor).
-610 core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

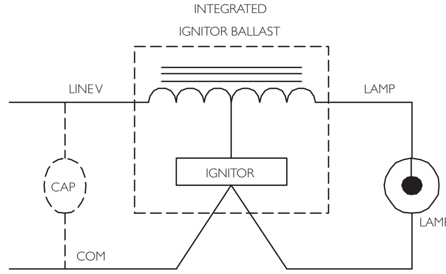


Fig. H

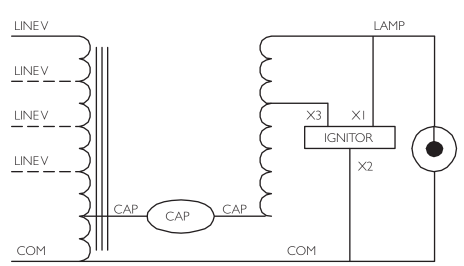


Fig. M

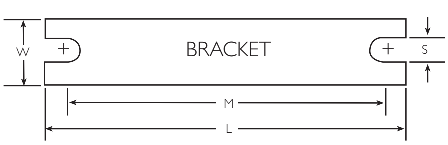
60 Hz Core & Coil Ballasts

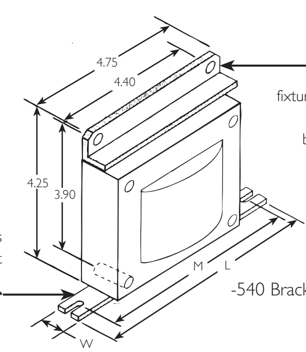
Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (Pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	Class H (180°C)	Philips Advance Class N (200°C)
750W Lamp, ANSI Code M149 (Pulse-Start)																			
120/208/ 240/277/ 480	**71A6452-001D**	Super CWA	818	7/4/ 3.5/3/ 2	355	20/10/ 10/8/ 5	M	8	2.4	4.3	28	400	7C280S40	D	18.0	LI573-H5	15	D/C/ D/D/ C	A/A/ A/A/ A
120/ 208/240	71A64E2-500D	Super CWA	812	7.0/ 4.0/3.5	355	20/ 10/10	M	8	2.2	4.3	28	400	7C280S40	D	17.0	LI573-H5	15	D/ C/D	A/ A/A
277/ 347/480	**71A64F2-001D**	Super CWA	818	3.0/ 2.5/1.7	355	8/ 7/5	M	8	2.3	4.3	28	400	7C280S40	D	17.0	LI573-H5	15	E/ E/E	A/ A/A
277/347/ 480/120T	71A64F2-500DT	Super CWA	818	3.0/2.5/ 1.7	355	8/7/ 5	M	8	2.3	4.3	28	400	7C280S40	D	17.0	LI573-H5	15	E/ E/E	A/A/ A
◆ 120/208/ 240/277	71A6490-500D	Super CWA	820	7.0/4.0/ 3.5/3.0	340	20/10/ 10/10	M	2	3.0	4.9	28	400	7C280S40	D	17.5	LI573-H5	10	D/D/ D/D	A/A A/A
◆ 347/480/ 120T	71A64F0-600T	Super CWA	820	2.5/1.7	340	7/5	M	2	3.0	4.9	28	400	7C280S40	D	17.5	LI573-H5	10	E/E	A/A
875W Lamp, ANSI Code M166 (Pulse-Start)																			
◆ 120/208/ 240/277	71A6498-500	Super CWA	940	7.8/4.3 3.9/3.4	415	20/10/ 10/8	M	2	3.0	5.0	21	480	MD2100-030	O	17.5	LI572-H5★	5	E/E/ E/E	A/A/ A/A
◆ 347/480/ 120T	71A64F8-500T	Super CWA	945	2.8/2.0	415	7/5	M	2	3.0	5.0	21	480	MD2100-030	O	17.5	LI572-H5★	5	E/E	A/A

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
2, 10	6.5	1.25	5.75	0.28
8	7.8	2.75	6.13	0.25





Suffix -540D denotes a welded angle bracket to allow linear reactors to mount in 400W fixtures designed for standard CWA ballasts without brackets. This bracket is standard on -001DEE.

Suffix -510 provides welded-on mounting foot

-540 Bracket Detail

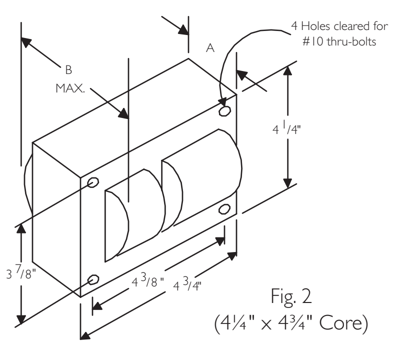


Fig. 2
(4¼" x 4¾" Core)

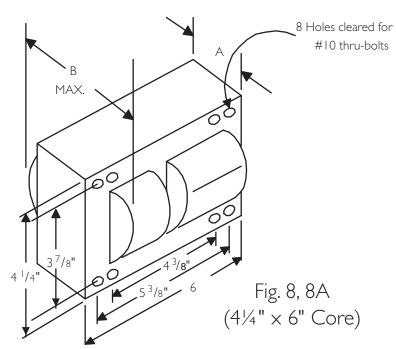


Fig. 8, 8A
(4¼" x 6" Core)

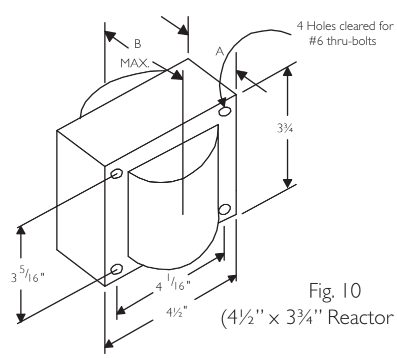


Fig. 10
(4½" x 3¾" Reactor Core)

HID • Core & Coil Metal Halide

60 Hz Core & Coil Ballasts

Metal Halide

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (Pg 5-4)	
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	Class H (180°C)	Philips Advance Class N (200°C)
	1000W Lamp, ANSI Code M47																			
NOM	220	71A65J2-500M	CWA	1080	4.9	430	12	A	8	2.6	4.5	24	480	MD2409-100	O	21.0	–	–	B	A
NOM	480/120T	**71A6542-001**	CWA	1080	2.2	430	6	A	8	2.6	4.5	24	480	MD2409-100	O	21.0	–	–	D	A
	480/120T	71A6542-500T	CWA	1080	2.2	430	6	A	8	2.6	4.5	24	480	MD2409-100	O	21.0	–	–	D	A
	480/120T	71A6542-500TA	CWA	1080	2.3	430	6	A	8	3.1	5.0	24	480	MD2409-100	O	21.0	–	–	D	A
	120/208 240/277	71A6592-500	CWA	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	A	8	2.6	4.5	24	480	MD2409-100	O	21.0	–	–	D/B/ B/B	A/A/ A/A
	120/208 240/277	71A6592-500A	CWA	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	A	8	3.1	5.0	24	480	MD2409-100	O	20.0	–	–	D/B/ B/B	A/A/ A/A
	120/208 240/277	**71A6572-001**	CWA	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	A	8	2.6	4.5	24	480	MD2409-100	O	21.0	–	–	D/B/ B/B	A/A/ A/A
	120/208/ 240/277/ 480	71A6552-500 **71A6552-001**	CWA	1080	9.0/5.6/ 4.7/4.1/ 2.4	430	22/15/ 12/10/ 6	A	8	3.0	4.7	24	480	MD2409-100	O	22.0	–	–	D/D/ D/C C	A/A/ A/A A
🍁	120/ 277/347	71A65A2-500 **71A65A2-001**	CWA	1080	9.0/ 3.9/3.2	430	20/ 10/8	A	8	2.8	4.5	24	480	MD2409-100	O	21.0	–	–	D/ C/C	A/ A/A
NOM ◆	120/208 240/277	71A6590-500	CWA	1070	9.0/5.2/ 4.5/3.9	415	20/15/ 10/10	A	2	3.4	5.3	24	480	MD2409-100	O	19.0	–	–	D/D/ D/D	A/A/ A/A
◆	347/480/ 120T	71A65F0-600T	CWA	1070	3.1/2.2	415	8/6	A	2	3.4	5.3	24	480	MD2409-100	O	19.0	–	–	D/D	A/A
	208/240 120T	71A65E6-500DT	CWI	1080	5.3/4.8	440	15/12	P	8	3.5	5.3	20	560	7C400P30-R (Two in Series)	D	25.0	–	–	C/D	A/A
	1000W Lamp, ANSI Code M141 (Pulse-Start)																			
	480	71A6543-500A	Super CWA	1080	2.3	430	6	M	8	3.1	5.0	24	480	MD2409-000	O	21.0	LI572-H5★	5	D	A
	120/208/ 240/277/ 480	71A6553-500	Super CWA	1080	9.1/5.6/ 4.7/4.1/ 2.4	430	22/15/ 12/10/ 6	M	8	3.0	4.7	24	480	MD2409-000	O	22.0	LI572-H5★	5	D/B/ B/B B	A/A/ A/A A
	120/208/ 240/277	71A6593-500 **71A6593-001**	Super CWA	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	M	8	2.8	4.5	24	480	MD2409-000	O	21.0	LI571-H5★	5	D/B/ B/B	A/A/ A/A
	347/480/ 120T	71A65F3-500T	Super CWA	1075	3.2/2.4	430	8/6	M	8	2.8	4.5	24	440	MD2409-000	O	21.0	LI571-H5★	5	D/D	A/A
◆	120/208/ 240/277	71A6591-500	Super CWA	1070	9.0/5.2/ 4.5/3.9	415	20/15/ 10/10	M	2	3.4	5.3	24	480	MD2409-000	O	19.0	LI572-H5★	5	D/D/ D/D	A/A/ A/A
◆	347/480/ 120T	71A65F1-500T	Super CWA	1070	3.1/2.2	415	8/6	M	2	3.4	5.3	24	480	MD2409-000	O	19.0	LI572-H5★	5	D/D	A/A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

◆ Special compact 4¼ x 4¾ core design

HID • Core & Coil Metal Halide

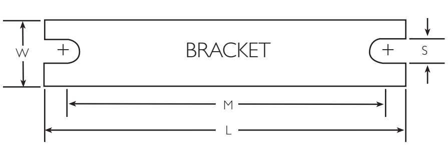
60 Hz Core & Coil Ballasts

Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (Pg 5-4) Class H (180°C)	Philips Advance Class N (200°C)
1500W Lamp, ANSI Code M48																			
480	71A6742-610 **71A6742-001**	CWA	1625	3.4	450	10	A	8a	4.2	6.2	32	525	MD3202-100	O	31.0	–	–	E	A
480/120T	71A6742-500A	CWA	1610	3.5	460	10	A	8a	4.7	6.7	32	525	MD3202-100	O	30.0	–	–	E	A
NOM 120/208 240/277	**71A6772-001**	CWA	1605	13.5/7.8/ 6.8/5.9	450	30/25/ 20/15	A	8a	4.1	6.1	32	525	MD3202-100	O	30.0	–	–	G/E/ E/G	C/A/ A/C
120/208 240/277	71A6792-500	CWA	1605	13.5/7.8/ 6.8/5.9	450	30/25/ 20/15	A	8a	4.1	6.1	32	525	MD3202-100	O	30.0	–	–	G/E/ E/G	C/A/ A/C
120/208 240/277	71A6792-500A	CWA	1610	13.5/7.8/ 6.8/5.9	460	30/25/ 20/15	A	8a	4.7	6.7	32	525	MD3202-100	O	30.0	–	–	G/E/ E/G	C/A/ A/C
120/ 277/347	71A67A2-600 **71A67A2-001**	CWA	1615	13.5/ 5.9/4.8	450	30/ 15/15	A	8a	4.1	6.1	32	525	MD3202-100	O	30.0	–	–	G/ G/G	C/ C/C
1650W Lamp, ANSI Code M112																			
347/480	71A68F0-600	CWA	1770	5.5/4.0	465	15/10	A	8a	4.4	6.5	34	550	2 Capacitor Set: MD1701-200 (2) 17 MFD Caps Connected in Parallel	O	32.0	–	–	I/J	E/F

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
2	6.5	1.25	5.75	0.28
8	7.8	2.75	6.13	0.25
8a	7.8	4.50	6.75	0.31



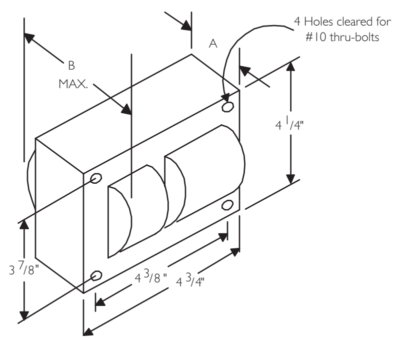


Fig. 2
(4¼" x 4¾" Core)

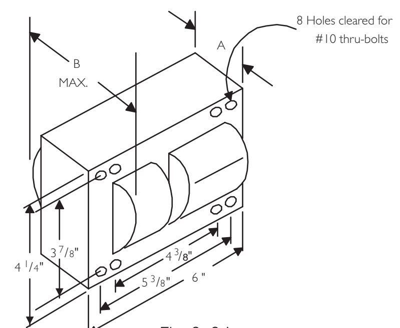


Fig. 8, 8A
(4¼" x 6" Core)

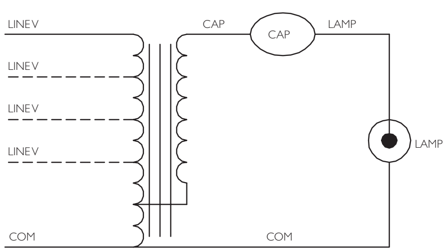


Fig. A

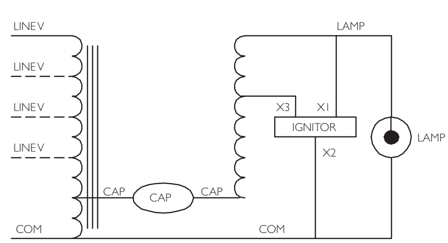


Fig. M

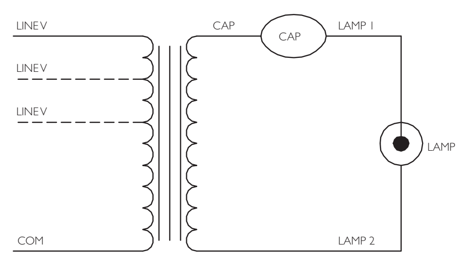


Fig. P

60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
35W Lamp, ANSI Code S76																		
120	71A7707-600 71A7707-500D	R-NPF R-HPF	46	1.4 .8	120	3 2	G	9	.7	1.8	– 14	– 120	——— 7C140L12RA	– D	1.3 1.5	LI551-H4	2	A
120	71A7707-600B **71A7707-001DB**	R-NPF R-HPF	46	1.4 .8	120	3 2	H	9	.7	2.2	– 14	–120	——— 7C140L12RA	– D	1.3 1.5	Integral Ignitor	2	A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

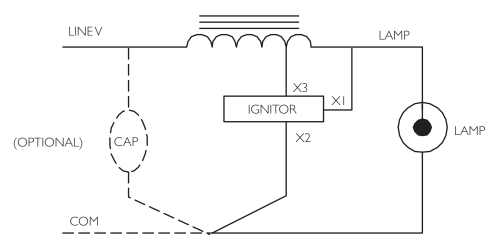


Fig. G

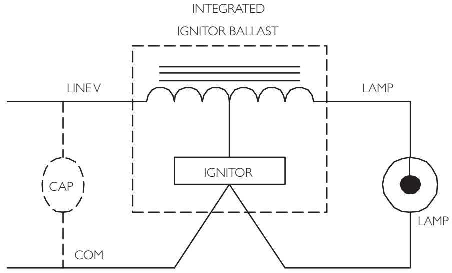


Fig. H

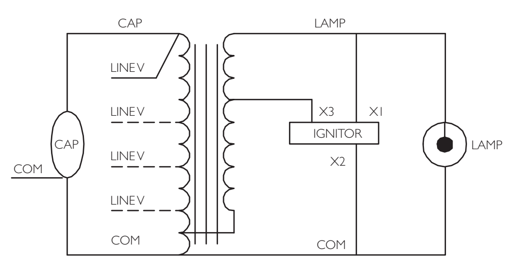


Fig. K

HID • Core & Coil HPS

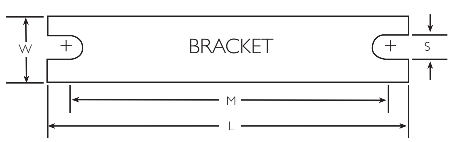
60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current•	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	A	B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
50W Lamp, ANSI Code S68																		
120	71A7807-610 71A7807-500D	R-NPF R-HPF	62	1.8 1.0	120	5 3	G	9	1.0	2.3	– 20	– 120	——— 7C200M12RA	– D	1.8 2.0	LI551-H4	2	A
120	71A7807-600B **71A7807-001DB**	R-NPF R-HPF	62	1.8 1.0	120	5 3	H	9	1.0	2.7	– 20	– 120	——— 7C200M12RA	– D	1.8 2.0	Integral Ignitor	2	A
120/277	71A7801-500D **71A7801-001D**	HX-HPF	66	1.0/.5	125	3/1	K	1	1.0	2.2	5	300	7C050L33RA	D	3.5	LI551-H4	2	A/A
120/208/ 240/277	71A7891-500D **71A7891-001D**	HX-HPF	66	1.0/.57/ .5/.45	125	3/2/ 2/1	K	1	1.0	2.2	5	300	7C050L33RA	D	3.5	LI551-H4	2	A/A A/A

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
9	4.0	0.75	3.50	0.28



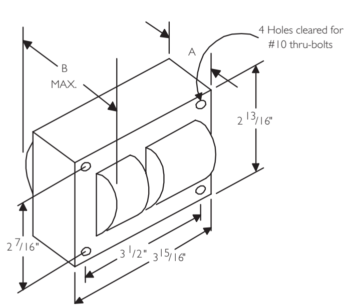


Fig. 1
(3" x 4" Core)

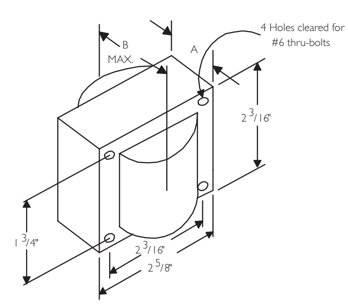


Fig. 9
($2^5/_8$'' x $2^3/_{16}$'' Reactor Core)

HID • Core & Coil HPS

60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
70W Lamp, ANSI Code S62																		
NOM 120	71A7907-600 71A7907-500D	R-NPF R-HPF	86	2.1 1.3	120	8 3	G	9	1.3	2.5	– 28	– 120	——— 7C280M12RA	– D	2.0	LI551-H4	2	A
120	71A7907-600B **71A7907-001DB**	R-NPF R-HPF	86	2.1 1.3	120	8 3	H	9	1.3	2.9	– 28	– 120	——— 7C280M12RA	– D	2.0	Integral Ignitor	2	A
220	71A79J1-500D	HX-HPF	91	.8	120	2	K	1	1.5	2.8	7	300	7C070L30RA	D	5.5	LI551-H4	2	A
480	71A7941-500D	HX-HPF	93	.4	120	2	K	1	1.9	3.2	7	300	7C070L30RA	D	6.5	LI551-H4	2	A
120/208 240/277	71A7991-500D	HX-HPF	91	1.4/.9 .8/.7	120	5/3/ 2/2	K	1	1.5	3.1	7	300	7C070L30RA	D	5.5	LI551-H4	2	B/C/ B/C
120/208 240/277	**71A7971-001D**	HX-HPF	91	1.4/.9 .8/.7	120	5/3/ 2/2	K	1	1.5	3.1	7	300	7C070L30RA	D	5.5	LI551-H4	2	B/C/ B/C
120/ 277/347	71A79A1-500D **71A79A1-001D**	HX-HPF	93	1.4/ .7/.6	120	5/ 2/2	K	1	1.5	3.1	7	300	7C070L30RA	D	5.5	LI551-H4	2	A/ B/A
NOM New 127/220	71A79H8-500DMA	CWA	95	.8/.5	105	2/2	M	1	1.9	3.2	32.5	300	7C325P30-RA	D	5.5	LI551-J4	2	A/D
NOM New 120/277	71A7988-500D	CWA	95	.9/.4	105	3/1	M	1	1.9	3.2	32.5	300	7C325P30-RA	D	5.5	LI551-J4	2	A/D
120/ 208/240	71A79E6-500D	CWI	95	.9/ .5/.5	110	3/ 2/2	V	1	1.6	2.9	24	300	7C240P30RA	D	5.8	LI551-J4	2	C/ C/D

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
-500D includes core & coil with dry-film capacitor.
-500 includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
-510D includes core & coil with welded bracket and dry-film capacitor.
-510 includes core & coil with welded bracket and oil-filled capacitor.
-600 core & coil only (no capacitor).
-610 core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

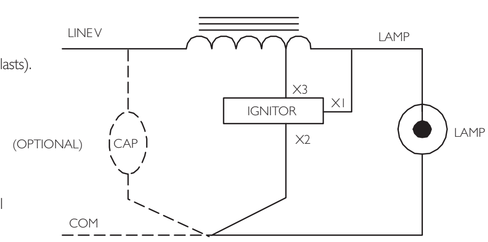


Fig. G

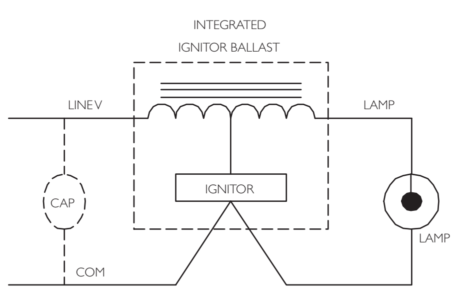


Fig. H

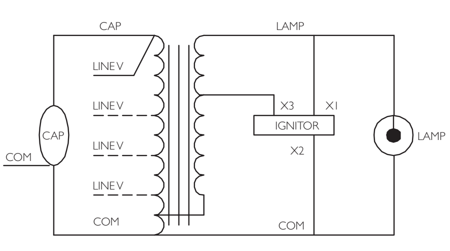


Fig. K

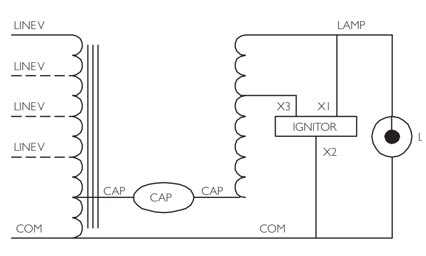


Fig. M

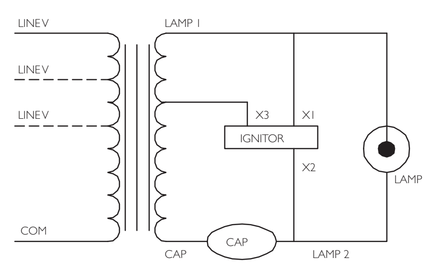


Fig. V

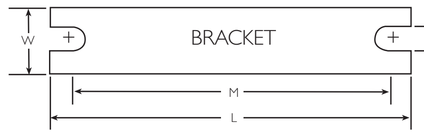
60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
100W Lamp, ANSI Code S54																		
120	71A8007-500D	R-HPF	115	1.8	120	5	G	9	1.5	2.7	36	120	7C360M12RA	D	2.8	LI551-H4	2	A
120	71A8007-500DB **71A8007-001DB**	R-HPF	115	1.8	120	5	H	9	1.5	2.7	36	120	7C360M12RA	D	2.8	Integral Ignitor	2	A
220	71A80J1-500D	HX-HPF	130	1.2	120	3	K	1	2.0	3.3	10	280	7C100M30RA	D	7.2	LI551-H4	2	B
480	71A8041-500D **71A8041-001D**	HX-HPF	130	.6	120	3	K	1	2.3	3.6	10	280	7C100M30RA	D	7.5	LI551-H4	2	E
120/208/ 240/277	71A8091-500D	HX-HPF	130	2.2/1.3/ 1.1/.9	120	7/5/ 3/3	K	1	2.0	3.6	10	280	7C100M30RA	D	7.2	LI551-H4	2	D/F/ D/D
120/208/ 240/277	**71A8071-001D**	HX-HPF	130	2.2/1.3/ 1.1/.9	120	7/5/ 3/3	K	1	2.0	3.6	10	280	7C100M30RA	D	7.2	LI551-H4	2	D/F/ D/D
120/ 277/347	71A80A1-500D **71A80A1-001D**	HX-HPF	130	2.2/ .9/.7	120	7/ 3/3	K	1	2.3	3.6	10	280	7C100M30RA	D	7.5	LI551-H4	2	C/ C/D
480/120T	71A8048-500DT	CWA	138	0.3	115	1	M	1	2.0	3.3	34	170	7C340P24RA	D	7.5	LI551-J4	5	E
120/277	71A8088-500D	CWA	138	1.2/.5	115	3/2	M	1	2.0	3.3	34	170	7C340P24RA	D	7.5	LI551-J4	5	F/F
NOM 127/220	71A80H8-500DMA	CWA	138	1.1/.7	115	3/2	M	1	2.4	3.7	34	170	7C340P24RA	D	7.5	LI551-J4	5	E/D
NOM 230	71A80J8-500DM	CWA	136	0.7	118	2	M	1	2.0	3.3	34	170	7C350P24RA	D	7.5	LI551-J4	5	E
120/ 208/240	71A80E6-500D	CWI	130	1.2/ .7/.6	110	3/ 2/2	V	1	2.1	3.4	35	170	7C350P24RA	D	6.8	LI551-J4	2	C/ C/B

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
9	4.0	0.75	3.50	0.28



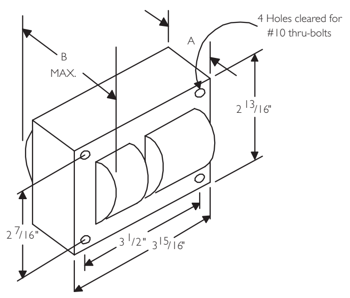


Fig. 1
(3" x 4" Core)

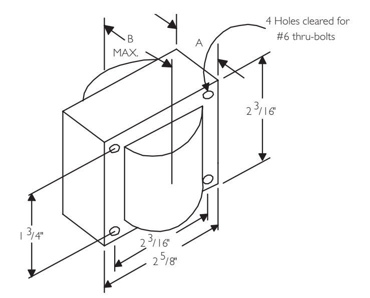


Fig. 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
150W Lamp, ANSI Code S55 (55V Arc Tube)																		
120	71A8107-600 71A8107-500D	R-NPF R-HPF	170	4.5 2.4	120	15 8	G	9	2.0	3.3	– 55	– 120	———— 7C550P12RA	– D	3.5 4.0	LI551-H4	2	A
120	71A8107-600B **71A8107-001DB**	R-NPF R-HPF	170	4.5 2.4	120	15 8	H	9	2.0	3.6	– 55	– 120	———— 7C550P12RA	– D	3.5 4.0	Integral Ignitor	2	A
220	71A81J2-500D	HX-HPF	188	1.5	120	4	K	1	2.6	3.8	14	280	7C140M30RA	D	7.5	LI551-H4	2	C
480	71A8142-510D **71A8142-001D**	HX-HPF	188	0.7	120	2	K	1	3.0	4.3	14	280	7C140M30RA	D	9.0	LI551-H4	2	E
480/120T	71A8142-500DT	HX-HPF	188	0.7	120	2	K	1	3.0	4.3	14	280	7C140M30RA	D	9.0	LI551-H4	2	E
120/208/ 240/277	71A8192-500D	HX-HPF	188	2.8/1.6/ 1.4/1.3	120	10/5/ 5/4	K	1	2.6	3.8	14	280	7C140M30RA	D	7.5	LI551-H4	2	E/D/ E/D
120/208/ 240/277	**71A8172-001D**	HX-HPF	188	2.8/1.6/ 1.4/1.3	120	10/5/ 5/5	K	1	2.6	3.8	14	280	7C140M30RA	D	7.5	LI551-H4	2	E/D/ E/D
🍁 120/ 277/347	71A81A2-500D **71A81A2-001D**	HX-HPF	188	2.8/ 1.3/.9	120	10/ 4/3	K	1	2.6	3.8	14	280	7C140M30RA	D	7.5	LI551-H4	2	D/ D/D

HID • Core & Coil
HPS

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.
Original equipment ballasts – typically ordered with capacitor (as shown).
- **-500D** includes core & coil with dry-film capacitor.
- **-500** includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
- **-510D** includes core & coil with welded bracket and dry-film capacitor.
- **-510** includes core & coil with welded bracket and oil-filled capacitor.
- **-600** core & coil only (no capacitor).
- **-610** core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

LL Special high efficiency/ low-loss ballast

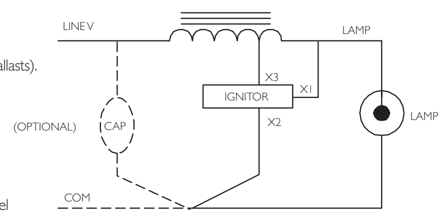


Fig. G

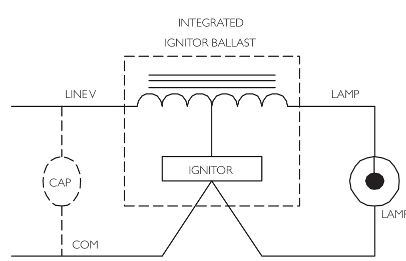


Fig. H

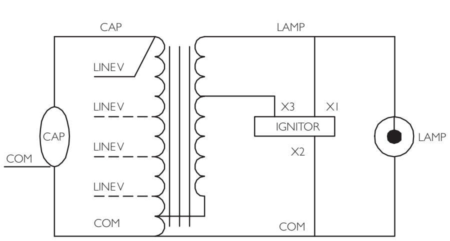


Fig. K

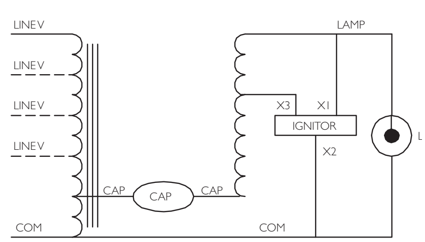


Fig. M

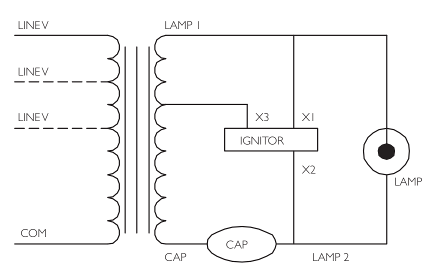


Fig. V

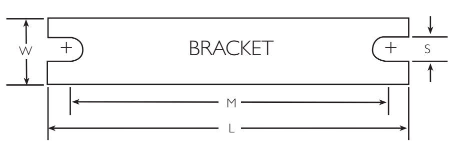
60 Hz Core & Coil Ballasts

High Pressure Sodium

	Input Volts	Catalog† Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 5-4)
	150W Lamp, ANSI Code S55 (55V Arc Tube)																		
	120/277	71A8188-500D	CWA	190	1.7/.7	110	5/3	M	1	2.8	4.1	55	170	7C550P24RA	D	8.5	LI551-J4	10	E/D
NOM	127/220	71A81H8-500DMA	CWA	190	1.6/.9	110	4/2	M	1	3.0	4.3	55	170	7C550P24RA	D	8.5	LI551-J4	10	D/C
	480	71A8148-500D	CWA	190	.5	110	1	M	1	2.5	3.8	55	170	7C550P24RA	D	8.0	LI551-J4	10	E
LL NOM	220/240	71A81J9-500DM	CWA	170	0.8/0.7	111	2/2	M	2	2.5	3.8	60	240	7C600P24RA	D	13.5	LI551-J4	2	A/A
	120/ 208/240	71A81E6-500D	CWI	190	1.7/ 1.1/.8	105	5/ 3/3	V	1	2.6	4.0	52	240	7C520P24RA	D	8.5	LI551-J4	2	E/ E/D
	150W Lamp, ANSI Code S56 (100V Arc Tube)																		
	480	71A8146-500D **71A8146-001D**	CWA	188	0.5	180	2	M	1	2.5	3.8	20	280	7C200P30RA	D	8.5	LI501-H4	2	B
	120/208 240/277	71A8196-500D	CWA	188	1.7/1.0 .9/.8	180	5/3/ 3/3	M	1	2.5	4.1	20	280	7C200P30RA	D	8.5	LI501-H4	2	E/D/ C/C
	120/208 240/277	**71A8176-001D**	CWA	188	1.7/1.0 .9/.8	180	5/3/ 3/3	M	1	2.5	4.1	20	280	7C200P30RA	D	8.5	LI501-H4	2	E/D/ C/C

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2	6.5	1.25	5.75	0.28
9	4.0	0.75	3.50	0.28



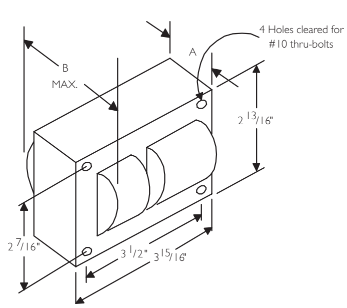


Fig. 1
(3" x 4" Core)

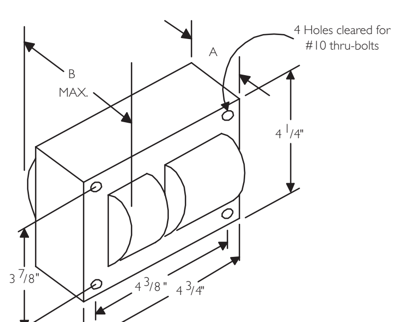


Fig. 2
(4¼" x 4¾" Core)

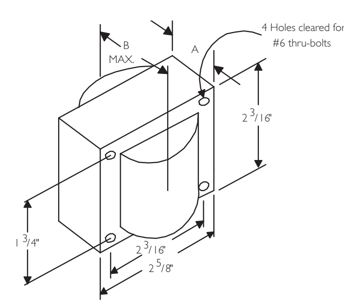


Fig. 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
200W Lamp, ANSI Code S66																		
480	**71A8940-001D**	CWA	240	.6	185	2	M	2	1.2	3.0	28	280	7C280P30-RA	D	8.5	LI501-H4	2	C
120/208/ 240/277	71A8990-500D	CWA	240	2.2/1.3 1.1/1.0	185	6/4/ 3/3	M	2	1.2	3.0	28	280	7C280P30-RA	D	8.5	LI501-H4	2	E/D/ D/C
120/208/ 240/277	**71A8970-001D**	CWA	240	2.2/1.3 1.1/1.0	185	6/4/ 3/3	M	2	1.2	3.0	28	280	7C280P30-RA	D	8.5	LI501-H4	2	E/D/ D/C
◆ 480	71A8941-500D	CWA	250	.6	195	2	M	1	3.0	4.2	24	280	7C240P30RA	D	8.5	LI501-H4	2	J
◆ 120/208/ 240/277	71A8991-500D	CWA	250	2.4/1.4 1.2/1.0	195	8/5/ 5/3	M	1	3.0	4.2	24	280	7C240P30RA	D	8.5	LI501-H4	2	H/G/ H/I

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.
Original equipment ballasts – typically ordered with capacitor (as shown).
-500D includes core & coil with dry-film capacitor.
-500 includes core & coil with oil-filled capacitor (required for higher wattage ballasts).
May also be available with welded bracket, and/or without capacitor:
-510D includes core & coil with welded bracket and dry-film capacitor.
-510 includes core & coil with welded bracket and oil-filled capacitor.
-600 core & coil only (no capacitor).
-610 core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

LL Special high efficiency/ low-loss ballast

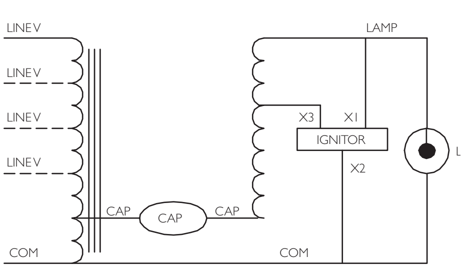


Fig. M

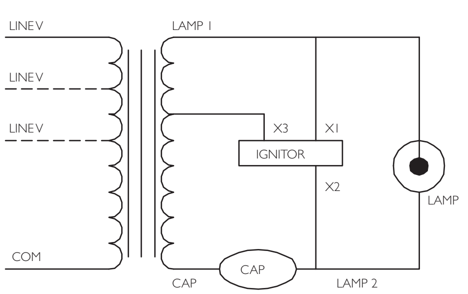


Fig. V

60 Hz Core & Coil Ballasts

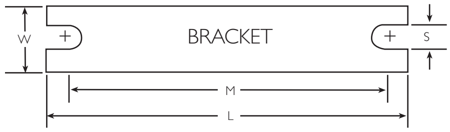
High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)		
250W Lamp, ANSI Code S50 or M168																			
127/220	71A82H1-500DM	CWA	295	2.5/1.5	185	7/4	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	D/C	NOM
480	71A8241-500DA	CWA	310	.7	185	2	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	B	
480/120T	71A8241-500DT **71A8241-001D**	CWA	310	.7	185	2	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	B	
120/208/240/277	71A8291-500DA	CWA	295	2.5/1.5/1.3/1.1	185	7/4/4/3	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	B/A/B/B	NOM
120/208/240/277	**71A8271-001D**	CWA	295	2.5/1.5/1.3/1.1	185	7/4/4/3	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	B/A/B/B	
120/208/240/277/480	71A8251-500DA **71A8251-001D**	CWA	300	2.6/1.5/1.3/1.2/.7	185	10/4/4/3/2	M	2	2.0	3.6	35	240	7C350P24RA	D	12.0	LI501-H4	2	B/B/B/B/B	
120/277/347	71A82A1-500D **71A82A1-001D**	CWA	295	2.7/1.2/.9	185	7/3/2	M	2	2.0	3.6	35	240	7C350P24RA	D	11.5	LI501-H4	2	C/C/B	♣
220/240	71A82J9-500DM	CWA	285	1.4/1.3	188	4/4	M	2	1.8	3.4	34	240	7C340P24RA	D	11.0	LI501-H4	5	A/A	LL NOM
120/208/240	71A82E6-500D	CWI	300	2.8/1.6/1.4	190	8/5/5	V	2	1.9	3.8	28	300	7C280P30-RA	D	11.0	LI501-J4	2	D/C/C	

HID • Core & Coil
HPS

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2	6.5	1.25	5.75	0.28



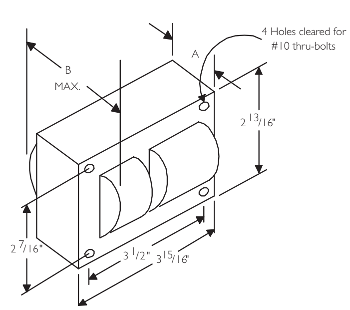


Fig. 1
(3" x 4" Core)

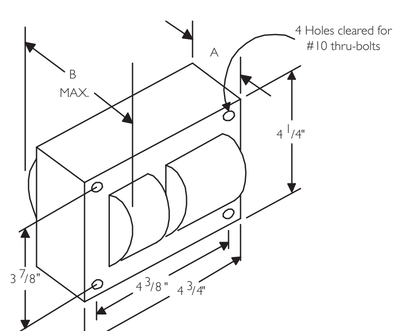


Fig. 2
(4¼" x 4¾" Core)

60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
310W Lamp, ANSI Code S67																		
120/208/ 240/277	**71A8371-001D**	CWA	365	3.4/1.9/ 1.7/1.4	175	8/5/ 5/5	M	2	2.2	4.1	45	280	7C450P30-RA	D	13.5	LI501-H4	2	D/C/ D/B
120/208/ 240/277/ 480	71A8351-500D	CWA	367	3.2/1.7/ 1.6/1.4/ .8	183	8/5/ 4/4/ 2	M	2	2.5	4.1	45	280	7C450P30-RA	D	14.0	LI501-H4	2	C/A/ B/B/ B
400W Lamp, ANSI Code S51 or M169																		
480	71A8443-510D **71A8443-001D**	CWA	464	1.0	190	3	M	2	2.6	4.3	55	240	7C550P24RA	D	15.0	LI501-H4	2	D
480/120T	71A8443-500DT	CWA	464	1.0	190	3	M	2	2.3	4.0	55	240	7C550P24RA	D	15.0	LI501-H4	2	D
480/120T	71A8443-500DTA	CWA	464	1.0	190	3	M	2	2.8	4.3	55	240	7C550P24RA	D	16.0	LI501-H4	2	D
NOM 120/208/ 240/277	71A8493-500D	CWA	464	3.8/2.2/ 1.9/1.7	190	10/8/ 5/5	M	2	2.1	4.0	55	240	7C550P24RA	D	13.5	LI501-H4	2	D/D/ D/D
NOM 120/208/ 240/277	71A8493-500DA	CWA	464	3.8/2.2/ 1.9/1.7	190	10/8/ 5/5	M	2	2.6	4.3	55	240	7C550P24RA	D	16.0	LI501-H4	2	D/D/ D/D
120/208/ 240/277	**71A8473-001D**	CWA	464	3.8/2.2/ 1.9/1.7	190	10/8/ 5/5	M	2	2.1	4.0	55	240	7C550P24RA	D	13.5	LI501-H4	2	D/D/ D/D
120/208/ 240/277/ 480	71A8453-500D **71A8453-001D**	CWA	465	3.9/2.2/ 1.9/1.7/ 1.0	195	10/6/ 5/5/ 3	M	2	2.7	4.4	55	240	7C550P24RA	D	16.0	LI501-H4	2	C/C/ D/D/ C
120/ 277/347	71A84A3-500D **71A84A3-001D**	CWA	464	3.8/ 1.7/1.3	190	10/ 5/5	M	2	2.3	4.0	55	240	7C550P24RA	D	13.5	LI501-H4	2	D/ D/D
120/ 208/240	71A84E6-500D	CWI	465	4.2/ 2.4/2.1	190	10/ 7/5	V	2	2.7	4.4	48	300	7C480S30RA	D	15.5	LI501-J4	2	E/ E/E

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
-500D includes core & coil with dry-film capacitor.
-500 includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
-510D includes core & coil with welded bracket and dry-film capacitor.
-510 includes core & coil with welded bracket and oil-filled capacitor.
-600 core & coil only (no capacitor).
-610 core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current –** For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

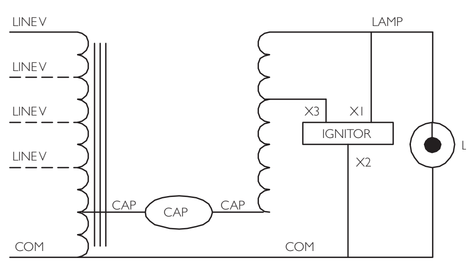


Fig. M

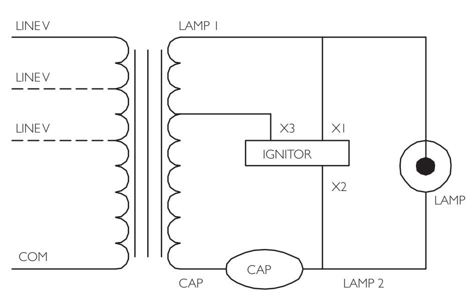


Fig. V

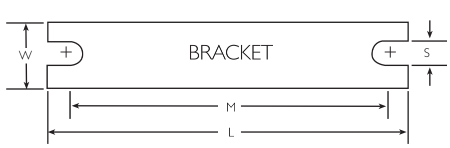
60 Hz Core & Coil Ballasts

High Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (Pg 5-4) Class H (180°C)	Philips Advance Class N (200°C)
600W Lamp, ANSI Code S106																			
120/ 208/240	71A85E5-500D	CWA	670	5.5/ 3.3/2.9	220	15/ 9/8	M	8a	3.2	5.1	64	280	7C640S28-RA	D	22.5	LI561-H5	2	A/ A/B	A/ A/A
277/ 347/480	71A85F5-500D	CWA	665	2.5/ 2.0/1.4	230	7/ 5/4	M	8a	3.2	5.1	64	280	7C640S28-RA	D	23.0	LI561-H5	5	A/ A/A	A/ A/A
750W Lamp, ANSI Code S111																			
120/ 208/240	71A86E5-500D	CWA	840	6.8/ 4.0/3.5	220	20/ 10/10	M	8a	3.2	5.1	75	280	7C750S28-RA	D	22.5	LI561-H5	5	D/ E/E	A/ A/A
277/ 347/480	71A86F5-500D	CWA	840	3.1/ 2.5/1.8	225	10/ 10/5	M	8a	3.2	5.1	75	280	7C750S28-RA	D	23.0	LI561-H5	5	E/ D/D	A/ A/A
1000W Lamp, ANSI Code S52																			
220	71A87J3-500	CWA	1100	5.0	435	15	M	8a	3.8	5.8	26	525	MD2602-030	O	28.0	LI571-H5★	15	C	A
480	71A8743-500 **71A8743-001**	CWA	1100	2.3	435	6	M	8a	3.9	5.8	26	525	MD2602-030	O	28.0	LI571-H5★	15	C	A
480/120T	71A8743-500T	CWA	1100	2.3	435	6	M	8a	3.9	5.8	26	525	MD2602-030	O	28.0	LI571-H5★	15	C	A
NOM 120/208 240/277	71A8793-500	CWA	1100	9.5/5.5/ 4.8/4.2	435	25/15/ 10/10	M	8a	3.8	5.8	26	525	MD2602-030	O	28.0	LI571-H5★	15	C/B/ C/C	A/A/ A/A
120/208 240/277	**71A8773-001**	CWA	1100	9.5/5.5/ 4.8/4.2	435	25/15/ 10/10	M	8a	3.8	5.8	26	525	MD2602-030	O	28.0	LI571-H5★	15	C/B/ C/C	A/A/ A/A
120/208 240/277/ 480	71A8753-600 **71A8753-001**	CWA	1100	9.3/5.3/ 4.7/4.1/ 2.3	437	25/15/ 12/10/ 6	M	8a	4.0	6.0	26	525	MD2602-030	O	29.0	LI571-H5★	15	C/C/ C/C/ C	A/A/ A/A/ A
120/ 277/347	71A87A3-500 **71A87A3-001**	CWA	1100	9.5/ 4.2/3.3	435	25/ 15/10	M	8a	3.9	5.9	26	525	MD2602-030	O	28.0	LI571-H5★	15	C/ C/C	A/ A/A

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
2	6.5	1.25	5.75	0.28
8a	7.8	4.50	6.75	0.31



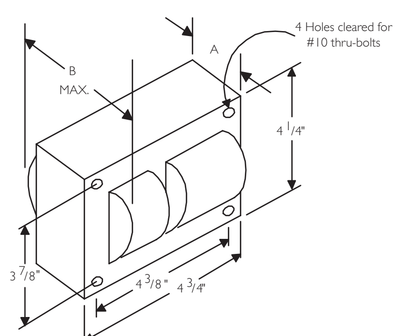


Fig. 2
(4¼" x 4¾" Core)

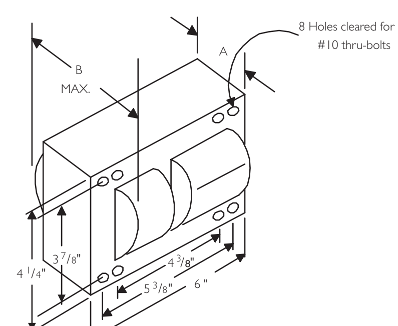


Fig. 8, 8A
(4¼" x 6" Core)

HID • Core & Coil HPS

60 Hz Core & Coil Ballasts

Low Pressure Sodium

Input Volts	Catalog † Number	Circuit Type	Input Watts	Max • Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		
18W Lamp, ANSI Code L69																
120/277	71A0280-500D	HX-PFC	30	1.0/.5	315	3/2	Q	I	1.0	2.4	5	250	7C050L30RA	D	4.5	A/A
35W Lamp, ANSI Code L70 or 55W Lamp, ANSI Code L71																
120/208/ 240/277	71A0490-500D **71A0490-001D**	HX-HPF/ HX-PFC	60 or 80	2.4/1.4/ 1.2/1.0	480	6/4/ 3/3	Q	I	2.3	3.5	14	240	7C140M30RA	D	8.0	A/A/ A/A
347/480	71A04F0-500D	HX-HPF	60 or 80	0.79/0.58	480	2/2	Q2	I	2.3	3.5	14	240	7C140M30RA	D	8.0	A/A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 5-5 to 5-9 for more information on replacement kits.

Original equipment ballasts – typically ordered with capacitor (as shown).
-500D includes core & coil with dry-film capacitor.
-500 includes core & coil with oil-filled capacitor (required for higher wattage ballasts).

May also be available with welded bracket, and/or without capacitor:
-510D includes core & coil with welded bracket and dry-film capacitor.
-510 includes core & coil with welded bracket and oil-filled capacitor.
-600 core & coil only (no capacitor).
-610 core & coil with welded bracket (no capacitor).

†† Each ballast requiring an ignitor is furnished standard with a short-range ignitor model shown for use within fixtures. long-range ignitors are available separately if required. See pages 5-xx to 5-yy for additional information.

• **Maximum Input Current** – For HX and R circuits, value is the highest of starting, operating or open circuit current. For CWA, SCWA and CWI circuits, value is the operating current.

NOM Certified ballast available for Mexican market. Add "M" to suffix (example: -500DM).

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 5-9.

HID • Core & Coil
LPS

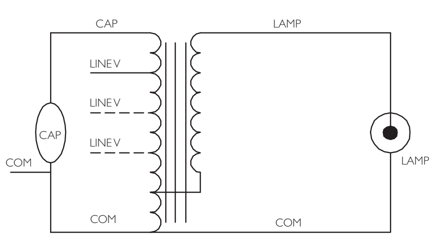


Fig. Q

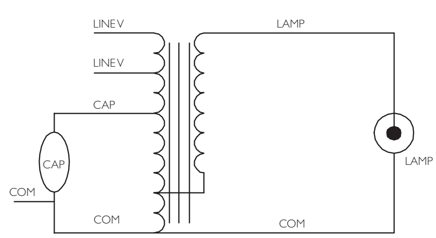


Fig. Q2

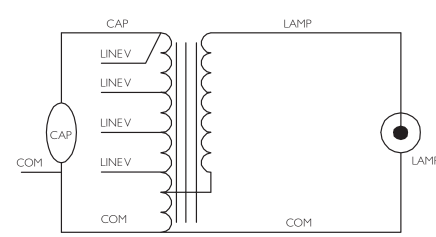


Fig. Q4

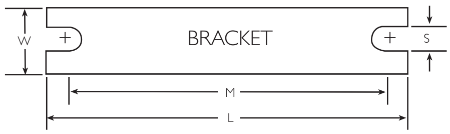
60 Hz Core & Coil Ballasts

Low Pressure Sodium

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions Fig	Dimensions A	Dimensions B	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (pg 5-4)
90W Lamp, ANSI Code L72																
120/208/ 240/277	71A0590-500D	HX-HPF	125	4.1/2.3/ 2.0/1.75	515	11/6/ 5/5	Q4	2	1.8	3.3	17.5	330	7C175M33-R	D	10.0	A/A/ A/A
347/480	71A05F0-500D	HX-HPF	125	1.35/0.95	520	4/3	Q2	2	1.8	3.4	16.0	330	7C160M33	D	10.2	A/A
135W Lamp, ANSI Code L73 or 180W Lamp, ANSI Code L74																
120/208/ 240/277	71A0790-500D	HX-HPF	180 or 208	5.28/2.82/ 2.62/2.25	695	15/7/ 7/6	Q	3a	2.4	4.0	16	330	7C160M33	D	15.3	A/A/ A/A
347/480	71A07F0-500D	HX-HPF	182 or 213	1.82/1.33	690	5/4	Q2	3a	2.4	4.0	16	330	7C160M33	D	15.0	A/A

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2	6.5	1.25	5.75	0.28
3a	7.8	2.75	6.13	0.25



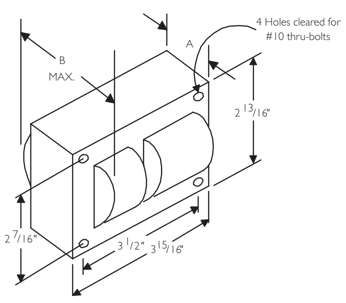


Fig. 1
(3" x 4" Core)

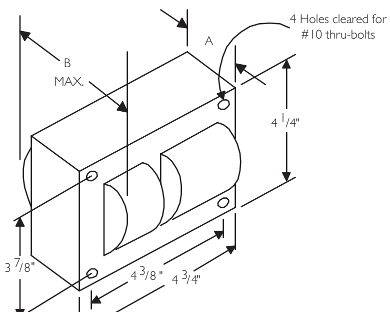


Fig. 2
(4¼" x 4¾" Core)

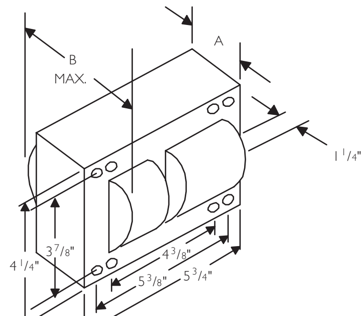


Fig. 3a
(4¼" x 5¾" Core)

HID • Core & Coil LPS

Capacitor Specifications

Recommended Capacitors for Bi-level Ballast Operation

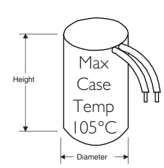
Advance Ballast Family	Nominal Lamp Watts	ANSI Code	Lamp Watts at Low Light	Full Light Capacitance Mfd.	Low Light Capacitance Mfd.	Primary Capacitor	Secondary Capacitor	Capacitor Connection
Metal Halide 60Hz CWA/SuperCWA Ballasts								
71A53_3	100 Pulse-Start	M90/140	55	10.0	7.8	10.0 mfd 330V (7C100M30RA)	35.0 mfd 300V (7C350P30RA)	Series
71A54A3	150 Pulse-Start	M102/ 142	90	22.0	15.0	22.0 mfd, 240V (7C220M24RA)	48.0 mfd, 300V (7C480S30RA)	Series
71A5493	150 Pulse-Start	M102/ 142	90	16.0	9.6	16.0 mfd, 280V (72160M30RA)	24.0 mfd, 120V (7C240P30RA)	Series
71A55_0	175	M57	122	10.0	8.0	10 mfd, 400V (7C100M40-R)	40 mfd, 300V (7C400P30-R)	Series
71A55_3	175 Pulse-Start	M137 or M152	102	11.0	7.7	11 mfd, 400V (7C110M40)	26 mfd, 330V (7C260:33-R)	Series
71A56_2 or 71A56_3	200 Pulse-Start	M136	102	15.0	9.3	15 mfd, 330V (7C150M33)	24 mfd, 300V (7C240P30)	Series
71A57_0 or 71A57_1	250	M58	127	15.0	9.0	15 mfd, 400V (7C150P40-R)	22.5 mfd, 300V (7C225P30-R)	Series
71A57_2	250 Pulse-Start	M138 or M153	133	17.0	10.8	17 mfd, 330V (7C170P33)	30 mfd, 345V (7C300S34)	Series
71A58_2	320 Pulse-Start	M132 or M154	149	21.0	13.1	21 mfd, 345V (7C210P34-R)	35 mfd, 300V (7C350P30-R)	Series
71A59_3	350 Pulse-Start	M131	163	22.5	14.4	22.5 mfd, 345V (7C225P34)	40 mfd, 300V (7C400 P30-R)	Series
71A60_1	400	M59	192	24.0	15.0	24 mfd, 400V (7C240P40-R)	40 mfd, 300V (7C400P30-R)	Series
71A60_2	400 Pulse-Start	M135 or M155	210	26.0	18.5	18.5 mfd, 330V (7C185P33-R)	7.5 mfd, 400V (7C075M40)	Parallel
71A63_3	450 Pulse-Start	M144	212	26.5	16.7	26.5 mfd, 400V (7C265P40-R)	45.0 mfd, 120V (7C450P12)	Series
71A64_2	750 Pulse-Start	M149	380	28.0	18.0	18 mfd, 400V (7C180P40-R)	10 mfd, 400V (7C100M40-R)	Parallel
71A64_8	875 Pulse-Start	M166	440	21.0	13.1	21 mfd 480V (MD2100-030)	35 mfd 170V (7C350P24RA)	Series
71A64_8	875 Pulse-Start	M166	440	21.0	13.1	13 mfd 480V (MD1300-100)	8 mfd 480V	Parallel
71A65_0, 71A65_1, 71A65_2, or 71A65_3	1000 Probe or Pulse-Start	M47 or M141	571	24.0	15.0	24 mfd, 480V (MD2409-100)	40 mfd, 300V (7C400P30-R)	Series
High Pressure Sodium 60Hz CWA Ballasts								
71A80_8	100	S54	52	34.0	26.0	26.0 mfd, 330V (7C260P33-R)	8.0 mfd, 330V (7C080L33-R)	Parallel
71A81_8	150	S55	66	55.0	40.0	40 mfd, 300V (7C400P30-R)	15 mfd, 330V (7C150M33)	Parallel
71A82_1	250	S50	144	35.0	28.0	28 mfd, 300V (7C280P30-R)	7 mfd, 330V (7C070L33-R)	Parallel
71A84_3	400	S51	189	55.0	40.0	40 mfd, 300V (7C400P30-R)	15 mfd, 330V (7C150M33)	Parallel
71A86_5	750	S111	356	75.0	55.0	35 mfd, 300V (7C350P30-R) in parallel with 20 mfd, 300V (7C200P33-R)	20 mfd, 330V (7C200P33-R)	Parallel
71A87_3	1000	S52	406	26.0	17.7	26 mfd, 525V (MD2602-030)	55 mfd, 240V (7C550P24)	Series
71A89_1	200	S66	130	24.0	18.0	24 mfd 280V (7C240P30RA)	72 mfd 120V (7C720P12RA)	Series
71A89_1	200	S66	130	24.0	18.0	18 mfd 280V	6 mfd 280V (7C060L30RA)	Parallel

Dry-Film Capacitors

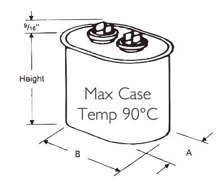
	Dimensions (in)	
Letter	Diameter	Height
L	1.18	2.2 or 2.7
M	1.58	2.7 or 3.7
P	1.77	3.7 or 4.9
S	1.97	5.0

Oil-Filled Capacitors

Dimensions (in)			
Oval	A	B	Height
1.25	1.30	2.15	As Shown in Tables
1.25	1.55	2.70	
1.75	1.90	2.90	
2.00	1.95	3.65	

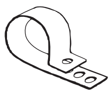


Dry-Film Capacitors
Thermal Plastic Case
Dry-film capacitors contain no oil; are furnished with 8" leads and include integral resistor where required.

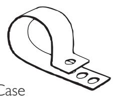


Oil-Filled Capacitor
Furnished with appropriate leads and/or resistors where required. Case must be grounded.

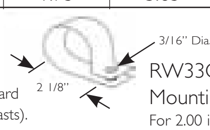
Note: Capacitor boots available, order catalog number CB-100.



RW33CC1252
Mounting Clip
For 1.18 thru 1.25 in diameter, Round Case



RW33CC175
Mounting Clip
For 1.25 thru 1.75 in. diameter Round Case (Furnished as standard with -001 and -001 D suffix ballasts).



RW33CC200
Mounting Clip
For 2.00 in. diameter Round Case. Mount in the middle of can.

Capacitor Specifications *HID Non-PCB Capacitors*

Mfd.	Voltage	Capacitor Part Number[1,2]	Dia/Oval	Height	Ballast family where used
5	300	7C050L30RA	1.25	2.25	71A02x0, 5037, 5081, 5137, 78x1 (60 Hz)
6	300	7C060L30RA	1.25	2.75	71A5181, 78R1
7	300	7C070L30RA	1.25	2.75	71A1580, 50x7 (50 Hz. only), 79x1 (60 Hz)
7.5	400	7C075M40	1.50	2.90	Bi-Level, 71A5283
8	300	7C080L30RA	1.25	2.75	71A20x0, 52x0, 52x2 (60 Hz. only), 5237, 5281
8.4	300	7C084L33R	1.25	2.90	71A79x1 (50 Hz)
10	300	7C100M30RA	1.65	2.75	71A25x1 (60 Hz), 50Y1, 52Y1, 52Y2, 5337, 5340-T, 5383, 53Y3, 80x1 (60 Hz)
10	400	7C100M40RA	1.40	3.75	71A55x0 (60 Hz)
11	400	7C110M40RA	1.65	3.75	71A55x3
12	300	7C120M30RA	1.65	2.75	71A25x1 (50 Hz), 29D1, 50x1 (50 Hz), 53x0 (60Hz, except 5340-T), 5637, 80x1 (50 Hz)
12	450	MD1204100	1.75	2.90	71A55x0 (50 Hz)
13	525	MD1300-100	1.75	3.90	71A57E6
14	120	7C140L12RA	1.25	2.25	71A7707
14	300	7C140M30RA	1.65	2.75	71A04x0, 29R0, 52x1 (50 Hz), 52x2 (50 Hz), 5437, 5737, 81x2 (60 Hz)
15	300	7C150M30RA	1.65	2.75	71A56x2, 56x3
15	400	7C150P40RA	1.75	3.75	71A57x0 (60 Hz), 57x1
16	300	7C160M30RA	1.65	2.75	71A05F0, 54x0, 54x2, 80x0
16	400	7C160P40	1.75	3.75	71A81x0, 07x0
16	525	MD1606-000	1.75	3.90	71A57x4, 82x0
16	525	MD1606-100	1.75	3.90	71A43x0
17	400	7C170P40RA	1.75	3.75	71A55x4, 5634, 57x2
17	550	MD1701-000	1.75	3.90	71A83x0
17	550	MD1701-100	1.75	3.90	71A69x0 (Use one 17 mfd-550V and one 26 mfd-540V in parallel)
17.5	300	7C175M30RA	1.65	3.75	71A0590, 30x2, 53N0, 5837, 81x2 (50 Hz)
18	400	7C180P40RA	1.75	3.75	56x3 (50 Hz), 71A57x0 (50 Hz), 89x4
18.5	330	7C185M33R	1.65	3.75	60x2 Bi-Level
20	120	7C200M12RA	1.25	2.75	71A0201, 7705, 7807
20	330	7C200P33R	1.75	3.75	71A57x2 (50 Hz), 53MO, 5880, 5937, 6037, 6137, 79xO, 81R6, 8146, 8176, 8196
20	450	MD2006-100	1.75	3.90	71A60x6
21	400	7C210P40RA	1.75	4.80	71A58x2 (60 Hz)
21	525	MD2100-030	1.75	3.90	71A59x4, 60x4 (60 Hz), 6334, 64x8
22	240	7C220M24RA	1.65	2.75	71A54A3
22.5	300	7C225P30RA	1.65	3.75	71A35x2 (60 Hz), 5486, 6337
22.5	345	7C225P34	1.75	3.75	71A59x3
24	300	7C240P30RA	1.65	3.75	71A79x6, 89x1
24	400	7C240P40RA	1.75	4.80	71A58x2 (50 Hz), 60x1 (60 Hz), 63x2
24	480	MD2409-000	1.75	3.90	71A84x0, 65x3 (60 Hz), 65x1
24	480	MD2409-100	1.75	3.90	71A50x0, 60N1, 65x2 (60 Hz), 65x0
25.5	400	7C225P40	1.75	4.80	71A59x3 (50 Hz)
26	330	7C260P33R	1.75	4.80	71A60x2 (60 Hz), 61E6
26	330	7C260S33R	2.00	4.80	Alternative to 7C260P33R
26	540	MD2602-030	1.75	5.30	71A69x0 (Uses one 17 mfd-540V and one 26 mfd-540V capacitor in parallel), 87x3 (60 Hz)
26	540	MD2602-100	1.75	5.30	71A60M2, 65x2 (50 Hz), 65x3 (50 Hz only)
26.5	400	7C265P40R	1.75	4.80	71A63x3 (60 Hz)
27.5	240	7C275P24RAT1	1.75	3.75	71A79J9
28	120	7C280M120RA	1.65	2.75	71A5005, 5105, 7805, 7907
28	300	7C280P30RA	1.75	3.75	71A35R2, 54x2 (50 Hz), 79x8, 82x6, 89x0
28	400	7C280S40R	2.00	4.80	71A64x0, 64x2 (60 Hz)
28	580	MD1408-230	1.50	3.90	71A87x3 (50 Hz only, uses two 14mfd-580 volt capacitors in parallel)
30	345	7C300S34	1.75	4.80	71A60N2
32	525	MD3202100	2.00	3.75	71A67x2 (60 Hz)
34	240	7C340P24RA	1.65	3.75	71A80x8
34	550	MD1701-200	1.75	3.90	71A68x0 (Uses two 17mfd-550 volt capacitors in parallel)
35	240	7C350P24RA	1.65	3.75	71A54M2, 80x6, 82x1 (60 Hz)
35	300	7C350P30RA	1.65	4.75	71A40x1 (60 Hz)
36	120	7C360M12RA	1.65	2.75	71A5205, 8007, 50Y5
40	300	7C400P30RA	1.75	4.75	71A40R1, 65E6 (two in series), 82x1 (50 Hz only), 65Y6 (two in series)
45	120	7C450P12RA	1.65	2.75	71A8005
45	300	7C450P30RA	1.75	4.75	71A65M6, 83x1
48	300	7C480S30RA	2.00	5.00	71A84x6, 85x6
52	240	7C520P24RA	1.75	3.75	71A8156, 81E6
52	280	7C520S28RA	2.00	4.00	Bi-Level
55	120	7C550P12RA	1.65	3.75	71A8107
55	240	7C550P24RA	1.75	3.75	71A81x8, 84x3 (60 Hz)
58	240	7C580P24RA	1.75	3.75	71A8593
60	240	7C600P24RA	1.75	3.75	71A99x2, 71A9968
64	280	7C640S28RA	2.00	5.00	71A84x3 (50 Hz), 85x5
66	280	7C660S28RA	2.00	5.00	71A9942, 71A9943
75	280	7C750S28RA	2.00	5.00	71A86x5

1. "R" suffix denotes capacitors with a discharge resistor where required by UL.
2. MD_ denotes 90° Oil Filled, 7C_ denotes 105° Dry Film with leads.

HID • Capacitors

Ballasts-to-Lamp Remote Mounting Distances

Ignitors

Ballasts that include an ignitor to start the HID lamp are limited in the distance which they may be mounted remotely from the lamp because the ignitor pulse attenuates as the wire length between the ballast and lamp increases. All Philips Advance open core & coil ballasts listed in this Atlas include a **standard ignitor** that provides the proper electrical pulse to start lamps when the ballast is mounted **within** the lighting fixture. For most of these ballast/ignitor combinations, the maximum ballast-to-lamp distance is listed as 2 feet. For ballast-to-lamp distances greater than the capability of the standard ignitor, a **long range ignitor** is required.

Use the tables on the following pages to find the proper long range ignitor for various metal halide and high pressure sodium ballasts. Not all ballasts listed in the Atlas have long range ignitor options. It may be necessary to use a ballast employing a different circuit to achieve the needed ballast-to-lamp distance.

Whichever ignitor is used, it must be installed with and adjacent to the core & coil, as the two components work together to deliver the proper pulse to the lamp. Do not install ignitors next to a remote lamp because the electrical pulse will be further attenuated as it first has to travel from the ignitor to the core & coil and then back to the lamp, thus doubling the actual ballast-to-lamp distance.

Metal Halide Ballasts

The distances at which most Metal Halide ballasts can be located from their respective lamps are limited by the ballast-to-lamp wire size. The exceptions being the ballasts for the new, lamps which require an ignitor for starting. The mounting distances for these are limited by the ignitor as shown on the following page.

Use this chart to determine the minimum wire size required for the Metal Halide (not requiring an ignitor) lamps shown:

Lamp		Maximum One-Way Length of Wire between Lamp and Ballast (ft) (Voltage Drop Limited to 1% of Lamp Voltage)				
Wattage	Metal Halide	#10	#12	#14	#16	#18
175	M57	425	265	165	105	65
250	M58	300	190	120	75	45
1-400 or 2-400	M59	200	125	75	50	30
1000	M47	325	205	125	80	50
1500	M48	225	140	85	55	35

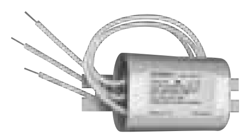
Ignitor Specifications *(Case Temperature Rating 105°C)*

Metal Halide

Metal Halide										
Ballast Data				Standard Ignitor			Long Range Ignitor			
Philips Advance Ballast Family	Lamp Watts	ANSI Code	Ballast Circuit Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type	Catalog Number	Min. Dist. (ft) To Lamp	Max. Dist. (ft) To Lamp	Case Type
71A5105	50	M110/148	HX	LI533-H4-IC	15	Round				
71A51_1	50	M110/148	HX	LI533-H4-IC	10	Round				
71A5137	50	M110/148	R	LI533-H4-IC	2	Round				
71A5205	70	M98/143	HX	LI533-H4-IC	25	Round				
71A52_2	70	M98/143	HX	LI533-H4-IC	15	Round				
71A5237	70	M98/143	R	LI533-H4-IC	10	Round				
71A52_1	70	M139	HX	LI533-H4-IC	10	Round				
71A53_0	100	M90/140	HX	LI533-H4-IC	20	Round				
71A5383	100	M90/140	CWA	LI533-H4-IC	2	Round				
71A5337	100	M90/140	R	LI533-H4-IC	2	Round				
71A54_2	150	M102/142	HX	LI533-H4-IC	10	Round				
71A5437	150	M102/142	R	LI533-H4-IC	2	Round				
71A55_3	175	M137/152	SuperCWA	LI533-H4-IC	2	Oval				
71A56_2	200	M136	SuperCWA	LI533-H4-IC	2	Round				
71A56_3	200	M136	SuperCWA	LI533-H4-IC	5	Round				
71A57_2	250	M138/153	SuperCWA	LI533-H4-IC	5	Round				
71A58_2	320	M132/154	SuperCWA	LI533-H4-IC	2	Round				
71A59_3	350	M131	SuperCWA	LI533-H4-IC	2	Round				
71A60_2	400	M135/155	SuperCWA	LI533-H4-IC	10	Round				
71A61E6	400	M135/155	SuperCWI	LI533-H4-IC	2	Round				
71A63_3	450	M144	Super CWA	LI533-H4-IC	5	Round				
71A64_0	750	M149	SuperCWA	LI573-H5	15	Oval				
71A64_2	750	M149	SuperCWA	LI573-H5-IC	15	Oval				
71A64_8	875	M-166	SuperCWA	LI572-H5-IC★	10	Oval				
71A65_1	1000	M141	SuperCWA	LI572-H5-IC★	10	Oval				
71A65_3	1000	M141	SuperCWA	LI571-H5-IC★	5	Oval				
71A50_5	35	M130	HX	LI533-H4-IC	15	Round	LI561-H5★	15	50	Oval
71A5081	35	M130	HX	LI533-H4-IC	15	Round	LI561-H5★	15	50	Oval
71A5037	35	M130	R	LI533-H4-IC	10	Round	LI561-H5★	10	50	Oval
71A52_0	70	M85	HX	LI522-H5-IC★	30	Oval	Not Available			
71A54A3	150	M102/142	SuperCWA	LI501-J4-IC★	15	Round	Not Available			
71A54_0	150	M81	HX	LI522-H5-IC★	20	Oval	Not Available			
71A5486	150	M81	CWA	LI523-H5-IC★	2	Oval	Not Available			
71A5880	250	M80	HX	LI522-H5-IC★	5	Oval	Not Available			
71A86_5	750	**	CWA	LI561-H5-IC★	5	Oval	Not Available			

XTENZA® Long-Range Ignitor
- Meets ANSI pulse requirements for all ballast to lamp distances from 0 to 50 ft.
- Features 105°C case temperature rating
- See Ordering Information Below

LI533-LR1 | 0 - 50 ft | Oval



LI533-LR | 0 - 50 ft | Oval

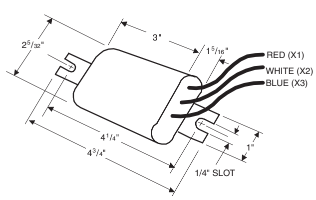
LI533-LR3★ | 0 - 50 ft | Oval

★ Equipped with an auto-rest thermal protector to help prevent ignitor from overheating in the event of lamp failure

XTENZA Ordering Information

To order in bulk, specify item no. LI533-LR, LI533-LR1 or LI533-LR3. For individual carton, add -IC to item no.

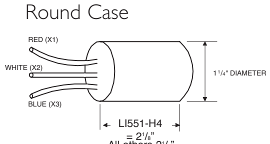
XTENZA is also available packaged with the ballasts shown at right.

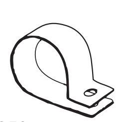


Oval Case

Lamp Watts	ANSI Code	Ballast Number	No Bracket	With Welded Bracket
35	M130	71A5005		-910DP
35	M130	71A5081	-900D	
70	M98/143	71A5205		-910DP
70	M98/143	71A5292	-900D	
70	M98/143	71A52A2	-900D	-910D
100	M90/140	71A5383		-910D
100	M90/140	71A5390	-900D	

Round Case





RW33CC1252
MOUNTING CLIP for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

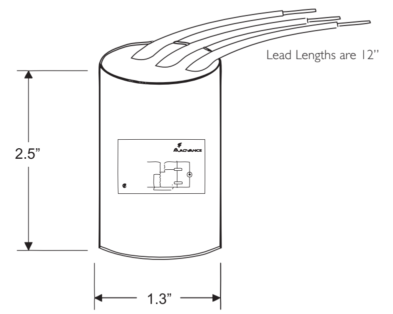
LISOD™

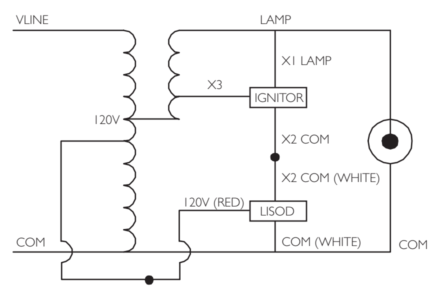
The Philips Advance shut-off device (LISOD™) enhances the reliability of High Intensity Discharge (HID) lighting systems where ignitors are utilized to start the HID lamps. This includes all high pressure sodium lamps as well as all low, medium, and high wattage pulse-start metal halide lamps. The LISOD shut-off device is used in addition to a standard ignitor.

The LISOD shut-off device increases the life of the ignitor by disabling it from the circuit and eliminating any concern over long-term ballast reliability due to continuously pulsing ignitors when a lamp is burned out. The LISOD provides a simple solution to eliminate lamp cycling typically associated with lamps that have reached their end of life. The LISOD disables the ignitor after 15 minutes of pulsing in cases when lamp is taken out of socket or lamp fails to ignite.

- Compatible with any Philips Advance Reactor (R), High-Reactance (HX), and Constant Wattage Autotransformer (CWA) ballast and ignitor circuit that includes a 120V input tap.
- Integral timer automatically disables ignitor from ballast circuit 15-minutes after power is applied to the ballast
- Extends ignitor life, which is typically rated for 10,000 hours of continuous pulsing
- Protects ballast coil insulation from potential damage due to a continuously pulsing ignitor
- Prevents cycling of end-of-life lamps making identification for lamp replacement easy
- Automatically resets/restarts itself after 0.6 second of power interruption (voltage dropout)

Catalog Number	Description	Quantity Per Carton
LISOD**1**-IC	Ignitor shut-off device for HID CWA, HX, and R ballasts with ignitors. Individual carton packaging	1
LISOD**1**	Ignitor shut-off device for HID CWA, HX and R ballasts with ignitors. Bulk packaging	50

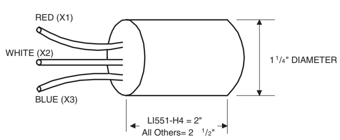




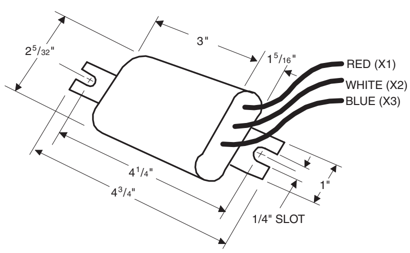
Ignitor Specifications *(Case Temperature Rating 105°C)*

High Pressure Sodium

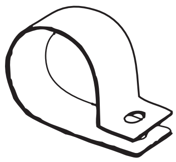
High Pressure Sodium									
Ballast Data				Standard Ignitor			Long Range Ignitor		
Philips Advance Ballast Family	Lamp Watts	ANSI Code	Ballast Circuit Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type
71A7707	35	S76	R	LI551-H4-IC	2	Round	LI551-J4-IC	15	Round
71A7801	50	S68	HX	LI551-H4-IC	2	Round	LI551-J4-IC	35	Round
71A7807	50	S68	R	LI551-H4-IC	2	Round	LI551-J4-IC	15	Round
71A79_1	70	S62	HX	LI551-H4-IC	2	Round	LI551-J4-IC	35	Round
71A79_6	70	S62	CWI	LI551-J4-IC	2	Round	Not Available		
71A79_8	70	S62	CWA	LI551-J4-IC	5	Round	Not Available		
71A7907	70	S62	R	LI551-H4-IC	2	Round	LI551-J4-IC	15	Round
71A80_1	100	S54	HX	LI551-H4-IC	2	Round	LI551-J4-IC	35	Round
71A80_8	100	S54	CWA	LI551-J4-IC	5	Round	Not Available		
71A8007	100	S54	R	LI551-H4-IC	2	Round	LI551-J4-IC	15	Round
71A80_6	100	S54	CWI	LI551-J4-IC	2	Round	Not Available		
71A81_2	150	S55	HX	LI551-H4-IC	2	Round	LI551-J4-IC	35	Round
71A81_8	150	S55	CWA	LI551-J4-IC	10	Round	Not Available		
71A8107	150	S55	R	LI551-H4-IC	2	Round	LI551-J4-IC	15	Round
71A8156	150	S55	CWI	LI551-J4-IC	2	Round	Not Available		
71A85_5	150	S55	CWI	LI551-J4-IC	2	Round	Not Available		
71A81_6	150	S56	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A86_7	150	S56	R	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round



Round Case



Oval Case



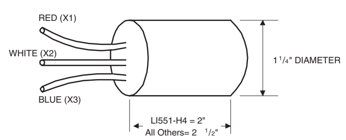
RW33CC1252
Mounting Clip for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

Ignitor Specifications *(Case Temperature Rating 105°C)*

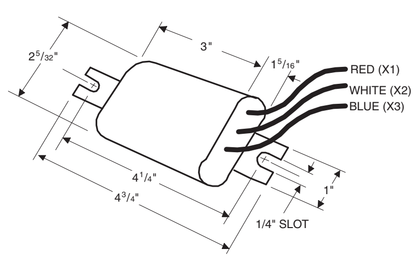
High Pressure Sodium

High Pressure Sodium									
Ballast Data				Standard Ignitor			Long Range Ignitor		
Philips Advance Ballast Family	Lamp Watts	ANSI Code	Ballast Circuit Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type
71A89_0	200	S66	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A89_1	200	S66	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A89_7	200	S66	R	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A82_1	250	S50	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A82_6	250	S50	CWI	LI501-J4-IC	2	Round	Not Available		
71A82_7	250	S50	R	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A8392	250	S50	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A83_1	310	S67	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A83_7	310	S67	R	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A84_3	400	S51	CWA	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A84_6	400	S51	CWI	LI501-J4-IC	2	Round	Not Available		
71A84_7	400	S51	R	LI501-H4-IC	2	Round	LI501-J4-IC	50	Round
71A85_6	430	n/a	CWI	LI501-H4-IC	15	Round	LI501-J4-IC	35	Round
71A85_5	600	S106	CWA	LI561-H5-IC	5	Oval	Not Available		
71A85_8	600	S106	CWI	LI561-H5-IC	2	Oval	Not Available		
71A86_5	750	S111	CWA	LI561-H5-IC	5	Oval	Not Available		
71A87_3	1000	S52	CWA	LI571-H5-IC★	15	Oval	LI571-J5-IC★	75	Oval

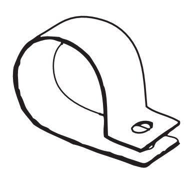
★ Equipped with an auto-rest thermal protector to help prevent ignitor from overheating in the event of lamp failure.



Round Case



Oval Case



RW33CC1252
Mounting Clip for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

Transformers & Autotransformers

Stepdown Transformers and Autotransformers

Lamp Type	Lamp Watts	Input: Output (Volts)	Catalog † Number	Max. Input Current	Max. Input Watts	Max. V.A. Load	Wiring Diagram	Dimensions			Weight (lbs)
								Fig	A	B	
Stepdown Transformers for 6 and 12V Halogen Lighting											
Halogen	75	120:11.5	71A9743-600C	.8	81	75	T-1	9	1.5	2.8	2.5
	50/75	277:11.8	71A9833-600C	.3/.4	60/86	75	T-1	9	1.5	2.8	2.5
Stepdown Autotransformers for 120V Incandescent Lighting											
Incandescent	150	277:115	71A9749-600	.6	150	150	T-2	9	1.5	2.7	2.3
	200		71A9839-600 (-J)	.8	199	200	T-2	9 (11)	2.2	3.8(4.2)	3.8(4.1)
	300		71A9741-600 (-J)	1.1	300	300	T-2	9 (11)	2.0	3.5(4.0)	3.5(3.8)
Stepdown & Step-up Autotransformers for use with HID Reactor Ballasts											
High Pressure Sodium	100/150	347:120/277	71A9862-600	1.7	200	395	T-2	9	2.7	3.9	4.5
	100	277:120	71A9876-600 (-J)	.9	125	265	T-2	4 (11)	1.9	2.6(3.9)	6.5(6.8)
Metal Halide	70	120:277	71A9900-600	2.5	85	250	T-4	9	1.9	3.4	3.3
	100/150		71A9741-600 (-J)	2.4	125	300	T-4	9 (11)	2.0	3.5(4.0)	3.5(3.8)
	50/100/150	347:120/277	71A9862-600 (-J)	1.7	200	395	T-2	9 (11)	2.7	3.9(4.7)	4.5(4.8)
LED*	150	480:270 or 347:190	71A9843-600	0.65	100	300	T-2	9	2.4	3.8	3.7

† Ordering information:
Add proper suffix to catalog number:
-600 includes core and coil only
-J (available where shown) includes J-Box cover and auto-reset thermal protection. Refer to Figure 11.

* For use with Intellivolt LED Drivers.

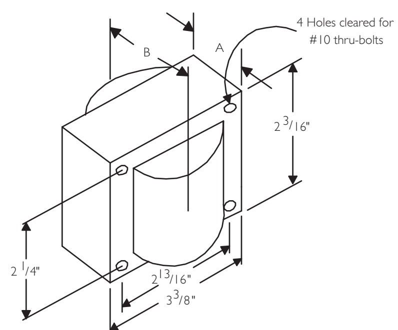


Fig 4
($2^3/_{16}$" x $3^3/_8$" Reactor Core)

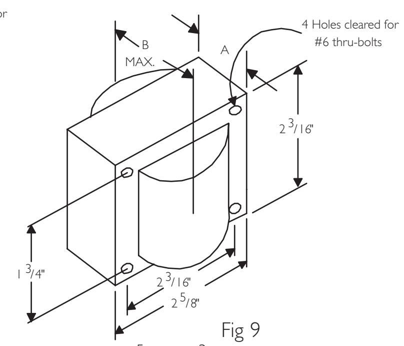


Fig 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

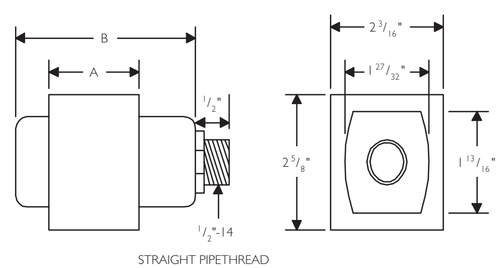


Fig 11
(J-Box Ballast)

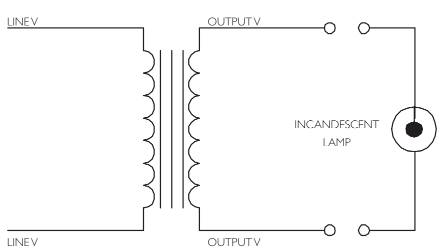


Fig T-1

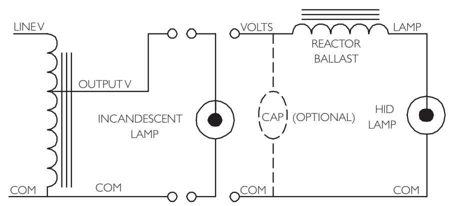


Fig T-2

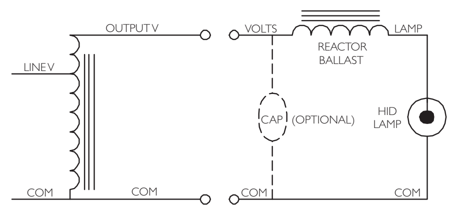


Fig T-4

60 Hz F-Can Ballasts, (Indoor, Outdoor Type 1)

Metal Halide

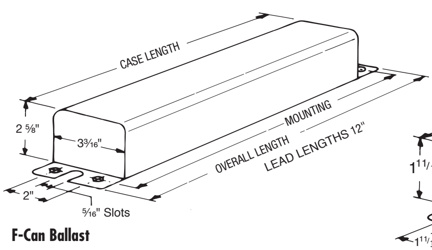
Input Voltage	Catalog Number	Circuit Type	Input Amps: Operating	Input Amps: Starting	Input Amps: Open Circuit	Input Watts	Nom. Open Circuit Voltage	Fuse Rating Amps	Over-all Length	Case Length	Mtg. Dim.	Total Wt. (lbs)	Max. Ballast to Lamp Distance (ft)	Certifications: UL	Certifications: CSA
35/39W Lamp, ANSI Code M130 (Pulse-Start)													SOUND RATING B		
120/277	72C5081-NP	HX-HPF	.6/.3	.6/.3	1.0/.4	56	255	3/1	11.75	10.50	11.13	9.0	10	✓	✓
50W Lamp, ANSI Code M110 or M148 (Pulse-Start)													SOUND RATING B		
120/277	72C5181-NP	HX-HPF	.7/.3	.8/.4	1.2/.5	72	254	3/2	11.75	10.50	11.13	9.0	25	✓	✓
	72C5181-NP-001														✓
120/347	72C51C1-NP		.6/.2	.5/.2	1.6/.6	67	277	4/2					20	20	20
70W Lamp, ANSI Code M85 (Double-ended lamp) (Pulse-Start)													SOUND RATING B		
120/277	**72C5280-NP-001**	HX-HPF	.9/.4	1.0/.5	1.7/.8	94	240	5/2	11.75	10.50	11.13	8.5	10	✓	✓
120/347	72C52C0-NP		.8/.3	1.0/.4	1.7/.6								35		✓
70W Lamp, ANSI Code M98 or M143 (Pulse-Start)													SOUND RATING B		
120/277	72C5282-NP	HX-HPF	.9/.4	1.3/.6	1.6/.8	94	255	4/2	11.75	10.50	11.13	8.5	10	✓	✓
	72C5282-NP-001														
	72C5282-NP-900•												50		✓
120/347	72C52C2-NP		.9/.3	1.2/.4	1.7/.7			5/2					20		✓
70W Lamp, ANSI Code M139 (Pulse-Start)													SOUND RATING B		
120/277	72C5281-NP-900•	HX-HPF	.9/.4	1.0/.5	1.7/.8	94	240	5/2	11.75	10.50	11.13	8.5	50	✓	✓
120/347	72C52C1-NP-900•		.8/.3	1.0/.4	1.7/.6	94	255	5/2	11.75	10.50	11.13	8.5	50	✓	✓
100W Lamp, ANSI Code M90 or M140 (Pulse-Start)													SOUND RATING B		
120/277	72C5381-NP	HX-HPF	1.1/.5	2.2/1.0	2.4/1.1	125	277	6/3	11.75	10.50	11.13	11.0	5	✓	✓
	72C5381-NP-001														
	72C5381-NP-900•												50		
120/347	72C53C1-NP		1.1/.4	2.2/.8	2.4/.9			6/2					15		✓
150W Lamp, ANSI Code M81 (Double-ended lamp) (Pulse-Start)													SOUND RATING B		
120/277	72C5481-NP	HX-HPF	1.6/.7	1.7/.8	3.7/1.6	180	240	10/4	14.30	13.13	13.75	13.0	10	✓	✓
150W Lamp, ANSI Code M102 or M142 (Pulse-Start)													SOUND RATING B		
120/277	72C5482-NP	HX-HPF	1.6/.7	1.5/.8	3.7/1.6	180	277	10/4	14.30	13.13	13.75	13.0	5	✓	✓
	72C5482-NP-900•												50		
120/347	72C54C2-NP-900•		1.6/.6	1.7/.6	3.7/1.3	180	240	10/4	14.30	13.13	13.75	13.0	50		✓

All Philips Advance dual-volt, F-can ballasts include auto-reset thermal protection for both taps.

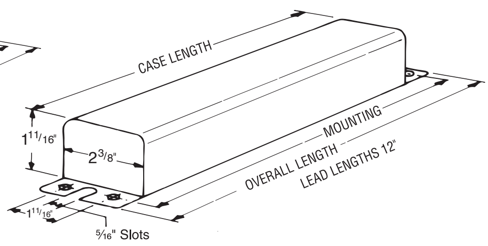
Replacement ballasts in individual cartons indicated by **bold type** with **suffix -001**.

- Ballasts with suffix -900 include integral XTENXA® Long-Range Ignitor for 50ft. max. ballast to lamp distance. Also suitable for shorter distances.

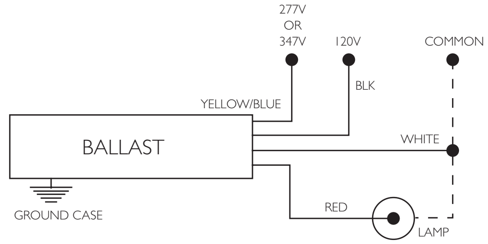
" All 150W thru 400W F-Can Ballasts are **not** EISA compliant.



Dimensions



Dimensions
(72C5005-NP)



Wiring Diagram
All lead lengths 12"

60 Hz F-Can Ballasts, (Indoor, Outdoor Type 1)

Metal Halide

Input Voltage	Catalog Number	Circuit Type	Input Amps			Input Watts	Nom. Open Circuit Voltage	Fuse Rating Amps	Over-all Length	Case Length	Mtg. Dim.	Total Wt. (lbs)	Max. Ballast to Lamp Distance (ft)	Certifications	
			Operating	Starting	Open Circuit									UL	CSA
175/150W Lamp, ANSI Code M57 or M107															SOUND RATING C
120/277	**72C5581-NP-001**	CWA	2.0/.9	2.0/.9	1.4/.7	205	300	5/3	11.75	10.50	11.13	12.0	✪	✓	✓
120/347	72C55C1-NP		1.9/.7	1.9/.7	1.7/.5	208		5/2							✓
175W Lamp, ANSI Code M137 or M152 (Pulse-Start)															SOUND RATING B
120/277	72C5582-NP	Super CWA	1.7/.8	.9/.4	2.2/.9	205	300	5/3	14.30	13.13	13.75	15.5	50	✓	✓
250W Lamp, ANSI Code M58															SOUND RATING C
120/277	**72C5782-NP-001**	CWA	2.6/1.1	2.1/.9	2.1/.9	290	300	8/4	16.70	15.50	16.13	16.0	✪	✓	✓
120/347	72C57C2-NP		2.5/.9	2.0/.7	2.0/.7			7/3	14.30	13.13	13.75	14.0			✓
250W Lamp, ANSI Code M138 or M153 (Pulse-Start)															SOUND RATING B
120/277	72C5783-NP	Super CWA	2.8/1.2	2.5/1.1	1.9/.8	290	300	8/3	16.70	15.50	16.13	18.0	50	✓	✓
320W Lamp, ANSI Code M132 or M154 (Pulse-Start)															SOUND RATING C
120/277	72C5882-NP	Super CWA	3.4/1.5	2.8/1.2	1.6/.7	370	270	8/3	19.20	18.00	18.63	21.0	50	✓	✓
350W Lamp, ANSI Code M131 (Pulse-Start)															SOUND RATING C
120/277	72C5983-NP	Super CWA	3.7/1.7	2.5/1.2	3.9/1.7	410	310	10/4	19.20	18.00	18.63	24.0	50	✓	✓
400W Lamp, ANSI Code M59															SOUND RATING C
120/277	**72C6082-NP-001**	CWA	3.9/1.7	3.3/1.4	3.9/1.7	460	310	10/5	19.20	18.00	18.63	22.5	✪	✓	✓
400W Lamp, ANSI Code M135 or M155 (Pulse-Start)															SOUND RATING C
120/277	**72C6182-NP-001**	Super CWA	4.1/1.8	2.9/1.3	3.9/1.7	465	310	10/4	19.20	18.00	18.63	24.0	50	✓	✓

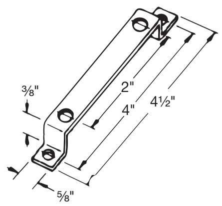
All Philips Advance dual-volt, F-can ballasts include auto-reset thermal protection for both taps..

✪ Ballast to lamp distance is only limited by the size of the conductor between the ballast and the lamp. For proper wire size, see table on page 5-46 of this catalog.

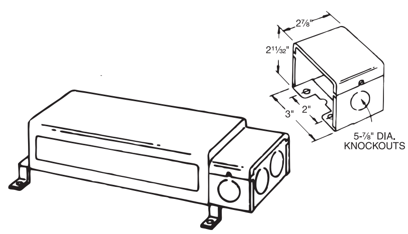
Replacement ballasts in individual cartons indicated by **bold type** with **suffix -001**.

° All 150W thru 400W F-Can Ballasts are **not** EISA compliant.

Accessories



PKG-625
Mounting Bracket Kit
Includes (2) mounting brackets and (4) #10-32 screws with nuts and washers.



PC-857
Wiring Compartment
For end mounting, includes (5) M\," dia. knockouts. May be used with or without PC-625 Mtg. Brkt. Kit

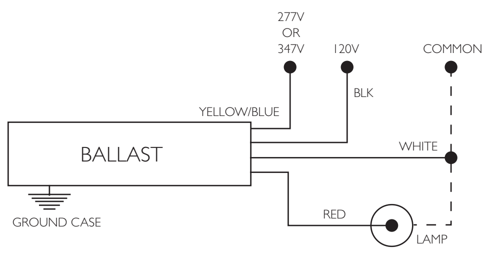
60 Hz F-Can Ballasts, (Indoor, Outdoor Type 1)

High Pressure Sodium

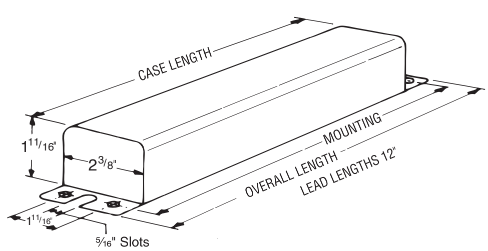
Input Voltage	Catalog Number	Circuit Type	Input Amps			Input Watts	Nom. Open Circuit Voltage	Fuse Rating Amps	Over-all Length	Case Length	Mtg. Dim.	Total Wt. (lbs)	Max. Ballast to Lamp Distance (ft)	Certifications	
			Operating	Starting	Open Circuit									UL	CSA
50W Lamp, ANSI Code S68															SOUND RATING B
120/277	**72C7884-NP-001**	HX-HPF	.7/.3	.7/.4	1.4/.7	65	120	4/2	11.75	10.50	11.13	11.0	15	✓	✓
70W Lamp, ANSI Code S62															SOUND RATING B
120/277	72C7984-NP	HX-HPF	.9/.4	1.0/.5	1.4/.7	90	120	5/2	11.75	10.50	11.13	10.0	7	✓	✓
120/277	**72C7984-NP-001**	HX-HPF	.9/.4	1.0/.5	1.4/.7	90	120	5/2	11.75	10.50	11.13	10.0	7	✓	✓
120/347	72C79C4-NP	HX-HPF	.8/.3	.9/.3	1.4/.5	94	120	4/2	11.75	10.50	11.13	10.0	7		✓
100W Lamp, ANSI Code S54															SOUND RATING B
120/277	72C8084-NP	HX-HPF	1.1/.5	1.5/.7	1.9/.8	125	120	6/3	11.75	10.50	11.13	11.0	15	✓	✓
120/277	**72C8084-NP-001**	HX-HPF	1.1/.5	1.5/.7	1.9/.8	125	120	6/3	11.75	10.50	11.13	11.0	15	✓	✓
150W Lamp, ANSI Code S55 (55V Arc Tube)															SOUND RATING B
120/277	72C8185-NP	HX-HPF	1.7/.7	2.6/1.2	2.2/1.0	185	120	8/4	14.30	13.13	13.75	14.0	5	✓	✓

All Philips Advance dual-volt, F-can ballasts include auto-reset thermal protection for both taps.

Replacement ballasts in individual cartons indicated by **bold type** with suffix -001.

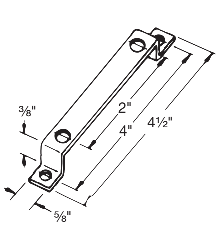


Wiring Diagram
All lead lengths 12"

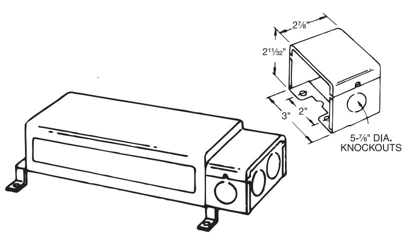


Dimensions

Accessories



PKG-625
Mounting Bracket Kit
Includes (2) mounting brackets and (4) #10-32 screws with nuts and washers.



PC-857
Wiring Compartment
For end mounting, includes (5) M\," dia. knockouts. May be used with or without PC-625 Mtg. Brkt. Kit

60 Hz Encapsulated Core & Coil Ballasts

Metal Halide

Input Volts	Catalog † Number	Circuit Type	Input Watts	Max Input Current •	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Case Style	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)	
70W Lamp, ANSI Code M98 Medium Base (Pulse-Start)														SOUND RATING A		
120/277	73B5282-500D	HX-HPF	90	1.9/.8	255	4/2	K	PC709-2	8	280	7C080L30RA	D	9.0	LI533-H4	15	
100W Lamp, ANSI Code M90 or M140 (Pulse-Start)														SOUND RATING A		
120/277	73B5383-500D	CWA	128	1.1/.5	222	3/2	M	PC709-4	10	330	7C100M30RA	D	10.0	LI533-H4	2	
150W Lamp, ANSI Code M102 (Medium Base) or M142 (Pulse-Start)														SOUND RATING A		
120/277	73B5482-500D	HX-HPF	185	3.7/1.6	265	10/4	K	PC709-4	16	280	7C160M33-R	D	11.0	LI533-H4	10	
175W Lamp, ANSI Code M57														SOUND RATING A		
120/208/ 240/277	73B5590-500D	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	A	PC709-4	10	400	7C100M40-R	D	12.0	–	–	
175W Lamp, ANSI Code M137 or M152 (Pulse-Start)														SOUND RATING A		
120/208/ 240/277	73B5591-500DEE	Super CWA	198	1.7/1.0/ .8/.7	285	5/3/ 3/2	M	PC767-1	11	370	7C110M40	D	15.0	LI533-H4	2	Ⓔ
250W Lamp, ANSI Code M138 or M153 (Pulse-Start)														SOUND RATING B		
120/208/ 240/277	73B5792-500DAEE	Super CWA	283	2.5/1.5/ 1.3/1.1	275	8/5 5/3	M	PC767-1	17	350	7C170P40	D	16.0	LI533-H4	2	Ⓔ
250W Lamp, ANSI Code M58														SOUND RATING B		
120/208/ 240/277	73B-5790-500DA	CWA	295	2.5/1.4/ 1.3/1.1	300	8/5/ 5/3	A	PC767-1	15	400	7C150P40-R	D	15.0	–	–	
120/ 277/347	73B57A0-500D	CWA	295	2.5/ 1.1/.9	315	8/ 3/3	A	PC767-1	15	400	7C150P40-R	D	15.2	–	–	
320W Lamp, ANSI Code M132 or M154 (Pulse-Start)														SOUND RATING B		
120/208/ 240/277	73B5892-500DAEE	Super CWA	361	3.3/1.9/ 1.7/1.4	270	8/6/ 5/3	M	PC768-1	21	345	7C210P40R	D	18.0	LI533-H4	2	Ⓔ
350W Lamp, ANSI Code M131 (Pulse-Start)														SOUND RATING B		
120/208/ 240/277	73B5993-500DAEE	Super CWA	397	3.4/2.0/ 1.7/1.5	270	10/7/ 5/5	M	PC767-3	22.5	345	7C225P40	D	18.0	LI533-H4	2	Ⓔ

† **Ordering information:**
Original equipment ballasts – typically ordered with capacitor (as shown)
-500D includes core & coil with dry-film capacitor
May also be available without capacitor:
-600 core & coil only (no capacitor)

• For CWA, figure is operating current. For HX circuits, figure is highest of starting, operating or open circuit currents

†† Each ballast requiring an ignitor is furnished standard with the **short-range** ignitor model shown for use within fixtures. Long-range ignitors are available separately, if required. See pages 5-40 to 5-44 for additional information.

Ⓔ Indicates the ballast meets the 88% efficiency requirements of EISA (Energy Independence and Security Act of 2007)

60 Hz Encapsulated Core & Coil Ballasts

Metal Halide

Input Volts	Catalog † Number	Circuit Type	Input Watts	Max • Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Case Style	Non-PCB Capacitor (Page 5-38 & 5-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44) Part Number	Max Dist To Lamp (ft)
400W Lamp, ANSI Code M59														SOUND RATING B	
120/208/ 240/277	73B6091-500DA	CWA	458	4.0/2.3/ 2.0/1.7	300	10/7/ 5/5	A	PC-767-3	24	400	7C240P40-R	D	20.0	–	–
120/ 277/347	73B60A1-500D	CWA	460	4.0/ 1.7/1.4	300	10/ 5/4	A	PC-767-3	24	400	7C240P40-R	D	20.2	–	–
400W Lamp, ANSI Code M135 or M155 (Pulse-Start)														SOUND RATING B	
Ⓔ 120/208/ 240/277	73B6092-500DAEE	Super CWA	454	3.8/2.2/ 1.9/1.7	270	10/7/ 5/5	M	PC-767-3	26	330	7C260P33R	D	15.0	LI533-H4	10
Ⓔ 120/208/ 240/277 480	73B6052-500DAEE	Super CWA	454	3.8/2.2/ 1.9/1.7/ 1	275	10/7/ 5/5/ 3	M	PC-767-3	26	330	7C260P33R	D	17.0	LI533-H4	2
1000W Lamp, ANSI Code M47														SOUND RATING C	
120/208/ 240/277	73B6590-500	CWA	1070	9.0/5.2 4.5/3.9	415	20/15 10/10	A	PC-768-2	24	480	MD2409-100	O	28.0	–	–
120/ 277/347	73B65A2-500	CWA	1080	9.0/ 3.9/3.2	430	20/ 10/8	A	PC-768-1	24	480	MD2409-100	O	28.0	–	–
1000W Lamp, ANSI Code M141 (Pulse-Start)														SOUND RATING C	
120/208/ 240/277	73B6593-500	Super CWA	1080	9/5.3/ 4.5/3.9	430	20/15 10/10	M	PC-768-1	24	480	MD2409-000	O	29.0	L1571-H5	5

† Ordering information:
Original equipment ballasts - add proper suffix to catalog number:
-500D includes core & coil with dry-film capacitor
-500 includes core & coil with oil-filled capacitor
-600 core & coil only (no capacitor)

• For CWA, figure is operating current.

Ⓔ Indicates the ballast meets the 88% efficiency requirements of EISA (Energy Independence and Security Act of 2007)

HID • Encapsulated Core & Coil

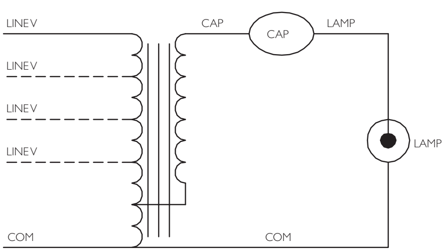


Fig. A

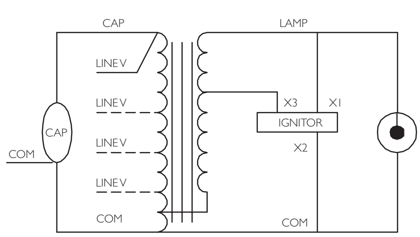


Fig. K

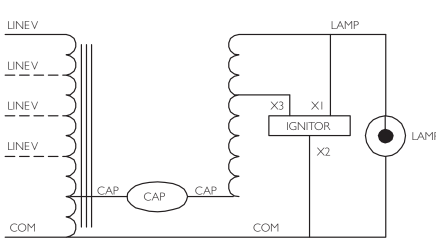


Fig. M

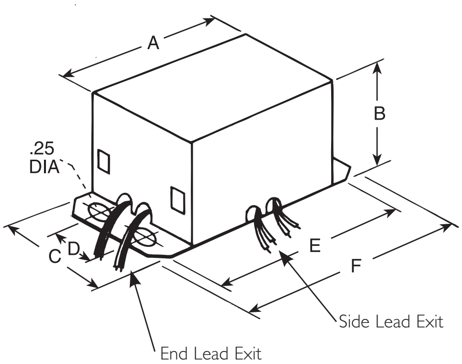
60 Hz Encapsulated Core & Coil Ballasts

Metal Halide

Input Volts	Catalog† Number	Circuit Type	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Case Style	Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)	
									Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)
250W Lamp, ANSI Code S50															SOUND RATING B
120/208/ 240/277	73B8291-500DA	CWA	295	2.5/1.5/ 1.3/1.1	187	7/4/ 4/3	M	PC-767-3	35	240	7C350P24RA	D	15.4	LI501-H4	2
400W Lamp, ANSI Code S51															SOUND RATING B
120/208/ 240/277	73B8493-500D	CWA	460	3.8/2.2/ 1.9/1.7	190	10/8/ 5/5	M	PC-767-3	55	240	7C550P24RA	D	21.0	LI501-H4	2

DIMENSIONS

Case Style	Lead Exit	A	B	C	D	E	F
PC709-2	Side	4.6	3.4	3.6	2.0	5.25	6.0
PC709-4	Side	4.6	4.4	3.6	2.0	5.25	6.0
PC767-1	Side	5.4	5.0	3.8	2.0	6.0	6.75
PC767-3	Side	5.4	5.0	4.3	2.0	6.0	6.75
PC768-1	Side	6.5	5.0	5.2	2.0	7.0	7.75
PC768-2	Side	6.3	4.9	5.9	2.0	7.0	7.75



60 Hz Postline Ballasts

Metal Halide

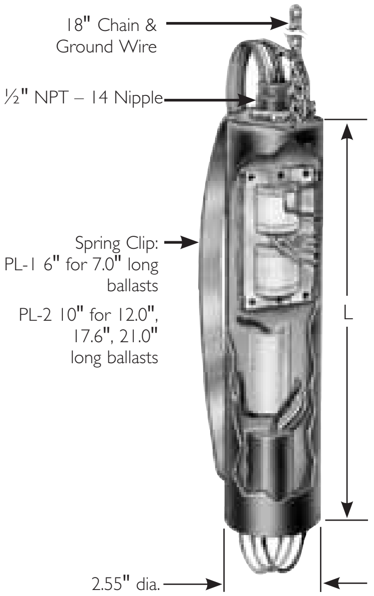
Input Volts	Catalog Number† (P=Thermally Protected)	Circuit Type	Input Watts	Max• Input Current	Nom. Open Circuit Voltage	Fuse (amps)	Length (in)	Weight (lbs)	Spring Clip & Support Chain Kit	Max Dist To Lamp (ft)	Certifications UL	CSA
50W Lamp, ANSI Code M110												
120	74P5104-011P	HX-PFC	69	1.1	260	3	12.0	6.0	PL-2 (Optional)	20	✓	✓

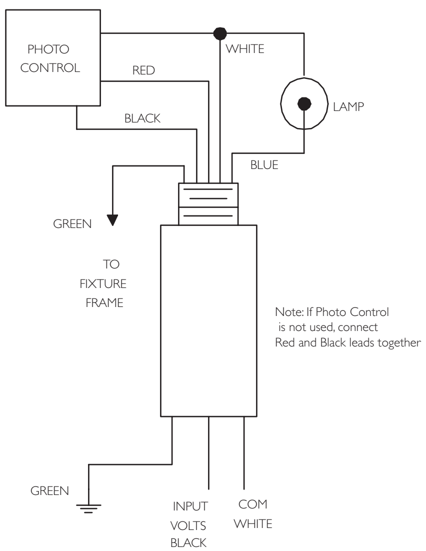
† Ordering information:
Order catalog number indicated. If spring clip and support chain kit is desired, order separately.

• For HX and R circuits, figure is highest of starting, operating or open circuit current.

PL-1 and PL-2 - Spring Clip and Support Chain Kits

Included pre-assembled with all postline ballasts rated 100 watts and above. Support chain lowers ballast 18" down post while 6" or 10" spring clip forces ballast against post's inner wall to assure proper heat dissipation away from ballast's internal components. Also includes factory-connected ground wire to provide for proper grounding of ballast case and fixture housing. Kits include instruction sheet and may be ordered separately to retrofit existing installations.





Postline Wiring Diagram

60 Hz Postline Ballasts

High Pressure Sodium

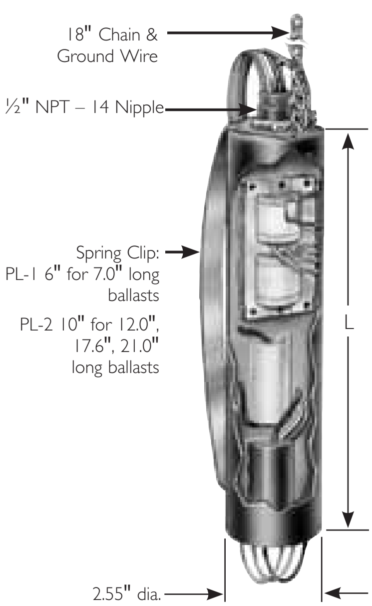
Input Volts	Catalog Number† (P=Thermally Protected)	Circuit Type	Input Watts	Max Input Current	Nom. Open Circuit Voltage	Fuse (amps)	Length (in)	Weight (lbs)	Spring Clip & Support Chain Kit	Max Dist To Lamp (ft)	Certifications UL	Certifications CSA
35W Lamp, ANSI Code S76												
120	74P7703-011P	R-HPF	43	.8	120	2	7.0	3.5	PL-1 (Optional)	10	✓	✓
50W Lamp, ANSI Code S68												
120	74P7803-011P	R-HPF	61	1.3	120	4	12.0	4.8	PL-2 (Optional)	10	✓	✓
70W Lamp, ANSI Code S62												
120	74P7903-011P	R-PFC	84	1.6	120	4	12.0	5.0	PL-2 (Optional)	10	✓	✓
277	74P7933-011P	HX-HPF	97	.7	277	2	17.6	8.5	PL-2* (Included)	10	✓	
100W Lamp, ANSI Code S54												
120	74P8003-011P	R-HPF	122	2.5	120	7	17.6	7.3	PL-2 (Included)	5	✓	✓
208 240 277	74P8013-011P 74P8023-011P 74P8033-011P	HX-HPF	136	1.1 1.0 .9	208 240 277	3 3 3	21.0	12.7	PL-2 (Included)	5	✓ ✓ ✓	
150W Lamp, ANSI Code S55 (55V Arc Tube)												
120	74P8104-011P	R-HPF	178	3.6	120	9	17.6	7.8	PL-2 (Included)	5	✓	✓

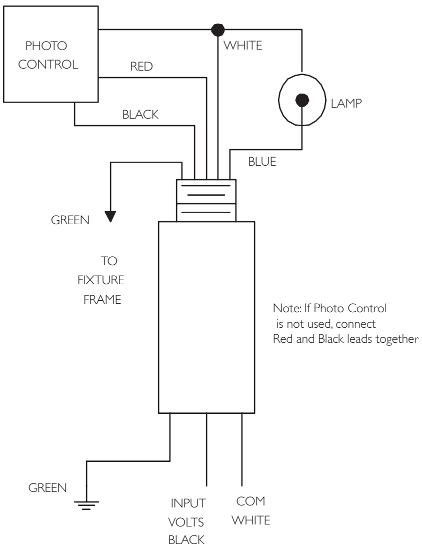
† Ordering information:
Order catalog number indicated. Ballasts rated 100W and above include pre-assembled spring clip and support chain kit. For ballasts rated less than 100W, if spring clip and support chain kit is desired, order separately.

* 70W High Pressure Sodium ballasts with 208, 240, or 277V inputs will always be supplied with the spring clip and chain kit.

PL-1 and PL-2 - Spring Clip and Support Chain Kits

Included pre-assembled with all postline ballasts rated 100 watts and above. Support chain lowers ballast 18" down post while 6" or 10" spring clip forces ballast against post's inner wall to assure proper heat dissipation away from ballast's internal components. Also includes factory-connected ground wire to provide for proper grounding of ballast case and fixture housing. Kits include instruction sheet and may be ordered separately to retrofit existing installations.





Postline Wiring Diagram

60 Hz Indoor Enclosed Ballasts

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type (Maximum Ambient Temp.)	Input Watts	Max• Input Current	Nom. Open Circuit Voltage	Fuse (amps)	Wiring Dia.	Case Style	Weight (lbs)	Certification UL	Certification CSA
400W Lamp, ANSI Code S51											
120/208/240/277	78E8493-001	CWA (40°C)	464	3.8/2.2/1.9/1.7	190	10/8/5/5	IE-2	PC-724	38	✓	✓
480	78E8493-001			1.0		3	IE-1			✓	
1000W Lamp, ANSI Code S52											
120/208/240/277	78E8793-001	CWA★ (40°C)	1100	9.5/5.5/4.8/4.2	435	25/15/10/10	IE-2	PC-746	60	✓	✓
480	78E8743-001			2.3		6	IE-1			✓	

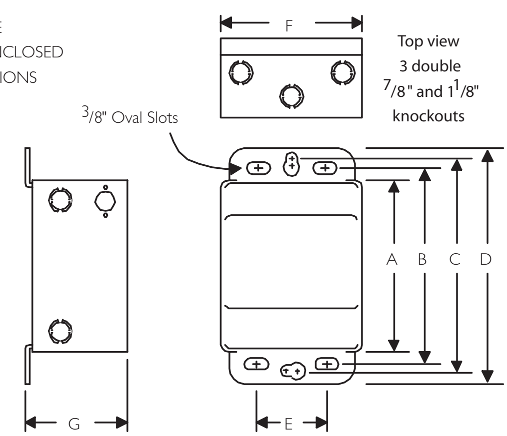
Note: Ballasts must be mounted at least 12" apart. All indoor enclosed high pressure sodium and pulse-start metal halide lamp ballasts are furnished with an Philips Advance long range ignitor built into the ballast enclosure. Maximum lamp-to-ballast distance is 50 ft. (Except 1000 watt ballasts which are 75 ft). For ballasts not requiring ignitors, see page 5-44 for remote mounting considerations.

- • For CWA circuits, figure is operating current.
- ★ Equipped with an auto-reset thermal protector to prevent ignitor from overheating in the event of lamp failure.
- ◇ White can typically used for indoor tennis courts.

DIMENSIONS

Case Style	A	B	C	D	E	F	G
PC-723	11 3/8	12	12¾	13¾	3 5/16	6 9/16	4¾
PC-724	12 1/16	12 11/16	13 7/16	14 7/16	3 5/16	7 11/16	5¾
PC-746	17 3/8	18	18¾	19¾	3 5/16	7 11/16	5¾

78E
INDOOR ENCLOSED
DIMENSIONS



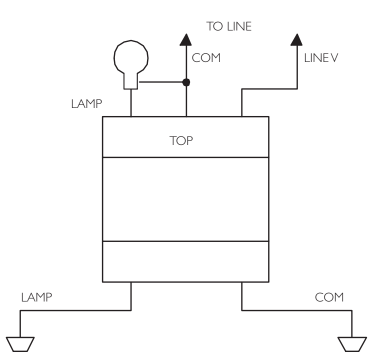


Fig IE-1

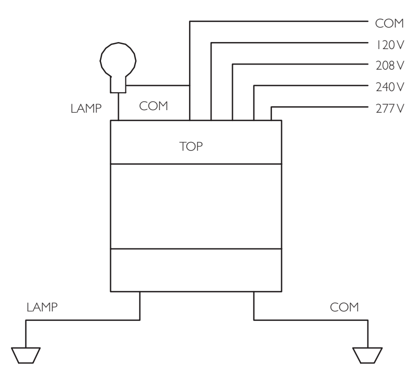


Fig IE-2

60 Hz Indoor Enclosed Ballasts

Metal Halide

	Input Volts	Catalog Number	Circuit Type (Maximum Ambient Temperature)	Input Watts	Max• Input Current	Nom Open Circuit Voltage	Fuse (amps)	Wiring Dia.	Case Style	Weight (lbs)	Certification UL	Certification CSA
	175/150W Lamp, ANSI Code M57/M107											
	120/208/ 240/277	78E5590-001	CWA (65°C)	210	1.8/1.1/ 0.9/.8	305	5/3/ 3/2	IE-2	PC-723	22	✓	✓
	175/150W Lamp, ANSI Code M137/M152 (Pulse Start)											
Ⓔ	120/208/ 240/277	78E5591-001EE	Super CWA (65°C)	198	1.7/1.0/ .8/.7	285	5/3/ 3/2	IE-2	PC-723	22	✓	✓
	250W Lamp, ANSI Code M58											
	120/208/ 240/277	78E5790-001	CWA (65°C)	285	2.5/1.5/ 1.3/1.1	310	8/5/ 5/3	IE-2	PC-723	24	✓	✓
	250W Lamp, ANSI Code M138/M153 (Pulse Start)											
Ⓔ	120/208/ 240/277/ 480	78E5752-001EE	Super CWA (55°C)	284	2.4/1.4/ 1.2/1.1 .6	280	8/5/ 5/3/ 2	IE-2	PC-723	23	✓	✓
	320W Lamp, ANSI Code M132/M155/M170 (Pulse Start)											
Ⓔ	120/208/ 240/277/ 480	78E5852-001EE	Super CWA (55°C)	363	3.3/1.9/ 1.7/1.4/ 0.6	275	10/7/ 5/5/ 5	IE-2	PC-724	30	✓	✓
	350W Lamp, ANSI Code M131 (Pulse-Start)											
	120/208/ 240/277	78E5993-001	Super CWA (55°C)	400	3.4/2.0/ 1.7/1.51	270	10/7/ 5/5	IE-2	PC-724	31.25	✓	✓
Ⓔ	120/208/ 240/277/ 480	78E5953-001EE	Super CWA (55°C)	397	3.4/2.0/ 1.7/1.5/ .9	285	10/7/ 5/5/ 5	IE-2	PC-724	31.5	✓	✓
	400W Lamp, ANSI Code M59											
	120/208/ 240/277	78E6091-001	CWA (55°C)	458	4.0/2.3/ 2.0/1.8	300	10/7/ 5/5	IE-2	PC-724	32	✓	✓
	480	78E6041-001		462	1.0		3	IE-1			✓	
	400W Lamp, ANSI Code M135 (Pulse-Start)											
Ⓔ	120/208/ 240/277/ 480	78E6052-001EE	Super CWA (55°C)	454	3.8/2.3/ 1.9/1.7/ 1	265	10/7/ 5/5 3	IE-2	PC-724	32.8	✓	✓
	Two 400W Lamps, ANSI Code M59											
	120/240	78E6351-001	CWA-ILO (40°C)	890	8.4/4.2	330	20/10	IE-3	PC-746	58	✓	
	120/277/ 480	78E6381-001 78E6341-001			8.4/3.6 2.1		20/10 5				✓ ✓	
	1000W Lamp, ANSI Code M47											
	120/208/ 240/277	78E6592-WC1◇ 78E6592-001	CWA (55°C)	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	IE-2	PC-724	42	✓ ✓	✓ ✓
	480	78E6542-001			2.3		6	IE-1			✓	
	120/ 277/347	78E65A2-001	CWA (55°C)	1080	9.0/ 3.9/3.2	430	20/ 10/8	IE-4	PC-724	42.2	✓	✓
	1000W Lamp, ANSI Code M141 (Pulse-Start)											
	120/208 240/277	78E6593-WC1◇	Super CWA (50°C)	1080	9.0/5.2/ 4.5/3.2	430	20/15/ 10/10	IE-2	PC-724	43.2	✓	✓
	277/ 347/480	78E65F3-WC1◇	Super CWA (40°C)	1075	3.8/ 3.2/2.4	430	10/ 8/5	IE-2	PC-724	42	✓	✓

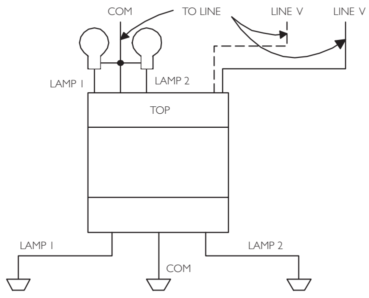


Fig IE-3

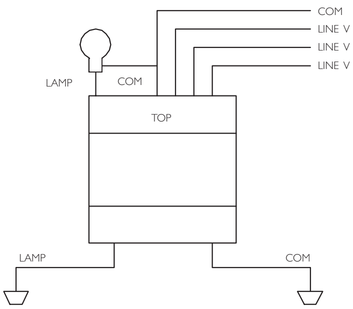


Fig IE-4

60 Hz Outdoor Weatherproof Ballasts

Metal Halide

Input Volts	Catalog Number	Circuit Type	Input Watts	Max • Input Current	Nom Open Circuit Voltage	Fuse (amps)	Wiring Dia.	Height (in)	Weight (lbs)	Certification UL	Certification CSA
175/150W Lamp, ANSI Code M57/M107											
120/208/ 240/277	79W5590-001	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	OW-2	6.6	15	✓	✓
250W Lamp, ANSI Code M58											
120/208/ 240/277	79W5790-001	CWA	285	2.5/1.5/ 1.3/1.1	310	8/5/ 5/3	OW-2	8.6	18	✓	✓
400W Lamp, ANSI Code M59											
120/208/ 240/277	79W6091-001	CWA	458	4.0/2.3/ 2.0/1.8	300	10/7/ 5/5	OW-2	8.6	21	✓	✓
480	79W6341-001		462	1.0		4	OW-1			✓	
Two 400W Lamps, ANSI Code M59											
120/240	79W6351-001	CWA (ILO)	890	8.4/4.2	330	25/15	OW-3	13.8	43	✓	✓
480	79W6341-001			2.1		7				✓	✓
1000W Lamp, ANSI Code M47											
120/208/ 240/277	79W6592-001	CWA	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	OW-2	11.3	33	✓	✓
480	79W6542-001			2.3		6	OW-1			✓	✓

• For CWA circuits, figure is operating current.

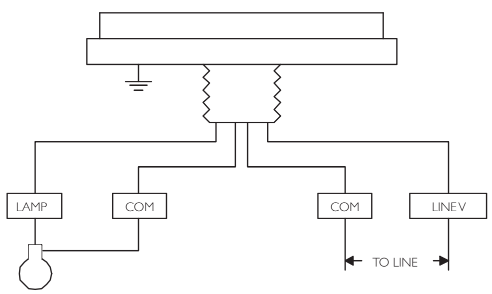


Fig OW-1

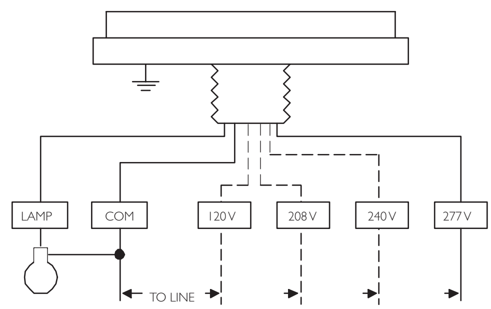


Fig OW-2

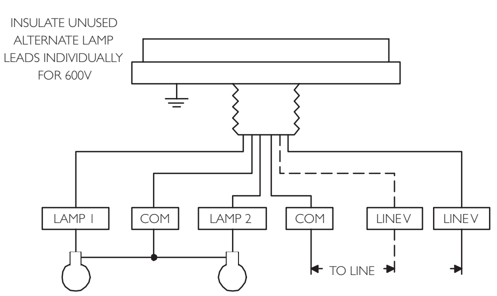


Fig OW-3

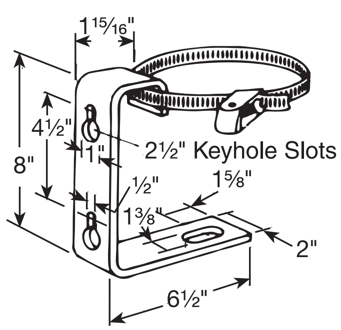
60 Hz Outdoor Weatherproof Ballasts

High Pressure Sodium

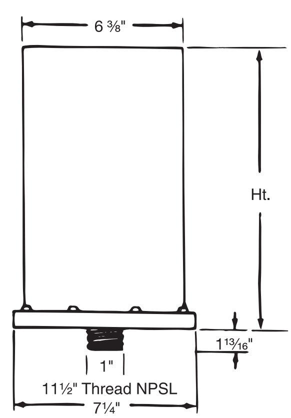
Input Volts	Catalog Number	Circuit Type	Watts Input	Max• Input Current	Nom Open Circuit Voltage	Fuse (amps)	Wiring Dia.	Height (in)	Weight (lbs)	Certification UL	Certification CSA
400W Lamp, ANSI Code S51											
120/208/ 240/277	79W8493-001	CWA	464	3.8/2.2 1.9/1.7	430	10/8/ 5/5	OW-2	11.3	20	✓	✓
480	79W8443-001			1.0		3	OW-1			✓	
1000W Lamp, ANSI Code S52											
120/208/ 240//277	79W8793-001	CWA ★	1100	9.5/5.5/ 4.8/4.2	435	25/15/ 10/10	OW-2	13.8	34	✓	✓
480	79W8743-001			2.3		6	OW-1			✓	

All weatherproof high pressure sodium lamp ballasts are furnished with an Philips Advance long range ignitor built into the ballast enclosure. Maximum lamp-to-ballast distance is 50 ft. (except 1000W ballasts which are 75 ft.)

- • For CWA circuits, figure is operating current. For HX circuits, figure is highest of starting, operating or open circuit current.
- ★ Equipped with an auto-reset thermal protector to prevent ignitor from overheating in the event of lamp failure.



SH-1 Mounting Bracket
(RW4759007 and RW4777010)



AmbiStar™

PureVOLT™

Centium®

Core & Coil

SPECIALTY PRODUCTS

Contents

Specialty / International Ballasts

Corporate Offices
(800) 322-2086

Customer Support/Technical Service
(800) 372-3331 • (+) 1 847 390-5000 (International)

Visit our web site at www.philips.com/advance

RESIDENTIAL BALLASTS

Fluorescent Ballasts - Electronic - AmbiStar™

Residential Ballasts for 4-pin CFL, T5, T8 or T12 Lamps

Today's fluorescent fixtures offer greater flexibility and energy savings for residential and hospitality settings than ever before, thanks to Philips Advance AmbiStar electronic ballasts. No matter what type of fluorescent lighting you're considering, these ballasts help create warm, inviting interiors while providing Class B FCC EMI Rating – a requirement for the EPA ENERGY STAR® residential lighting fixtures – at a very competitive price.

AmbiStar fixed ballasts feature sleek, compact designs to fit in today's stylish fixtures. They deliver quiet, flicker-free performance, which makes them perfect for any residential or hospitality setting. Fluorescent lighting isn't just for garages and basements anymore.

AmbiStar dimming ballasts are designed to work with most incandescent dimmers, so they are easy to install with new or existing dimming systems. Now you can create any ambiance with dimmable lighting and still enjoy the energysaving benefits of fluorescent lighting.

Class B FCC EMI Rating

Requirement for EPA ENERGY STAR Residential Lighting Fixtures

Title 24 Energy Efficiency Requirements

For use in high efficiency residential fixtures as stated in applicable California's Title 24 requirements

Electronic circuitry

Reduces energy used when compared to magnetic alternatives

Fluorescent Ballasts - Electronic - PureVOLT™

Electronic Ballasts for High Output (HO) Germicidal Ultraviolet (UV) Lamps

In support of the growing popularity of High Output (HO) germicidal UV-C lamps – which have been effective at improving indoor air quality in low temperature environments such as HVAC systems – Philips Advance PureVOLT electronic UV ballast is specially designed to operate a variety of 800mA HO UV lamps. PureVOLT is ideal in such applications as hospitals, food processing facilities, schools, office buildings, recreational facilities, and residences.

Microprocessor-controlled design
Enables one UV ballast to operate multiple lamps

IntelliVolt® multiple-voltage technology enables operation from 120 to 277V, 50/60 Hz
Enhances accuracy of ordering and reduces SKU requirements

Lamp End-Of-Life (EOL) Protection Circuit
Removes power to the lamp upon lamp failure

Auto-restart
Eliminates the need to reset power mains after lamp replacement

Programmed-start technology
Provides extended lamp life in frequent switching applications

For 7-42W Lamps

SOUND RATED A

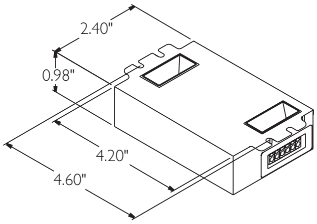
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	UL Listed Lamp Types	Page No.
CFL Lamps						
1 or 2	120	RS	AmbiStar	RCF-2S13-H1-LD-QS RCF-2S13-M1-BS-QS	(1) or (2) 13W CFL	1-23, 1-25
1 or 2	120	RS	AmbiStar	RCF-2S18-H1-LD-QS RCF-2S18-M1-BS-QS	(1) or (2) 18W CFL	1-23, 1-26
1 or 2	120	RS	AmbiStar	RCF-2S26-H1-LD-QS RCF-2S26-M1-BS-QS	(1) or (2) 26W CFL (1) 32W, 42W CFL	1-24, 1-27, 1-28
1	120	IS	AmbiStar	REB-113-M6-BLS REB-113-M6-EL	(1) 13W CFL	1-23, 1-25
1	120	IS	AmbiStar	REB-118-M6-BLS REB-118-M6-EL	(1) 18W CFL	1-23
1	120	IS	AmbiStar	REB-126-M6-BLS REB-126-M6-EL	(1) 26W CFL	1-24, 1-27
1 or 2	120	RS	AmbiStar	REB-2S26-M1-BS-DIM REB-2S26-M1-LS-DIM	(1) or (2) 26W CFL (1) 32W, 42W CFL	2-5
2	120	IS	AmbiStar	REB-2S13-M6-EL REB-2S13-M6-BL	(2) 13W CFL	1-23, 1-25
2	120	IS	AmbiStar	REB-2S18-M6-EL REB-2S18-M6-BL	(2) 18W CFL	1-23, 1-26
2	120	IS	AmbiStar	REB-2S26-M6-EL REB-2S26-M6-BL	(2) 26W CFL	1-24, 1-27
1	120	IS	AmbiStar	RMB-1P26-S2	(1) 26W CFL (1) 18W, 24W Long Twin Tube or (1) 22W Circline	1-24, 1-27, 1-30 1-38, 1-66
CFL & Linear T5 Lamps						
1	120	IS	AmbiStar	RMB-1P13-S1	(1) 7W, 9W, 13W CFL (1) F8T5, F13T5, F14T5 Linear	1-22, 1-23, 1-25 1-36, 1-37
1 or 2	120	IS	AmbiStar	RMB-2P13-S2	(1) 18W or (2) 7W, 9W, 13W CFL (1) F8T5 & (1) F13T5 or (2) F8T5, F13T5, F14T5 Linear	1-22, 1-23, 1-25 1-26, 1-36, 1-37
Linear T8 Lamps						
1 or 2	120	IS	AmbiStar	REB-2P32-SC	(1) or (2) F17T8, F25T8, F32T8 Linear	1-41, 1-42, 1-45 1-46, 1-57, 1-58
3 or 4	120	IS	AmbiStar	REB-4P32-SC	(3) or (4) F17T8, F25T8, F32T8 Linear	1-43, 1-44, 1-47 1-48, 1-59, 1-60
Linear T12 Lamps						
1	120	RS	AmbiStar	RELB-1S40-SC	(1) F34T12, F40T12 Linear	1-66
2	120	RS	AmbiStar	RELB-2S40-SC	(2) F34T12, F40T12 Linear	1-66

Above ballasts comply with the requirements of the Federal Communications Commission (FCC) rules and requlations Title 47 CFR Part 18, Consumer (Class B) for EMI/RFI (conducted and radiated).
Above ballasts meet the ballast-controlled performance requirements in the ENERGY STAR Program Requirements for Residential Lite Fixtures
The most current list of ballasts can be found at www.philips.com/advance in the file "ENERGY STAR Ballast Matrix"

For 18 - 145W Lamps

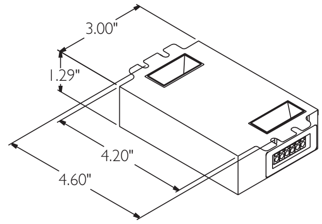
HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Lamp Current (mAmps)	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
PL-L18W/TUV (18W)											
1	120 - 277	PS	PureVOLT	IUV-2S18-H1-LD	30	290	10	0.26 - 0.11	0/-18	Size 1	160
2	120 - 277	PS	PureVOLT	IUV-2S18-H1-LD	55	280	10	0.47 - 0.20	0/-18	Size 1	159
PL-L36W/TUV (36W)											
1	120 - 277	PS	PureVOLT	IUV-2S36-M2-LD	51	330	10	0.44 - 0.19	0/-18	Size 2	160
2	120 - 277	PS	PureVOLT	IUV-2S36-M2-LD	90	285	10	0.78 - 0.33	0/-18	Size 2	159
PL-L35WHO/TUV (35W)											
1	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	40	850	10	0.35 - 0.15	0/-18	Size 4	160
2	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	78	850	10	0.68 - 0.29	0/-18	Size 4	159
PL-L60WHO/TUV (60W)											
1	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	70	850	10	0.60 - 0.26	0/-18	Size 4	160
2	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	138	850	10	1.20 - 0.52	0/-18	Size 4	159
PL-L95WHO/TUV (95W)											
1	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	100	800	10	0.87 - 0.37	0/-18	Size 4	160
TUV 36T5/HO (75W)											
1	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	80	800	10	0.69 - 0.30	0/-18	Size 4	160
2	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	155	800	10	1.30 - 0.56	0/-18	Size 4	159
TUV 64T5/HO (145W)											
1	120 - 277	PS	PureVOLT	IUV-2S60-M4-LD	155	800	10	1.30 - 0.56	0/-18	Size 4	160



-LD

Size 1



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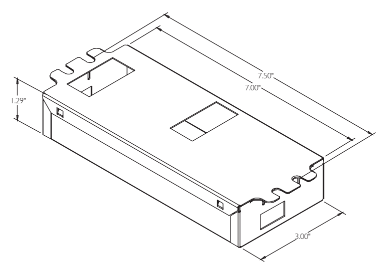
Size 2



Size 4

Refer to pages 6-6 for wiring diagrams

For 58 -70W Lamps

HIGH POWER FACTOR SOUND RATED A

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F58T8 (58W)											
1	120 - 277	PS	Centium	ICN-2S54 ICN-2S54-90C	58	1.00	10	0.49 - 0.22	-20/-18	D	73
2	120 - 277	PS	Centium	ICN-2S54 ICN-2S54-90C	116	1.00	10	0.97 - 0.42	-20/-18	D	74
3	120 - 277	PS	Centium	ICN-4S54-90C-2LS-G	171	1.00	10	1.43 - 0.62	-20/-18	G	*75
4	120 - 277	PS	Centium	ICN-4S54-90C-2LS-G	225	1.00	10	1.88 - 0.81	-20/-18	G	75
F70T8 (70W)											
1	120 - 277	PS	Centium	ICN-1S80	73	0.77	10	0.62 - 0.26	-20/-18	D	73

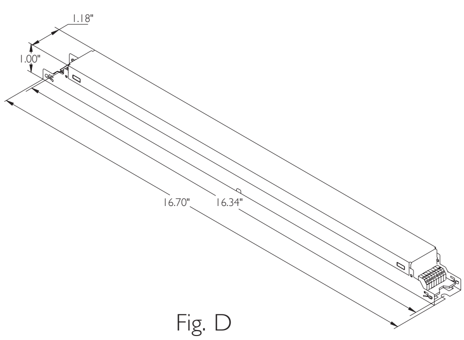


Fig. D

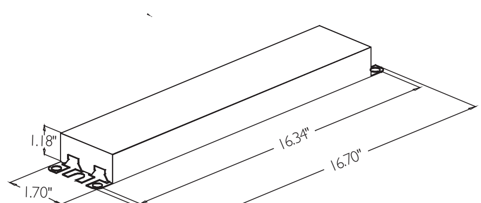
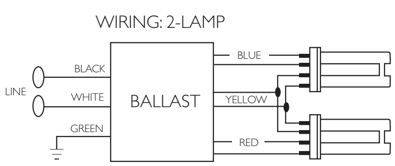
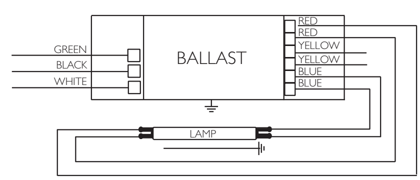


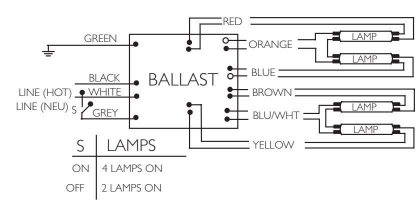
Fig. G



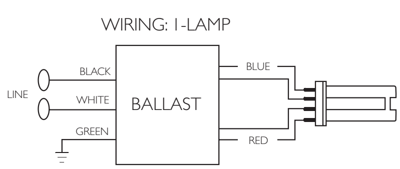
Diag. 159
Green Terminal must be Grounded



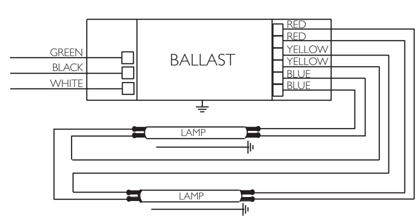
Diag. 73
For 1 lamp operation, do not use yellow leads



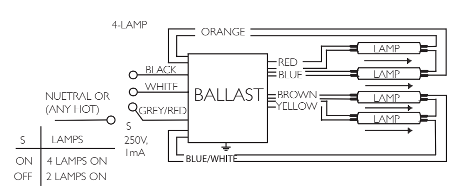
Diag. 75



Diag. 160
Green Terminal must be Grounded



Diag. 74



Diag. *75

INTERNATIONAL ELECTROMAGNETIC HID BALLASTS

Philips Lighting Electronics offers an extensive range of High Intensity Discharge ballasts to run ANSI specification (U.S. style) lamps. These ballasts are suitable for International markets and range in voltage from 120 through 240V, 50 Hz.

Philips Advance HID Ballasts are available to operate the wide variety of mercury, metal halide, high pressure sodium and low pressure sodium lamps available in today's marketplace.

Like fluorescent, HID lamps are electric discharge lamps. Light is produced by an arc discharge between two electrodes located at opposite ends of an arc tube within the lamp's outer glass envelope. The ballast is the lamp's power supply; its purpose is to provide proper starting and operating voltage and current to initiate and sustain this arc.

Core & Coil

The basic ballast is the open core & coil which is most often used as a component within a lighting fixture. The core & coil also forms the nucleus of the five other ballast configurations detailed in this section. It consists of either one, two or three copper coils on a core (or "stack") of electrical-grade steel laminations. The coils are assembled to core sections which are then surface-welded together. At Philips Lighting Electronics the assembled ballast is vacuum impregnated with a silica-filled polyester varnish to re-enforce the electrical insulation, preclude moisture, inhibit noise, and dissipate heat. Some HID ballast manufacturers apply varnish via a preheat-and-dip process which only puts a thin coat of varnish on the outer surface of the ballast.

Encapsulated Core & Coil

Where quiet performance is required, the standard open core & coil ballasts are encapsulated (potted) in a cube-shaped steel can utilizing Class H (180°C) polyester compound. These ballasts carry a Class A noise rating up through 175W and Class B for 250 and 400W. As with the open core & coil, the capacitor (and ignitor where included) are mounted separately within the fixture.

EPAct 2005

The Energy Policy Act of 2005 (EPACT 2005) requires that mercury vapor lamp ballasts shall not be manufactured in or imported into the United States after January 1, 2008. With regard to imported ballasts, the standard applies to both the importing of ballasts as well as the importing of mercury vapor lamp luminaires with ballasts, since importing a mercury vapor lamp luminaire with a mercury vapor lamp ballast would be the same as importing a mercury vapor lamp ballast. Therefore, as of January 1, 2008, luminaires cannot be imported with mercury vapor lamp ballasts.

Replacements

For capacitors, see pages 5-38 & 5-39

For ignitors, see pages 5-40 & 5-41

Special Voltages

For voltage and frequencies not shown in the charts of the following pages, please contact your Philips Lighting Electronics Sales Representative.

CERTIFICATIONS

Indicates ballast is listed by Underwriters Laboratories, Inc. in accordance with UL 1029 Standard for HID Ballasts. Each ballast is marked appropriately.

All HID Ballasts are designed and manufactured in accordance with the American National Standards Institute Standard for HID Ballasts, ANSI C82.4.

NOM

Norma Obligatorio Mexicana.
(contact your local salesperson for availability)

50 HZ Core & Coil Ballasts

Mercury

These products are for use outside the USA ONLY

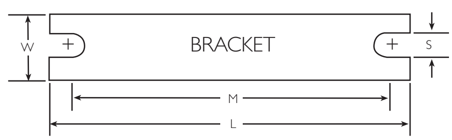
Input Volts	Catalog† Number	Circuit Type	Watts Input	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (Pg 5-4)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		
175W Lamp, ANSI Code H39																
120/ 220/240	See 175W Metal Halide CWA 71A55N0-500D (page 6-9)															
250W Lamp, ANSI Code H37																
120/ 220/240	See 250W Metal Halide CWA 71A57N0-500D (page 6-9)															
400W Lamp, ANSI Code H33																
120/ 220/240	See 400W Metal Halide CWA 71A60N1-500 (page 6-9)															
1000W Lamp, ANSI Code H36																
120/ 220/240	See 1000W Metal Halide CWA 71A65N2-500 (page 6-9)															

† Ordering information:
Original equipment ballasts - add proper suffix to catalog number:
-500D includes core & coil with dry-film capacitor
-510D includes core & coil with welded bracket and dry-film capacitor
-600 core & coil only (no capacitor)

• For CWA circuits, figure is operating current.

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2	6.5	1.25	5.75	0.28



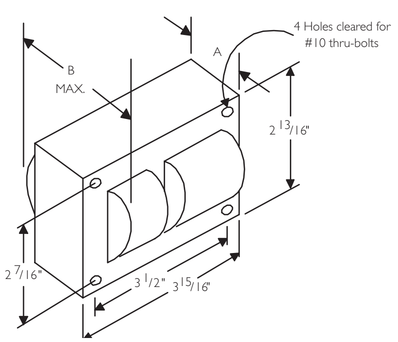


Fig. 1
(3" x 4" Core)

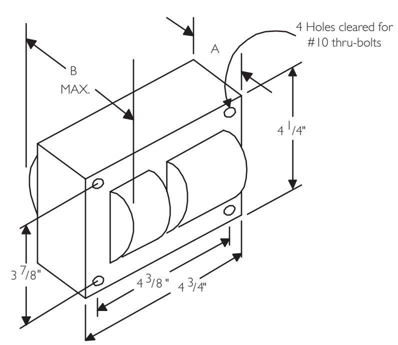


Fig. 2
(4¼" x 4¾" Core)

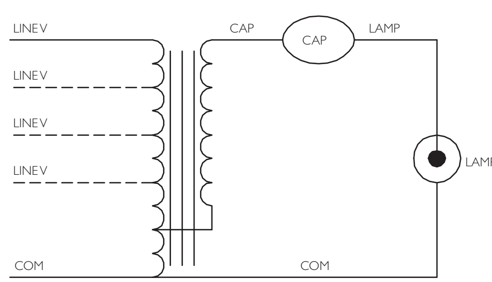


Fig. A

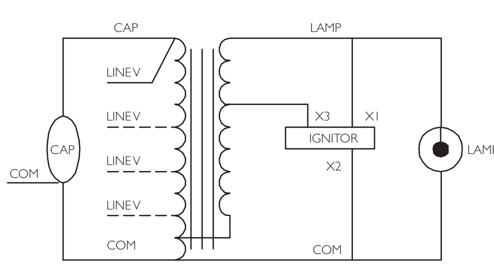


Fig. K

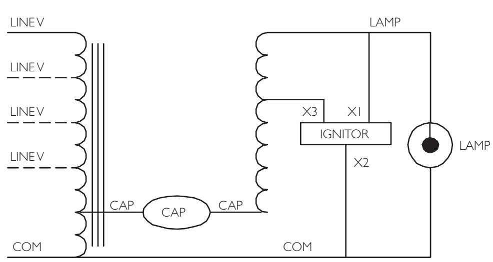


Fig. M

International HID

50 HZ Core & Coil Ballasts

Metal Halide

These products are for use outside the USA ONLY

Input Volts	Catalog† Number	Circuit Type	Watts Input	Max* Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (Pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	Class H (180°C)	Philips Advance Class N (200°C)
70W Lamp, ANSI Code M98 or M143 (Pulse-Start)																			
120/ 220/240	71A52N2-500D	HX-HPF	95	1.7/ 1.0/.9	256	5/ 3/3	K	1	1.5	2.8	14	280	7C140M30RA	D	5.0	LI533-H4	15	B/ A/B	–
100W Lamp, ANSI Code M90 or M140 (Pulse-Start)																			
120/ 220/240	71A53N0-500D	HX-HPF	129	2.2/ 1.2/1.1	266	6/ 3/3	K	1	1.9	3.2	17.5	300	7C175M30RA	D	6.0	LI533-H4	15	A/ A/A	–
150W Lamp, ANSI Code M102 or M142 (Pulse-Start)																			
120/ 220/240	71A54N2-500D	HX-HPF	187	3.7/ 2.0/1.8	248	10/ 5/5	K	1	2.5	4.1	28	240	7C280P30RA	D	7.5	LI533-H4	5	C/ C/D	–
175W Lamp, ANSI Code M57 or H39; or 150 Watt Lamp, ANSI Code M107																			
120/ 220-240	71A55N0-500	CWA	210	2.0/ 1.0	310	5/ 3	A	1	2.8	4.0	12	450	MD1204-100	O	9.0	–	–	C/ C	–
250W Lamp, ANSI Code M58 or H37																			
120/ 220-240	71A57N0-500D	CWA	290	2.5/ 1.3	315	7/ 4	A	2	1.9	3.4	18	400	7C180P40-R	D	11.5	–	–	D/ A	–
250W Lamp, ANSI Code M138 or M153 (Pulse-Start)																			
120/ 220-240	71A57N2-500D	Super CWA	294	2.6/ 1.4	280	6/ 3	M	2	1.8	3.3	20	330	7C200P33-R	D	11.5	LI533-H4	5	C/ C	–
320W Lamp, ANSI Code M132 or M154 (Pulse-Start)																			
120/ 220-240	71A58N2-500D	Super CWA	365	3.1/ 1.6	280	10/ 5	M	2	2.1	3.8	24	400	7C240P40-R	D	12.5	LI533-H4	2	A/ A	–
400W Lamp, ANSI Code M59 or H33																			
120/ 220-240	71A60N1-500	CWA	462	4.1/ 2.1	320	10/ 6	A	2	2.2	3.7	24	450	MD2409-100	O	14.0	–	–	D/ D	–
400W Lamp, ANSI Code M135 or M155 (Pulse-Start)																			
120/ 220-240	71A60N2-500D	Super CWA	454	3.9/ 2.0	270	10/ 5	M	2	2.1	3.8	30	345	7C300S34	D	12.3	LI533-H4	2	C/ E	–
1000W Lamp, ANSI Code M47 or H36																			
120/ 220/240	71A65N2-500	CWA	1090	9.3/ 5.0/4.5	450	24/ 13/13	A	8	3.0	5.0	26	525	MD2602-100	O	23.0	–	–	D/ C/C	A/ A/A
1500W Lamp, ANSI Code M48																			
220/240	71A67R2-510	CWA	1605	7.5/6.9	450	20/20	A	8a	4.4	6.4	36	540	2 Capacitor Set: MD1802-200 (2) 18mFd Caps [Connected in Parallel]	O	32.0	–	–	E/E	A/A

Refer to pages 6-8 for ballast dimensions and wiring diagrams

International HID

50 HZ Core & Coil Ballasts

High Pressure Sodium

These products are for use outside the USA ONLY

Input Volts	Catalog† Number	Circuit Type	Watts Input	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 5-38 & 5-39)				Total Weight (lbs)	Ignitor †† (Page 5-40 to 5-44)		U.L. Bench Top Rise Code 1029 (Pg 5-4)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	Class H (180°C)	Philips Advance Class N (200°C)
70W Lamp, ANSI Code S62																			
120/ 220/240	71A79N1-500D	HX-HPF	94	1.4/ 0.8/.7	125	4/ 2/2	K	1	1.9	3.1	8.4	280	7C084L30RA	D	6.0	LI551-H4	2	A/ A/A	–
100W Lamp, ANSI Code S54																			
120/ 220/240	71A80N1-500D	HX-HPF	130	2.4/ 1.3/1.2	120	6/ 4/4	K	1	2.4	3.7	12	280	7C120M30RA	D	8.0	LI551-H4	2	A/ A/A	–
150W Lamp, ANSI Code S55																			
120/ 220/240	71A81N2-500D	HX-HPF	188	3.0/ 1.7/1.6	120	8/ 5/4	K	1	3.0	4.2	17.5	260	7C175M30RA	D	7.5	LI551-H4	2	C/ B/B	–
250W Lamp, ANSI Code S50																			
120/ 220-240	71A82N1-500D	CWA	300	2.8/ 1.4	190	7/ 4	M	2	2.1	3.7	40	240	7C400P30-RA	D	12.0	LI501-H4	2	D/ C	–
400W Lamp, ANSI Code S51																			
120/ 220-240	71A84N3-500D	CWA	465	4.0/ 2.0	190	10/ 6	M	2	2.5	4.1	64	280	7C640S28-RA	D	15.0	LI501-H4	2	D/ D	–
1000W Lamp, ANSI Code S52																			
220/240	71A87R3-500	CWA	1100	6.0/5.6	435	15/15	M	8a	4.3	6.3	28	580	2 Capacitor Set: MD1408-230 (2) 14mFd Caps [Connected in Parallel]	O	35.5	LI571-H5★	2	E/E	A/A

† Ordering information:
Original equipment ballasts - add proper suffix to catalog number:
- -500D includes core & coil with dry-film capacitor
- -510D includes core & coil with welded bracket and dry-film capacitor
- -500 includes core & coil with oil-filled capacitor
- -510 includes core & coil with welded bracket and oil-filled capacitor
- -600 core & coil only (no capacitor)

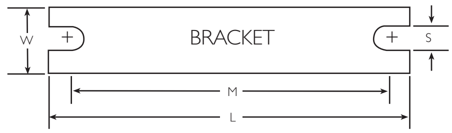
†† Each ballast requiring an ignitor is furnished as standard with the Short Range ignitor model shown for use within fixtures. If a Long Range ignitor is required for remote mounting, specify on order. See pages 5-40 to 5-44 for additional information.

• For HX and R circuits, figure is highest of starting, operating or open circuit current. For CWA circuits, figure is operating current.

★ Equipped with an auto-reset thermal protector to prevent ignitor from overheating in the event of lamp failure.

WELDED BRACKET DIMENSIONS

Ballast Dimensions Fig	L	W	M	S
1	5.1	1.00	4.50	0.25
2	6.5	1.25	5.75	0.28
8	7.8	2.75	6.13	0.25
8a	7.8	4.50	6.75	0.31



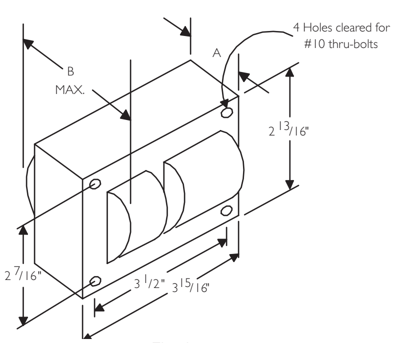


Fig. 1
(3" x 4" Core)

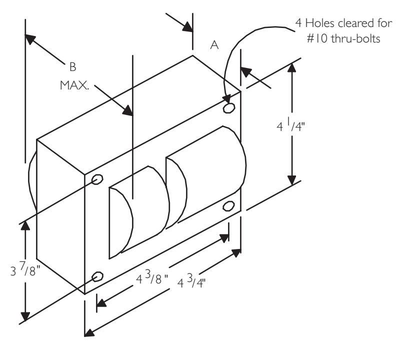


Fig. 2
(4¼" x 4¾" Core)

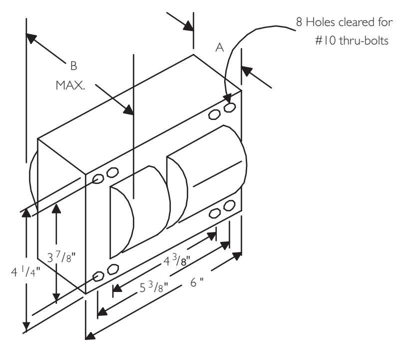
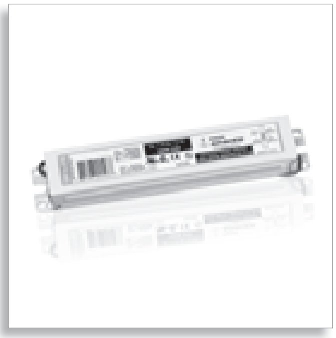


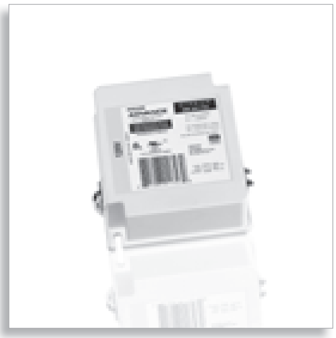
Fig. 8 and 8a
(4 ¼" x 6" core)

International HID

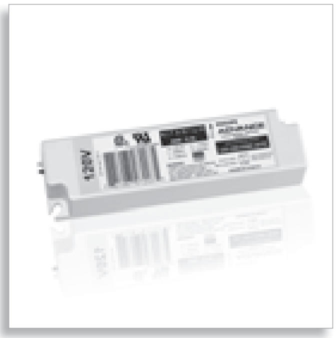
Notes



LED Drivers for 12vdc
and 24vdc LED Systems



LED Drivers for
Luxeon Brand LEDs



LED Dimming Controller for
12vdc and 24vdc LED Systems

LED Drivers for 350mA
and 700mA LEDs

Xitanium® LED ELECTRONIC DRIVERS

Contents

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(800) 322-2086

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Xitanium LED Electronic Drivers

Output Power (W)		Output Voltage (V)	Output Current (Amps)	Min/Max Ambient Temp (C/F)	Input Volts	Catalog #	Certifcations		Input Current Max (A)	Input Power Max (W)	Max. THD %	Power Factor	Env. Rating	Dim./Wiring Dia.
Max	Min						CSA	UL						
DC/DC Dimming Controller														
60	0	12	5.000	-40C / 60C	12VDC	913710830902	✓	✓	5.00	60	N/A	N/A	Dry, Damp	C/4
100	0	24	4.100		24VDC		✓	✓	4.10	100	N/A	N/A	Dry, Damp	C/4
UL Class 1 Drivers														
100	21	60 ~ 140	0.350	-40C / 60C	120	LEDINTA700C140F3O	✓	✓	0.53	64	20	0.9	Dry, Damp	F/5
					230				0.29	67				
					277				0.25	69				
			0.525		120				0.78	94				
					230				0.41	94				
					277				0.35	97				
			0.700		120				1.04	125				
					230				0.55	127				
					277				0.46	127				
150	42	120 ~ 425	0.350	-40C / 60C	120	LEDINTA0350C425FO	✓	✓	1.40	165	20	0.9	Dry, Damp	F/1
					230				0.72					
					277				0.60					
150	42	60 ~ 210	0.700	-40C / 60C	120	LEDINTA0700C210FO	✓	✓	1.40	165	20	0.9	Dry, Damp	F/1
					230				0.72					
					277				0.60					
150	42	60 ~ 210	0.700	-40C / 60C	347	LEDINTA0700C210DN	✓	✓	0.48	165	20	0.9	Dry, Damp	F/2
					480				0.34					
Luxeon Drivers														
4	2	2.8 ~ 12	0.350	-10C / 40C	120	LEDUNIA0350C12F		✓	0.07	8.5	20	0.5	Dry	G/3
					230				0.04					
8	2	2.8 ~ 12	0.700	-10C / 40C	120	LEDUNIA0700C12F		✓	0.15	18.5	20	0.5	Dry	G/3
					230				0.08					
12	2	2.8 ~ 33	0.350	-40C / 60C	120	LED120A0350C33F	✓	✓	0.13	15	20	0.9	Dry	A/6
12	2	2.8 ~ 28	0.350	-40C / 60C	120	LED120A0350C28FO	✓	✓	0.10	12.5	20	0.9	Dry, Damp	C/1
12	2	2.8 ~ 12	1.000	-40C / 60C	120	LED120A0012V10F	✓	✓	0.13	15	20	0.9	Dry, Damp	C/1
17	2	2.8 ~ 24	0.700	-40C / 60C	120	LED120A0700C24F	✓	✓	0.18	21.6	20	0.9	Dry	A/6
17	2	2.8 ~ 24	0.700	-40C / 60C	120	LED120A0700C24FO	✓	✓	0.18	21.6	20	0.9	Dry, Damp	C/1
20	2	2.8 ~ 28	0.700	-40C / 60C	120	LED120A0700C28FO	✓	✓	0.20	24	20	0.9	Dry, Damp	C/1
20	2	10 ~ 28	0.700	-40C / 60C	277	LED277A0700C28FO	✓	✓	0.09	24	20	0.9	Dry, Damp	C/1
25	3	2.8 ~ 12	2.100	-40C / 60C	120	LED120A0012V21F	✓	✓	0.25	30.4	20	0.9	Dry	B/8
25	3	2.8 ~ 24	1.050	-40C / 60C	120	LED120A0024V10F	✓	✓	0.25	30.4	20	0.9	Dry	B/8
34	5	3.6 ~ 24	1.400	-40C / 60C	120	LED120A1400C24F	✓	✓	0.33	40	20	0.9	Dry	B/8
34	5	3.6 ~ 24	1.400	-40C / 60C	120	LED120A0024V14FO	✓	✓	0.33	40	20	0.9	Dry, Damp	E/7
40	5	2.8 ~ 24	1.750	-40C / 60C	120	LED120A0024V18F	✓	✓	0.42	50	20	0.9	Dry	B/8
40	5	2.8 ~ 24	1.750	-40C / 60C	120	LED120A0024V18FO	✓	✓	0.42	50	20	0.9	Dry, Damp	E/7
40	5	2.8 ~ 24	1.750	-40C / 60C	277	LED277A0024V18F	✓	✓	0.18	50	20	0.9	Dry	B/8
48	4	2 ~ 24	2.000	-40C / 60C	120	LEDINTA0024V20FLO	✓	✓	0.47	56	20	0.9	Dry, Damp	F/1
					230				0.24					
					277				0.20					
67	6	2 ~ 24	2.800	-40C / 60C	120	LEDINTA0024V28FO	✓	✓	0.65	78	20	0.9	Dry, Damp	D/1
					230				0.34					
					277				0.28					
72	6	2 ~ 24	3.000	-40C / 60C	120	LEDINTA0024V30FLO	✓	✓	0.70	84	20	0.9	Dry, Damp	F/1
					230				0.37					
					277				0.30					
100	8	2 ~ 24	4.160	-40C / 55C	120	LEDINTA0024V41FLO	✓	✓	1.00	117	20	0.9	Dry, Damp	F/1
					230				0.51					
					277				0.42					
100	8	2 ~ 24	4.160	-40C / 55C	120	LEDINTA0024V41FO	✓	✓	1.00	117	20	0.9	Dry, Damp	D/1
					230				0.51					
					277				0.42					

Xitanium LED Electronic Drivers

Output Power (W) Max	Output Power (W) Min	Output Voltage (V)	Output Current (Amps)	Min/Max Ambient Temp (C/F)	Input Volts	Catalog #	Certifcations CSA	Certifcations UL	Input Current Max (A)	Input Power Max (W)	Max. THD %	Power Factor	Env. Rating	Dim./ Wiring Dia.
12VDC & 24VDC LED Drivers														
4	2	12	-	-10C / 40C	120	LEDUNIA0350C12F		✓	0.07	8.5	20	0.5	Dry	G/3
					230				0.04					
8	2	12	-	-10C / 40C	120	LEDUNIA0700C12F		✓	0.15	18.5	20	0.5	Dry	G/3
					230				0.08					
12	2	12	-	-40C / 60C	120	LED120A0012V10F	✓	✓	0.13	15	20	0.9	Dry, Damp	C/1
17	2	24	-	-40C / 60C	120	LED120A0700C24F	✓	✓	0.18	21.6	20	0.9	Dry	A/6
17	2	24	-	-40C / 60C	120	LED120A0700C24FO	✓	✓	0.18	21.6	20	0.9	Dry, Damp	C/1
25	3	12	-	-40C / 60C	120	LED120A0012V21F	✓	✓	0.25	30.4	20	0.9	Dry	B/8
25	3	24	-	-40C / 60C	120	LED120A0024V10F	✓	✓	0.25	30.4	20	0.9	Dry	B/8
25	3	24	-	-40C / 60C	120	LED120A0024V10D	✓	✓	0.25	30.4	20	0.9	Dry	B/9
34	5	24	-	-40C / 60C	120	LED120A1400C24F	✓	✓	0.33	40	20	0.9	Dry	B/8
34	5	24	-	-40C / 60C	120	LED120A0024V14FO	✓	✓	0.33	40	20	0.9	Dry, Damp	E/7
40	5	24	-	-40C / 60C	120	LED120A0024V18F	✓	✓	0.42	50	20	0.9	Dry	B/8
40	5	24	-	-40C / 60C	120	LED120A0024V18FO	✓	✓	0.42	50	20	0.9	Dry, Damp	E/7
40	5	24	-	-40C / 60C	277	LED277A0024V18F	✓	✓	0.18	50	20	0.9	Dry	B/8
60	10	12	-	-40C / 60C	120	LED120A0012V50F	✓	✓	0.63	75	20	0.9	Dry, Damp	D/1
48	2	24	-	-40C / 60C	120	LEDINTA0024V20FLO	✓	✓	0.47	56	20	0.9	Dry, Damp	F/1
					230				0.24					
					277				0.20					
60	2	12	-	-40C / 60C	120	LEDINTA0012V50FO	✓	✓	0.58	70	20	0.9	Dry, Damp	D/1
					230				0.30					
					277				0.25					
67	2	24	-	-40C / 60C	120	LEDINTA0024V28FO	✓	✓	0.65	78	20	0.9	Dry, Damp	D/1
					230				0.34					
					277				0.28					
72	2	24	-	-40C / 60C	120	LEDINTA0024V30FLO	✓	✓	0.70	84	20	0.9	Dry, Damp	F/1
					230				0.37					
					277				0.30					
80	10	24	-	-40C / 60C	120	LED120A0024V33F	✓	✓	0.80	95	20	0.9	Dry, Damp	D/1
100	2	24	-	-40C / 55C	120	LEDINTA0024V41FO	✓	✓	1.00	117	20	0.9	Dry, Damp	D/1
					230				0.51					
					277				0.42					
Dimming Drivers (0-10V Dimming)														
20	2	2.8 ~ 28	0.700	-40C / 60C	120	LED120A0700C28DO	✓	✓	0.20	24	20	0.9	Dry, Damp	C/2
25	3	14 ~ 24	1.050	-40C / 60C	120	LED120A0024V10D	✓	✓	0.25	30.4	20	0.9	Dry	B/9
100	62	15 ~ 24	4.160	-40C / 55C	120	LEDINTA0024V41DLO	✓	✓	1.00	117	20	0.9	Dry, Damp	F/2
					230				0.51					
					277				0.42					
150	42	210	0.700	-40C / 60C	120	LEDINTA0700C210DN	✓	✓	1.40	165	20	0.9	Dry	F/2
					230				0.72					
					277				0.60					

Xitanium LED ELECTRONIC DRIVERS

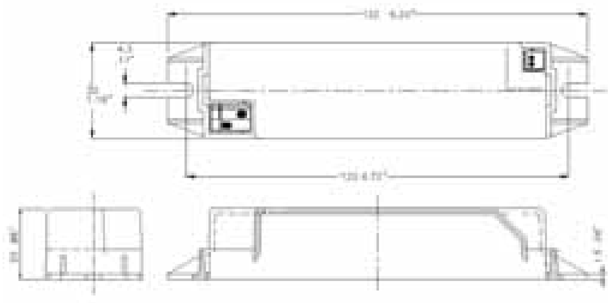


Fig. A

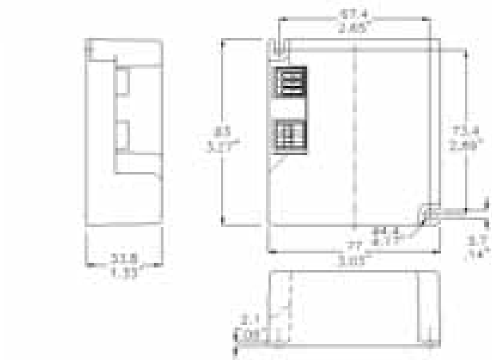


Fig. B

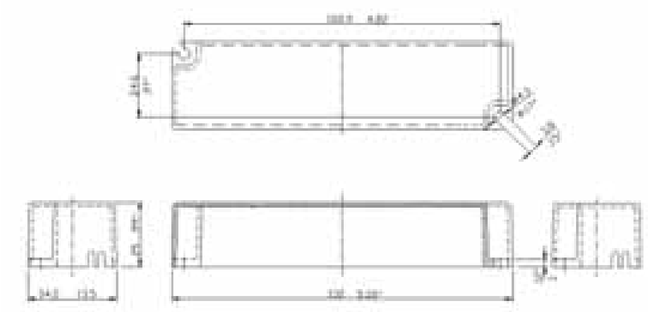


Fig. C

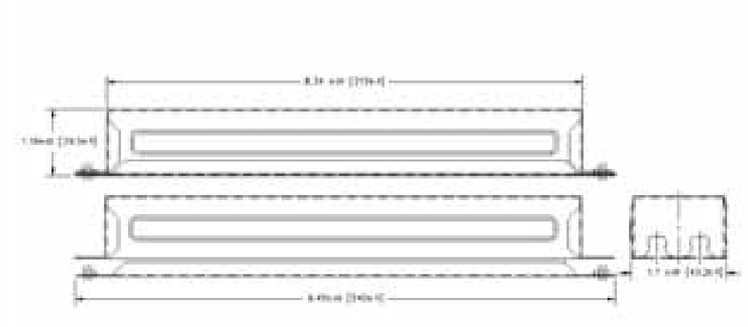


Fig. D

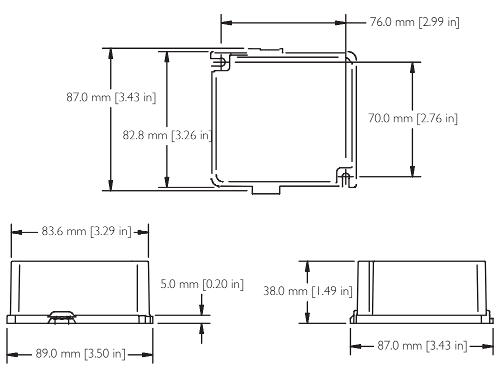


Fig. E

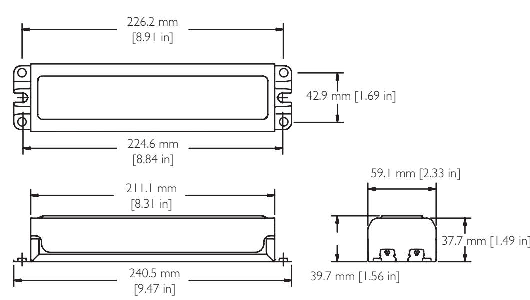


Fig. F

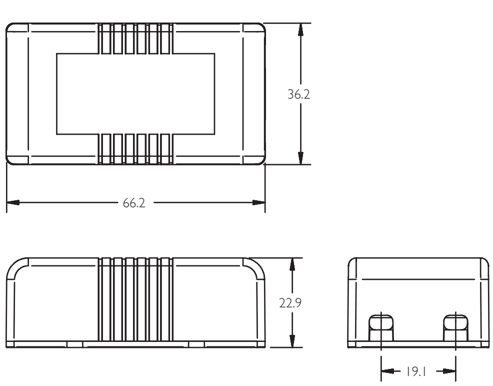
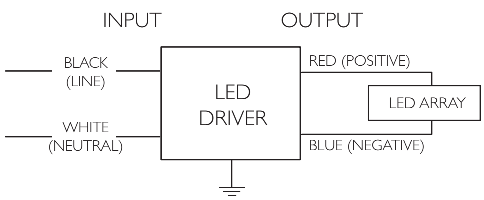
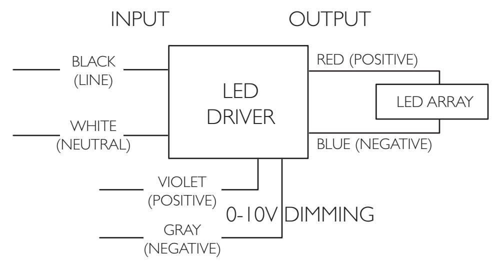


Fig. G

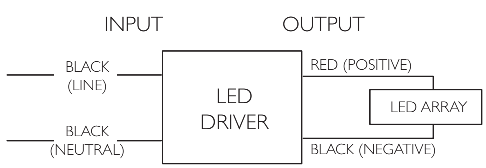
Xitanium LED ELECTRONIC DRIVERS



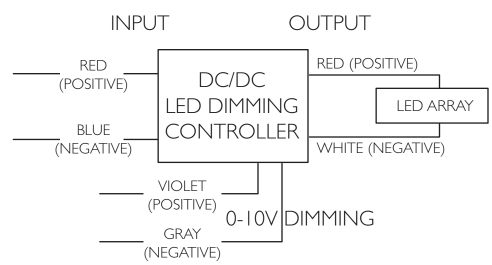
Diag. 1



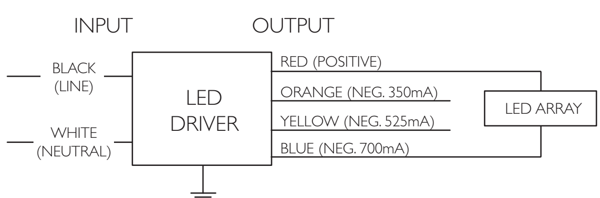
Diag. 2



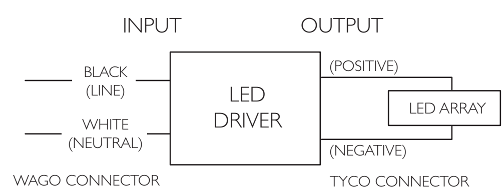
Diag. 3



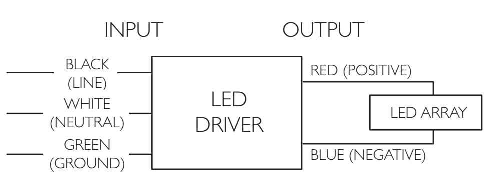
Diag. 4



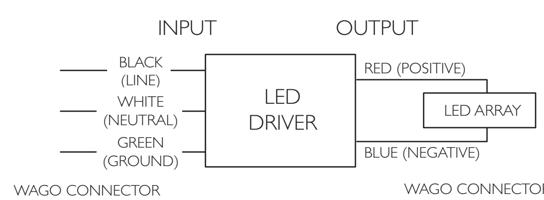
Diag. 5



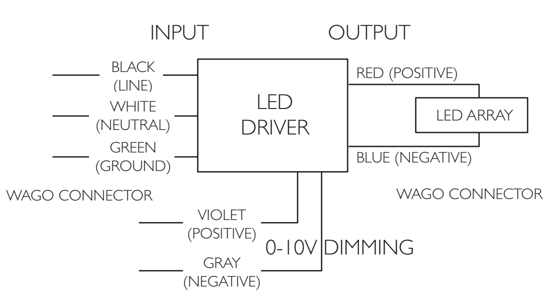
Diag. 6



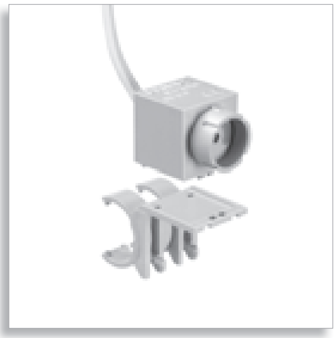
Diag. 7



Diag. 8



Diag. 9



LuxSense™

MicroLuxSense™

ActiLume™

ActiLume™ Color

OccuSwitch™ Wireless

Dynadimmer™

Chronosense™

CONTROLS

PHILIPS

Contents

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Controls

CONTROLS

LuxSense™

Provides daylight regulation via a single miniature sensor

Philips LuxSense is a daylight sensor that can control up to 20 fixtures equipped with Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts. The sensor measures the reflected light coming from the designated surface below, such as a desk or tabletop. It dims the lamp output when the light level exceeds the required level defined by the LuxSense sensor. The light level is easily adjusted via a simple dial.

Luxsense provides the benefit of a comfortable and controllable level of illumination throughout the working day. More importantly it can provide energy savings when installed near windows where natural illumination is usually greatest.

It is also designed to save energy by reducing excess light output that occurs from design factors of lumen depreciation. Lamps are dimmed slightly when new, but the light levels will then be raised over time to compensate for depreciation of lamp output that occurs in normal lamp aging.

State-of-the-art daylight sensor

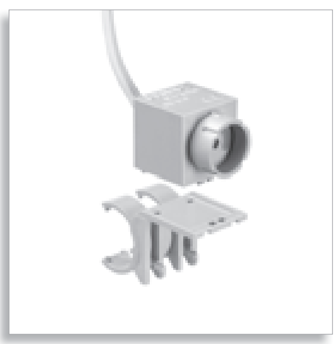
Provides a potential energy savings of up to 32% without sacrificing visual comfort*

Simple to use lighting control system

No specific lighting control training is needed to commission or adjust light levels or operation modes

Flexibility in design

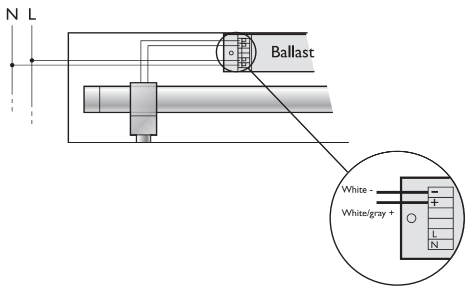
LuxSense can be incorporated directly into a fixture or alternatively clipped to a T5 lamp.**



* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

** External installation of class 2 wiring where allowed by local codes.

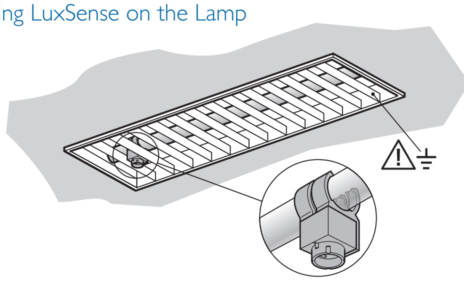
Installation of LuxSense into existing fixtures



Connecting diagram of the sensor to the ballast

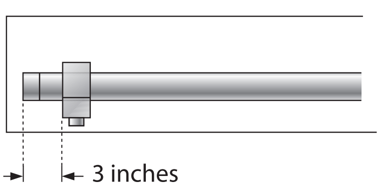
The maximum fixture temperature should always remain below 70°C. The sensitivity opening angle should never be obscured by the optics or any other part of the fixture. Metal optics should be properly grounded.

Mounting LuxSense on the Lamp



LuxSense mounted with a lamp clip (For use with T5 lamps only).

Not for use with T5/HO lamps.

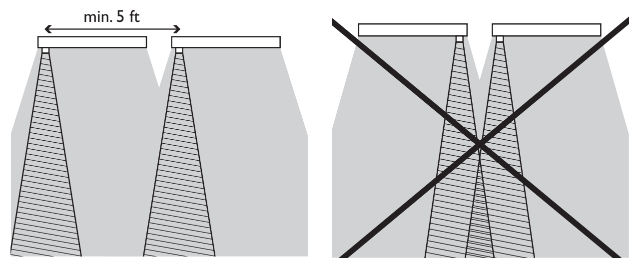


Position LuxSense 3 inches away from the end cap on the (electrical) "cold" side of the lamp. This is the side of the lamp that is connected to the terminals of the ballast that allows for the longest wiring to the lamp.

Installation of fixtures that include LuxSense

Install fixtures

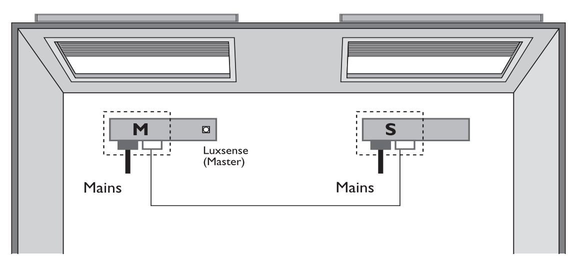
Interconnecting LuxSense Master fixtures (M) to Satellite fixtures (S)



Interconnecting LuxSense Master fixture (M) to Satellite fixture (S).

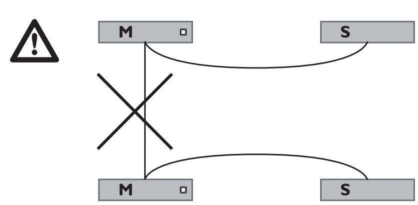
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7® *0-10V* or EssentiaLine *0-10V* ballasts.

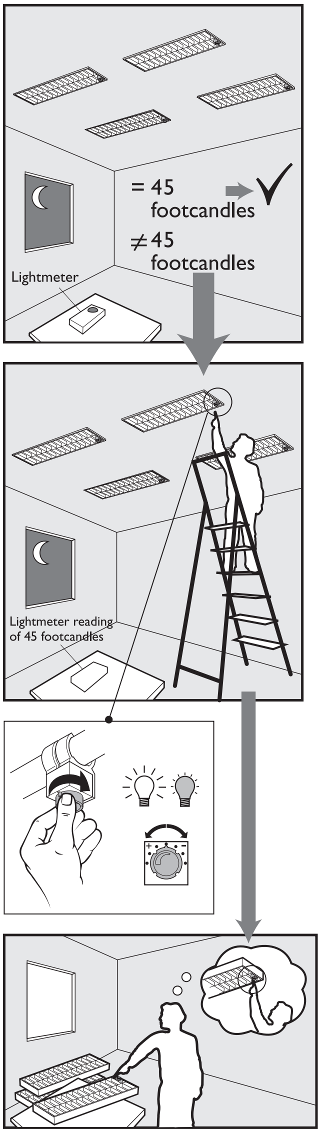
Satellite fixture should have similar daylight conditions to the master.



Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!





Measure the light level under each LuxSense sensor with no or negligible daylight contribution.

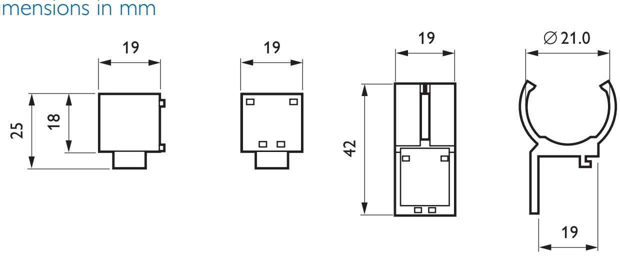
If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).

See diagram on the left to manually adjust the light levels.

You can easily copy the new set point to other rooms when similar daylight and reflector conditions exist.

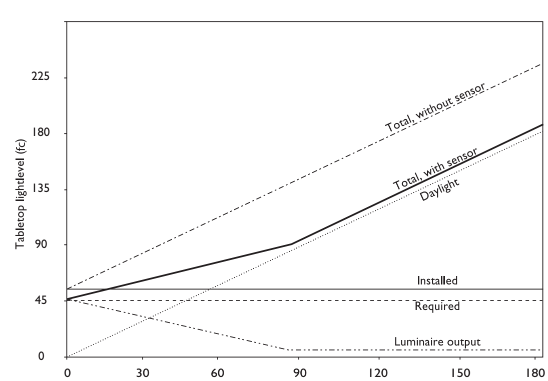
Warning: the required light level should be no more than 30% lower than the average installed light level, without daylight contribution (e.g. 55 footcandles installed, adjustment down to 39 foot candles is possible). Please note that LuxSense is not designed for maintaining a constant light level.

Dimensions in mm



Technical data

Operation conditions	
Ambient temperature	5°C to 55°C
Rel. humidity	15% to 90%, no condensation
Max. temperature of clip to lamp contact surface	70°C
Storage conditions	
Ambient temperature	-25°C to 70°C
Rel. humidity	5% to 95% at 25°C
Connection	20 AWG, flying leads, length 27 inches.
Color coding of cable:	white/grey + white – Connecting the wires in the reverse will result in minimum light output.
Housing	
Material	ASA
Color	light grey (similar to RAL 7035)
Weight/dimensions	Approx. 20 grams, 25x21x19mm.
Control signal input	- operating voltage: 1.5 - 10VDC - operating current sink 100µA-3mA (sufficient for 20 0-10VDC ballasts) - control voltage variation: < 0.5V over current and temperature range - max. input voltage (maximum rating): 15 Vdc - max. current sink (maximum rating): 50 mA
Optical characteristics	It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft. in height) will result in 2.3 fc seen by the controller at ceiling height (8 ft.) under a viewing angle of 45° - The opening angle can be adapted by the diaphram control, realizing an adjustment factor between 1/3 and 3.
Controls characteristics	LuxSense compensates approximately for 50% of the added light (simulated and measured with a fluorescent light source). See graph below. In case of a natural light source, the light compensation is higher than 50%.



LuxSense controls characteristics

MicroLuxSense™

Provides daylight regulation via a single miniature sensor

MicroLuxSense is a DayLight Regulation option (DLR) for luminaires equipped with a Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts. The sensor measures the reflected light coming from the surface below. It dims down the lamp output when the light level exceeds the required light level defined by the light sensor set point.

MicroLuxSense can be installed in the luminaire either mounted between the louvers or recessed in the housing.

Connect to the 0-10VDC control input of the Mark 7 or EssentiaLine ballast
Provides a potential energy savings of up to 32% without sacrificing visual comfort*

Maximize visual comfort
Automated regulation of artificial lighting allows for task illumination to be maintained.

Arrives from the factory in a standard preset configuration
No need for complex commissioning. Field adjustment possible if needed.

Regulate up to 20 luminaires
Utilize one sensor for continuous rows or multiple sensors with single luminaires

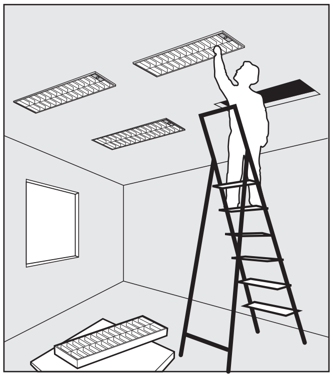
Uses common sensor footprint with ActiLume and ActiLume Color
One luminaire design now has the capability to provide various control options

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

Controls

CONTROLS

Installation

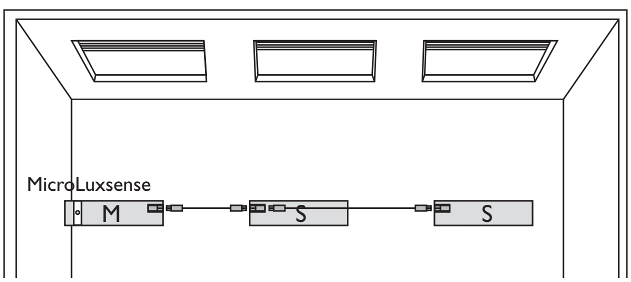


Mount the luminaire with MicroLuxSense daylight Regulation option.

Interconnecting MicroLuxSense Master fixture (M) to Satellite fixture (S).

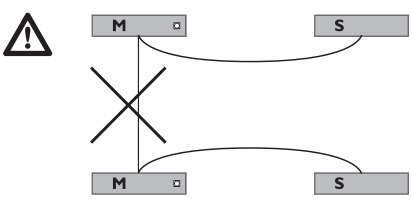
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7® *0-10V* or EssentiaLine *0-10V* ballasts.

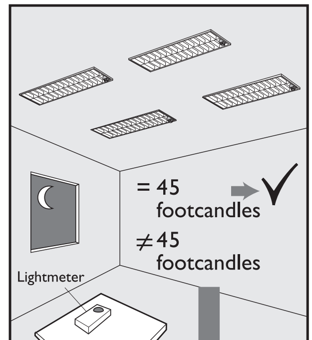
Satellite fixture should have similar daylight conditions to the master.



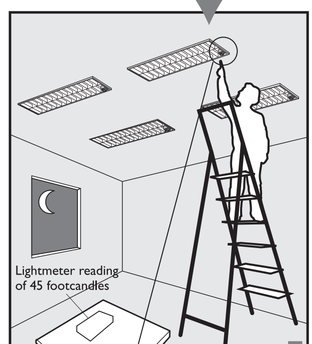
Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!

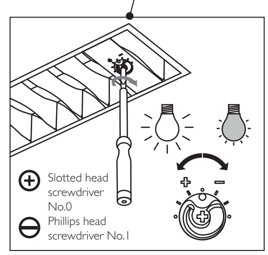




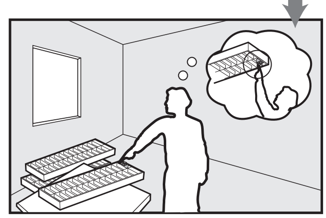
Measure the light level under each MicroLuxSense sensor with no or negligible daylight contribution.



If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).



The setpoint of the sensor can be changed manually by using a screwdriver to turn the control ring on the front, which influences the diaphragm. The housing is equipped with an indication of the default setting.



You can easily copy the new set point to other rooms when similar daylight and reflector conditions exist.

Warning: the required light level should be no more than 30% lower than the average installed light level, without daylight contribution (e.g. 55 footcandles installed, adjustment down to 39 foot candles is possible). Please note that MicroLuxSense is not designed for maintaining a constant light level.

General Specifications

Technical data

Operation conditions

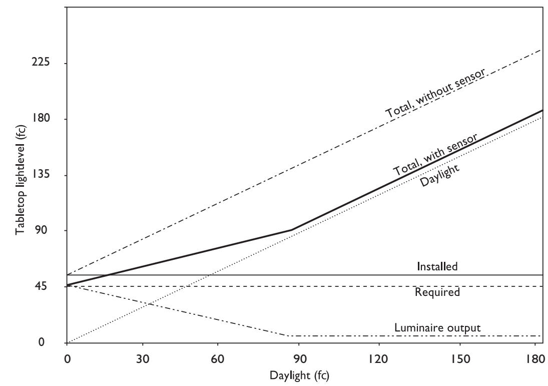
Ambient temperature	5°C to 55°C
Rel. humidity	5% to 90%, no condensation
Max. allowed temperature	55°C
Anywhere on the sensor housing	

Storage conditions

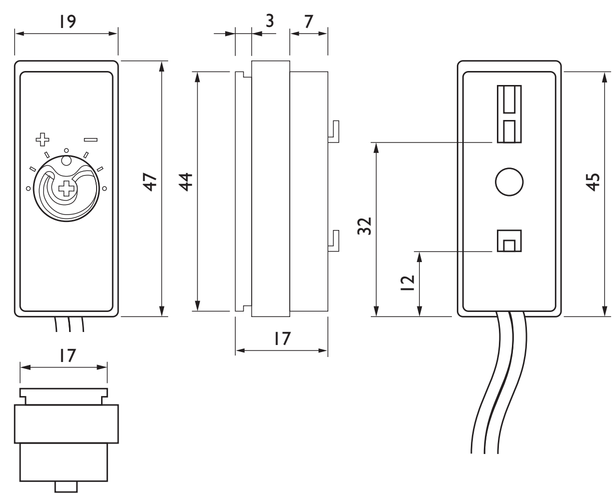
Ambient temperature	-25°C to 70°C
Rel. humidity	5% to 95% at 25°C
Connection	20 AWG, flying leads, length 27 inches.
Color coding of cable	white/grey +, white –. Connecting the wires in the reverse will result in minimum light output.
Housing material	Polycarbonate UL94 V-0
Color bottom part	Ultra Dark Grey (similar to RAL 7024)
Color cover part	Light Grey (similar to RAL 7035)
Weight/dimensions	Approx. 25 grams, 47x19x19 mm
Control signal input	
operating voltage	+1.5 - +10Vdc
operating current sink	100µA-3mA (sufficient for 20 Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts)
control voltage variation	< 0.7V over current and temp. range
max. input voltage	15 Vdc (maximum rating)
max. current sink	50 mA (maximum rating)
Optical characteristics	- It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft. in height) will result in 2.3 fc seen by the controller at ceiling height (8 ft.) under a viewing angle of 45° - The opening angle can be adapted by the diaphram control, realizing an attenuation factor between 1/3 and 3.

MicroLuxSense control characteristics

The control characteristics are described in the graph. The light sensor roughly compensates for 50% of the ingressing daylight by dimming the artificial light output, until the minimum output is reached.



Dimensions in mm



Controls

ActiLume™

An easy to use and install lighting control system

ActiLume is a revolutionary new plug-and-play daylight/occupancy lighting system that virtually eliminates any worries of complicated programming procedures. Commissioning is easily achieved by pushing a button on the sensor that calibrates the light level and switches the controller between open plan and private office modes.

Actilume consists of a ready to use sensor and control unit to be built directly into a luminaire. This system is designed to deliver maximum visual comfort and potential energy savings of up to 65%* to the commercial sector.

The relative light output of the luminaire is defined by its placement within the space (window or corridor side of the office). The controller switches the lamps in a fixture automatically on and off based on occupancy and regulates the light output according to the amount of daylight entering the space. The system is operated with Philips Advance ROVR™ electronic ballasts.

State-of-the-art daylight/occupancy sensor
Provides a potential energy savings of up to 65% without sacrificing visual comfort*

Simple to use lighting control system
No specific lighting control training is needed to commission or adjust light levels or operation modes

Two pre-programmed application modes
Private or open plan modes can be selected via a simple push of the service button

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

ActiLume
Controller LLC 1654
Sensor LRI 1653

General Specifications

Plug & Play control models

- Mode 1, Private Office: Lights switch off after 15 minutes, saving energy in a private office situation.
- Mode 2, Open Office: Lights dim after 15 minutes, but are not switched off until unoccupied for 2 additional hours. This avoids dark areas in an open plan office.

Technical data for installation, mains operation

Rated mains voltage	120-277 V
Voltage tolerance:	+/- 10% 108-305 V
Mains frequency	50/60 Hz
Input power (system)	<2W
Maximum number of ballasts	9
Maximum number of extension sensors	2

Technical data for design and mounting in fixtures

Operating conditions

Ambient temperature	0 °C to 55 °C Sensor and controller
Relative humidity	20% to 85%, no condensation

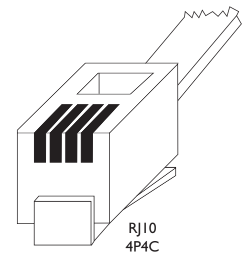
Storage Conditions

Ambient temperature	-25 °C to +85 °C
Relative humidity	10% to 95%

Controller / Sensor Specifications

Sensor LRI 1653

Connection — RJ-10 4-Pole
Fixed to LRI1653 3 ft. cable

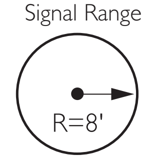


Housing (casing)

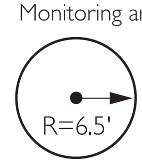
Material	Polycarbonate UL94 V-0
Mounting The sensor housing has two mechanisms that may be used for mounting:	1. Latching tabs on the back of the sensor 2. Four small ridges, two on each long side of the sensor
Safety, basic insulation	> 1500 V

When placed at a height of 9 ft. the following values are valid:

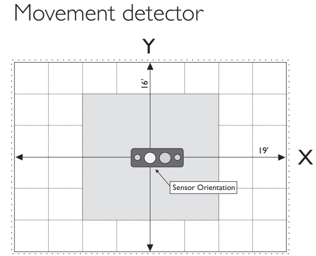
Infrared receiver — Signal Range



Light sensor — Monitoring range of 2.5 to 35 foot-candles at sensor
Monitoring area



Movement detector — Passive Infra Red (PIR)



Maximum height PIR: 11 ft.
X-angle PIR: 100°
Y-angle PIR: 82°

Detection area at 9 ft. height:
- 13x13 ft. (sensitive for small movements)
- 20x16 ft. (sensitive for larg movements)

Controls

CONTROLS

Lighting Controls

Set the reference light level adjustment:

Pressing the service button (>3 seconds) until the lamp gives a light flash (wink) will start the automatic calibration procedure for light level adjustment. Step aside or remove stepladder, if used.

The light output of the luminaires connected to window row is set to 80%. The light output of the luminaires connected to a corridor row is set to 100%.

After 30 seconds the ActiLume controller is saving the actual light level as new reference light level (indicated by a second flash). This 30 seconds time delay is required to have sufficient time to step aside or remove a stepladder.

Select the user mode (application):

The user mode can be toggled between mode 1 and 2 by means of a short push on the service button (<3 seconds). [Fig. A]

After the service button has been released the lamp will flash to indicate the selected user mode: 1 flash = User mode 1 (Private office application) 2 flashes = User mode 2 (Open plan office application). The flash count begins after the lamp has been dimmed. Count only the short lamp pulses and not the final lamp level.

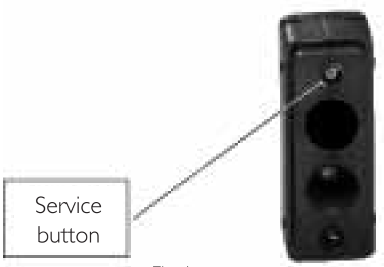


Fig. A

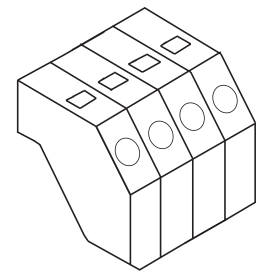
Controller unit LLC 1654

Window and corridor output	In user mode 1 and user mode 2 the system is programmed as one channel with two zones. When enough daylight enters the room, the amount of artificial light will be automatically reduced on the window row and the amount of light on the corridor row will be offset with 30% more light.
Safety, basic insulation	> 1500 V
Material	Polycarbonate UL94 V-0
Mounting	The controller housing contains snap-in pins for quick fixation. The diameter of the fixation holes should be maximum 4.5 mm. The snap-in pins are designed for a metal thickness of maximum 0.8 mm. The maximum distance between the fixation holes is 78 mm.

ActiLume / Sensor

Connector type

Connection wiring is greatly simplified through use of POKE-IN connectors.

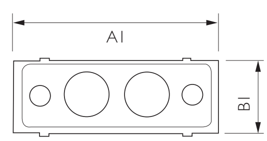


Wire cross-section

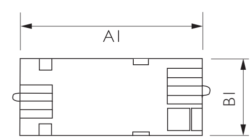
22 AWG - 18 AWG solid or stranded with tinned ends

Strip length 3/8"

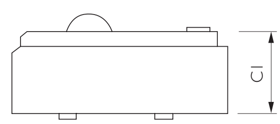
Dimensions in inches



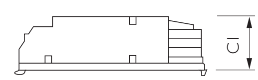
Sensor LRI1653



Controller LLC1654



Sensor LRI1653



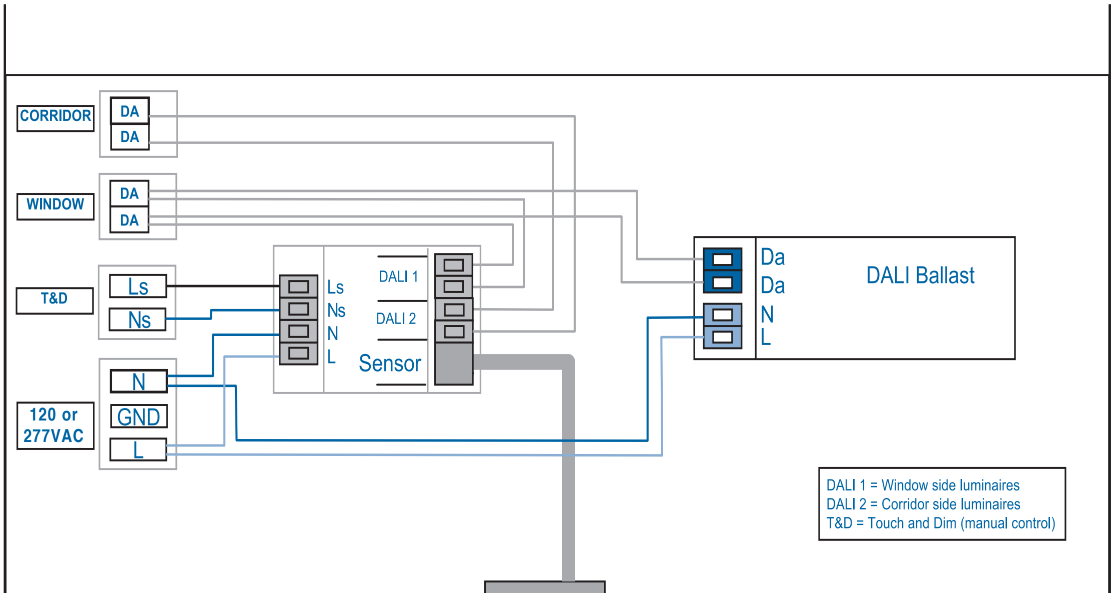
Controller LLC1654

	A1	B1	C1
Sensor LRI 1653	1 3/4	5/8	5/8
Controller LLC 1654	3 1/8	1 3/16	7/8

Dimensions in inches

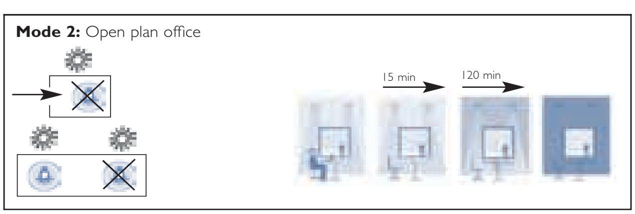
ActiLume
Controller LLC 1654
Sensor LRI 1653

ActiLume / Sensor



ActiLume Modes

Besides the private office and open plan office modes, in the future it will be possible to recall additional (yet to be determined) application modes. This will make the ActiLume system very flexible for all different kinds of applications. An advanced remote control will be added in the future to allow users to select and store other specific modes to meet the space needs.

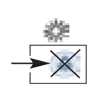


Presence - Area is occupied.

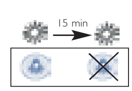
Absence - Light stays on. (internal timer is activated to clock absence time)

Absence - Light dims down to a background level (internal timer is activated to clock absence time) or surrounding light at 100%.

Absence - Light switched off.



When enough daylight is detected, the lights will NOT be switched on automatically when someone enters the room.



When enough daylight is detected (measured over 15 minutes), the lights will automatically be switched off.

Controls

ActiLume™ Color

A true plug and play color management system for the retail, hospitality, and architectural markets

Philips ActiLume Color is a stand-alone, lighting control designed for dynamic and static color effects in small, medium and large sized applications. This plug and play color system makes commissioning easy; simply wire the system and you can start color changing with the infrared remote control. With no specific training needed, the operator can quickly recall ten pre-programmed dynamic color changing sequences and ten pre-programmed static scenes. This system has been designed for all indoor applications within retail, hospitality, and other public spaces, to attract people to specific areas and to enhance areas with color for scene setting. In addition, for maximum flexibility it is compatible with many light sources including LEDs and fluorescent lamps.

A maximum of 10 color luminaires can be controlled per ActiLume Color controller via the DALI broadcast output ports. You can also synchronize up to 60 ActiLume Color controllers (or 600 RGB fixtures) simultaneously. This system can also be operated in larger and existing DALI or DMX backbone based networks.

The ActiLume Color system is available with the ActiLume Color Programming Kit. Included in the kit is an easy to use software called ActiLume Color Studio, that allows you to create your own static colors or dynamic color sequences off-site and then upload them to the color controller during on-site commissioning.

Easy to use color management system

Plug and Play controller requires no specific lighting controls training

State-of-the-art controller

Provides the functionality of all input lighting control signals from various input devices (remote control, DALI interface, etc).

Design flexibility

Can be used in one fixture or up to 10 interconnected fixtures as well as the ability to be networked with up to 60 other controllers

ActiLume Color
LLC 1670

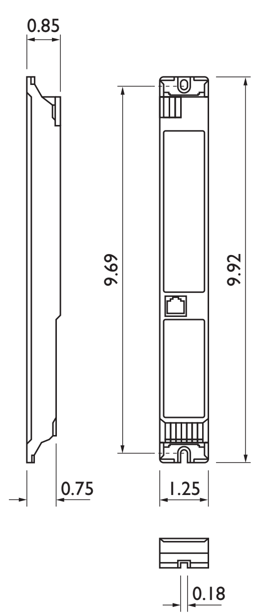
ActiLume Color System

- It can be used for both dynamic sequences from very fast to very slow (24 hr cycle), and static colors that are selected to support many applications including seasonal fashion, merchandise change, a specific atmosphere in a bar or restaurant or to enhance an architectural design.
- It offers 10 pre-programmed sequences corresponding with seasons (Christmas, autumn) and daily ambiance (nature, sunset).

Plug and Play control

- Simple systems with one ActiLume Color controller can be operated by DALI push button controls or remote control. The Philips Advance ROVR ballasts are directly connected to the Red, Green, and Blue outputs without any commissioning.

Dimensions in inches



Technical data
Compliances and approvals

Safety Standards	NEMA 410 UL935
Quality standard	ISO 9001
Environmental standard	ISO 14001
Approval marks	ENEC: 72/23/EEC (low voltage) 89/336/EEC (electromagnetic compatibility) CSA UL-recognized (UL1310 for class II power supplies) CE marking

Technical data for installation

Mains operation	Rated mains voltage 120-277 V
With tolerances for operation	+/- 10%
Mains frequency	50/60 Hz
Output power (system)	
R output	Maximum 10 DALI loads (20 mA)
G output	Maximum 10 DALI loads (20 mA)
B output	Maximum 10 DALI loads (20 mA)
Ext output	Maximum 40 DALI loads (80 mA)
DMX	64 mA
Sensor	5 mA

Technical data for design and mounting in fixtures

Operating conditions	Ambient temperature +5 … 50 °C
Controller and sensor	
Rel. humidity operating	20% … 85%, no condensation
Tcase	75 °C
Storage Conditions	-25 … +70 °C
Rel. humidity storage	10% … 95%
Lifetime	10% failure rate at 50k hrs with Tcase of 75 °C
DMX operation	
Operating temperature	+5 … 55°C
Protocol standards	ANSI 1.11-2004 (USITT DMX512-A) ANSI 1.20-2006 (RDM)
Connector	8-position modular connector (RJ45)
Transient/Burst Immunity and Surge	IEC 61000-4-4/5, level 2 on IO: 0.5kV UL840: over voltage category II (<50 V): 0.5 kV
Network requirements	According to EIA-485-A specification

ActiLume Color Controller unit LLC1670

In standard operation and based on the pre-programmed colors, ActiLume Color calculates the different dim levels for the Red, Green and Blue lamps, and the fading (dim levels) in between two color points. On the extended output, additional ActiLume colors can be operated within the same sequences or scenes.

In DMX operation, the real time DMX commands are directly translated into DALI commands on the output side.

ActiLume Color Inputs/Outputs

4x DALI current limited outputs	DALI-R: 10 DALI loads max DALI-G: 10 DALI loads max DALI-B: 10 DALI loads max DALI-EXT: 40 DALI loads max (mentioned as group RGBE_DA)

1x ActiLume Multi-Sensor input, labeled SENSOR

1x RS-485 connection, based on DMX (RDM)
The controller only supports the RDM address setting. The RDM requires bidirectional RS-485 (half duplex) and a factory programmed device unique ID.

Transmission load terminators	32 devices, with
Transmission level range common	0 ≤V≤+6 with respect to
Transmission frequency	250 kBit/s ± 2%
Reception level range common	+12/-7 with respect to
Reception frequency	250 kBit/s ± 2,5%
Turn around time of DMX transceiver	176 µs after transmission of the last stop bits. When a DMX-RDM controller expects a response, the device must place its transmitter in high impedance state within 88 µs after transmission of the last stop-bit (of the last transmitted byte). Time between slots (data-bytes) may not exceed 76 µs

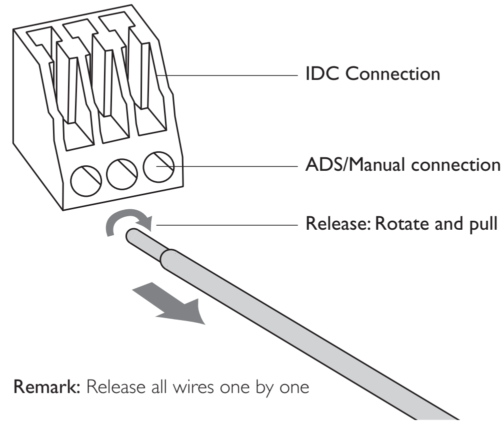
1x DALI passive input, (DALI GP)

Transmit:	
Short circuit current	Max 250 mA
High-level range	11.5 … 20.5 V
Low-level range	–4.5 … 4.5 V
Rise/fall time	10 …50 µs
Transmission frequency	1200 Hz +/- 5%
Receive:	
High-level range	9.5 … 300 V
Low-level range	–6.5 … 6.5 V
Rise/fall time	10 …50 ms (mains), 0 …100 µs (DALI)
Reception frequency	50/60 Hz (mains), 1200 Hz +/- 10% (DALI)

1x Universal mains input

Glow wire test	850 °C / 5 s
Safety, basic insulation	< 2000 V
Material	Polycarbonate + ABS Bay blend KU-2 1514 UL94 V-0
Housing color	Dark gray
Mounting	The minimum distance between the fixation holes is 9.29 inches.

Connections for DALI and mains



Remark: Release all wires one by one

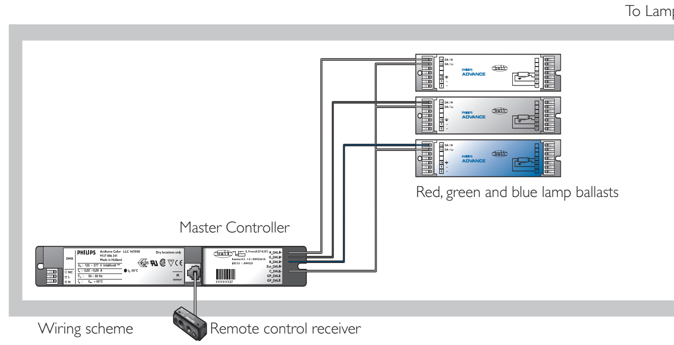
IDC Connection	20 AWG solid/18 AWG stranded
ADS or manual push	20 AWG - 18 AWG solid wire
Strip length	0.32 inches – 0.35 inches

User interfaces

Remote control	IRT1670 needs to be pointed to the sensor (IRR1654, or IRR8125) for starting dynamic sequences or static scenes.
Philips DALI	Broadcast commands will start pre-programmed sequences/static colors

Advanced color selection remote control IRT1670

This remote control can be used for selecting pre-programmed color sequences and static colors. These programmed dynamic sequences can be played faster (in half of the time), or slower (factor 3 or 6 slower). Static colors can be selected in hue and dim level and stored into the controller. Batteries are included.



ActiLume Color Programming Kit LCK1671

Consists of:

A. ActiLume Color Studio. An intuitive software for programming sequences into the ActiLume Color controller allowing for direct preview, light plan overview, and grouping.

B. RS232 gateway the RS232-DALI gateway translates all communication between the personal computer and the DALI network. The connection between PC and the DALI network is only necessary when the sequences are uploaded into the ActiLume Color Controller. The gateway requires a 24V power supply, not provided.

C. Interconnecting cable for the PC/Gateway.

Ordering and Packing data

Type	Description	Packaging (PCS)
LLCI670	Controller	24
IRR1654	IR Sensor with cap	24
IRR8125	IR Sensor invisable	1
IRT1670	Remote Control	18
LCK1671	Programming Kit	1

IRR 1654 with cap
IRR 8125 invisible

Connection	RJ-10 4-Pole 100 cm cable
Housing (casing)	
Material	Polycarbonate UL94 V-0
Glow wire test	950 °C / 5 s
Safety, basic insulation	<2000 V
Infrared receiver	RC5 signal
	Minimum range 20 m^2
Cap material IRR1654	Polycarbonate, RAL7035

IRR 8125

IRR 1654

OccuSwitch™ Wireless

A simple, easy, and effortless way to create a more sustainable work environment

The Philips OccuSwitch Wireless Occupancy Sensor is an advanced wireless system that automatically turns lights off when a workspace is unoccupied, saving energy and helping to create a more sustainable work environment. The system consists of a wireless battery-powered ceiling mounted sensor that communicates to a wall switch. Multiple sensors and switches can be used for additional coverage.

Using a combination of passive infrared (PIR) technology and advanced logic for detecting major and minor motion, the sensor recognizes when the room is occupied (or unoccupied), helping to eliminate false triggers. The system adapts to accommodate varying user patterns with built-in intelligence to automatically adjust the shut off time delay.

The Philips OccuSwitch Wireless Control System is a unique indoor plug and play system perfect for retrofits and new installations in commercial applications including private offices, conference rooms, restrooms, breakrooms, copyrooms, storage areas, and lobby areas. Uncompromising on style, the functional design allows for easy setup and adjustments to system settings via front accessible buttons.

Easy-to-install retrofit
Wireless controls means no sensor wiring providing quick set-up times, minimizing disruptions

Advanced occupancy sensing
Helps eliminate false triggers which optimizes energy savings

Sleek Low Profile Design
Stylish low-profile design easily blends into existing and current office designs

10-year battery life design*
Provides worry free maintenance, just install and leave for long lasting performance

Manual-On/Auto-Off Capability
Compliant with applicable California Title 24 energy efficiency code requirements

* Product has a 2-year limited warranty. See page 8-18 for more details.

CONTROLS

OccuSwitch Wireless
Occupancy Sensor LRM 1742
Switch LRM 1720

Wireless Occupancy Sensor Specifications

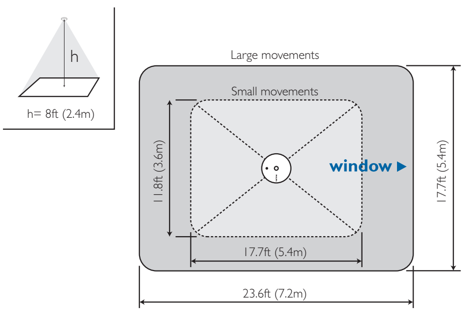
Detection Technology
Passive Infrared (PIR)

Mounting Height
Can be installed for up to 12ft ceiling height

Detection Area
Will vary based on ceiling height.
For a typical ceiling height of 8 ft (2.4m):

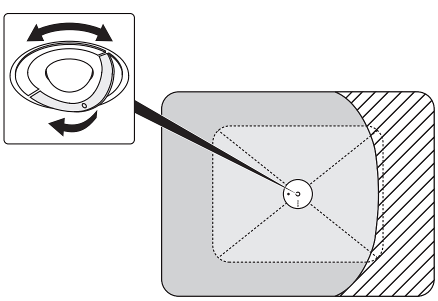
Major motion coverage	17.7 x 23.6ft (5.40m x 7.20m)
Minor motion coverage	11.8 x 17.7ft (3.60m x 5.40m)

Larger areas will require multiple sensors.



The orientation of the window arrow on the mounting plate aligns the direction of the rectangular detection area.

Rotating Shield



During installation the retractable sensor shield can be rotated to partially mask the sensor's field of view and prevent unwanted movement detection.

Wireless Network Protocol	ZigBee Pro 2.4GHz Universal license free band

Wireless Compatibility
Can be connected with multiple OccuSwitch Wireless Wall Switches.
Up to 10 sensors and switches can be networked together.

Wireless Range
Switch to Sensor: 50ft (17m)

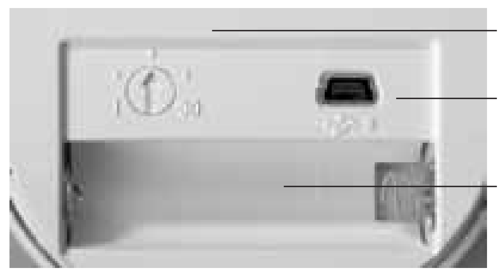
Switch to Switch (same plane): 18ft (6m)

Switch to Switch (line of sight): 50ft (17m)

Battery
Standard AA size 3.6V DC Lithium-thionyl chloride (Included)
10-year battery life design. Actual battery lifetime will vary based on application and occupancy activity.

Intelligent Delay Timer
The switch-off delay can be manually set between 1 and 30 minutes using the dial on the sensor. Once system is operational, the initial setting is automatically adjusted to the user's occupancy pattern

USB Port
Incorporates ability for future field firmware upgrades



Dimensions	
Diameter	3.3 inches (84mm)
Height (with ceiling plate)	0.98 inches (25mm)
Operating Conditions	
Temperature	41°F – 104°F (5°C – 40°C) For Indoor use only.
Humidity	20% – 85%, non-condensing
Environmental Compliance	RoHS
Regulatory Compliance	UL, CSA, FCC, California Title 24 Energy Efficient Standards

Wireless Wall Switch Specifications

Operating Voltage	Universal Input 120V AC or 277V AC, 60 Hz
Load Rating	
Electronic Fluorescent Ballast:	120V / 1300VA 277V / 1300VA
Electromagnetic Fluorescent Ballast:	120V / 1300VA 277V / 1300VA
Incandescent lamps	120V / 800W
Motor load	120V / 0.25HP
Wireless Network Protocol	ZigBee Pro 2.4GHz Universal license free band

Wireless Compatibility
Can be connected to multiple OccuSwitch Wireless Sensors and Switches. Up to 10 sensors and switches can be networked together.

Stand alone or 3-way switching
Each Wireless Switch can be configured to operate as a standalone switch or a 3-way switch.

By default the switch will act as a stand-alone switch: the switch only controls the load that is connected to it.

When configured as a 3-way switch, all loads are controlled from any switch.

USB Port
Incorporates ability for future field firmware upgrades

Color	White Almond
Dimensions	
length x width x depth	4.13 x 2.56 x 1.79 inches (105 x 65 x 45mm)

Designed to fit in a standard single-gang wall box.
Can also be installed in a multi-gang configuration.

Operating Conditions	
Temperature	41°F – 104°F (5°C – 40°C) For Indoor use only.
Humidity	20% – 85%, non-condensing
Environmental Compliance	RoHS
Regulatory Compliance	UL, CSA, FCC, California Title 24 Energy Efficient Standards

Product Warranty
2-year limited warranty. Go to our website for up-to-date warranty information on this product: www.philips.com/advancewarranty.

Type	Description	Quantity
LRM 1742/00	OccuSwitch Wireless occupancy sensor	1
LRA 1720/00	OccuSwitch Wireless wall switch (White color)	1
LRA 1720/01	OccuSwitch Wireless wall switch (Almond color)	1

For complete ordering information, contact your local sales representative.

Dynadimmer™

A simple, easy to install outdoor controller for electronic lighting systems

The Dynadimmer is a stand-alone dimming control with a 0-10 volt dimming output that can be used in combination with a compatible dimmable electronic driver. Easy to install into a luminaire or pole without any need for external control components or additional signal wiring, it is fully flexible and can be reprogrammed at any time to fit new lighting demands if changes are needed.

The Dynadimmer can be configured to dim to any level that the end-user wishes at set periods, with a maximum of five set periods. Both the levels and the time period are configured with an easy-to-use software tool, which also calculates and displays the energy savings that may be obtained from a particular dimming schedule.

The designed configuration is then loaded into a standard personal computer that will be used later to program the Dynadimmer via a USB cable. This configuration can be modified at any time by down-loading a new dimming schedule to adapt the lighting to a new situation or simply fine-tune the savings.

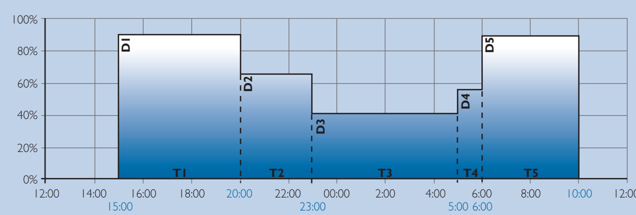
The five time periods and five dim levels guarantee an optimal schedule whether the application is an industrial area, parking lot, residential area or road. The Dynadimmer can help to meet certain road/area-lighting requirements and standards, which entail the introduction of illumination levels that take account of road use and/or traffic flows.

Energy savings and reduced light nuisance through dimming

Small size that can fit within almost any luminaire

Easy-to-use software that can provide a forecast of energy savings

Energy savings may be are maximized with the Dynadimmer. The fact that any level can be configured at any time makes very low levels late at night possible, high levels at peak times (though not necessarily 100%) and medium levels during the transitional periods. For example, a dimming schedule like the one shown in the picture projects an overall yearly energy saving of 40%.



Avaialble in Q2, 2010 – Contact your local sales rep or agent for more details.

CONTROLS

Chronosense™

A simple, easy to install outdoor controller for magnetic lighting systems

The Chronosense is a stand-alone dimming control with a 1-step dim control output that can be used in combination with one multi-wattage electro-magnetic ballast or additional dim ballast. Easy to install into a luminaire or pole without any need for external control components or additional signal wiring, it is fully flexible and can be reprogrammed at any time to fit new lighting demands if changes are needed.

The time period for which the Chronosense applies the 1-step dimming can easily be changed by means of dipswitches in the unit and can be modified at any time in the future. To calculate the hours for which it should operate, Chronosense counts the time that the lights were turned on and determines a mid-point, which is used as an intelligent reference point.

The Chronosense comes ready to operate with a factory pre-set value of a 6-hour dimming period. The six-position dipswitch sets both mode of operation (test/normal) and the appropriate dimming period. Switches 1-3 set the dim hours before the midpoint of the night, switches 4-5 the dim hours after and the sixth sets the mode of operation.

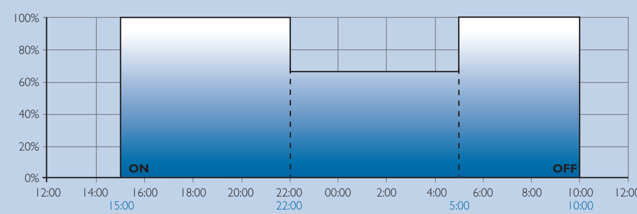
The Chronosense is suitable for new installations as well as retrofit solutions for electro-magnetic controlled luminaires. The flexible dipswitch settings guarantee an optimal schedule whether the application is an industrial area, parking lot or residential area. The Chronosense can help to meet certain Outdoor lighting requirements and standards, which entail the introduction of illumination levels that take account of use and/or traffic flows.

Energy savings and reduced light nuisance through dimming

Easy to install and flexible to reprogram

Suitable for new installations as well as retrofit

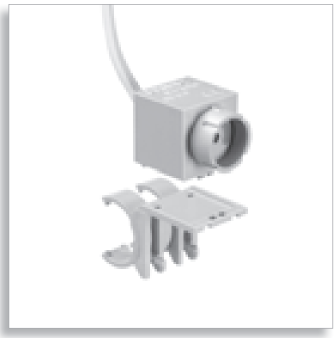
The energy savings with Chronosense are determined by the ballast combination used. A typical configuration with a multi-wattage 100/150W ballast projects an overall yearly energy saving of 20%. The ballast determines the dim level, but using the combination with the multi-wattage 100/150W it is usually about 65% of full power (as shown in the picture).



Avaialble in Q2, 2010 – Contact your local sales rep or agent.

Controls

Notes



LuxSense™

MicroLuxSense™

ActiLume™

ActiLume™ Color

OccuSwitch™ Wireless

Dynadimmer™

Chronosense™

CONTROLS

PHILIPS

Contents

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CONTROLS

LuxSense™

Provides daylight regulation via a single miniature sensor

Philips LuxSense is a daylight sensor that can control up to 20 fixtures equipped with Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts. The sensor measures the reflected light coming from the designated surface below, such as a desk or tabletop. It dims the lamp output when the light level exceeds the required level defined by the LuxSense sensor. The light level is easily adjusted via a simple dial.

Luxsense provides the benefit of a comfortable and controllable level of illumination throughout the working day. More importantly it can provide energy savings when installed near windows where natural illumination is usually greatest.

It is also designed to save energy by reducing excess light output that occurs from design factors of lumen depreciation. Lamps are dimmed slightly when new, but the light levels will then be raised over time to compensate for depreciation of lamp output that occurs in normal lamp aging.

State-of-the-art daylight sensor

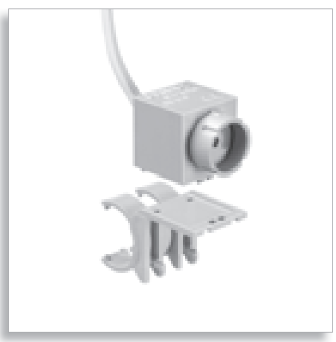
Provides a potential energy savings of up to 32% without sacrificing visual comfort*

Simple to use lighting control system

No specific lighting control training is needed to commission or adjust light levels or operation modes

Flexibility in design

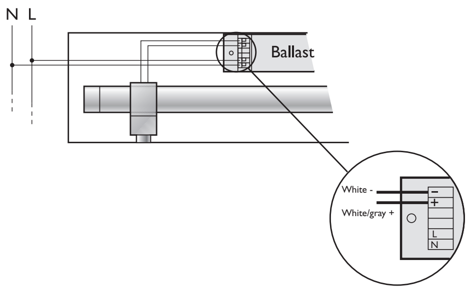
LuxSense can be incorporated directly into a fixture or alternatively clipped to a T5 lamp.**



* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

** External installation of class 2 wiring where allowed by local codes.

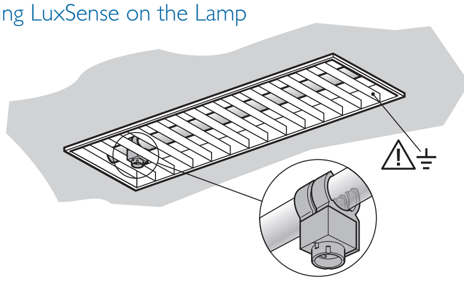
Installation of LuxSense into existing fixtures



Connecting diagram of the sensor to the ballast

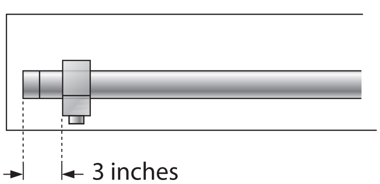
The maximum fixture temperature should always remain below 70°C. The sensitivity opening angle should never be obscured by the optics or any other part of the fixture. Metal optics should be properly grounded.

Mounting LuxSense on the Lamp



LuxSense mounted with a lamp clip (For use with T5 lamps only).

Not for use with T5/HO lamps.

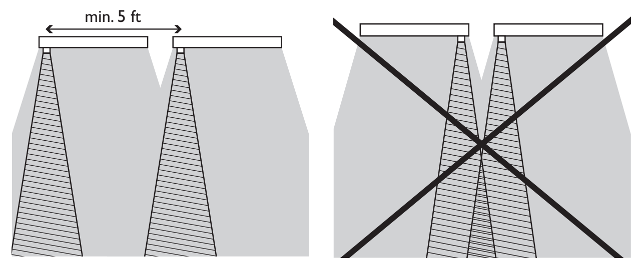


Position LuxSense 3 inches away from the end cap on the (electrical) "cold" side of the lamp. This is the side of the lamp that is connected to the terminals of the ballast that allows for the longest wiring to the lamp.

Installation of fixtures that include LuxSense

Install fixtures

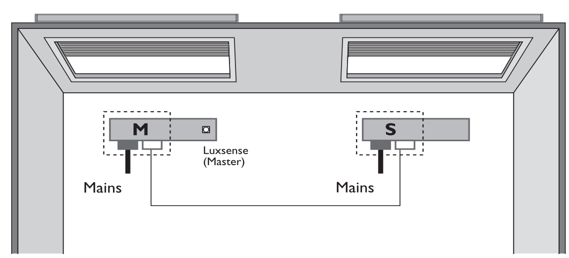
Interconnecting LuxSense Master fixtures (M) to Satellite fixtures (S)



Interconnecting LuxSense Master fixture (M) to Satellite fixture (S).

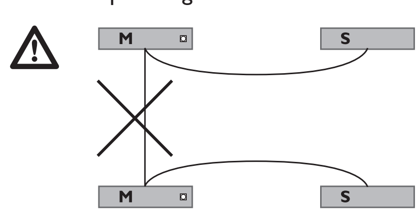
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7® *0-10V* or EssentiaLine *0-10V* ballasts.

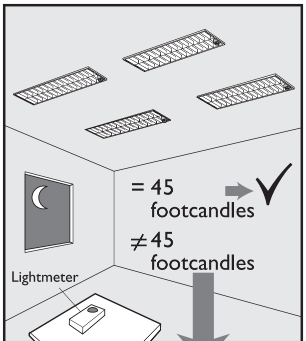
Satellite fixture should have similar daylight conditions to the master.



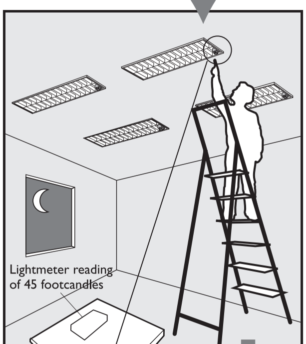
Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!

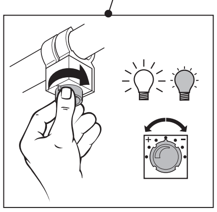




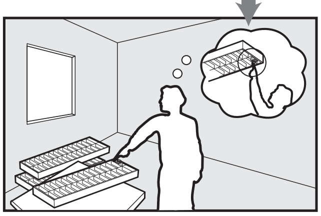
Measure the light level under each LuxSense sensor with no or negligible daylight contribution.



If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).



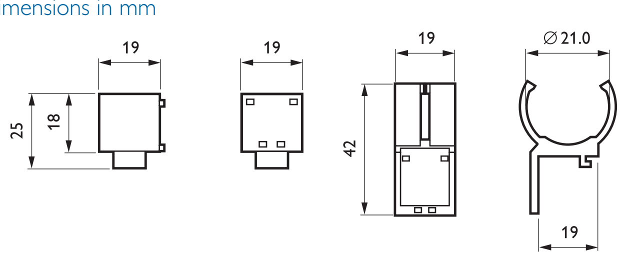
See diagram on the left to manually adjust the light levels.



You can easily copy the new set point to other rooms when similar daylight and reflector conditions exist.

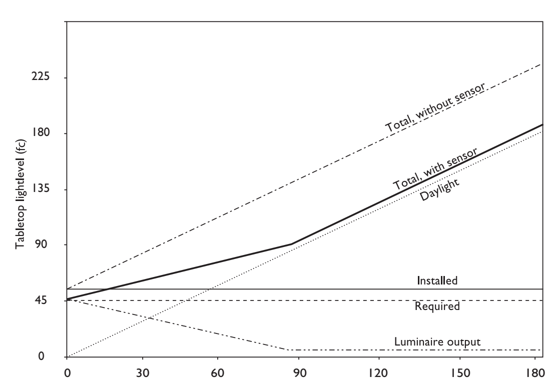
Warning: the required light level should be no more than 30% lower than the average installed light level, without daylight contribution (e.g. 55 footcandles installed, adjustment down to 39 foot candles is possible). Please note that LuxSense is not designed for maintaining a constant light level.

Dimensions in mm



Technical data

Operation conditions	
Ambient temperature	5°C to 55°C
Rel. humidity	15% to 90%, no condensation
Max. temperature of clip to lamp contact surface	70°C
Storage conditions	
Ambient temperature	-25°C to 70°C
Rel. humidity	5% to 95% at 25°C
Connection	20 AWG, flying leads, length 27 inches.
Color coding of cable:	white/grey + white – Connecting the wires in the reverse will result in minimum light output.
Housing	
Material	ASA
Color	light grey (similar to RAL 7035)
Weight/dimensions	Approx. 20 grams, 25x21x19mm.
Control signal input	- operating voltage: 1.5 - 10VDC - operating current sink 100µA-3mA (sufficient for 20 0-10VDC ballasts) - control voltage variation: < 0.5V over current and temperature range - max. input voltage (maximum rating): 15 Vdc - max. current sink (maximum rating): 50 mA
Optical characteristics	It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft. in height) will result in 2.3 fc seen by the controller at ceiling height (8 ft.) under a viewing angle of 45° - The opening angle can be adapted by the diaphram control, realizing an adjustment factor between 1/3 and 3.
Controls characteristics	LuxSense compensates approximately for 50% of the added light (simulated and measured with a fluorescent light source). See graph below. In case of a natural light source, the light compensation is higher than 50%.



LuxSense controls characteristics

MicroLuxSense™

Provides daylight regulation via a single miniature sensor

MicroLuxSense is a DayLight Regulation option (DLR) for luminaires equipped with a Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts. The sensor measures the reflected light coming from the surface below. It dims down the lamp output when the light level exceeds the required light level defined by the light sensor set point.

MicroLuxSense can be installed in the luminaire either mounted between the louvers or recessed in the housing.

Connect to the 0-10VDC control input of the Mark 7 or EssentiaLine ballast

Provides a potential energy savings of up to 32% without sacrificing visual comfort*

Maximize visual comfort

Automated regulation of artificial lighting allows for task illumination to be maintained.

Arrives from the factory in a standard preset configuration

No need for complex commissioning. Field adjustment possible if needed.

Regulate up to 20 luminaires

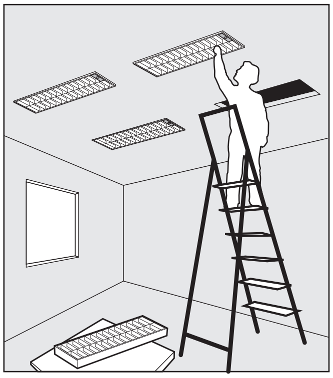
Utilize one sensor for continuous rows or multiple sensors with single luminaires

Uses common sensor footprint with ActiLume and ActiLume Color

One luminaire design now has the capability to provide various control options

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

Installation

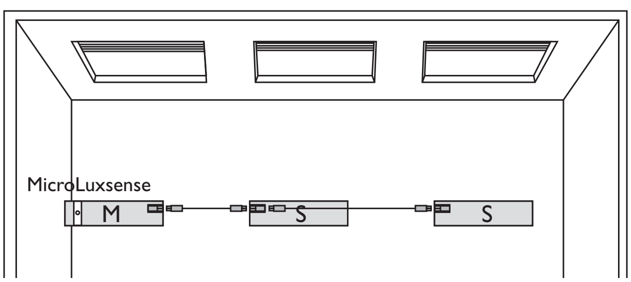


Mount the luminaire with MicroLuxSense daylight Regulation option.

Interconnecting MicroLuxSense Master fixture (M) to Satellite fixture (S).

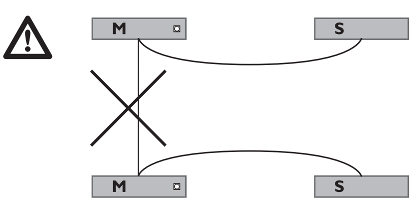
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7® *0-10V* or EssentiaLine *0-10V* ballasts.

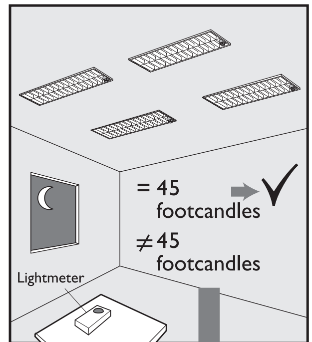
Satellite fixture should have similar daylight conditions to the master.



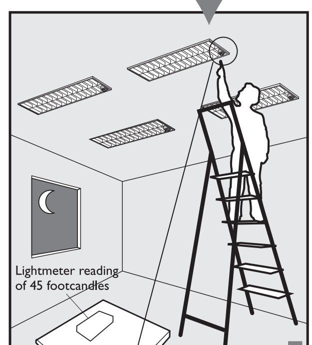
Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!

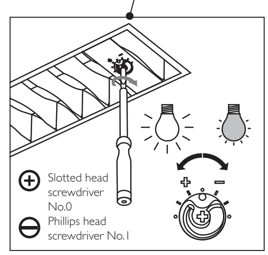




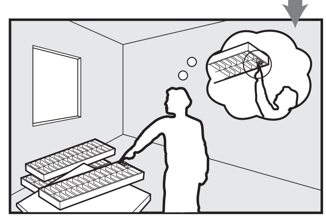
Measure the light level under each MicroLuxSense sensor with no or negligible daylight contribution.



If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).



The setpoint of the sensor can be changed manually by using a screwdriver to turn the control ring on the front, which influences the diaphragm. The housing is equipped with an indication of the default setting.



You can easily copy the new set point to other rooms when similar daylight and reflector conditions exist.

Warning: the required light level should be no more than 30% lower than the average installed light level, without daylight contribution (e.g. 55 footcandles installed, adjustment down to 39 foot candles is possible). Please note that MicroLuxSense is not designed for maintaining a constant light level.

General Specifications

Technical data

Operation conditions

Ambient temperature	5°C to 55°C
Rel. humidity	5% to 90%, no condensation
Max. allowed temperature	55°C
Anywhere on the sensor housing	

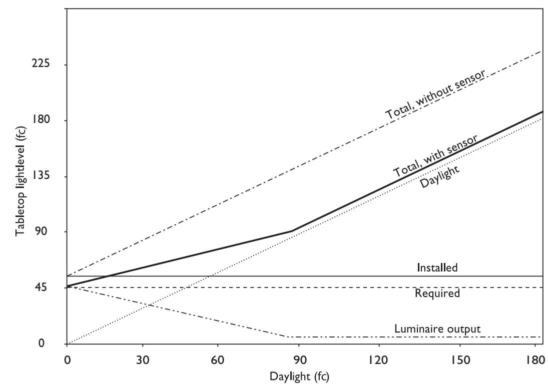
Storage conditions

Ambient temperature	-25°C to 70°C
Rel. humidity	5% to 95% at 25°C

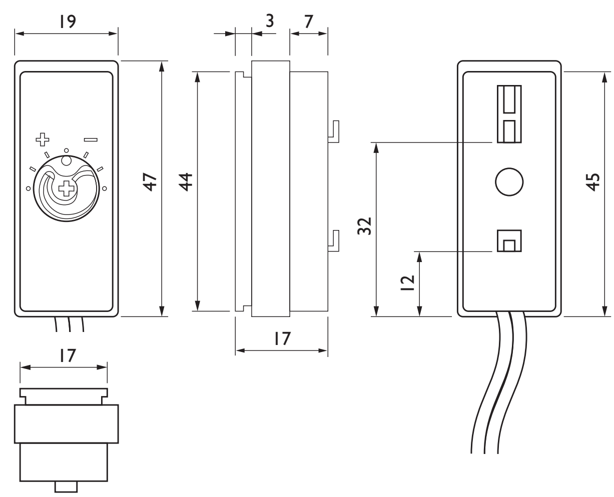
Connection	20 AWG, flying leads, length 27 inches.
Color coding of cable	white/grey +, white –. Connecting the wires in the reverse will result in minimum light output.
Housing material	Polycarbonate UL94 V-0
Color bottom part	Ultra Dark Grey (similar to RAL 7024)
Color cover part	Light Grey (similar to RAL 7035)
Weight/dimensions	Approx. 25 grams, 47x19x19 mm
Control signal input	
operating voltage	+1.5 - +10Vdc
operating current sink	100μA-3mA (sufficient for 20 Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts)
control voltage variation	< 0.7V over current and temp. range
max. input voltage	15 Vdc (maximum rating)
max. current sink	50 mA (maximum rating)
Optical characteristics	- It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft. in height) will result in 2.3 fc seen by the controller at ceiling height (8 ft.) under a viewing angle of 45° - The opening angle can be adapted by the diaphram control, realizing an attenuation factor between 1/3 and 3.

MicroLuxSense control characteristics

The control characteristics are described in the graph. The light sensor roughly compensates for 50% of the ingressing daylight by dimming the artificial light output, until the minimum output is reached.



Dimensions in mm



CONTROLS

ActiLume™

An easy to use and install lighting control system

ActiLume is a revolutionary new plug-and-play daylight/occupancy lighting system that virtually eliminates any worries of complicated programming procedures. Commissioning is easily achieved by pushing a button on the sensor that calibrates the light level and switches the controller between open plan and private office modes.

Actilume consists of a ready to use sensor and control unit to be built directly into a luminaire. This system is designed to deliver maximum visual comfort and potential energy savings of up to 65%* to the commercial sector.

The relative light output of the luminaire is defined by its placement within the space (window or corridor side of the office). The controller switches the lamps in a fixture automatically on and off based on occupancy and regulates the light output according to the amount of daylight entering the space. The system is operated with Philips Advance ROVR™ electronic ballasts.

State-of-the-art daylight/occupancy sensor
Provides a potential energy savings of up to 65% without sacrificing visual comfort*

Simple to use lighting control system
No specific lighting control training is needed to commission or adjust light levels or operation modes

Two pre-programmed application modes
Private or open plan modes can be selected via a simple push of the service button

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 7-29

Controls

ActiLume
Controller LLC 1654
Sensor LRI 1653

General Specifications

Plug & Play control models

- Mode 1, Private Office: Lights switch off after 15 minutes, saving energy in a private office situation.
- Mode 2, Open Office: Lights dim after 15 minutes, but are not switched off until unoccupied for 2 additional hours. This avoids dark areas in an open plan office.

Technical data for installation, mains operation

Rated mains voltage	120-277 V
Voltage tolerance:	+/- 10% 108-305 V
Mains frequency	50/60 Hz
Input power (system)	<2W
Maximum number of ballasts	9
Maximum number of extension sensors	2

Technical data for design and mounting in fixtures

Operating conditions

Ambient temperature	0 °C to 55 °C Sensor and controller
Relative humidity	20% to 85%, no condensation

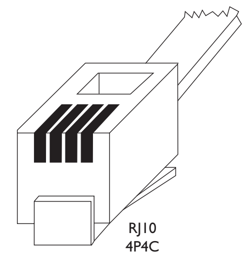
Storage Conditions

Ambient temperature	-25 °C to +85 °C
Relative humidity	10% to 95%

Controller / Sensor Specifications

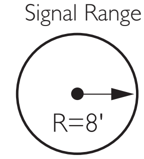
Sensor LRI 1653

Connection	RJ-10 4-Pole Fixed to LRI1653 3 ft. cable

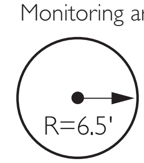


Housing (casing)

Material	Polycarbonate UL94 V-0
Mounting The sensor housing has two mechanisms that may be used for mounting:	1. Latching tabs on the back of the sensor 2. Four small ridges, two on each long side of the sensor
Safety, basic insulation	> 1500 V
When placed at a height of 9 ft. the following values are valid:	
Infrared receiver	Signal Range

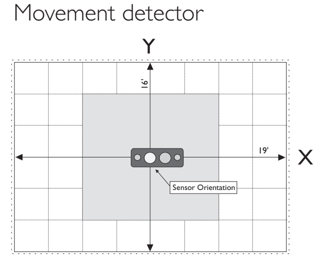


Light sensor	Monitoring range of 2.5 to 35 foot-candles at sensor Monitoring area



Movement detector	Passive Infra Red (PIR)

Detection area at 9 ft. height:
- 13x13 ft. (sensitive for small movements)
- 20x16 ft. (sensitive for larg movements)



Maximum height PIR: 11 ft.
X-angle PIR: 100°
Y-angle PIR: 82°

Controls

Lighting Controls

Set the reference light level adjustment:

Pressing the service button (>3 seconds) until the lamp gives a light flash (wink) will start the automatic calibration procedure for light level adjustment. Step aside or remove stepladder, if used.

The light output of the luminaires connected to window row is set to 80%. The light output of the luminaires connected to a corridor row is set to 100%.

After 30 seconds the ActiLume controller is saving the actual light level as new reference light level (indicated by a second flash). This 30 seconds time delay is required to have sufficient time to step aside or remove a stepladder.

Select the user mode (application):

The user mode can be toggled between mode 1 and 2 by means of a short push on the service button (<3 seconds). [Fig. A]

After the service button has been released the lamp will flash to indicate the selected user mode: 1 flash = User mode 1 (Private office application) 2 flashes = User mode 2 (Open plan office application). The flash count begins after the lamp has been dimmed. Count only the short lamp pulses and not the final lamp level.

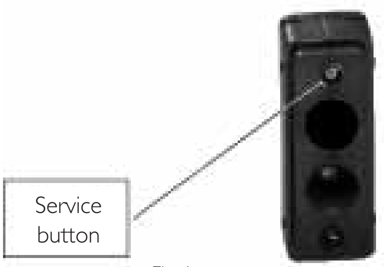


Fig. A

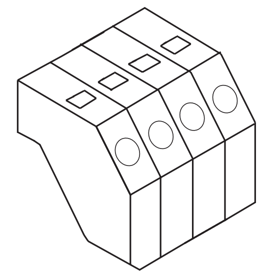
Controller unit LLC 1654

Window and corridor output	In user mode 1 and user mode 2 the system is programmed as one channel with two zones. When enough daylight enters the room, the amount of artificial light will be automatically reduced on the window row and the amount of light on the corridor row will be offset with 30% more light.
Safety, basic insulation	> 1500 V
Material	Polycarbonate UL94 V-0
Mounting	The controller housing contains snap-in pins for quick fixation. The diameter of the fixation holes should be maximum 4.5 mm. The snap-in pins are designed for a metal thickness of maximum 0.8 mm. The maximum distance between the fixation holes is 78 mm.

ActiLume / Sensor

Connector type

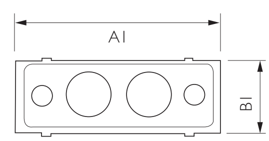
Connection wiring is greatly simplified through use of POKE-IN connectors.



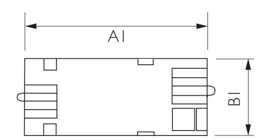
Wire cross-section

22 AWG - 18 AWG solid or stranded with tinned ends
Strip length 3⁄8"

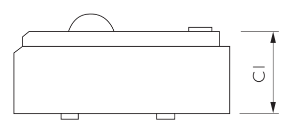
Dimensions in inches



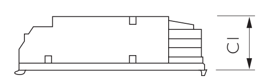
Sensor LRI1653



Controller LLC1654



Sensor LRI1653



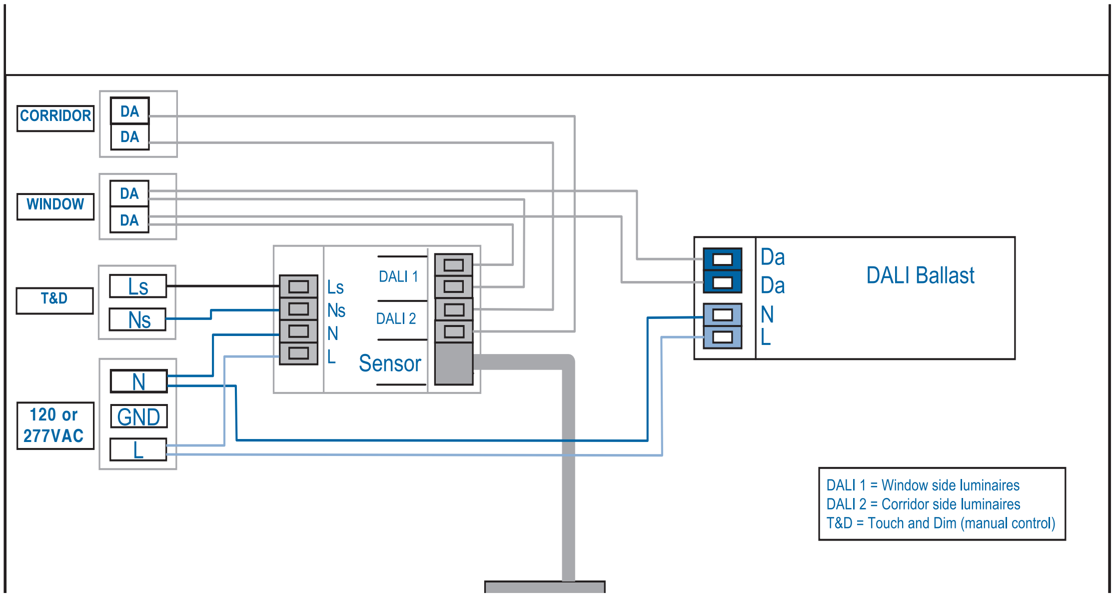
Controller LLC1654

	A1	B1	C1
Sensor LRI 1653	1 ¾	⅝	⅝
Controller LLC 1654	3 ⅛	1 3⁄16	⅞

Dimensions in inches

ActiLume
Controller LLC 1654
Sensor LRI 1653

ActiLume / Sensor



ActiLume Modes

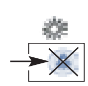
Besides the private office and open plan office modes, in the future it will be possible to recall additional (yet to be determined) application modes. This will make the ActiLume system very flexible for all different kinds of applications. An advanced remote control will be added in the future to allow users to select and store other specific modes to meet the space needs.

Presence - Area is occupied.

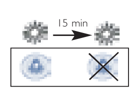
Absence - Light stays on. (internal timer is activated to clock absence time)

Absence - Light dims down to a background level (internal timer is activated to clock absence time) or surrounding light at 100%.

Absence - Light switched off.



When enough daylight is detected, the lights will NOT be switched on automatically when someone enters the room.



When enough daylight is detected (measured over 15 minutes), the lights will automatically be switched off.

Controls

ActiLume™ Color

A true plug and play color management system for the retail, hospitality, and architectural markets

Philips ActiLume Color is a stand-alone, lighting control designed for dynamic and static color effects in small, medium and large sized applications. This plug and play color system makes commissioning easy; simply wire the system and you can start color changing with the infrared remote control. With no specific training needed, the operator can quickly recall ten pre-programmed dynamic color changing sequences and ten pre-programmed static scenes. This system has been designed for all indoor applications within retail, hospitality, and other public spaces, to attract people to specific areas and to enhance areas with color for scene setting. In addition, for maximum flexibility it is compatible with many light sources including LEDs and fluorescent lamps.

A maximum of 10 color luminaires can be controlled per ActiLume Color controller via the DALI broadcast output ports. You can also synchronize up to 60 ActiLume Color controllers (or 600 RGB fixtures) simultaneously. This system can also be operated in larger and existing DALI or DMX backbone based networks.

The ActiLume Color system is available with the ActiLume Color Programming Kit. Included in the kit is an easy to use software called ActiLume Color Studio, that allows you to create your own static colors or dynamic color sequences off-site and then upload them to the color controller during on-site commissioning.

Easy to use color management system

Plug and Play controller requires no specific lighting controls training

State-of-the-art controller

Provides the functionality of all input lighting control signals from various input devices (remote control, DALI interface, etc).

Design flexibility

Can be used in one fixture or up to 10 interconnected fixtures as well as the ability to be networked with up to 60 other controllers

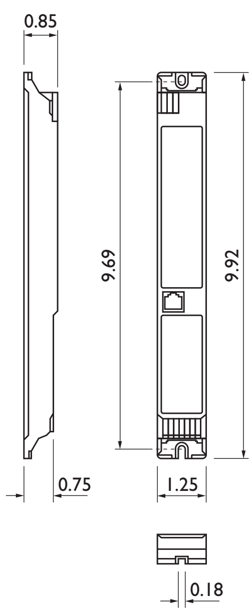
ActiLume Color System

- It can be used for both dynamic sequences from very fast to very slow (24 hr cycle), and static colors that are selected to support many applications including seasonal fashion, merchandise change, a specific atmosphere in a bar or restaurant or to enhance an architectural design.
- It offers 10 pre-programmed sequences corresponding with seasons (Christmas, autumn) and daily ambiance (nature, sunset).

Plug and Play control

- Simple systems with one ActiLume Color controller can be operated by DALI push button controls or remote control. The Philips Advance ROVR ballasts are directly connected to the Red, Green, and Blue outputs without any commissioning.

Dimensions in inches



Technical data

Compliances and approvals

Safety Standards	NEMA 410 UL935
Quality standard	ISO 9001
Environmental standard	ISO 14001
Approval marks	ENEC: 72/23/EEC (low voltage) 89/336/EEC (electromagnetic compatibility) CSA UL-recognized (UL1310 for class II power supplies) CE marking

Technical data for installation

Mains operation	Rated mains voltage 120-277 V
With tolerances for operation	+/- 10%
Mains frequency	50/60 Hz
Output power (system)	
R output	Maximum 10 DALI loads (20 mA)
G output	Maximum 10 DALI loads (20 mA)
B output	Maximum 10 DALI loads (20 mA)
Ext output	Maximum 40 DALI loads (80 mA)
DMX	64 mA
Sensor	5 mA

Technical data for design and mounting in fixtures

Operating conditions	Ambient temperature +5 … 50 °C
Controller and sensor	
Rel. humidity operating	20% … 85%, no condensation
Tcase	75 °C
Storage Conditions	-25 … +70 °C
Rel. humidity storage	10% … 95%
Lifetime	10% failure rate at 50k hrs with Tcase of 75 °C
DMX operation	
Operating temperature	+5 … 55°C
Protocol standards	ANSI 1.11-2004 (USITT DMX512-A) ANSI 1.20-2006 (RDM)
Connector	8-position modular connector (RJ45)
Transient/Burst Immunity and Surge	IEC 61000-4-4/5, level 2 on IO: 0.5kV UL840: over voltage category II (<50 V): 0.5 kV
Network requirements	According to EIA-485-A specification

CONTROLS

ActiLume Color Controller unit LLC1670

In standard operation and based on the pre-programmed colors, ActiLume Color calculates the different dim levels for the Red, Green and Blue lamps, and the fading (dim levels) in between two color points. On the extended output, additional ActiLume colors can be operated within the same sequences or scenes.

In DMX operation, the real time DMX commands are directly translated into DALI commands on the output side.

ActiLume Color Inputs/Outputs

4x DALI current limited outputs	DALI-R: 10 DALI loads max DALI-G: 10 DALI loads max DALI-B: 10 DALI loads max DALI-EXT: 40 DALI loads max (mentioned as group RGBE_DA)

1x ActiLume Multi-Sensor input, labeled SENSOR

1x RS-485 connection, based on DMX (RDM)
The controller only supports the RDM address setting. The RDM requires bidirectional RS-485 (half duplex) and a factory programmed device unique ID.

Transmission load terminators	32 devices, with
Transmission level range common	0 ≤V≤+6 with respect to
Transmission frequency	250 kBit/s ± 2%
Reception level range common	+12/-7 with respect to
Reception frequency	250 kBit/s ± 2,5%
Turn around time of DMX transceiver	176 µs after transmission of the last stop bits. When a DMX-RDM controller expects a response, the device must place its transmitter in high impedance state within 88 µs after transmission of the last stop-bit (of the last transmitted byte). Time between slots (data-bytes) may not exceed 76 µs

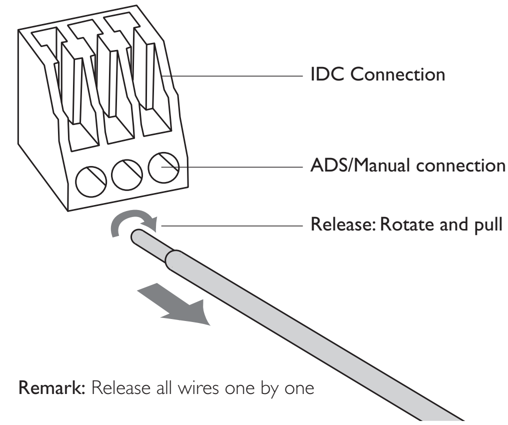
1x DALI passive input, (DALI GP)

Transmit:	
Short circuit current	Max 250 mA
High-level range	11.5 … 20.5 V
Low-level range	–4.5 … 4.5 V
Rise/fall time	10 …50 µs
Transmission frequency	1200 Hz +/- 5%
Receive:	
High-level range	9.5 … 300 V
Low-level range	–6.5 … 6.5 V
Rise/fall time	10 …50 ms (mains), 0 …100 µs (DALI)
Reception frequency	50/60 Hz (mains), 1200 Hz +/- 10% (DALI)

1x Universal mains input

Glow wire test	850 °C / 5 s
Safety, basic insulation	< 2000 V
Material	Polycarbonate + ABS Bay blend KU-2 1514 UL94 V-0
Housing color	Dark gray
Mounting	The minimum distance between the fixation holes is 9.29 inches.

Connections for DALI and mains



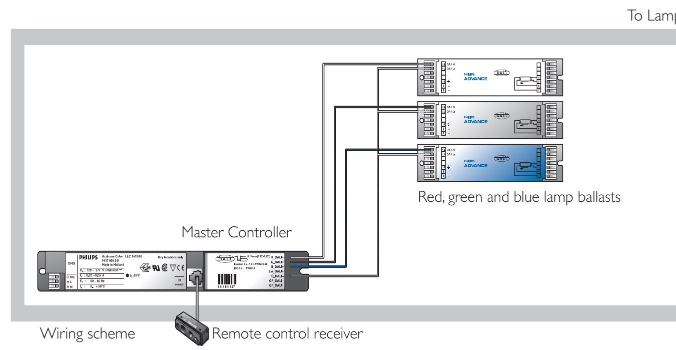
IDC Connection	20 AWG solid/18 AWG stranded
ADS or manual push	20 AWG - 18 AWG solid wire
Strip length	0.32 inches – 0.35 inches

User interfaces

Remote control	IRT1670 needs to be pointed to the sensor (IRR1654, or IRR8125) for starting dynamic sequences or static scenes.
Philips DALI	Broadcast commands will start pre-programmed sequences/static colors

Advanced color selection remote control IRT1670

This remote control can be used for selecting pre-programmed color sequences and static colors. These programmed dynamic sequences can be played faster (in half of the time), or slower (factor 3 or 6 slower). Static colors can be selected in hue and dim level and stored into the controller. Batteries are included.



ActiLume Color Programming Kit LCK1671

Consists of:

A. ActiLume Color Studio. An intuitive software for programming sequences into the ActiLume Color controller allowing for direct preview, light plan overview, and grouping.

B. RS232 gateway the RS232-DALI gateway translates all communication between the personal computer and the DALI network. The connection between PC and the DALI network is only necessary when the sequences are uploaded into the ActiLume Color Controller. The gateway requires a 24V power supply, not provided.

C. Interconnecting cable for the PC/Gateway.

Ordering and Packing data

Type	Description	Packaging (PCS)
LLCI670	Controller	24
IRR1654	IR Sensor with cap	24
IRR8125	IR Sensor invisable	1
IRT1670	Remote Control	18
LCK1671	Programming Kit	1

IRR 1654 with cap
IRR 8125 invisible

Connection	RJ-10 4-Pole 100 cm cable
Housing (casing)	
Material	Polycarbonate UL94 V-0
Glow wire test	950 °C / 5 s
Safety, basic insulation	< 2000 V
Infrared receiver	RC5 signal
	Minimum range 20 m^2
Cap material IRR1654	Polycarbonate, RAL7035

IRR 8125

IRR 1654

CONTROLS

OccuSwitch™ Wireless

A simple, easy, and effortless way to create a more sustainable work environment

The Philips OccuSwitch Wireless Occupancy Sensor is an advanced wireless system that automatically turns lights off when a workspace is unoccupied, saving energy and helping to create a more sustainable work environment. The system consists of a wireless battery-powered ceiling mounted sensor that communicates to a wall switch. Multiple sensors and switches can be used for additional coverage.

Using a combination of passive infrared (PIR) technology and advanced logic for detecting major and minor motion, the sensor recognizes when the room is occupied (or unoccupied), helping to eliminate false triggers. The system adapts to accommodate varying user patterns with built-in intelligence to automatically adjust the shut off time delay.

The Philips OccuSwitch Wireless Control System is a unique indoor plug and play system perfect for retrofits and new installations in commercial applications including private offices, conference rooms, restrooms, breakrooms, copyrooms, storage areas, and lobby areas. Uncompromising on style, the functional design allows for easy setup and adjustments to system settings via front accessible buttons.

Easy-to-install retrofit
Wireless controls means no sensor wiring providing quick set-up times, minimizing disruptions

Advanced occupancy sensing
Helps eliminate false triggers which optimizes energy savings

Sleek Low Profile Design
Stylish low-profile design easily blends into existing and current office designs

10-year battery life design*
Provides worry free maintenance, just install and leave for long lasting performance

Manual-On/Auto-Off Capability
Compliant with applicable California Title 24 energy efficiency code requirements

* Product has a 2-year limited warranty. See page 8-18 for more details.

OccuSwitch Wireless
Occupancy Sensor LRM 1742
Switch LRM 1720

Wireless Occupancy Sensor Specifications

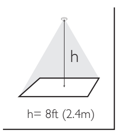
Detection Technology
Passive Infrared (PIR)

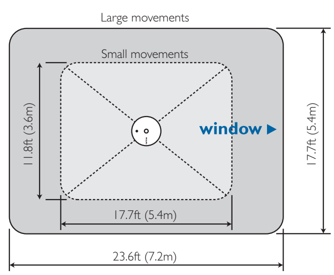
Mounting Height
Can be installed for up to 12ft ceiling height

Detection Area
Will vary based on ceiling height.
For a typical ceiling height of 8 ft (2.4m):

Major motion coverage	17.7 x 23.6ft (5.40m x 7.20m)
Minor motion coverage	11.8 x 17.7ft (3.60m x 5.40m)

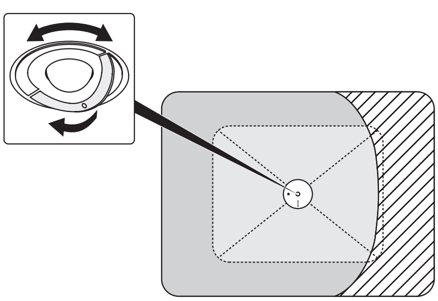
Larger areas will require multiple sensors.





The orientation of the window arrow on the mounting plate aligns the direction of the rectangular detection area.

Rotating Shield



During installation the retractable sensor shield can be rotated to partially mask the sensor's field of view and prevent unwanted movement detection.

Wireless Network Protocol	ZigBee Pro 2.4GHz Universal license free band

Wireless Compatibility
Can be connected with multiple OccuSwitch Wireless Wall Switches.
Up to 10 sensors and switches can be networked together.

Wireless Range
Switch to Sensor: 50ft (17m)

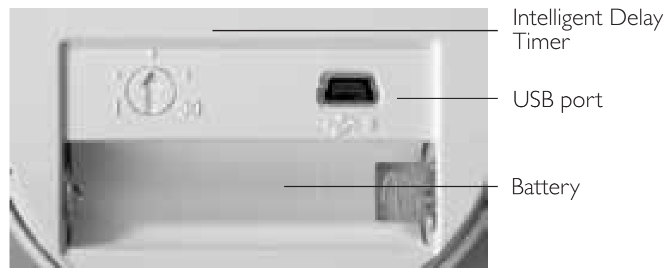
Switch to Switch (same plane): 18ft (6m)

Switch to Switch (line of sight): 50ft (17m)

Battery
Standard AA size 3.6V DC Lithium-thionyl chloride (Included)
10-year battery life design. Actual battery lifetime will vary based on application and occupancy activity.

Intelligent Delay Timer
The switch-off delay can be manually set between 1 and 30 minutes using the dial on the sensor. Once system is operational, the initial setting is automatically adjusted to the user's occupancy pattern

USB Port
Incorporates ability for future field firmware upgrades



Dimensions

Diameter	3.3 inches (84mm)
Height (with ceiling plate)	0.98 inches (25mm)

Operating Conditions

Temperature	41°F – 104°F (5°C – 40°C) For Indoor use only.
Humidity	20% – 85%, non-condensing
Environmental Compliance	RoHS
Regulatory Compliance	UL, CSA, FCC, California Title 24 Energy Efficient Standards

Wireless Wall Switch Specifications

Operating Voltage	Universal Input 120V AC or 277V AC, 60 Hz
Load Rating	
Electronic Fluorescent Ballast:	120V / 1300VA 277V / 1300VA
Electromagnetic Fluorescent Ballast:	120V / 1300VA 277V / 1300VA
Incandescent lamps	120V / 800W
Motor load	120V / 0.25HP
Wireless Network Protocol	ZigBee Pro 2.4GHz Universal license free band

Wireless Compatibility
Can be connected to multiple OccuSwitch Wireless Sensors and Switches. Up to 10 sensors and switches can be networked together.

Stand alone or 3-way switching
Each Wireless Switch can be configured to operate as a standalone switch or a 3-way switch.

By default the switch will act as a stand-alone switch: the switch only controls the load that is connected to it.

When configured as a 3-way switch, all loads are controlled from any switch.

USB Port
Incorporates ability for future field firmware upgrades

Color	White Almond
Dimensions	
length x width x depth	4.13 x 2.56 x 1.79 inches (105 x 65 x 45mm)

Designed to fit in a standard single-gang wall box.
Can also be installed in a multi-gang configuration.

Operating Conditions	
Temperature	41°F – 104°F (5°C – 40°C) For Indoor use only.
Humidity	20% – 85%, non-condensing
Environmental Compliance	RoHS
Regulatory Compliance	UL, CSA, FCC, California Title 24 Energy Efficient Standards

Product Warranty
2-year limited warranty. Go to our website for up-to-date warranty information on this product: www.philips.com/advancewarranty.

Type	Description	Quantity
LRM 1742/00	OccuSwitch Wireless occupancy sensor	1
LRA 1720/00	OccuSwitch Wireless wall switch (White color)	1
LRA 1720/01	OccuSwitch Wireless wall switch (Almond color)	1

For complete ordering information, contact your local sales representative.

Dynadimmer™

A simple, easy to install outdoor controller for electronic lighting systems

The Dynadimmer is a stand-alone dimming control with a 0-10 volt dimming output that can be used in combination with a compatible dimmable electronic driver. Easy to install into a luminaire or pole without any need for external control components or additional signal wiring, it is fully flexible and can be reprogrammed at any time to fit new lighting demands if changes are needed.

The Dynadimmer can be configured to dim to any level that the end-user wishes at set periods, with a maximum of five set periods. Both the levels and the time period are configured with an easy-to-use software tool, which also calculates and displays the energy savings that may be obtained from a particular dimming schedule.

The designed configuration is then loaded into a standard personal computer that will be used later to program the Dynadimmer via a USB cable. This configuration can be modified at any time by downloading a new dimming schedule to adapt the lighting to a new situation or simply fine-tune the savings.

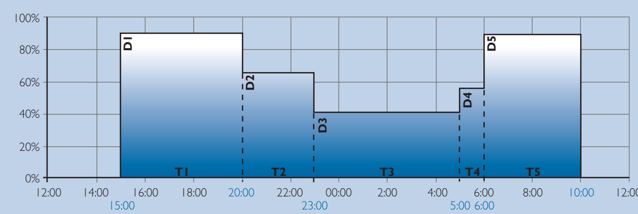
The five time periods and five dim levels guarantee an optimal schedule whether the application is an industrial area, parking lot, residential area or road. The Dynadimmer can help to meet certain road/area-lighting requirements and standards, which entail the introduction of illumination levels that take account of road use and/or traffic flows.

Energy savings and reduced light nuisance through dimming

Small size that can fit within almost any luminaire

Easy-to-use software that can provide a forecast of energy savings

Energy savings may be are maximized with the Dynadimmer. The fact that any level can be configured at any time makes very low levels late at night possible, high levels at peak times (though not necessarily 100%) and medium levels during the transitional periods. For example, a dimming schedule like the one shown in the picture projects an overall yearly energy saving of 40%.



Avaialble in Q2, 2010 – Contact your local sales rep or agent for more details.

Controls

CONTROLS

Chronosense™

A simple, easy to install outdoor controller for magnetic lighting systems

The Chronosense is a stand-alone dimming control with a 1-step dim control output that can be used in combination with one multi-wattage electro-magnetic ballast or additional dim ballast. Easy to install into a luminaire or pole without any need for external control components or additional signal wiring, it is fully flexible and can be reprogrammed at any time to fit new lighting demands if changes are needed.

The time period for which the Chronosense applies the 1-step dimming can easily be changed by means of dipswitches in the unit and can be modified at any time in the future. To calculate the hours for which it should operate, Chronosense counts the time that the lights were turned on and determines a mid-point, which is used as an intelligent reference point.

The Chronosense comes ready to operate with a factory pre-set value of a 6-hour dimming period. The six-position dipswitch sets both mode of operation (test/normal) and the appropriate dimming period. Switches 1-3 set the dim hours before the midpoint of the night, switches 4-5 the dim hours after and the sixth sets the mode of operation.

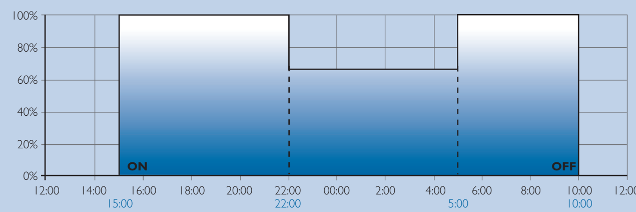
The Chronosense is suitable for new installations as well as retrofit solutions for electro-magnetic controlled luminaires. The flexible dipswitch settings guarantee an optimal schedule whether the application is an industrial area, parking lot or residential area. The Chronosense can help to meet certain Outdoor lighting requirements and standards, which entail the introduction of illumination levels that take account of use and/or traffic flows.

Energy savings and reduced light nuisance through dimming

Easy to install and flexible to reprogram

Suitable for new installations as well as retrofit

The energy savings with Chronosense are determined by the ballast combination used. A typical configuration with a multi-wattage 100/150W ballast projects an overall yearly energy saving of 20%. The ballast determines the dim level, but using the combination with the multi-wattage 100/150W it is usually about 65% of full power (as shown in the picture).



Avaialble in Q2, 2010 – Contact your local sales rep or agent.

Controls

Notes

Centium®

Optanium®

SmartMate®

Mark 10® *Powerline*

EssentiLine™ 0-10V

Mark III®

e-Vision®

CosmoPolis™

MasterColor CDM™ Elite MV

Core & Coil

F-Can Ballasts

Encapsulated Core & Coil

AmbiStar™

LED Drivers for
Luxeon Brand LEDs

ActiLume™

OccuSwitch™

REFERENCE MATERIALS

Contents

Corporate Offices
(800) 322-2086

Customer Support/Technical Service
(800) 372-3331 • (+) 1 847 390-5000 (International)

Visit our web site at www.philips.com/advance

Philips Lighting Electronics N.A. Lamp Ballast Limited Warranty

Philips Lighting Electronics N.A., 10275 W. Higgins Road, Rosemont, IL 60018
warrants that its lamp ballasts will be free from defects in material
and workmanship from the date of manufacture by
Philips Lighting Electronics for specific time periods.

Ballast warranty depends upon ballast type, product family and maximum case temperature.
Please go to our web site for up-to-date warranty information.

www.philips.com/advancewarranty

Limited Warranty Terms and Conditions

This limited warranty is conditioned upon proper storage, installation, use and maintenance. This warranty is not applicable to any ballast which is not installed and operated in accordance with the current edition of The National Electric Code (NEC), the Standards for Safety of Underwriters' Laboratory, Inc. (UL), the Standards for the American National Standards Institute (ANSI), and with Philips Lighting Electronics' instructions and guidelines for the ballast.

This warranty is not applicable to any ballast which is installed with lamps not meeting ANSI requirements unless the ballast is designed to operate a specific non-ANSI lamp and marked accordingly. This warranty is not applicable to any ballast subjected to abnormal stresses and operating conditions.

Philips Lighting Electronics N.A. shall correct any defects, at Philips Lighting Electronics' option, by either repairing any defective part or parts or by replacing any defective part or parts or by making available a new replacement ballast.

The conditions of any tests concerning any ballast which is claimed to have not performed to this warranty shall be mutually agreed upon in writing and Philips Lighting Electronics shall be notified of, and may be represented at any such tests. This express limited warranty is extended by Philips Lighting Electronics only to the original or first end-user purchaser.

Warranty claims are to be made in accordance with Philips Lighting Electronics' published Warranty Service Program.

NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY BEYOND THE AFOREMENTIONED WARRANTY PERIOD. The foregoing warranty is exclusive of all other statutory, written or oral warranties, and no other warranties of any kind, statutory or otherwise, are given or herein expressed. This warranty sets forth Philips Lighting Electronics' responsibilities regarding the ballast and claimant's exclusive remedy.

LIMITATION OF LIABILITY. Philips Lighting Electronics N.A. will not under any circumstances whether as a result of breach of contract, breach of warranty, tort, strict liability or otherwise be liable for consequential, incidental, special or exemplary damages including but not limited to, loss of profits or revenues, loss of use of ballast or any other goods or associated equipment or damage to any associated equipment, cost of capital, cost of substitute products, facilities of services, down time cost, or claims of claimant's customers.

Philips Lighting Electronics' liability on any claim of any kind for any loss or damages arising out of, resulting from or concerning any aspect of this agreement of from the product or services furnished hereunder shall not exceed the price of the specific ballast or ballasts to the claim. This warranty gives the claimant specific legal rights. The claimant may also have other rights which vary from state to state.

5-Tap - An HID ballast that allows for a choice of five different input voltages

AC (Alternating Current) - The common form of electricity from power plant to home/office. Its direction is reversed 60 times per second in the U.S.; 50 times in Europe

AlInGaP - The preferred LED (Light Emitting Diode) chip technology containing Aluminum, Indium, Gallium, and Phosphorous to produce red, orange and amber-colors.

Ambient Sound Levels - "Background noise" generated by electrical equipment operating in a building.

Ambient Temperature - Temperature of the atmosphere of the surrounding environment.

Ampere ("Amp") - A measure of electrical current

ANSI (American National Standards Institute) - Group that generates voluntary product performance standards for many U.S. industries.

ANSI Watts - System wattage as measured utilizing a reference ballast and lamps on a bench top in open air as prescribed by ANSI C82.2

Anti-Arc Circuit - Circuitry used to detect and limit arcing of ballast output leads

Anti-Striation Circuit - Circuitry used to dectect and reduce striations or spiraling in energy saving lamps due to low temperature or low current operation

Arc (Lamp) - Intense luminous discharge formed by the passage of electric current across a space between electrodes.

Auto-Restrike - Circuitry used to restart the lamps without resetting the power to the ballast

Autotransformer - Tapped winding transformer that changes the voltage available to the voltage required by a particular load

Ballast - Device for starting and regulating fluorescent and high intensity discharge lamps.

Ballast Cycling - Undesirable condition under which the ballast turns lamps on and off (cycles) due to the overheating of the thermal switch inside the ballast. This may be due to incorrect lamps, improper voltage being supplied, high ambient temperature around the fixture, or the early stage of ballast failure.

Ballast Efficacy Factor (BEF) - Measure used to compare various lighting systems based upon light output and power input. Higher BEF is favorable. BEF = Ballast Factor x 100 / Input Watts

Ballast Factor - Measure of light output from lamp operated by commercial ballast, as compared to a laboratory standard reference ballast.

Ballast Losses - Power that is supplied to the ballast but is not converted into light energy.

Ballast Noise "Hum" - Sound made by operating Core & Coil assemblies in both electromagnetic and electronic ballasts, generated by the vibration of laminations in the electromagnetic field that transforms the voltage and current used by discharge lamps. The sound made by high frequency electronic ballasts is lower and any noise made by models with electronic power factor correction circuits is inaudible.

Ballast Regulation - The ability of a ballast to control lamp wattage (and therefore light output) when subject to changes in line voltage.

Bin - In LED's, the systematic dividing of distribution of performance parameters (Flux, Color or CCT, and Vf) in to smaller groups that meet aesthetic requirements of the assembly.

Binning - The separation of LEDs subsequent to a production run for full manufactured, distribution in terms of clor, flux and forward voltage.

Canadian Energy Standards - Indicates the ballast complies with the Canadian Energy Standards and meets the requirements of CAN/CSA-C654-M91

Canadian Standards Association (CSA) - Association that generates product performance and safety standards for many Canadian industries.

Capacitor - Device in ballast that stores electrical energy.

Centigrade (C) - Celsius temperature scale where 0°C = 32°F and 100°C = 212°F.

Chip - A very small square of semi-conducting material. Also known as a die, it is the active light-emitting component of an LED.

Circle E - Marking on ballast that shows compliance with Federal Ballast Energy Law (Public Law 100-357)

Coil - Windings of copper or aluminum wire surrounding a core in ballast.

Conformal Coating - Material that surrounds and adheres to components and protects them.

Constant Wattage Autotransformer (CWA) - An HID ballast in which the primary and secondary coils are electrically connected.

Core - Component of electromagnetic ballast that is surrounded by the coil and comprised of steel laminations or solid ferrite material.

Core & Coil Ballast - Another term for electromagnetic ballast.

Crest Factor - Ratio of peak lamp current to RMS (average) lamp current.

CSA E - Marking on ballast that shows compliance with Canadian Ballast Energy Law.

Cycling - See 'Ballast Cycling'

DC forward current - Continuous direct current applied which is constant over time.

Decibel (dB) - Unit of measurement of the volume of sounds

Die - Chip: heart of the LED

Digital Addressable Lighting Interface (DALI) - An industry standard digital protocol that allows components from different manufacturers (ballasts, sensors, controllers, etc.) to be mixed together seamlessly into complete systems.

Diode - A two-electrode device with an anode and a cathode that passes current in only one direction. It may be designed as an electron tube or as a semiconductor device.

Direct Current (DC) - An electrical current flowing steadily in one direction only.

Discharge Lamp - A light producing device that depends on an electric arc, rather than a filament, to create illumination.

Driver - Electronics used to power illumination sources. Ballast.

Efficacy - See 'System Efficacy'

Electrode - See 'Filament'

Electromagnetic Ballast - A low frequency (50 - 60 Hz.) ballast that uses a "Core & Coil" assembly to transform electrical energy (voltage and current) to start and operate fluorescent and high intensity discharge (HID) lamps.

Electromagnetic Interference(EMI) - Electrical interference (noise) generated by electrical and electronic devices. Levels generated by high frequency electronic devices are subject to regulation by the Federal Communications Commission (FCC). Two classifications exist Non-Consumer (also referred to as Class A or Commercial) and Consumer (also referred to as Class B or Residential).

Electronic Ballast - A ballast that, with the aid of electronic components converts 60 Hz. input voltage and current to high frequency (20 kHz to 60 kHz.) to operate fluorescent and high intensity discharge (HID) lamps.

Electronic Component - A device or part employed in an electronic circuit to obtain some desired electronic action.

Energy - Work done by an electrical system measured in watts.

EOL Protection Circuit - For all T5 and smaller lamps, operating parameters within the ballast that, when exceeded, will shutdown the ballast

ETL - Independent electrical testing laboratory, which performs ballast testing.

Federal Communication Commission (FCC) - The U.S. federal agency that is charged with regulating electrical interference emissions of the electromagnetic spectrum. The regulation entitled, "Part 18" deals with electromagnetic interference (EMI) from all lighting devices operating at frequencies higher than 9 kilohertz (kHz).

Feedback Signal - A control signal which regulates power through the LED driver to produce various effects in LEDs.

Filament - Coated coil of special wire that emits electrons or light when heated.

Filament Voltage - Voltage applied to heat the lamp filament coil.

Fluorescent Lamp - Gas filled lamp in which light is produced by the interaction of an arc with phosphors lining the lamp's glass tube.

Forward Current - Current through a diode in the direction of its greatest conduction.

Forward Voltage (VF) - The voltage across a diode for a given forward current.

Frequency - Rate of alteration in an AC current. Expressed in cycles per second or Hertz (Hz).

Fundamental Frequency - Lowest frequency in a complex waveform. Also known as first harmonic

Harmonic Distortion - A measurement of the magnitude of voltage and current harmonics as compared with the amplitude of the fundamental frequency. Harmonic distortion can be generated by a load and fed back into the AC mains, causing distortion of the sinusoidal waveform.

Harmonics - Refers to components of the overall frequency, an integral multiple of the fundamental sinewave frequency.

Hertz (Hz) - Unit used to measure frequency (cycles per second) of alternating current or voltage.

High Frequency Electronic Ballast - In this book, refers to the operation of electronic ballasts as frequencies > 20,000 Hertz (20 kHz)

High Intensity Discharge (HID) Lamp - A discharge lamp containing an arc tube in which the active elements within (mercury, sodium, etc.) becomes vaporized (a gaseous state) within the electric arc stream to produce light.

High Light Output - Ballast with a nominal ballast factor of 1.18

High Power Factor Ballast - A ballast in which the power factor is greater than 0.9 (90%). These ballasts require less line current than normal power factor ballast.

High Reactance Autotransformer Ballast (HX) - HID ballast used when the input voltage does not meet the starting voltage requirement for a lamp. The ballast will transform the input voltage to the required level.

Hot Restart Time - The time it takes a HID lamp to restart and reach 90% of its light output after going from on to off to on. Typical restart times are 1 to 2 minutes for HPS and 5 to 20 minutes for Metal Halide.

IEC (International Electrotechnical Commission) - Organization made up of national committees from over 60 countries that sets international electrical and electronics standards

IEEE (Institute of electrical and Electronics Engineers)- Organization of engineers that establishes standards for electrical and electronics industries.

Ignitor (Starter) - A device used within the ballast circuit to generate high voltage electrical pulses needed to start high pressure sodium and some metal halide lamps

Illuminating Engineering Society (IES) - Recognized technical authority on the advancement of the art and science of illumination and its dissemination.

InGaN - The preferred LED (Light Emitting Diode) semiconductor technology containing Indium, Gallium, and Nitrogen to produce green, blue and white-colored LED light sources.

Input Power - See Input Watts

Input Voltage - Voltage, provided by a power line or power supply, to the ballast or driver.

Input Watts - Total power input to the ballast that includes lamp watts and ballast losses.

Inrush Current - Initial surge of current when an electrical device is turned on.

Instant Start Ballast - Electromagnetic or electronic lighting circuit without lamp filament heating that produces instant light.

IntelliVolt - Multi-voltage feature of Philips Advance electronic ballasts that allow the ballast to operate from a nominal input voltage range of 120 - 277V at nominal frequencies of 50 or 60 Hz.

Kilohertz (kHz) - One thousand Hertz (cycles per second).

Laminations - Layers of steel, making up the ballast "core" that is surrounded by the coils in a core & coil ballast.

Lamp - The lighting industry term for light bulb. It refers to the complete assembly including the internal parts as well as the outer bulb or tube and base(s).

Lamp Current - The current delivered to the lamp by the ballast to generate light.

Lamp Current Crest Factor - See "Crest Factor."

Lamp Watts (Rated) - The power consumed by the lamp to generate light.

Lead-Lag Slimline Ballast - Ballast that operate fluorescent lamps independently of one another. Can start lamps at 0°F.

LED Driver - See 'Driver'

Light - Radiant energy that can be sensed or seen by the human eye. Visible light is measured in lumens.

Light Emitting Diode (LED) - A solid-state semiconductor device that converts electrical energy directly into light. On its most basic level, the semiconductor is comprised of two regions. The p-region contains positive electrical charges while the n-region contains negative electrical charges. When voltage is applied and current begins to flow, the electrons move across the n region into the p region. The process of an electron moving through the p-n junction releases energy. The dispersion of this energy produces photons with visible wavelengths.

Line Current - See Ampere

Low Power Factor - See 'Normal Power Factor'

Low Voltage Control - DC voltage used for signaling purposes

Low Watt - Ballast with a nominal ballast factor of 0.78 or less

Lumens - Measurement of light emitted by a lighted lamp.

Luminaire - A complete lighting fixture consisting of a lamp (or lamps), ballast(or ballasts) as required, together with the parts designed to distribute the light, position and protect the lamp, and connect them to the incoming power.

National Electric Code (NEC) - A nationally accepted electrical installation code developed by the National Fire Protection Association to reduce the risk of fire.

National Electrical Manufacturers Association (NEMA) - U.S. based association that sets many common standards used in electrical products

NOM (Normas Oficial Mexicana) - Laboratory that sets safety standards for building materials, electrical appliances and other products for Mexico.

Normal Light Output - Ballast with a nominal ballast factor of 0.88 for most T8 ballasts, and 1.00 for most T5 and dimming ballasts.

Normal Power Factor - Ballast in which the power factor is less than 0.80 (80%). These ballasts require about twice the line current of high power factor ballasts.

Open Circuit Voltage [OCV] - Voltage, as measured at the lamp socket (HID or CFL) or across the lamp holders (fluorescent) when the lamp is not present, generated by the ballast needed to start a lamp when power is turned on.

Operating Position or Burn Position - The orientation of an HID lamp in a lighting fixture such as base up, base down, horizontal, or universal.

Packaged LED - Consists of the die, a lead frame, which houses the die, the encapsulation epoxy that protectively surrounds the die, and also disperses the light.

Parallel (LED) - Electrical condition where LEDs operate under the same voltage being provided by a driver.

Parallel Circuit - Ballast circuit in which the lamps connected to one ballast operate independently of one another - if one lamp fails, the rest remain lit.

PCB (Polychlorinated Biphenyls) - An organic compound that was used in ballasts manufactured prior to 1979. The ballast industry transitioned to non-PCB capacitors during 1979, as a result of EPA directions.

Potting - Compound used to completely surround and cover components of some magnetic and electronic ballasts in order to protect components, dampen sound, and dissipate heat.

Power - The amount of energy consumed or needed by a device (ballast, lamp, or ballast plus lamp) to perform its function. Power is measured in watts.

Power Factor (PF) - A measurement of how efficiently an electrical device uses power supplied by the power line. PF = Watts / (Volts x Amps).

Power Factor Corrected (PFC) - Ballast with a power factor from 0.80 to 0.89

Powerline Control - Method of dimming control where the phase of the sine wave is 'chopped' to dim the lamps.

Preheat Ballast - Electromagnetic ballast that requires a separate starter in order to ignite the lamp

Probe Start - Method of starting mercury vapor and specific metal halide lamps in which an additional electrode at one end of the arc tube assists in lamp starting.

Programmed Start Ballast - An electronic lighting circuit similar to rapid start that provides precise heating of the lamp filaments and tightly controls the preheat duration before applying starting voltage to ignite the lamp.

Pulse Start - Method of starting high pressure sodium and specific metal halide lamps in which a high voltage starting pulse starts the lamps

Quadri-Volt (Quad-Tap) - Feature within a ballast which gives you a choice of 4 different input voltages

Rank - See 'Bin'

Rapid Start Ballast - Electromagnetic or electronic ballast that provides both filament heating and starting voltage to the lamp at the same time in order to ignite the lamp.

Reference Ballast (standard reactor) - Laboratory device used to provide ANSI specified measurements of initial and mean lamp lumens.

Regulation, Lamp Wattage - The measure of the ability of a ballast or ballast circuit type to control (regulate) a lamp's operating wattage as the input voltage varies from nominal. It is the ratio of the percent change in line voltage (input voltage) divided by the resultant percent change in lamp wattage

Reverse Current - Current flowing through a diode in the direction opposite to the direction of maximum conduction

Reverse Voltage - Volatge across the diode for a given reverse current.
RFI (Radio Frequency Interference) - Form of electromagnetic interference.

Series (LED) - Electrical condition where LEDS operate under the same current being provided by a driver.

Series Circuit - Ballast circuit in which the lamps connected to one ballast operate as a group. If one lamp fails or is removed, then all lamps in the circuit turn off

Series-Sequence Slimline Ballast - Ballasts that operate with lamps starting in sequence.

Series-Parallel Circuit - Ballast circuit in which the lamps connected to one ballast operate both as a group and independently. If one lamp fails or is removed in the series connected section, then all lamps in that section will turn off, but the lamps in the parallel circuit remain on.

Sine Wave - A mathematical function used to represent voltage and current.

Sound Rating - Classification given to a ballast based upon ballast noise.

Starting Temperature - The minimum ambient temperature at which the lamp will start. Light output may be affected due to lamp characteristics.

Striation - Spiraling or swirling of fluorescent lamps at initial turn on mostly with energy-saving lamps at low temperature or low current.

System Efficacy - Overall efficiency of the lamp/ballast system. System efficacy = total lamp lumens/system wattage

Thermal Protector - A self-resetting switch that disconnects power to the ballast if internal temperatures rise above the trip point (typically 105°C)

Third Harmonic - Third multiple of the fundamental frequency that will add in the neutral wire of a three phase, 4 wire, Wye system and will cause over heating of the neutral wire should it exceed 33 1/3 percent.

Three-Phase, Four-Wire Wye - Most popular electrical wiring system used today for commercial building

Total Harmonic Current (THC) - The combined effect of all of the harmonic distortion on the AC waveform produced by a ballast or other device. Excessive levels of THC can create large currents on the neutral line of a 3 phase 4 wire wye power system. See Harmonic Distortion.

Total Harmonic Distortion (THD) - Total Harmonic Current (THC) expressed as a percentage.

Transients - High voltage and resultant high current surges through an electrical system caused by lightning strikes to nearby transformers, overhead lines or the ground. May also be caused by switching of large motors or other electrical loads, as well as by short circuits or utility system switching. Can lead to premature failure of ballasts or other electrical devices.

Trigger Start Ballast - Electromagnetic ballast that starts and operates preheat lamps similar to a rapid start lamp. No separate starter is needed to ignite the lamp.

UL (Underwriters' Laboratories, Inc.) - A not for profit organization in the US that generates product performance and safety standards for electrical equipment, building materials, and other products. End use products such as lighting fixtures, fully encased ballasts, and home appliances are examples of UL Listed products and bear the UL logo. Components such as HID open core & coil ballasts, electrical insulating materials are UL Component Recognized products and bear the UL Component Recognition logo

UR (UL Recognized) - A part or subassembly covered under UL's Recognition Service and intended for factory installation in UL certified products. They are intended for use as components of complete equipment submitted for investigation by UL.

Voltage - A measurement of the electromotive force (electrical pressure) in an electrical circuit or device expressed in volts. Voltage can be thought of as being analogous to the pressure in a plumbing system.

Voltage Sag - Drop in voltage levels of electrical distribution system that interferes with the operation of electrical and electronic equipment. Commonly called "Brownout". Results when demand for electricity exceeds capacity of the distribution system.

Watt - The unit of measurement of electrical power.
Watts = Volts x Amps x Power Factor

Ballast Specification for Lighting

Electronic Fluorescent

- Standard
- Centium® Micro Can
- Centium T5
- Centium T8, T12 and FT5
- Optanium®
- Mark 5™
- SmartMate®
- AmbiStar™
- PowrKut®
- PureVOLT™
- Optanium® Step-Dim
- EssentiaLine™
- Mark 7® 0-10V
- Mark 10® Powerline
- ROVR™

Magnetic HID (Including Metal Halide, High Pressure Sodium, Low Pressure Sodium and Mercury Vapor)

Electronic HID (Metal Halide)

- e-Vision®
- DynaVision®

Xitanium™ LED Drivers

Electronic Fluorescent

Ballast Specification for Electronic Fluorescent

Standard

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be __________ (Instant or Rapid) Start.

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.4 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 20 kHz and 30 kHz or above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% for Standard models and THD of less than 10% for Centium models when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.

2.11 Ballast shall have a minimum starting temperature of _______ [-18C (0F) for standard T8 lamps, 10C (50F) for T8/HO, standard T12, Slimline T12 and Long Twin Tube lamps, 0C (32F) for Slimline T8, -29C (-20F) for T12/HO lamps,] for primary lamp application. Ballast shall have a minimum starting temperature of 60F (16C) for energy-saving T8 and T12 lamps.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

Centium® Micro Can

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Instant Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18C (0F) for standard T8 lamps and 16C (60F) for energy-saving T8 lamps.

2.11 Ballast shall provide Lamp EOL Protection Circuit.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

Centium® T5

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads or poke-in wire trap connectors color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of ___________ (120V through 277V or 347V through 480V) with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp application.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of _______ {-18C (0F) or -28C (-20F)} for primary lamp. Consult lamp manufacturer for temperature versus light output characteristics.

2.11 Ballast shall provide Lamp EOL Protection Circuit.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.13 Four lamp ballast shall have (semi-independent or independent) lamp operation

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating.

3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Electronic Fluorescent

Centium® T8, T12 & FT5

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be _________ (Instant, Rapid or Programmed).

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballats allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power (except for T8/HO ballasts).

2.4 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency). IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz ("GCN" models between 20kHz and 30kHz) to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating.

2.11 Ballast shall have a minimum starting temperature of _______ [-18C (0F) for standard T8 and Long Twin Tube lamps, 10C (50F) for standard T12 lamps, 0C (32F) for Slimline T8 lamps and "GCN" models, -29C (-20F) for T8/HO lamps] for primary lamp application. Ballast shall have a minimum starting temperature of 16C (60F) for energy-saving T8 and T12 lamps.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.13 Ballast for FT5 lamps shall provide Lamp EOL Protection Circuit.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

Optanium®

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be _________ (Instant or Programmed) Start.

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start and Programmed Start Parallel ballats allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency). GOPA ballasts shall operate from an input source of 347V.

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.

2.6 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.7 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.77 for Low Watt, 0.87 for Normal Light Output, and 1.18 for High Light for Instant Start ballasts or 0.71 for Low Watt and 0.88 for Normal Light Output for Programmed Start ballasts.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating for all 4-foot lamps and smaller.

2.11 Ballast shall have a minimum starting temperature of -29C (-20F) on Instant Start ballasts or -18C (0F) on Programmed Start ballasts for standard T8 lamps and 16C (60F) for energy-saving T8 lamps. Consult lamp manufacturer for temperature versus light output characteristics.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.13 Ballast shall have lamp striation-reduction circuitry.

2.14 Programmed Start ballast shall provide lamp EOL protection circuitry.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall meet NEMA/CEE High Performance T8 Lighting System Specifications.

3.7 IOP ballasts shall comply with UL Type CC rating.

3.8 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

Mark 5™

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of 90V – 305V.

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor for primary lamp application as follows: 0.75 for Low Watt, 0.85 for Normal Light Output, and 1.20 for High Light.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.5 or less for primary lamp and 1.6 or less for all others.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18C (0F) for standard T8 lamps and 16C (60F) for energy-saving T8 lamps.

2.11 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.12 Ballast shall provide lamp EOL protection circuitry.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

SmartMate®

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

1.3 Ballast shall be provided with poke-in wire trap connectors color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start except for ballasts with -QS suffix, which shall be Rapid Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 1.00 for primary lamp.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18C (0F) for primary lamp. Ballasts for PL-H lamps shall have a minimum starting temperature of -30C (-22F) for primary lamp.

2.11 Ballast shall provide Lamp EOL Protection Circuit.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall be rated for use in air-handling spaces.

3.4 Ballast shall comply with ANSI C62.41 Category A for transient protection.

3.5 Ballast shall comply with ANSI C82.11 where applicable.

3.6 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Electronic Fluorescent

AmbiStar™

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads or poke-in wire trap connectors color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be ________ (Instant or Rapid) Start.

2.2 Ballast shall provide Independent Lamp Operation (ILO) for Instant Start ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power

2.4 Ballast shall operate from 60 Hz input source of 120V with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor for primary lamp as follows: greater than 0.98 for RCF and RELB models or greater than 0.50 for REB and RMB models.

2.7 Fixed Output Ballast shall have a minimum ballast factor of 0.85 for primary lamp.

2.8 Dimming Ballast shall have a minimum ballast factor of 0.85 at maximum light output and 0.15 at minimum light output for primary lamp.

2.9 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.10 Ballast input current shall have Total Harmonic Distortion (THD) when operated at nominal line voltage with primary lamp as follows: less than 10% for RCF models, less than 20% for RELB models or less than 150% for REB and RMB models.

2.11 Ballast shall have a Class A sound rating.

2.12 Ballast shall have a minimum starting temperature for primary lamp as follows: 0°F/-18°C for RCF, REB and RMB models, 50°F/10°C for Dimming Ballasts or 50°F/10°C for standard T12 lamps and 60°F/16°C for energy-saving T12 lamps.

2.13 Ballast shall provide Lamp EOL Protection Circuit for CFL and T5 lamps.

2.14 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.15 Dimming Ballast shall ignite the lamps at any light output setting without first going to another output setting.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast for CFL lamps shall be rated for use in air-handling spaces.

3.4 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.5 Ballast shall comply with ANSI C82.11 where applicable.

3.6 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

PowrKut®

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Rapid Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall operate lamps at a frequency of 60 Hz.

2.5 Ballast shall have a Power Factor greater than 0.90 for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 0.85 for primary lamp

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% when operated at nominal line voltage with primary lamp.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.

2.11 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Note: Energy saving T8 lamps (25W, 28W or 30W) may experience lamp striations if operated on ballasts not rated for their use. See pages 1-49 to 1-56 for recommended ballasts.

Ballast Specification for Electronic Fluorescent

PureVOLT™

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.96 for primary lamp.

2.6 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.7 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.8 Ballast shall have a Class A sound rating.

2.9 Ballast shall have a minimum starting temperature of -18C (0F) for primary lamp.

2.10 Ballast shall provide Lamp EOL Protection Circuit.

2.11 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall be rated for use in air-handling spaces.

3.4 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.5 Ballast shall comply with ANSI C82.11 where applicable.

3.6 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Controllable Light Output Electronic Fluorescent

Optanium® Step-Dim

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency between 42 kHz and 52 KHz to avoid interference with infrared devices eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.

2.5 Ballast shall have a Power Factor greater than 0.98 at 100% power and greater than 0.90 at 50% power.

2.6 Ballast shall have a ballast factor of 0.95 or 1.15 depending on model.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage and 100% power.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of 0C (32F). Consult lamp manufacturer for temperature versus light output characteristics.

2.11 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.12 Ballast shall provide lamp EOL protection circuitry.

2.13 Ballast shall control lamp light output in two steps - 100% power and 50% power. Control shall be from any device that switches the input mains. Both input mains must be on the same phase for proper operation.

2.14 Ballast shall ignite the lamps at any light output setting without first going to another output setting.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with UL Type CC rating.

3.7 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Controllable Light Output Electronic Fluorescent

EssentiaLine™ 0-10V

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be provided in an all metal housing to meet all plenum requirements.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall be provided with integral protection circuitry to withstand connection of low voltage control leads to mains power supply. In this event, ballast shall default to maximum light output.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.4 Ballast shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps above 42kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 at full light output, and greater than 0.90 throughout the dimming range for the primary lamp.

2.7 Ballast shall have Ballast Factor of 0.88 at full light output and 0.20 at minimum light output for the primary lamp.

2.8 Ballast shall provide for a Lamp Current Crest factor of 1.7 or less throughout the dimming range in accordance with lamp manufacturer's recommendations.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of 10°C (50°F) for primary lamp.

2.11 Ballast shall start the lamps at any selected light output setting without first going to any other light output setting.

2.12 Ballast input current shall have Total Harmonic Distortion (THD) of less than 20% at maximum light output when operated at nominal line voltage with primary lamp.

2.13 Ballast shall tolerate sustained open circuit or momentary short circuit output conditions.

2.14 Ballast shall properly start lamps in the event lamps are replaced with ballast energized.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall be RoHS compliant.

3.7 Ballast shall meet the requirements of California Title 24 Energy Efficient Standards for Residential and Non-residential Buildings and NEMA Premium.

3.8 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be controlled by a Class 1 or Class 2 low voltage 0-10VDC controller.

Ballast Specification for Controllable Light Output Electronic Fluorescent

Mark 7® 0-10V

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

1.3 Ballast shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall be provided with integral protection circuitry to withstand connection of low voltage control leads to mains power supply. In this event, ballast shall default to maximum light output.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.4 Ballast shall operate from 50/60 Hz input source of 120V or 277V with sustained variations of +/- 10% (voltage and frequency). IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 at full light output and greater than 0.90 throughout the dimming range for primary lamp.

2.7 Ballast shall have a minimum ballast factor of 1.00 (1-3 lamp models) or 0.88 (4-lamp models with 1.18 for HL version) at maximum light output and 0.03 at minimum light output for primary lamp.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage and 100% power.

2.10 Ballast shall have a Class A sound rating.

2.11 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.

2.12 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/HO, and CFL lamps.

2.13 Ballast shall control lamp light output from 100% - 3% relative light output for series operation T8 and CFL lamps, 100%-10% relative light output for parallel operation T8, and 100% - 1% relative light output for T5/HO lamps.

2.14 Ballast shall ignite the lamps at any light output setting without first going to another output setting.

2.15 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.16 For parallel operation ballasts, lamps shall be switched off when ballast receives a control signal ≤0.4VDC and restrike when ballast receives a signal ≥1.0VDC.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be controlled by a Class 1 or Class 2 low voltage 0-10VDC controller.

4.5 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Controllable Light Output Electronic Fluorescent

Mark 10® Powerline

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

1.3 Ballast shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.3 Ballast shall operate from 60 Hz input source of 120V, 277V or 347V as applicable with sustained variations of +/- 10% (voltage and frequency).

2.4 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.5 Ballast shall have a Power Factor greater than 0.98 at full light output and greater than 0.90 throughout the dimming range for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 1.00 at maximum light output and 0.05 at minimum light output for primary lamp.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% at maximum light output when operated at nominal line voltage with primary lamp. Total Harmonic Current (THC) at minimum light output shall not exceed THC at maximum light output.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.

2.11 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/HO, and CFL lamps.

2.12 Ballast shall control lamp light output from 100% - 3% relative light output for T8 and CFL lamps and 100% - 1% relative light output for T5/HO lamps.

2.13 Ballast shall ignite the lamps at any light output setting without first going to another output setting.

2.14 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be controlled by a compatible Mark 10 Powerline two-wire dimmer.

4.5 Ballast shall be Philips Advance part # __________ or approved equal.

Ballast Specification for Controllable Light Output Electronic Fluorescent

ROVR™

Section I - Physical Characteristics

1.1 Ballast shall be physically interchangeable with standard electromagnetic or standard electronic ballasts, where applicable.

1.2 Ballast shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

1.3 Ballast shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Ballast shall be Programmed Start.

2.2 Ballast shall be provided with integral protection circuitry to withstand connection of low voltage control leads to mains power supply. In this event, ballast shall default to maximum light output.

2.3 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.4 Ballast shall operate from 50/60 Hz input source of 120V or 277V with sustained variations of +/- 10% (voltage and frequency). IntelliVolt models shall operate from 50/60 Hz input source of 120V through 277V with sustained variations of +/- 10% (voltage and frequency).

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency above 42 kHz to avoid interference with infrared devices and eliminate visible flicker.

2.6 Ballast shall have a Power Factor greater than 0.98 at full light output and greater than 0.90 throughout the dimming range for primary lamp.

2.7 Ballast shall have a minimum ballast factor of 1.00 at maximum light output and 0.03 at minimum light output for primary lamp.

2.8 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less.

2.9 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at nominal line voltage with primary lamp.

2.10 Ballast shall have a Class A sound rating.

2.11 Ballast shall have a minimum starting temperature of 10C (50F) for primary lamp.

2.12 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/HO, and CFL lamps.

2.13 Ballast shall control lamp light output from 100% - 3% relative light output for T8 and CFL lamps and 100% - 1% relative light output for T5/HO lamps.

2.14 Ballast shall ignite the lamps at any light output setting without first going to another output setting.

2.15 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory Requirements

3.1 Ballast shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Ballast shall be Underwriters Laboratories (UL) listed, Class P and Type 1 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Ballast shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Ballast shall comply with ANSI C82.11 where applicable.

3.5 Ballast shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

3.6 Ballast shall comply with NEMA 410 for in-rush current limits.

Section IV - Other

4.1 Ballast shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Ballast shall carry a ______ limited warranty from date of manufacture against defects in material or workmanship for operation at a maximum case temperature of ______ (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Ballast shall be controlled by a compatible DALI protocol control.

4.5 Ballast shall be Philips Advance part # __________ or approved equal.

Magnetic HID

Ballast Specification for Magnetic HID Ballasts

Metal Halide, High Pressure Sodium & Low Pressure Sodium

Performance Requirements:

1. Ballasts shall be designed in accordance with all applicable ANSI specifications including ANSI C82.4.
2. The Core & Coil ballast shall be designed with class "H" (180°C) or higher insulation system and vacuum-pressure impregnated with a silica-filled polyester resin.
3. All coils shall be precision wound.
4. Core & Coil ballasts shall be designed to operate for 60,000 hours of continuous operation at their maximum rated temperature.
5. Core & Coil ballasts and starter combinations shall be designed to provide a reliable lamp starting down to -40°C for High Pressure Sodium and -30°C for Metal Halide at nominal line voltage of plus or minus 10%.
6. All HID ballast shall have a nominal ballast factor of 1.0
7. All HID ballasts shall contain no exposed live parts.

Other Requirements

1. Ballast shall be manufactured in an ISO 9001 and ISO 14001Certified Facility.
2. Ballast shall carry a 2-year limited warranty from date of manufacture against defects in material or workmanship. (Go to our website for up-to-date warranty information: www.philips.com/advance).
3. Manufacturer shall have been manufacturing HID ballasts for at least ten years.
4. All HID ballasts shall be UL component recognized.
5. All HID ballasts shall be CSA certified.
6. Ballast must be a Philips Advance branded ballast (or approved equal).

Capacitors for HID

1. All capacitors will be provided with a self-contained internal bleeder resistor where required according to UL1029.
2. Oil-filled capacitors will be housed in aluminum or corrosion resistant steel cans and contain .25" quick disconnect terminals.
3. Oil filled capacitors shall have a 90°C max case temperature rating.
4. Dry film capacitors shall have a 105°C max. case temperature rating.
5. All dry film capacitors provided by the ballast manufacturer have been tested and approved for use with the manufacturer's ballast.
6. All capacitors rated 400V or less shall be dry film type.
7. All dry film capacitors shall have no exposed live parts.

Ignitors for HID

1. All ignitors will be polyester resin-filled with either a plastic or aluminum external housing.
2. The ignitor shall be so designed to provide six months of lamp open circuit operation without failure.
3. All ignitors shall have a case rating temperature of 105°C.
4. All ignitors shall be designed to withstand 10,000 hours of continuous pulsing.
5. All ignitors shall have no exposed live parts.

HID Retrofit Kits

1. All HID kits shall be precision wound to insure proper insulation.
2. All HID kits shall be pre-wired with ignitors.
3. HID core and coil shall be interchangeable with prior ballast or include mounting bracket to adapt ballast to intended fixture.
4. All HID kits shall be supplied with pre-insulated input voltage leads.
5. All HID kits are to be UL and CSA recognized following the guidelines found in UL 1029 and CAN/CSA-22.2 No. 74-92 (part 2 and 3).
8. The core & coil shall be designed with class "H" (180°C) or higher insulation system and vacuum-pressure impregnated with a silica-filled polyester resin.
9. All capacitors rated 400V or less shall be dry film type rated 105°C.
10. There are to be no exposed live parts on the core & coil, ignitor, or dry capacitor.
11. Must meet all ANSI Specifications for the specified lamp.
12. Kit must include installation instructions and a 1-800# for field assistance.
13. Ballast must be Philips Advance Part #____________ (or approved equal).

Electronic HID (Metal Halide)

Ballast Specification for Electronic Metal Halide

e-Vision™ Electronic Ballast Specifications

Section I - Physical Characteristics

1.1 The electronic ballast shall be furnished with integral, color-coded leads.

Section II - Performance Requirements

2.1 The electronic ballast shall be IntelliVolt® and operate from a nominal line voltage range of 120-277 volts, +/-10%, 50/60 Hz unless stated otherwise.

2.2 The electronic ballast input current shall have Total Harmonic Distortion (THD) of less than 15%.

2.3 The electronic ballast shall have a Power Factor greater than 90%.

2.4 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit.

2.5 The electronic ballast shall be Sound Rated A.

2.6 The electronic ballast output frequency to the lamps shall be less than 200 Hz to prevent acoustic resonance inside the lamp arc tube and to minimize visible flicker.

2.7 The electronic ballast shall provide a "Lamp Current Crest Factor" of less than 1.5.

2.8 The electronic ballast shall be thermally protected to shut off when operating temperatures reach unacceptable levels.

Section III - Regulatory Requirements

3.1 The electronic ballast shall meet the requirements of the Federal Communications Commission rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.2 The electronic ballast shall be Underwriters Laboratories (UL) Listed and CSA Certified where applicable.

Section IV - Other

4.1 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB's).

4.2 Ballast shall carry a 3-year limited warranty from date of manufacture against defects in material or workmanship at marked case temperature or less. (Go to our website for up-to-date warranty information: www.philips.com/advance).

4.3 The manufacturer shall have a twenty-five year history of producing HID lamp ballasts for the North American market.

4.4 The electronic ballast shall be produced in a factory certified to ISO 9001 Quality System Standards

Electronic HID (Metal Halide)

Ballast Specification for Electronic Metal Halide

DynaVision™ Electronic Ballast Specifications

Section I - Physical Characteristics

1.1 The electronic ballast shall be fully enclosed in an aluminum housing painted white.

1.2 The aluminum housing shall include a divided wiring compartment to separate the power leads from the control leads. All leads to be color-coded.

Section II - Performance Requirements

2.1 The electronic ballast shall be multivoltage capable and operate from a line voltage range of 180 – 305 volts, 50/60 Hz.

2.2 The electronic ballast shall incorporate a microprocessor controller to provide for optimum starting and operation of the HID lamp.

2.3 The electronic ballast input current shall have Total Harmonic Distortion (THD) of less than 15% when operated at nominal line voltage (200V, 208V, 230V, 240V, 277V).

2.4 The ballast shall incorporate a 0-10V dimming interface and control the dimming function such that the HID lamp is allowed to warm up for fifteen minutes at full power before the lamp will be allowed to dim, regardless of the level of the 0-10V signal. 10V applied to the dimming control leads, shall result in full light output. 0V applied, or shorting the control leads together, shall result in dimming to 50% of nominal lamp power.

2.5 The ballast shall include a 120V/250W auxiliary output for stand-by incandescent lighting that shall include an integral control to turn the auxiliary lamp on and off. The integral control shall include a time delay feature to keep the auxiliary lamp on until the HID lamp reaches 50% power.

2.6 The electronic ballast shall have a Power Factor greater than 90%.

2.7 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit.

2.8 The electronic ballast shall be Sound Rated A.

2.9 The electronic ballast output frequency to the lamps shall be higher than 100 kHz to prevent acoustic resonance inside the lamp arc tube and to minimize visible flicker.

210 The electronic ballast shall be thermally protected to shut off when operating temperatures reach unacceptable levels.

Section III - Regulatory Requirements

3.1 The electronic ballast shall meet the requirements of the Federal Communications Commission rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

3.2 The electronic ballast shall be Underwriters Laboratories (UL) Listed and CSA Certified where applicable.

Section IV - Other

4.1 The electronic ballast shall not contain Polychlorinated Biphenyl (PCB's).

4.2 The electronic ballast shall carry a three-year limited warranty from the date of manufacture against defects in material or workmanship for operation at an ambient temperature of 55° C or less and when operated as a stand alone product (i.e. remotely from a lighting fixture housing). When operated within a lighting fixture housing, the same three-year limited warranty shall apply for a maximum ballast case hot spot temperature of 76° C or less (Go to our website for up-to-date warranty information: www.philips.com/advance).

4.3 The manufacturer shall have a twenty-five year history of producing HID lamp ballasts for the North American market.

4.4 The electronic ballast shall be produced in a factory certified to ISO 9001 Quality System Standards

Xitanium™ LED Drivers

Ballast Specification Xitanium™ LED Drivers

Xitanium™

Section I - Physical Characteristics

1.1 Driver shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

1.2 Driver shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

Section II - Performance Requirements

2.1 Driver shall operate from 60 Hz input source of 120V with sustained variations of +/- 10% (voltage and frequency) with no damage to the Driver.

2.2 Driver output shall be regulated to +/- 5% across published load range.

2.3 Driver shall operate LEDs at a frequency of 60 Hz.

2.4 Driver shall have a Power Factor greater than 0.90 for primary application.

2.5 Driver input current shall have Total Harmonic Distortion (THD) of less than 20%.

2.6 Driver shall have a Class A sound rating.

2.7 Driver shall have a minimum operating temperature of -40C (-40F).

2.8 Driver shall tolerate sustained open circuit and short circuit output conditions without damage and without need for external fuses or trip devices.

Section III - Regulatory Requirements

3.1 Driver shall not contain any Polychlorinated Biphenyl (PCB).

3.2 Driver shall be Underwriters Laboratories (UL) listed, Class 2 Outdoor; and Canadian Standards Association (CSA) certified where applicable.

3.3 Driver shall comply with ANSI C62.41 Category A for Transient protection.

3.4 Driver shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

Section IV - Other

4.1 Driver shall be manufactured in a factory certified to ISO 9001 Quality System Standards.

4.2 Driver shall carry a five-year limited warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 90C (Go to our web site for up-to-date warranty information: www.philips.com/advancewarranty).

4.3 Manufacturer shall have a twenty-year history of producing electronic ballasts for the North American market.

4.4 Dimmable drivers shall be controlled by a Class 2 low voltage 0-10VDC controller.

4.5 Driver shall be Philips Advance Part #______ or approved equal.

Catalog Number to Page Number *Lead Lengths and Shipping Data*

Catalog Number	See Page No.	Lead Lengths for ballasts purchased in bulk or mid-pack cartons Tolerance: +2", -1"												Shipping Data		
		Black	White	Blue	Red	Yellow	Blue/ White	Black/ White	Yellow/ Blue	Brown	Red/ White	Or- ange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
ASB-0412-12-BL-TP	3-24	18	18	33	33	51								1	12	✓
ASB-0620-24-BL-TP	3-24	24	24	75	46	75	46			46				1	12	✓
ASB-1224-24-BL-TP	3-24	24	24	74	32	70	52			78				1	14	✓
ASB-1240-46-BL-TP	3-24	24	24	50	80	70	50			50		50	50	1	21	✓
ASB-2040-24-BL-TP	3-24	24	24	80	80	72	54			72				1	21	✓
ASB-2432-34-BL-TP	3-24	24	24	72	72	72	72			72				1	18	✓
ASB-2448-46-BL-TP	3-24	24	24	50	50	70	50			50		50	50	1	21	✓
DIM-140-H-TP	3-22		35	35	20			20	20					10	37	
DIM-240-H-TP	3-22	18	34	34	20	20	34		18					6	38	✓
H-1B13-TP-W	3-21		15	15				15						36	36	✓
H-1B9-TP-W	3-21		15	15				15						36	29	✓
H-1Q26-TP-W	3-21		15	15				15						20	46	✓
H-2B13-TP-BLS	3-21	7	7	7										20	36	
H-2B13-TP-W	3-21	15	15	15										20	36	
H-2Q26-TP-BLS	3-21	7	7	7										10	40	
H-2Q26-TP-W	3-21	15	15	15										10	40	
HCN-2S54-90C-WL	1-30, 1-32, 1-33, 1-38, 1-39, 1-40	31	31	28	28	48								12	12	✓
HCN-4S54-90C-2LS-G	1-30, 1-32, 1-33, 1-39, 1-40			54	51	60	42	32		60		42	32	6	18	✓
HM-1P20-TP	3-18		8	10	10			8						10	32	✓
HM-2SP20-TP	3-18	10	10	13	13	16								10	34	✓
GOPA-1P32-LW-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	
GOPA-1P32-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	
GOPA-2P32-LW-SC	1-41, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	
GOPA-2P32-SC	1-41, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	
GOPA-3P32-LW-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	
GOPA-3P32-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	
GOPA-4P32-LW-SC	1-43, 1-44, 1-47, 1-48, 1-50, 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	
GOPA-4P32-SC	1-43, 1-44, 1-47, 1-48, 1-50, 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	
ICF-1D38-H1-LD	1-35, 1-38	No Leads - Poke in Connectors												20	8	
ICF-1H120-M4-LD	1-29	No Leads - Poke in Connectors												16	21	
ICF-2S13-H1-LD	1-23, 1-25, 1-34	No Leads - Poke in Connectors												20	8	
ICF-2S13-H1-LD-K	1-23, 1-25, 1-34	No Leads - Poke in Connectors												20	8	✓
ICF-2S13-M1-BS	1-23, 1-25, 1-34	No Leads - Poke in Connectors												16	6.4	
ICF-2S13-M1-BS-QS	1-23, 1-25	No Leads - Poke in Connectors												16	6.4	
ICF-2S18-H1-LD	1-23, 1-26, 1-34	No Leads - Poke in Connectors												20	8	
ICF-2S18-H1-LD-K	1-23, 1-26, 1-34	No Leads - Poke in Connectors												20	8	✓
ICF-2S18-M1-BS	1-23, 1-26, 1-34	No Leads - Poke in Connectors												16	6.4	
ICF-2S18-M1-BS-QS	1-23, 1-26	No Leads - Poke in Connectors												16	6.4	
ICF-2S26-H1-LD	1-24, 1-27, 1-28, 1-30, 1-34	No Leads - Poke in Connectors												20	8	
ICF-2S26-H1-LD-K	1-24, 1-27, 1-28, 1-30, 1-34	No Leads - Poke in Connectors												20	8	✓
ICF-2S26-M1-BS	1-24, 1-27, 1-28, 1-30, 1-34	No Leads - Poke in Connectors												16	6.4	
ICF-2S26-M1-BS-QS	1-24, 1-27, 1-28	No Leads - Poke in Connectors												16	6.4	
ICF-2S42-M2-BS	1-24, 1-27, 1-28, 1-30, 1-31, 1-35, 1-38	No Leads - Poke in Connectors												16	13	
ICF-2S42-M2-LD	1-24, 1-27, 1-28, 1-30, 1-31, 1-35, 1-38	No Leads - Poke in Connectors												20	16	
ICF-2S42-M2-LD-K	1-24, 1-27, 1-28, 1-30, 1-31, 1-35, 1-38	No Leads - Poke in Connectors												20	16	✓
ICF-2S42-90C-M2-BS	1-24, 1-27, 1-28, 1-30, 1-31, 1-35, 1-38	No Leads - Poke in Connectors												16	13	
ICF-2S42-90C-M2-LD	1-24, 1-27, 1-28, 1-30, 1-31, 1-35, 1-38	No Leads - Poke in Connectors												20	16	
ICF-2S70-M4-LD	1-28	No Leads - Poke in Connectors												20	26	
ICN-132-MC	1-41, 1-45, 1-53, 1-57		25	31	37			25						20	15	✓
ICN-1P32-LW-SC	1-41, 1-45, 1-53, 1-57		25	31	37			25						20	28	✓
ICN-1P32-N	1-41, 1-45, 1-53, 1-57		25	31	37			25						20	28	✓
ICN-2S110-SC	1-68	25	25	46	46	79								20	34	✓
ICN-1S80	1-33, 1-40, 6-6	No Leads - Poke in Connectors												12	12	
ICN-1TTP40-SC	1-31		25	30	30			25						20	28	✓
ICN-2M32-MC	1-42, 1-46, 1-54, 1-58	25	25	31	37									20	15	✓
ICN-2P32-LW-SC	1-41, 1-42, 1-45, 1-46, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	✓
ICN-2P32-N	1-41, 1-42, 1-45, 1-46, 1-53, 1-54, 1-57, 1-61	25	25	31	37									20	28	✓
ICN-2P60-SC	1-67	25	25	46	79									20	28	✓
ICN-2S24	1-30, 1-31, 1-38, 1-39	No Leads - Poke in Connectors												12	12	✓
ICN-2S28		No Leads - Poke in Connectors												12	12	✓
ICN-2S28-N	1-36	23	23	27	27	42								30	30	✓

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** Also includes 36" violet & grey control leads.

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Catalog Number	See Page No.	Lead Lengths for ballasts purchased in bulk or mid-pack cartons Tolerance: +2", -1"												Shipping Data		
		Black	White	Blue	Red	Yellow	Blue/ White	Black/ White	Yellow/ Blue	Brown	Red/ White	Or- ange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
ICN-2S39	1-30, 1-31, 1-38, 1-39	No Leads - Poke in Connectors												12	12	✓
ICN-2S40-N	1-66	25	25	31	31	46								30	30	✓
ICN-2S54	1-30, 1-32, 1-33, 1-38, 1-39, 1-40, 6-6	No Leads - Poke in Connectors												12	12	✓
ICN-2S54-90C	1-30, 1-32, 1-33, 1-38, 1-39, 1-40, 6-6													12	12	✓
ICN-2S54-90C-SC	1-30, 1-32, 1-33, 1-38, 1-39, 1-40		35	35	31	32	52							12	12	✓
ICN-2S86	1-64		22	22	46	46	70							6	25	✓
ICN-3P32-LW-SC	1-42, 1-43, 1-46, 1-47, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
ICN-3P32-SC	1-42, 1-43, 1-46, 1-47, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
ICN-3S14-D	1-37	No Leads - Poke in Connectors												12	12	
ICN-2TTP40-SC	1-31	25	25	30	30									20	28	✓
ICN-4P32-LW-SC	1-43, 44, 47, 48, 55, 56, 59, 60, 62	25	25	31	31	39								20	28	✓
ICN-4P32-SC	1-43, 44, 147, 48, 55, 56, 59, 60, 62	25	25	31	31	39								20	28	✓
ICN-4S54-90C-2LS	1-30, 1-32, 1-39, 1-40	No Leads - Poke in Connectors												12	18	
ICN-4S54-90C-2LS-G	1-30, 1-32, 1-33, 1-39, 1-40, 6-6	32	32	54	51	60	42			60		42		6	18	✓
ICN-3TTP40-SC	1-31	25	25	30	30									20	28	✓
IDA-132-SC	2-23		22	46	26			22						20	15	
IDA-154	2-21, 2-22	No Leads - Poke in Connectors												12	12	
IDA-2S32-SC	2-23	22	22	26	26	46								20	21	
IDA-2S54	2-21, 2-22	No Leads - Poke in Connectors												12	12	
IDA-3S32-G	2-23	22	22	28	54	28	54							6	18	
IDA-4S32	2-23	No Leads - Poke in Connectors												12	12	
IDL-2S26-M5-BS	2-20	No Leads - Poke in Connectors												16	14	
IDL-2S26-M5-LD	2-20	No Leads - Poke in Connectors												20	16	
IDL-2T42-M5-BS	2-20	No Leads - Poke in Connectors												16	14	
IDL-2T42-M5-LD	2-20	No Leads - Poke in Connectors												20	16	
IEZ-2S24-D	2-10, 2-11	No Leads - Poke in Connectors												12	12	
IIC-132-SC	1-41, 1-45, 1-53, 1-57		22	46	26			22						20	20	✓
IIC-2S32-SC	1-42, 1-46, 1-54, 1-58	22	22	26	26	46								20	20	✓
IIC-3S32-SC	1-43, 1-47, 1-55, 1-59	22	22	26	46	26	46							20	30	✓
ILV-2S32-SC	2-7	22	22	26	26	46								20	21	
ILV-4S32-G	2-7	22	22	15	15	64	15		64			50	50	6	12	
IOP-1P32-HL-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOP-1P32-LW-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOP-1P32-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOP-1S32-LW-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	36	26			25						20	20	
IOP-1S32-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	36	26			25						20	20	
IOP-2P32-HL-SC	1-51, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	✓
IOP-2P32-LW-SC	1-41, 1-42 1-45, 1-46, 1-49, 1-51, 1-53,1-54, 1-57, 1-58,1-61	25	25	31	37									20	28	✓
IOP-2P32-SC	1-41, 1-42 1-45, 1-46, 1-49, 1-51, 1-53,1-54, 1-57, 1-58,1-61	25	25	31	37									20	28	✓
IOP-2P59-SC	1-63	22	22	46	70									20	20	✓
IOP-2S28-115-SC		22	22	26	26	36								20	20	
IOP-2S28-115-SC-SD	2-3	(2) 22	22	26	26	36								20	20	
IOP-2S28-95-SC		22	22	26	26	36								20	20	
IOP-2S28-95-SC-SD	2-3	(2) 22	22	26	26	36								20	20	
IOP-2S32-LW-SC	1-41, 1-42 1-45, 1-46, 1-49, 1-51, 1-53,1-54, 1-57, 1-58,1-61	25	25	26	26	36								20	20	✓
IOP-2S32-SC	1-41, 1-42 1-45, 1-46, 1-49, 1-51, 1-53,1-54, 1-57, 1-58,1-61	25	25	26	26	36								20	20	✓
IOP-3P32-HL-90C-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	32	✓
IOP-3P32-LW-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
IOP-3P32-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
IOP-3PSP32-SC	1-47, 1-50, 1-52, 1-55, 1-59	25	25	33	33	48	33							20	28	
IOP-3S32-LW-SC	1-43, 1-47, 1-50, 1-52, 1-55, 1-59	25	25	46	36	36	36							20	28	✓
IOP-3S32-SC	1-43, 1-47, 1-50, 1-52, 1-55, 1-59	25	25	46	36	36	36							20	28	✓
IOP-4P32-HL-90C-G	1-43, 1-44, 1-47, 1-48, 1-50, 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								6	18	✓
IOP-4P32-LW-SC	1-43, 1-44, 1-47, 1-48, 1-50, 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	✓
IOP-4P32-SC	1-43, 1-44, 1-47, 1-48, 1-50, 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	✓
IOP-4PSP32-SC	1-44, 1-48, 1-50, 1-52, 1-56, 1-60	25	25	33	33	48	33			33				20	28	
IOP-4S32-LW-SC	1-44, 1-48, 1-50, 1-52, 1-56, 1-60	25	25	26	26	36	36			46				20	28	✓
IOP-4S32-SC	1-44, 1-48, 1-50, 1-52, 1-56, 1-60	25	25	26	26	36	36			46				20	28	✓

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** Also includes 36" violet & grey control leads.

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		Black	White	Blue	Red	Yellow	Blue/ White	Black/ White	Yellow/ Blue	Brown	Red/ White	Or- ange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
IOPA-1P32-LW-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOPA-1P32-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOPA-1P32-HL-SC	1-41, 1-45, 1-49, 1-51, 1-53, 1-57		25	31	37			25						20	28	✓
IOPA-2P32-LW-SC	1-41, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	✓
IOPA-2P32-SC	1-41, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	✓
IOPA-2P32-HL-SC	1-41, 1-42, 1-45, 1-46, 1-49, 1-51, 1-53, 1-54, 1-57, 1-58, 1-61	25	25	31	37									20	28	✓
IOPA-3P32-LW-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
IOPA-3P32-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	28	✓
IOPA-3P32-HL-SC	1-42, 1-43, 1-46, 1-47, 1-49, 1-50, 1-51, 1-52, 1-54, 1-55, 1-58, 1-59, 1-61	25	25	31	37									20	32	✓
IOPA-4P32-LW-SC	1-43, 1-44, 1-47, 1-48, 1-50 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	✓
IOPA-4P32-SC	1-43, 1-44, 1-47, 1-48, 1-50 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	✓
IOPA-4P32-HL	1-43, 1-44, 1-47, 1-48, 1-50 1-52, 1-55, 1-56, 1-59, 1-60, 1-62	25	25	31	31	39								20	28	✓
IUV-2S18-H1-LD	6-5	No Leads - Poke in Connectors												20	8	
IUV-2S36-M2-LD	6-5	No Leads - Poke in Connectors												20	16	
IUV-2S60-M4-LD	6-5	No Leads - Poke in Connectors												20	26	
IZT-132-SC	2-17, 2-18		22	46	26			22						20	15	✓
IZT-2S26-M5-BS	2-14	No Leads - Poke in Connectors												16	14	
IZT-2S26-M5-LD	2-14	No Leads - Poke in Connectors												20	16	
IZT-2S32-SC	2-17, 2-18	22	22	26	26	46								20	21	✓
IZT-2T42-M5-BS	2-14	No Leads - Poke in Connectors												16	14	
IZT-2T42-M5-LD	2-14	No Leads - Poke in Connectors												20	16	
IZT-2TTS40-SC	2-15	12	12	24	24	24								20	21	
IZT-3S32-SC	2-17, 2-18	22	22	26	46	26	46							20	21	✓
IZT-4S32	2-17, 2-18	No Leads - Poke in Connectors												12	12	
JOP-2S84-G	1-65			28	28	48		31					31	6	18	✓
L-140F-TP	3-16, 3-17		43	27				14						20	42	✓
LC-13-TP	3-20	17		14										50	35	
LC-14-20-C	3-16, 3-17	14, 17												50	30	✓
LC-14-20-C-TP		17		14										50	35	
LC-25-TP	3-17, 3-20	18		22										50	35	✓
LC-4-9-C	3-16	(2) 10												50	30	✓
LC-4-9-C-TP	3-20	10		10										50	30	
LO-13-22	3-16, 3-17	(2) 15												72	43	
LO-13-22-TP	3-20	15		15										72	43	
LOS-1Q28	3-20	(2) 15												72	58	
LPL-5-9	3-16	(2) 9												135	41	
LPL-5-9-TP	3-20	9		9										120	36	
LX-140-F-TP			26	26			26	10			26			20	40	✓
R-140-TP	3-6		12	12	12			12						10	36	✓
R-1P32-TP	3-5		18	36	23			18						10	37	✓
R-2E60-S-TP	3-15	12	12	12	12									6	49	✓
R-2E75-S-TP	3-14, 3-15	12	12	12	12									6	49	✓
R-2P32-TP	3-5	20	20	24	24	36								10	37	✓
R-2S110-TP	3-10, 3-11	22	22	46	46	70								6	71	✓
R-2S34-TP	3-6	12	12	12	12	12								10	36	✓
R-2S40-TP	3-6	12	12	12	12	12								10	36	✓
R-4S40-A-TP-AC	3-6	No Leads - Poke in Connectors												1	7	✓
RC-2S102-TP	3-12, 3-13	18	18	43	43	19								4	46	✓
RC-2S110-FO	3-23	6.5	6.5	6.5	6.5	6.5								1	17	✓
RC-2S200-TP	3-12, 3-13	22	22	44	44	68								4	60	✓
RC-2S85-FO	3-23	6.5	6.5	6.5	6.5	6.5								1	18	✓
RC-2S85-TP	3-7, 3-8, 3-9, 3-10, 3-11	18	18	33	33	51								6	60	✓
RC-4S60-TP	3-7, 3-8, 3-10	24	24	46	46	46	46			46				6	66	✓
RC-4S85-TP	3-8, 3-9, 3-10, 3-11	24	24	74	32	70	52			78				4	55	✓
RCF-2S13-H1-LD-QS	1-23, 1-25, 6-4	No Leads - Poke in Connectors												20	8	
RCF-2S13-M1-BS-QS	1-23, 1-25, 6-4	No Leads - Poke in Connectors												16	6.4	
RCF-2S18-H1-LD-QS	1-23, 1-26, 6-4	No Leads - Poke in Connectors												20	8	
RCF-2S18-M1-BS-QS	1-23, 1-26, 6-4	No Leads - Poke in Connectors												16	6.4	
RCF-2S26-H1-LD-QS	1-24, 1-27, 1-28, 6-4	No Leads - Poke in Connectors												20	8	
RCF-2S26-M1-BS-QS	1-24, 1-27, 1-28, 6-4	No Leads - Poke in Connectors												16	6.4	
RCN-1S32-SC	1-41, 1-45, 1-53, 1-57		25	36	26			25						20	28	✓

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** Also includes 36" violet & grey control leads.

Catalog Number to Page Number *Lead Lengths and Shipping Data*

Catalog Number	See Page No.	Lead Lengths for ballasts purchased in bulk or mid-pack cartons Tolerance: +2", -1"												Shipping Data		
		Black	White	Blue	Red	Yellow	Blue/ White	Black/ White	Yellow/ Blue	Brown	Red/ White	Or- ange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
RCN-2S32-SC	1-42, 1-46, 1-54, 1-58	25	25	26	26	36								20	28	✓
RCN-3S32-SC	1-43, 1-47, 1-55, 1-59	25	25	46	36	36	36							20	28	✓
RCN-4S32-SC	1-44, 1-48, 1-56, 1-60	25	25	36	36	46	36			46				20	28	✓
REB-113-M6-BLS	1-23, 1-25, 6-4	6	6	6	6									20	10	
REB-113-M6-EL	1-23, 1-25, 6-4	6	6	6	6									30	15	
REB-118-M6-BLS	1-23, 6-4	6	6	6	6									20	10	
REB-118-M6-EL	1-23, 6-4	6	6	6	6									30	15	
REB-126-M6-BLS	1-24, 1-27, 6-4	6	6	6	6									20	10	
REB-126-M6-EL	1-24, 1-27, 6-4	6	6	6	6									30	15	
REB-2P32-SC	1-41, 1-42, 1-45, 1-45, 1-57, 1-58, 6-4	25	25	31	37									20	15	
REB-2S13-M6-EL	1-23, 1-25, 6-4	6	6	6	6	6								16	6.4	
REB-2S13-M6-BL	1-23, 1-25, 6-4	6	6	6	6	6								20	8	
REB-2S18-M6-EL	1-23, 1-26, 6-4	6	6	6	6	6								16	6.4	
REB-2S18-M6-BL	1-23, 1-26, 6-4	6	6	6	6	6								20	8	
REB-2S26-M6-EL	1-24, 1-27, 6-4	6	6	6	6	6								16	6.4	
REB-2S26-M6-BL	1-24, 1-27, 6-4	6	6	6	6	6								20	8	
REB-2S26-M1-BS-DIM	2-5, 6-4	6	6	6	6	6								16	6.4	
REB-2S26-M1-LS-DIM	2-5, 6-4	6	6	6	6	6								20	8	
REB-4P32-SC	1-43, 1-44, 1-47, 1-48, 1-59, 1-60, 6-4	25	25	31	31	39								20	20	
RELB-1S40-SC	1-66, 6-4		22	36	26			22						20	24	✓
RELB-2S40-SC	1-66, 6-4	22	22	26	26	36								20	24	✓
REZ-132-SC	2-12		22	46	26			22						20	20	✓
REZ-154	2-10, 2-11	No Leads - Poke in Connectors												12	12	
REZ-1Q18-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
REZ-1Q18-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
REZ-1T42-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
REZ-1T42-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
REZ-1T42-M2-LD-K	2-9	No Leads - Poke in Connectors												20	16	✓
REZ-1TTS40-SC	2-10		12	24	24			12						20	20	
REZ-2Q18-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
REZ-2Q18-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
REZ-2Q26-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
REZ-2Q26-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
REZ-2Q26-M2-LD-K	2-9	No Leads - Poke in Connectors												20	16	✓
REZ-2S32-SC	2-12	22	22	26	26	46								20	20	✓
REZ-2S54	2-10, 2-11	No Leads - Poke in Connectors												12	12	
REZ-2T42-M3-BS	2-9	No Leads - Poke in Connectors												16	18	
REZ-2T42-M3-LD	2-9	No Leads - Poke in Connectors												20	22	
REZ-2TTS40-SC	2-10	12	12	24	24	24								20	20	
REZ-3S32-SC	2-12	22	22	26	46	26	46							20	20	✓
RIF-1	3-22	6	(2) 6		6									24	22	
RK-132-TP	1-57		22	35	23			22						10	35	✓
RK-2S32-TP	1-58	22	22	26	26	36								10	38	✓
RL-140-TP	3-5, 3-6, 3-19		36	36	25			10						20	42	✓
RL-2SP20-TP	3-18	15	15	15	15	18								20	50	✓
RLCS-140-TP-W	3-19		11	11	11			10						10	21	✓
RLQ-120-TP	3-18		18	18	12			10						20	42	✓
RLQS-122-TP-W	3-19		13/11	11	11			13						10	22	✓
RM-2S35-TP	3-6	22	22	26	26	36								10	35	✓
RM-2SP30-TP	3-5	18	18	17	17	26								10	37	✓
RMB-1P13-S1	1-22, 1-23, 1-25, 1-36, 1-37, 6-4	No Leads - Poke in Connectors												75	10	
RMB-1P26-S2	1-24, 1-27, 1-30, 1-38, 1-66, 6-4	No Leads - Poke in Connectors												60	11	
RMB-2P13-S2	1-22, 1-23, 1-25, 1-26, 1-36, 1-37, 6-4	No Leads - Poke in Connectors												60	11	
RS-110-TP	3-7, 3-8, 3-9, 3-10, 3-11		22	70	46			22						6	59	
RS-22-32-TP-W	3-19	15	15	10	10	10								10	26	✓
RS-2S200-TP	3-12, 3-13	22	22	44	44	68								4	60	✓
RS-32-40-TP-W	3-19	10	10	10	10	10								10	26	✓
RSM-175-S-TP	3-14, 3-15		70	46				19						10	62	✓
RZT-154	2-15, 2-16	No Leads - Poke in Connectors												12	12	
RZT-2S54	2-15, 2-16	No Leads - Poke in Connectors												12	12	
SM-140-S-TP	3-14		34	22				10						6	40	✓
SM-2E40-S-TP	3-14	41	41	23	23									10	58	✓
V-140-TP	3-6		12	12	12			12						10	36	✓
V-1P32-TP	3-5		18	36	23			18						10	37	✓
V-2E60-S-TP	3-15	12	12	12	12	12								6	49	✓
V-2E75-S-TP	3-14, 3-15	12	12	12	12	12								6	49	✓
V-2P32-TP	3-5	20	20	24	24	36								10	37	✓

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** Also includes 36" violet & grey control leads.

Catalog Number to Page Number *Lead Lengths and Shipping Data*

Catalog Number	See Page No.	Lead Lengths for ballasts purchased in bulk or mid-pack cartons Tolerance: +2", -1"												Shipping Data		
		Black	White	Blue	Red	Yellow	Blue/ White	Black/ White	Yellow/ Blue	Brown	Red/ White	Or- ange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
V-2S110-TP	3-10, 3-11	22	22	46	46	70								6	71	✓
V-2S34-TP	3-6	12	12	12	12	12								10	36	✓
V-2S40-TP	3-6	12	12	12	12	12								10	36	✓
VC-2S102-TP	3-12, 3-13	18	18	43	43	19								4	47	✓
VC-2S85-TP	3-7, 3-8, 3-9, 3-10, 3-11	22	22	47	47	70								6	60	✓
VCN-1S32-SC	1-41, 1-45, 1-53, 1-57		25	36	26			25						20	28	✓
VCN-2S32-SC	1-42, 1-46, 1-54, 1-58	25	25	26	26	36								20	28	✓
VCN-3S32-SC	1-43, 1-47, 1-55, 1-59	25	25	46	36	36	36							20	28	✓
VCN-4S32-SC	1-44, 1-48, 1-56, 1-60	25	25	36	36	46	36			46				20	28	✓
VEL-1S40-SC	1-66		22	36	26			22						20	32	✓
VEZ-132-SC	2-12		22	46	26			22						20	20	✓
VEZ-154	2-10, 2-11	No Leads - Poke in Connectors												12	12	
VEZ-1Q18-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
VEZ-1Q18-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
VEZ-1T42-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
VEZ-1T42-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
VEZ-1T42-M2-LD-K	2-9	No Leads - Poke in Connectors												20	16	✓
VEZ-1TTS40-SC	2-10		12	24	24			12						20	20	
VEZ-2Q18-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
VEZ-2Q18-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
VEZ-2Q26-M2-BS	2-9	No Leads - Poke in Connectors												16	14	
VEZ-2Q26-M2-LD	2-9	No Leads - Poke in Connectors												20	16	
VEZ-2Q26-M2-LD-K	2-9	No Leads - Poke in Connectors												20	16	✓
VEZ-2S32-SC	2-12	22	22	26	26	46								20	20	✓
VEZ-2S54	2-10, 2-11	No Leads - Poke in Connectors												12	12	
VEZ-2T42-M3-BS	2-9	No Leads - Poke in Connectors												16	18	
VEZ-2T42-M3-LD	2-9	No Leads - Poke in Connectors												20	22	
VEZ-2TTS40-SC	2-10	12	12	24	24	24								20	20	
VEZ-3S32-SC	2-12	22	22	26	46	26	46							20	20	✓
VH-1B13-TP-W	3-21		15	15				15						24	34	✓
VH-1B9-TP-W	3-21		15	15				15						24	26	
VH-1Q26-TP-W	3-21		15	15				15						24	36	✓
VH-2B13-TP-BLS	3-21	7	7	7										27	40	
VH-2B13-TP-W	3-21	15	15	15										24	36	
VH-2Q26-TP-BLS	3-21	7		7	7									10	36	
VH-2Q26-TP-W	3-21	15		15	15									10	36	
VK-132-TP	1-57		22	35	23			22						10	35	✓
VK-2S32-TP	1-58	22	22	26	26	36								10	38	✓
VLO-13-TP	3-20	15		15										72	72	✓
VLO-2S13-TP	3-20	7		7										20	26	✓
VS-110-TP	3-7, 3-8, 3-9, 3-10, 3-11		22	40	46			22						6	59	✓
VS-2S200-TP	3-12, 3-13	22	22	44	44	68								4	60	✓
VSB-0412-12-BL-TP	3-24	18	18	33	33	51								1	12	✓
VSB-0620-24-BL-TP	3-24	24	24	75	46	75	46			46				1	12	✓
VSB-1224-24-BL-TP	3-24	24	24	74	32	70	52			78				1	14	✓
VSB-1240-46-BL-TP	3-24	24	24	50	80	70	50			50		50	50	1	21	✓
VSB-2040-24-BL-TP	3-24	24	24	80	80	72	54			72				1	21	✓
VSB-2448-46-BL-TP	3-24	24	24	50	50	70	50			50		50	50	1	21	✓
VSM-175-S-TP	3-14, 3-15		70	48				10						10	62	✓
VSM-2E40-S-TP	3-14	25	35	23	23	35								10	58	✓
VZT-154	2-15, 2-16	No Leads - Poke in Connectors												12	12	
VZT-180	2-15, 2-16	No Leads - Poke in Connectors												12	12	
VZT-2S54	2-15, 2-16	No Leads - Poke in Connectors												12	12	
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VZT-4S32-G**	2-18	32	32	15	15	60	15			50				6	12	
VZT-4S32-HL**	2-18	12	12	12	15	59	15			45				6	12	

Reference

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71A5205	71A5205-P	5-13	....
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71A5229 (Reactor)	....	....	71A5292 (3x4 Core)
71A5237	71A5237-P	5-13	....
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71A5281	71A52A1	5-13	....
71A5282	71A5292	5-13	....
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71A5289 (Reactor + Transformer)	....	....	71A5292 (3x4 Core)
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71A5300	71A5390	5-14,41	....
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* Availability limited to existing stocks.

** The CWA ballasts offered as replacements are furnished with a capacitor which must be used in the ballast circuit as shown in the wiring diagram in this Atlas. The original ballast circuit in the lighting fixture may have been low or normal power factor, and therefore, no capacitor was used. If the CWA ballast with its capacitor does not fit in the fixture, contact Philips Lighing Electronics for assistance.

Philips Advance Replacement ballasts shown are functionally equivalent to listed obsolete ballasts. Dimensional differences can exist.

Suffix "T" ballast catalog numbers indicate ballast is equipped with 120V output tap.

Standard practice is to use 120V tap on quadri-volt ballast, where quadri-volt ballasts are available.

Where no replacement ballast is shown, ballast has been discontinued and inventories are exhausted.

Consult nearest Philips Lighing Electronics sales office for assistance.

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71A5386	....	....	....
71A5387 (Reactor + Transformer)	....	....	71A5390 (3x4 Core)
71A5388	....	....	....
71A53C0	71A53A0	5-14	71A5390 (3x4 Core)
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71A5402	....	....	....
71A5427 (Reactor)	....	....	71A5390 (3x4 Core)
71A5428 (Reactor)	....	....	71A5390 (3x4 Core)
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71A5488 (Reactor + Autotransformer)	....	....	71A5490 (3x4 Core)
71A5489 (Reactor + Autotransformer)	....	....	71A5492 (3x4 Core)
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71A55J0	71A55H0	5-16	....
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71A5730	71A5770/90	5-6	....
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71A5793	71A5792	5-6, 19	71A5792
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71A57J0	71A55H0	5-16	....
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71A7805	....	....	....

* Availability limited to existing stocks.

** The CWA ballasts offered as replacements are furnished with a capacitor which must be used in the ballast circuit as shown in the wiring diagram in this Atlas. The original ballast circuit in the lighting fixture may have been low or normal power factor, and therefore, no capacitor was used. If the CWA ballast with its capacitor does not fit in the fixture, contact Philips Lighing Electronics for assistance.

Philips Advance Replacement ballasts shown are functionally equivalent to listed obsolete ballasts. Dimensional differences can exist.

Suffix "T" ballast catalog numbers indicate ballast is equipped with 120V output tap.

Standard practice is to use 120V tap on quadri-volt ballast, where quadri-volt ballasts are available.

Where no replacement ballast is shown, ballast has been discontinued and inventories are exhausted.

Consult nearest Philips Lighing Electronics sales office for assistance.

Discontinued Catalog Number to Replacement Number *HID*

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A7809	....	....	....
71A7891	71A7801	5-27, 43	....
71A78H1	71A79H8	5-28	....
71A78R1	....	....	....
71A7900	....	....	....
71A7901	71A7991	5-28	....
71A7910*	....	....	....
71A7920	....	....	....
71A7931	71A7991	5-28	....
71A7948	....	....	....
71A7950	....	....	....
71A7956	71A79E6 (120/208/240V)	5-28	....
71A7960 (240/480V)	....	....	....
71A79D1 (120/240/347V)	71A79A1 (120/240/347V)	5-28	71A7971/91
71A79S1	....	....	....
71A79T8	....	....	....
71A8000	....	....	....
71A8001	71A8091	5-7, 29	....
71A8005	....	....	....
71A8021	71A8091	5-7, 29	....
71A8030	....	....	....
71A8050	....	....	....
71A8056	71A80E6 (120/277/347)	5-29	....
71A8060 (240/480V)	....	....	....
71A8080	....	....	....
71A80B6	....	....	....
71A80D1 (120/240/347V)	71A80A1 (120/240/347V)	5-29	71A8071/91
71A80J9	....	....	....
71A80L1	71A8071/91	5-7, 29	....
71A80R1	71A79N1, 71A80N1	6-10	....
71A80S1	....	....	....
71A80W1	....	....	....
71A8102	71A8192	5-30	....
71A8106*	....	....	71A8176/96
71A8111	....	....	71A8176/96
71A8116*	....	....	71A8176/96
71A8127	....	....	....
71A8130	....	....	....
71A8131	71A8176/96	5-7, 31	71A8176/96
71A8136	71A8176/96	5-7, 31	71A8176/96
71A8141	....	....	....
71A8150	....	....	....
71A8151	....	....	71A8176/96
71A8156	71A81E6 (120/208/240V)	5-31	....
71A8160	....	....	....
71A8180	....	....	....
71A81B6	....	....	....
71A81D2 (120/240/347V)	71A81A2 (120/240/347V)	5-30	71A8172/92
71A81L2	....	....	....
71A81R2	71A81N2	6-10	....
71A81R6	....	....	....
71A81S2	....	....	....
71A81T8	71A81N2	6-10	....
71A81W2	....	....	....
71A8201	71A8291	5-33	....
71A8211	71A8271/91	5-8, 33	71A8271/91
71A8221	71A8271/91	5-8, 33	71A8271/91
71A8230	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A8231	71A8291	5-33	
71A8250 (120/240V)	....	....	....
71A8256	71A82E6 (120/208/240V)	5-33	....
71A8260 (240/480V)	....	....	....
71A8280	....	....	....
71A8281	71A8271/91	5-8, 33	....
71A8290	....	....	....
71A8294 (120/208/240/277V)	....	....	....
71A82B1	71A82A1 (120/277/347V)	5-33	....
71A82B6	....	....	....
71A82D1 (120/240/347V)	71A82A1 (120/240/347V)	5-33	71A8271/91
71A82L1	71A8271/91	5-8, 33	....
71A82R1	71A82N1	6-10	....
71A82V1	....	....	....
71A82W1	....	....	....
71A8311	....	....	71A8371/91
71A8321	....	....	71A8371/91
71A8331	....	....	71A8371/91
71A8341	71A8351	5-34	....
71A8343	....	....	
71A8350	....	....	....
71A8360	....	....	....
71A8391	71A8351	5-34	....
71A8392	....	....	....
71A8401	71A8403	....	71A8473/93
71A8402	71A8403	.....	71A8473/93
71A8403	71A8473/93	5-8, 34	....
71A8411	71A8473/93	5-8, 34	71A8473/93
71A8412	71A8473/93	5-8, 34	71A8473/93
71A8413	71A8473/93	5-8, 34	71A8473/93
71A8420	....	....	....
71A8421	71A8473/93	5-8, 34	71A8473/93
71A8422	71A8473/93	5-8, 34	71A8473/93
71A8423	71A8473/93	5-8, 34	71A8473/93
71A8430	....	....	....
71A8431	71A8473/93	5-8, 34	71A8473/93
71A8432	71A8473/93	5-8, 34	71A8473/93
71A8433	71A8473/93	5-8, 34	....
71A8440	....	....	....
71A8441	71A8443	5-34	....
71A8442	71A8443	5-34	....
71A8450	....	....	....
71A8456	71A84E6 (120/208/240V)	5-34	....
71A8460	....	....	....
71A8471	....	....	71A8473/93
71A8472	....	....	71A8473/93
71A8480	---	....	....
71A8482	....	....	71A8473/93
71A8484	....	....	....
71A8490	....	....	....
71A8491	....	....	71A8473/93
71A8492	....	....	71A8473/93
71A84B6	....	....	....
71A84D3 (120/240/347V)	71A84A3 (120/240/347V)	5-9, 34	71A8473/93
71A84H3	....	....	....
71A84J7	....	....	....
71A84L3	71A8473/93	5-8, 34	....
71A84R2	71A84N3	6-10	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A84V3	....	....	....
71A84W2	....	....	....
71A8540	71A85F5	5-35	....
71A8590 (120/208/240/277V)	71A85E5 (120/208/240V)	5-35	71A85F5 (277/347/480)
71A85A3	....	....	....
71A85B0	....	....	....
71A85E6	....	....	....
71A85F6	....	....	....
71A8703	71A8773/93	5-8, 35	....
71A8733	71A8773/93	5-8, 34	....
71A8741	71A8743	5-35	....
71A8755	71A8753	5-35	....
71A8771	71A8773/93	5-8, 34	71A8773/93
71A8791	71A8773/93	5-8, 34	71A8773/93
71A87D3 (120/240/347V)	71A87A3 (120/240/347V)	5-35	71A8773/93
71A87V9	....	....	....
71A8900	....	....	71A8970/90
71A8930	....	....	71A8970/90
71A8931	....	....	71A8991
71A8941	....	....	....
71A8950	71A8940/90	5-8, 32	....
71A8954	....	....	....
71A8964	....	....	....
71A8976	71A8970/90	5-8, 34	....
71A8984 (120/277V)	....	....	71A8970/90 (CWA)
71A9068	....	....	....
71A9073	....	....	....
71A9074	....	....	....
71A9082	....	....	....
71A9114	....	....	....
71A9115	....	....	....
71A9116	71A65N2	6-9	....
71A9124	....	....	....
71A9127	....	....	....
71A9135	....	....	....
71A9136	....	....	....
71A9137	....	....	....
71A9138	....	....	....
71A9139	....	....	....
71A9189	71A0590	5-37	....
71A9192	71A0490	5-36	....
71A9209	71A5570/90	5-6, 16	71A5570/90
71A9212	....	....	....
71A9240	....	....	....
71A9242	....	....	71A5570/90
71A9243	71A5540	5-6, 16	....
71A9263	....	....	....
71A9278	....	....	....
71A9279	....	....	....
71A9280	71A55N0	6-9	....
71A9282	71A65N2	6-9	....
71A9301	71A07F0	5-37	....
71A9302	....	....	71A6071/91
71A9303	....	....	71A6071/91
71A9305	....	....	71A6572/92
71A9306	....	....	....
71A9312	....	....	....
71A9313	....	....	....
71A9314	....	....	....
71A9315	....	....	....
71A9316	....	....	....
71A9317	71A0790	5-37	....

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Philips Advance Replacement ballasts shown are functionally equivalent to listed obsolete ballasts. Dimensional differences can exist.

Suffix "T" ballast catalog numbers indicate ballast is equipped with 120V output tap.
Standard practice is to use 120V tap on quadri-volt ballast, where quadri-volt ballasts are available.

Where no replacement ballast is shown, ballast has been discontinued and inventories are exhausted.

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Discontinued Catalog Number to Replacement Number *HID*

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A9318	71A0790	5-37	....
71A9319	....	....	....
71A9325	....		
71A9326	71A07F0	5-37	....
71A9327	71A04F0	5-36	....
71A9328	71A05F0	5-37	....
71A9331	....	....	....
71A9332	....	....	....
71A9334	....	....	....
71A9335	....	....	....
71A9341	71A0590	5-37	....
71A9352	....	....	....
71A9355	71A0790	5-37	....
71A9356	71A0590	5-37	....
71A9357	71A0490	5-36	....
71A9359	71A0490	5-36	....
71A9366	....	....	....
71A9377*	....	....	....
71A9378*	....	....	....
71A9416	....	....	....
71A9417	....	....	....
71A9418	....	....	....
71A9424	71A65A2	5-24	....
71A9426	71A57N0	6-9	....
71A9429	71A82N1	6-10	....
71A9430	71A84N3	6-10	....
71A9432 (240/480V)	....	....	....
71A9437 (240/480V)	....	....	....
71A9441	71A87R3	6-10	....
71A9445	71A0490	5-36	....
71A9446	....	....	....
71A9449	....	....	....
71A9451	71A82H1	5-33	....
71A9452	....	....	....
71A9462	....	....	....
71A9465	....	....	....
71A9467	....	....	....
71A9468	....	....	....
71A9469	....	....	....
71A9470	....	....	....
71A9471	....	....	....
71A9473	....	....	....
71A9474	....	....	....
71A9475	....	....	....
71A9476	....	....	....
71A9477	....	....	....
71A9478	71A65N2	6-9	....
71A9479	71A55N0	6-9	....
71A9480	71A57N0	6-9	....
71A9481	71A60N1	6-9	....
71A9482	71A65N2	6-9	....
71A9483	71A67R2	6-9	....
71A9484	71A79N1	6-10	....
71A9485	71A80N1	6-10	....
71A9486	71A81N2	6-10	....
71A9487	....	....	....
71A9489	71A82N1	6-10	....
71A9491	....	.....	....
71A9492	70A87R3	....	....
71A9494	....	....	....
71A9502(240/480V)	71A8241 (480V)	5-33	71A8271/91 (240V)
71A9519	....	....	....
71A9520	....	....	....
71A9521	....	....	....
71A9522	71A7941	5-28	....
71A9523	71A8041	5-29	....
71A9524	....	....	....
71A9525	....	....	....
71A9526	71A07F0	5-37	....
71A9530	....	....	....
71A9532	....	....	....
71A9533	....	....	....
71A9534	....	....	....
71A9545	71A8107	5-30, 39, 43	....
71A9546	71A8007	5-29,43	....
71A9547	71A7907	5-28,43	....
71A9590	....	....	71A8176/96
71A9597	....	....	....
71A9646	....	....	....
71A9665	....	....	....
71A9696	....	....	....
71A9720	71A60H1	5-21	....
71A9722	71A55H0	5-16	....
71A9733	....	....	....
71A9734	....	....	....
71A9735	....	....	....
71A9737	....	....	....
71A9740	....	....	....
71A9740-2T	....	....	....
71A9742	71A9743	5-45	....
71A9744	....	....	....
71A9745-2T	....	....	....
71A9748*	....	....	....
71A9761	71A65J2	5-24	....
71A9770	....		
71A9775	....	....	....
71A9784	71A57H0	5-18	....
71A9787	....	....	....
71A9789	....	....	....
71A9791	....	....	....
71A980 (120/277V)	....	....	....
71A9808*	....	....	....
71A9814	....	....	....
71A9833	....	....	....
71A9846	....	....	....
71A9847	....	....	....
71A9863	....	....	....
71A9877	71A9900	5-45	....
71A9884	....	....	....
71A9885	71A9862	5-45	....
71A9893	....	....	....
71A9907	71A8192	5-30	....
71A9911	71A80J1	5-29	....
71A9923	....	....	....
71A9928	....	....	....
71A9932	....	....	....
71A9934	....	....	....
71A9945	71A8990	5-32	....
71A9947	71A8271	5-8,33	....
71A9948	....	....	....
71A9951	....	....	....
71A9955	71A8196	5-31	....
71A9969	....	....	....
72C2584	....	....	....
72C3084	....	....	....
72C5005	72C5081	5-46	....
72C54C1	....	....	....
72C55C1	....	....	....
72C57C2	....	....	....
72C8005	....	....	....
72C80C4	....	....	....
72C81C5	....	....	....
72C9156	....	....	....
72C9159	....	....	....
72C9160	....	....	....
72C9163	....	....	....
72C9164	....	....	....
72C9167	....	....	....
72C9168	....	....	....
72C9171	....	....	....
72C9221	....	....	....
72C9222	....	....	....
72C9223	....	....	....
72C9224	....	....	....
72E5005-NP	IMH50ALF	....	....
72E5005-NP-BLS	IMH50ABLS	....	....
73B5181	....	....	....
73B5380	....	....	....
73B5480	....	....	....
73B5492	73B5482	5-49	....
73B54A3	....	....	....
73B5580	73B5590	5-49	73B5590
73B5593	73B5591-EE	5-49	....
73B55A0	....	....	....
73B5692	....	....	....
73B5740	....	....	....
73B5780	73B5790	....	73B5790
73B57A2	....	....	....
73B58A2	....	....	....
73B6041	73B6041-T	.....	....
73B6042	73B6052-EE	5-50	....
73B6081	73B6091	5-50	73B6091
73B60A2	....	....	....
73B6542	....	....	....
73B6592	73B6590	5-50	....
73B65N2	....	....	....
73B7705	....	....	....
73B7901	....	....	....
73B8005	....	....	....
73B8102	....	....	....
73B8188	....	....	....
73B8281	73B8291	5-51	....
73B82A1	....	....	....
73B8483	73B8493	5-51	....
74P1801	....	....	....
74P1831-011	....	....	....
74P2001	....	....	....
74P2321-011	....	....	....
74P2503	....	....	....
74P2513	....	....	....
74P2523	....	....	....
74P2533	....	....	....
74P2802	....	....	....
74P2832	....	....	....
74P3003	....	....	....
74P3013	....	....	....
74P3023	....	....	....
74P3033	....	....	....
74P3303	....	....	....

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Discontinued Catalog Number to Replacement Number

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Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
74P3313	....	....	....
74P3323	....	....	....
74P3333	....	....	....
74P3503	....	....	....
74P3533	....	....	....
74P5103	74P5104	5-52	....
74P7702	74P7703	5-53	....
74P7802	74P7803	5-53	....
74P7902	74P7903	5-53	....
74P7913	....	....	....
74P7923	....	....	....
74P8002	74P8003	5-53	....
74P8103	74P8104	5-53	....
77K5570	77L5570	5-10	....
77K5892	....	....	....
77K5993	....	....	....
77K6051	77L6051	5-10	....
77K6071	77L6051	5-10	....
77K8071	77L8071	5-10	....
77K8172	77L8172	5-10	....
77K8473	77L8453	5-10	....
78E3542-001	....	....	....
78E4041	....	....	....
78E4300 (Series)	....	....	....
78E4310 (Series)	....	....	....
78E4320 (ILO)	....	....	....
78E4330 (Series)	....	....	....
78E4340 (Series)	....	....	....
78E5040-001	....	....	....
78E5090-001	....	....	....
78E5330	....	....	....
78E5993	78E5593-EE	....	....
78E6092	78E6052-EE	5-55	....
78E6300 (Series)	....	....	....
78E6310 (Series)	....	....	....
78E6320 (Series)	....	....	....
78E6330 (Series)	....	....	....
78E6340 (Series)	....	....	....
78E6351*	....	....	....
78E64E2	....	....	....
78E64F2	....	....	....
78E65A2	....	....	....
78E8291	....	....	....
78E8391	....	....	....
78E8492	78E8493	5-54	....
78E8703	....	....	....
79W3092	....	....	....
79W3140	....	....	....
79W3150	....	....	....
79W3640	....	....	....
79W3650	....	....	....
79W4041	....	....	....
79W4300 (Series)	79W6351(ILO)	5-56	....
79W4320 (Series)	79W6351(ILO)	5-56	....
79W4330 (Series)	....	....	....
79W4340 (Series)	79W6341(ILO)	5-56	....
79W5090	....	....	....
79W6300 (Series)	79W6351(ILO)	5-56	....
79W6310 (Series)	....	....	....
79W6320 (Series)	79W6351(ILO)	5-56	....
79W6330 (Series)	....	....	....
79W6340 (Series)	79W6341(ILO)	5-56	....
79W6381*	....	....	....
79W6541	79W6542	5-56	....
79W6591	79W6592	5-56	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
79W65Z6	....	....	....
79W6742	....	....	....
79W6792	....	....	....
79W8192	....	....	....
79W8241	....	....	....
79W8291	....	....	....
79W8463 (240/480V)	79W8443 (480V)	5-57	79W8493 (240V)
79W8492	79W8493	5-57	....
79W9256	79W6351	5-56	....
79W9499*	....	....	....
79W9500 (240/480V)	....	....	....
79W9501*	....	....	....
79W9502 (240/480V)	....	....	....
79W9503 (240/480V)	79W8443 (480V)	5-57	79W8493 (240V)

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Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/240/277V
IMH100ALF (100W operation)	IMH100BLF	x-xx	....
IMH100ALF (70W operation)	IMH70ALF	x-xx	....
IMH100ABLS (100W operation)	IMH100DBLS	x-xx	....
IMH100ABLS (70W operation)	IMH70DBLS	x-xx	....
IMH39JLF	IMH39ELF	x-xx	....
IMH70JLF	IMH70ELF	x-xx	....
IMH200CLF	....	....	....
IWSN100CBLS	....	....	....
IZTEMH4003PSF	....	....	....
IZTSN150CLF	....	....	....

Ignitors

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/240/277V
LI500	LI501-H4	5-31, 32, 33, 34	....
LI501-A	LI501-H4	5-31, 32, 33, 34	....
LI501-B5	LI501-H4	5-31, 32, 33, 34	....
LI501-E	LI501-J4	4-41, 43, 44	....
LI505-H4 (Cut-off)	LI501-H4 (Std.)	5-31, 32, 33, 34	....
LI520-H5	LI522-H5	4-41	....
LI521-H5	LI522-H5	4-41	....
LI525-H6 (Cut-off)	LI522-H5 (Std.)	4-41	....
LI530-H5	LI533-H4	4-41	....
LI531-H5	LI533-H4	4-41	....
LI532-H4	LI533-H4	4-41	....
LI533-H4A	LI533-H4	4-41	....
LI540-H4	....	....	....
LI550	LI551-H4	4-43	....
LI551-B5	LI551-H4	4-43	....
LI551-RS	....	....	....
LI555-H4 (Cut-off)	LI551-H4 (Std.)	4-43	....
LI560-H5	LI561-H5	4-35, 41	....
LI570	LI571-H5	4-35, 41	....

* Availability limited to existing stocks.

** The CWA ballasts offered as replacements are furnished with a capacitor which must be used in the ballast circuit as shown in the wiring diagram in this Atlas. The original ballast circuit in the lighting fixture may have been low or normal power factor, and therefore, no capacitor was used. If the CWA ballast with its capacitor does not fit in the fixture, contact Philips Lighing Electronics for assistance.

Philips Advance Replacement ballasts shown are functionally equivalent to listed obsolete ballasts. Dimensional differences can exist.

Suffix "T" ballast catalog numbers indicate ballast is equipped with 120V output tap.
Standard practice is to use 120V tap on quadri-volt ballast, where quadri-volt ballasts are available.

Where no replacement ballast is shown, ballast has been discontinued and inventories are exhausted.

Consult nearest Philips Lighing Electronics sales office for assistance.

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
CF13DD			3-29, 3-31	
CF13DD/E	1-23	2-12, 2-18		
CF13DS			3-29, 3-31	
CF13DS/E				
CF13DT/E	1-25	2-12, 2-18		
CF18DD			3-32	
CF18DD/E	1-23	2-7, 2-12, 2-18		
CF18DF				
CF18DT			3-32	
CF18DT/E	1-36	2-7, 2-12, 2-18		
CF24DF				
CF26DD			3-30, 3-32	
CF26DD/E	1-24	2-5, 2-7, 2-12, 2-18		
CF26DT			3-32	
CF26DT/E	1-27	2-5, 2-7, 2-12, 2-18		
CF32DT/E	1-27	2-5, 2-7, 2-12, 2-18		
CF36DF				
CF42DT/E	1-28	2-5, 2-7, 2-12, 2-18		
CF57DT/E		2-7, 2-12, 2-18		
CF5DS			3-29, 3-31	
CF5DS/E				
CF70DT/E	1-28	2-7, 2-12, 2-18		
CF7DS			3-29, 3-31	
CF7DS/E	1-22			
CF9DD			3-29, 3-31	
CF9DS			3-29, 3-31	
CF9DS/E	1-22			
CFM18W/2G10				
CFM24W/2G10				
CFM36W/2G10				
CFQ10W/G24q				
CFQ13W/G24d				
CFQ13W/G24q	1-23	2-12, 2-18		
CFQ13W/GX23			3-29, 3-31	
CFQ18W/G24d			3-32	
CFQ18W/G24q		2-7, 2-12, 2-18		
CFQ20W/GX32d				
CFQ26W/G24d			3-30, 3-32	
CFQ26W/G24q		2-5, 2-7, 2-12, 2-18		
CFQ27W/GX32d			3-30	
CFQ9W/G23			3-29, 3-31	
CFS10W/GR10q	1-34			
CFS16W/GR10q	1-34			
CFS21W/GR10q	1-34		3-33	
CFS28W/GR10q	1-35		3-33	
CFS38W/GR10q	1-35			
CFS55W/GRY10q				
CFT13W/2GX7				
CFT13W/GX23			3-29, 3-31	
CFT5W/2G7				
CFT5W/G23			3-29, 3-31	
CFT7W/2G7	1-22			
CFT7W/G23			3-29, 3-31	
CFT9W/2G7	1-22			
CFT9W/G23			3-29, 3-31	
CFTR13W/GX24q	1-25	2-12, 2-18		
CFTR18W/GX24d			3-32	
CFTR18W/GX24q	1-26	2-7, 2-12, 2-18		
CFTR26W/GX24d			3-32	
CFTR26W/GX24q	1-27	2-5, 2-7, 2-12, 2-18		
CFTR32W/GX24q	1-27	2-5, 2-7, 2-12, 2-18		
CFTR42W/GX24q	1-28	2-5, 2-7, 2-12, 2-18		
CFTR57W/GX24q	1-28	2-5, 2-7, 2-12, 2-18		
CFTR70W/GX24q	1-28	2-5, 2-7, 2-12, 2-18		

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
F10 2D/4P	1-34			
F13BX			3-29, 3-31	
F13DBX/4P	1-23	2-12, 2-18		
F13DBX23T4			3-29, 3-31	
F13DBXT4				
F13T5	1-36			
F13T8			3-23, 3-25	
F13TBX/4P	1-25	2-12, 2-18		
F14T12			3-24, 3-26, 6-13	
F14T5	1-37			
F14T8			3-23	
F15T12			3-24, 3-26, 6-13	
F15T8			3-23, 3-25, 6-13	
F15T8/PLUS				
F15T8/XL				
F16 2D/4P	1-34			
F17T8	1-41, 1-42, 1-43, 1-44	2-10, 2-15, 2-21		
F18BX			3-30	
F18BX/RS	1-30			
F18DBX/4P	1-23	2-7, 2-12, 2-18		
F18DBXT4			3-32	
F18T12/HO				3-34, 3-36
F18T8			3-23	
F18TBX/4P	1-26	2-7, 2-12, 2-18		
F19T8			3-23	
F20T12			3-24, 3-26, 6-13	
F21 2D/4P	1-34		3-33	
F21T5	1-37			
F24T12			3-19	
F24T12/HO			3-11	3-34, 3-36
F24T5/HO	1-39	2-9		
F25T12 (28-33")			3-24	
F25T12 (36")			3-6	
F25T8	1-45, 1-46, 1-47, 1-48	2-10, 2-15, 2-21		
F26DBX/4P	1-24	2-5, 2-7, 2-12, 2-18		
F26DBXT4			3-32	
F26TBX/4P	1-27	2-5, 2-7, 2-12, 2-18		
F27BX/RS	1-30	2-8		
F28 2D/4P	1-35		3-33	
F28T5	1-37	2-3		
F30T12	1-66		3-6, 3-24, 6-10	
F30T12/HO			3-11	3-36
F30T8			3-23	
F32T8	1-57, 1-58, 1-59, 1-60	2-10, 2-16, 2-21	3-5	
F32T8/ES (25W)	1-49, 1-50			
F32T8/ES (28W)	1-51, 1-52			
F32T8/ES (30W)	1-53, 1-54, 1-55, 1-56			
F32T8/U6	1-57, 1-58, 1-59, 1-60	2-10, 2-16, 2-21	3-5	
F32TBX/4P	1-27	2-5, 2-7, 2-12, 2-18		
F34T12	1-66		3-7, 6-10	
F34T12/U	1-66		3-9	
F35T5				
F36T12			3-19	
F36T12/HO			3-11	3-34, 3-36
F38 2D/4P	1-35			
F39BX/RS	1-30	2-8, 2-13		
F39T5/HO	1-39			
F40BX	1-31	2-8, 2-13		
F40T10			3-6	
F40T12	1-66		3-8, 3-10, 3-24, 6-10	
F40T12/IS			3-19	
F40T12/U	1-66		3-9, 3-10	
F40T17/IS			3-19	
F40T8	1-61, 1-62			

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
F42T12			3-19	
F42T12/HO			3-12	3-34, 3-36
F42T6			3-18	
F42TBX/4P	1-28	2-5, 2-7, 2-12, 2-18		
F48PG17/VHO			3-16	3-35
F48T10/VHO			3-16	3-35
F48T12			3-19	
F48T12/ES			3-19	
F48T12/HO			3-12, 6-11	3-34, 3-36
F48T12/VHO			3-16	3-35
F48T5/VHO				
F48T8/HO	1-64			
F48T8/VHO	1-65			
F4T5			3-22	
F50BX/RS	1-32			
F54T5/HO	1-39, 1-50	2-9, 2-14, 2-20		
F55 2D/4P				
F55BX	1-33	2-8, 2-13, 2-19		
F57QBX/4P	1-28	2-7, 2-12, 2-18		
F58T8	6-6			
F5BX			3-29, 3-31	
F60T10/VHO			3-16	3-35
F60T12			3-20, 6-12	
F60T12/HO			3-13	3-34, 3-36
F60T12/VHO			3-16	3-35
F60T8/HO	1-64			
F64T12			3-20, 6-12	
F64T12/HO			3-13	3-34, 3-36
F64T6			3-18	
F6T5			3-22	
F70QBX/4P	1-28	2-7, 2-12, 2-18		
F70T8	6-6			
F72PG17/VHO			3-16	3-35
F72T10/VHO			3-16	3-35
F72T12	1-67		3-20, 6-12	
F72T12/HO			3-14, 6-11	3-34, 3-36
F72T12/VHO			3-16	3-35
F72T8 (200mA)	1-63		3-18	
F72T8 (265mA)	1-63			
F72T8/HO	1-64			
F7BX			3-29, 3-31	
F80T5/HO	1-40	2-14		
F84T12			3-20	
F84T12/HO			3-14	3-36
F8T5	1-36		3-22	
F96PG17/HO/ES			3-17	
F96PG17/VHO			3-17	3-35
F96T10/VHO			3-17	3-35
F96T12	1-67		3-21, 6-12	
F96T12/ES	1-67		3-21	
F96T12/HO	1-68		3-15, 6-11	3-34, 3-36
F96T12/HO/ES	1-68		3-15	
F96T12/VHO			3-17	3-35
F96T12/VHO/ES			3-17	
F96T8 (200mA)	1-63		3-18	
F96T8 (265mA)	1-63			
F96T8/ES	1-63			
F96T8/HO	1-64			
F9BX			3-29, 3-31	
F9DBX23T4			3-29, 3-31	
FB016T8		2-10, 2-15, 2-21		
FB024T8		2-10, 2-15, 2-21		
FB031T8		2-10, 2-16, 2-21	3-5	
FC12T5	1-48			

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
FC12T5/HO	1-38	2-9, 2-14, 2-20		
FC12T9			3-27, 3-28	
FC16T9			3-27, 3-28, 6-13	
FC6T9			3-27, 3-28	
FC8T9	1-66		3-27, 3-28	
FC9T5	1-38			
FO13T8/XP				
FT18DL			3-30	
FT18DL/RS	1-30			
FT18W/2G11			3-30	
FT18W/2G11/RS	1-30			
FT24DL	1-30	2-8		
FT24W/2G11	1-30	2-8		
FT36DL	1-30	2-8, 2-13		
FT36W/2G11	1-30	2-8, 2-13		
FT40DL/RS		2-8, 2-13		
FT40W/2G11/RS		2-8, 2-13		
FT50W/2G11/RS	1-32			
FT55DL	1-33	2-8, 2-13, 2-19		
FT55W/2G11	1-33	2-8, 2-13, 2-19		
FT80DL	1-33	2-13		
FT80W/2G11	1-33	2-13		
G15T8				
G30T8				
G64T5				
PL-C13W				
PL-C13W/4P	1-23			
PL-C13W/USA			3-29, 3-31	
PL-C15MM/22W				
PL-C15MM/28W			3-30	
PL-C18W			3-32	
PL-C18W/4P	1-27	2-7, 2-12, 2-18		
PL-C26W			3-30, 3-32	
PL-C26W/4P	1-24	2-5, 2-7, 2-12, 2-18		
PL-H120W/4P	1-29			
PL-H60W/4P	1-29			
PL-H85W/4P	1-29			
PL-L18W			3-30	
PL-L18W/TUV	6-5			
PL-L24W	1-30	2-8		
PL-L35WHO/TUV	6-5			
PL-L36W	1-30	2-8, 2-13		
PL-L36W/TUV	6-5			
PL-L40W	1-31	2-8, 2-13		
PL-L50W	1-32			
PL-L55W	1-33	2-8, 2-13, 2-19		
PL-L60WHO/TUV	6-5			
PL-L80W	1-33	2-13		
PL-L95WHO/TUV	6-5			
PL-Q 28W/4P	1-35		3-33	
PL-Q 38W/4P	1-35			
PL-S13W			3-29, 3-31	
PL-S5W			3-29, 3-31	
PL-S7W			3-29, 3-31	
PL-S9W			3-29, 3-31	
PL-T18W	1-26	2-7, 2-12, 2-18		
PL-T26W	1-27	2-5, 2-7, 2-12, 2-18		
PL-T32W	1-27	2-5, 2-7, 2-12, 2-18		
PL-T42W	1-28	2-5, 2-7, 2-12, 2-18		
PL-T57W	1-28	2-7, 2-12, 2-18		
TUV36T5/HO				
TUV64T5/HO				

HID Lamp to Ballast

Lamp Description		Ballast Type								
		Core & Coil				Encapsulated Page Number	F-Can Page Number	Postline Page Number	Indoor Enclosed Page No.	Outdoor Weatherproof Page Number
Watts	ANSI Code	Electronic Page No.	Replacement Page Number	OEM Page No.	50 Hz Page Number					
Metal Halide										
20	M156	4-7	....	....	....	....	....	....	....	....
22	C175	....	....	....	....	....	....	....	....	....
35/39	C179	....	....	....	....	....	....	....	....	....
35/39	M130	4-7	5-12	....	....	....	....	....	....	....
50	M110	4-7	5-12	....	....	....	5-46	5-52	....	....
50	M148	4-7	5-12	....	....	....	5-46	....	....	....
60	TBD	4-14	....	....	....	....	....	....	....	....
70	M98	4-8	5-13	....	6-9	5-49	5-46	....	....	....
70	M85	....	5-13	....	....	....	5-46	....	....	....
70	M143	4-8	5-13	....	6-9	....	5-46	....	....	....
70	M139	4-8	5-13	....	....	....	5-46	....	....	....
90	TBD	4-14	....	....	....	....	....	....	....	....
100	M90	4-8	5-14	....	6-9	5-49	5-46	....	....	....
100	M140	4-8	5-14	....	....	5-49	5-46	....	....	....
140	TBD	4-14	....	....	....	....	....	....	....	....
150	M102	4-8	5-15	....	....	5-49	5-46	....	....	....
150	M107	....	5-16	....	6-9	....	5-47	....	5-55	5-56
150	M81	....	5-15	....	....	....	5-46	....	....	....
150	M142	4-8	5-15	....	....	5-49	5-46	....	....	....
175	M57	....	5-16	....	....	5-49	5-47	....	5-55	5-56
175 (Pulse-Start)	M137	4-8	5-16	....	....	5-49	5-47	....	5-55	....
175 (Pulse-Start)	M152	4-8	5-16	....	....	5-49	5-47	....	5-55	....
200 (Pulse-Start)	M136	...	5-17	....	....	....	....	....	....	....
210	C183	4-15	....	....	....	....	....	....	....	....
250	M58	....	5-18	....	....	5-49	5-47	....	5-55	5-56
250	M80	....	....	....	....	....	....	....	....	....
250 (Pulse-Start)	M138	....	5-19	....	....	5-49	5-47	....	5-55	....
250 (Pulse-Start)	M153	....	5-19	....	....	5-49	5-47	....	5-55	....
315	C182	4-15	....	....	....	....	....	....	....	....
320 (Pulse-Start)	M132	4-13	5-20	....	....	5-49	5-47	....	5-55	....
320 (Pulse-Start)	M154	4-13	5-20	....	6-9	5-49	5-47	....	....	....
350 (Pulse-Start)	M131	4-13	5-20	....	....	5-49	5-47	....	5-55	....
400	M59	....	5-21	....	6-9	5-50	5-47	....	5-55	5-56
400 (Pulse-Start)	M128	....	....	....	....	....	....	....	....	....
400 (Pulse-Start)	M135	4-13	5-22	....	....	5-50	5-47	....	5-55	....
400 (Pulse-Start)	M155	4-13	5-22	....	....	5-50	5-47	....	5-55	....
450 (Pulse-Start)	M144	....	5-22	....	....	....	....	....	....	....
750 (Pulse-Start)	M149	....	5-23	....	....	....	....	....	....	....
1000 (Pulse-Start)	M141	....	5-24	....	....	5-50	....	....	5-55	....
1000	M47	....	5-24	....	....	5-50	....	....	5-55	5-56
1500	M48	....	5-25	....	6-9	....	....	....	....	....
1650	M112	....	5-25	....	....	....	....	....	....	....
2000	M134	....	....	....	....	....	....	....	....	....
High Pressure Sodium										
35	S76	....	5-26	....	....	....	....	5-53	....	....
50	S68	....	5-27	....	....	....	5-48	5-53	....	....
70	S62	....	5-28	....	6-10	....	5-48	5-53	....	....
100	S54	....	5-29	....	6-10	....	5-48	5-53	....	....
150 (55V)	S55	....	5-30, 5-31	....	6-10	....	5-48	5-53	....	5-63
150 (100V)	S56	....	5-31	....	....	....	....	....	....	....
200	S66	....	5-32	....	....	....	....	....	....	....
250	S50	....	5-33	....	6-10	5-51	....	....	....	....
310	S67	....	5-34	....	....	....	....	....	....	....
400	S51	....	5-34	....	6-10	5-51	....	....	5-54	5-57
430	S145	....	....	....	....	....	....	....	....	....
600	S106	....	5-35	....	....	....	....	....	....	....
750	S111	....	5-35	....	....	....	....	....	....	....
1000	S52	....	5-35	....	6-10	....	....	....	5-54	5-57
Low Pressure Sodium										
18	L69	....	5-36	....	....	....	....	....	....	....
35	L70	....	5-36	....	....	....	....	....	....	....
55	L71	....	5-36	....	....	....	....	....	....	....
90	L72	....	5-37	....	....	....	....	....	....	....
135	L73	....	5-37	....	....	....	....	....	....	....
180	L74	....	5-37	....	....	....	....	....	....	....

Compact Fluorescent Lamp Reference Guide

Lamp Type	Lamp Watts	NEMA Lamp Designation	PHILIPS	GE	OSRAM/ SYLVANIA	PANASONIC	Page No.
2-Pin lamps with built-in starter							
Twin Tube	5W	CFT5W/G23	PL-S5W	F5BX	CF5DS	-	3-20, 21
	7W	CFT7W/G23	PL-S7W	F7BX	CF7DS	-	3-20, 21
	9W	CFT9W/G23	PL-S9W	F9BX	CF9DS	-	3-20, 21
	13W	CFT13W/GX23	PL-S13W	F13BX	CF13DS	-	3-20, 21
Quad Tube	9W	CFQ9W/G23	-	F9DBX23T4	CF9DD	-	3-20, 21
	13W	CFQ13W/GX23	PL-C13W/USA	F13DBX23T4	CF13DD	FDS13/2	3-20, 21
	13W	CFQ13W/G24d	PL-C13W	F13DBXT4	-	-	-
	18W	CFQ18W/G24d	PL-C18W	F18DBXT4	CF18DD	FDS18/2	-
	22W	CFQ20W/GX32d	PL-C15MM/22W	-	-	FDL22	-
	26W	CFQ26W/G24d	PL-C26W	F26DBXT4	CF26DD	FDS26/2	3-20, 21
	28W	CFQ27W/GX32d	PL-C15MM/28W	-	-	FDL28	3-20
Triple Tube	18W	CFTR18W/GX24d	-	-	CF18DT	-	-
	26W	CFTR26W/GX24d	-	-	CF26DT	-	3-21
4-Pin lamps							
Flat Tube	18W	CFM18W/2G10	-	-	CF18DF	-	-
	24W	CFM24W/2G10	-	-	CF24DF	-	-
	36W	CFM36W/2G10	-	-	CF36DF	-	-
Twin Tube	5W	CFT5W/2G7	-	-	CF5DS/E	-	-
	7W	CFT7W/2G7	-	-	CF7DS/E	-	1-22
	9W	CFT9W/2G7	-	-	CF9DS/E	-	1-22
	13W	CFT13W/2GX7	-	-	CF13DS/E	-	-
Quad Tube	10W	CFQ10W/G24q	-	-	-	FDS10/4	-
	13W	CFQ13W/G24q	PL-C13W/4P	F13DBX/4P	CF13DD/E	FDS13/4	1-23
	18W	CFQ18W/G24q	PL-C18W/4P	F18DBX/4P	CF18DD/E	FDS18/4	1-23
	26W	CFQ26W/G24q	PL-C26W/4P	F26DBX/4P	CF26DD/E	-	-
Triple Tube	13W	CFTR13W/GX24q	-	F13TBX/4P	CF13DT/E	-	1-25
	18W	CFTR18W/GX24q	PL-T18W	F18TBX/4P	CF18DT/E	FHT18	1-26
	26W	CFTR26W/GX24q	PL-T26W	F26TBX/4P	CF26DT/E	FHT26	1-27
	32W	CFTR32W/GX24q	PL-T32W	F32TBX/4P	CF32DT/E	FHT32	1-27
	42W	CFTR42W/GX24q	PL-T42W	F42TBX/4P	CF42DT/E	-	1-28
	57W	CFTR57W/GX24q	PL-T57W	F57QBX/4P	CF57DT/E	-	1-28
	60W		PL-H60W/4P	-	-	-	-
	70W	CFTR70W/GX24q	-	F70QBX/4P	CF70DT/E	-	1-28
	85W		PL-H85W/4P	-	-	-	-
	120W		PL-H120W/4P	-	-	-	-
2D	10W	CFS10W/GR10q	-	F10 2D/4P	-	-	1-34
	16W	CFS16W/GR10q	-	F16 2D/4P	-	-	1-34
	21W	CFS21W/GR10q	-	F21 2D/4P	-	-	1-34
	28W	CFS28W/GR10q	PL-Q 28W/4P	F28 2D/4P	-	-	1-35
	38W	CFS38W/GR10q	PL-Q 38W/4P	F38 2D/4P	-	-	1-35
	55W	CFS55W/GRY10q	-	F55 2D/4P	-	-	-
Long Twin Tube	18W	FT18W/2G11	PL-L18W	F18BX	FT18DL	-	3-20
	18W	FT18W/2G11/RS	-	F18BX/RS	FT18DL/RS	-	1-30
	24-27W	FT24W/2G11	PL-L24W	F27BX/RS	FT24DL	-	1-30
	36-39W	FT36W/2G11	PL-L36W	F39BX/RS	FT36DL	-	1-30
	40W	FT40W/2G11/RS	PL-L40W	F40BX	FT40DL/RS	-	1-31
	50W	FT50W/2G11/RS	PL-L50W	F50BX/RS	-	-	1-32
	55W	FT55W/2G11	PL-L55W	F55BX	FT55DL	-	1-33
	80W	FT80W/2G11	PL-L80W	-	FT80DL	-	1-33

Notes

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