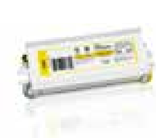
Lighting Electronics Atlas

A Full Line Catalog of LED Drivers, LED Modules, Ballasts and Lighting Controls 2014-2015

PHILIPS
ADVANCE

Contents



For the latest product updates, please visit:

Philips LED Drivers and Modules
www.philips.com/ledmodulesna

Philips Advance Ballasts
www.philips.com/advance

Philips Lighting Control Products
www.philips.com/lightingcontrolsna

Providing

the right solutions

From the cities we live in, to the places we work and shop, to our schools and care facilities, lighting touches our lives like nothing else. As a world leader in lighting, Philips is dedicated to improving people's lives through the introduction of innovative and energy-efficient solutions.

Philips is leading the way in providing energy-efficient lighting components and devices to manufacturers and distribution partners through the delivery of sustainable products.

At Philips every innovation is driven by the needs of the people, to help them feel more comfortable and to improve the functionality of their surroundings. Our approach is based on obtaining direct input both from customers and from end-users. Through this approach, we can assess specific customer needs, track changes over time, define new insights that fuel our innovation process, and ultimately help to bring the ideal new products into the market.

Make a difference

Sustainable Lighting Solutions

At Philips Lighting, transforming the way the world thinks and acts towards reducing its ecological footprint has long been our passion. We meet the energy efficiency challenge with new solutions to drive responsible energy practices while still providing the high quality components and devices that our customers require.

Along with our Green Products and Green Innovations, we inspire individuals to make simple changes that can have profound results.

We are committed to helping our customers "go-green" with a broad range of high-efficiency lighting components and devices that can help you:

- Significantly reduce energy consumption
- Reduce waste with more eco-friendly packaging
- Stay ahead of changing government regulations

We seek to facilitate new solutions to drive responsible energy practices, and have long focused on the energy efficiency of our products and production processes.

Smart Choice – Philips Products

A choice to sustain your success

Choosing a supplier is one of the most important decisions that you can make. The product lines that you carry reflect directly on your image and the value you offer your customers.

That's what makes us your ideal supplier. With the broadest selection of industry leading components, including Philips Advance LED Drivers and Ballasts or Philips LED Modules and Lighting Control devices we can provide you with a marketable – and sustainable – competitive advantage.

Anticipating your customer needs

The innovations that we deliver to the marketplace are inspired by you, our customers. By listening to your needs, we are able to deliver focused solutions that help you drive more business. Whether it's the latest energy saving technology in LED systems, or fluorescent and HID ballasts or lighting control devices, we are driven by your bottom line success.

RoHS Compliance

RoHS COMPLIANT

Philips is striving to achieve 100% RoHS compliance for all products. For mor information on the full line of RoHS compliant products, please visit: www. philips.com

Conflict minerals

Background

The proceeds from harmful social and environmental practices in mines, especially in the eastern provinces of the Democratic Republic of Congo (DRC), have been used to fuel armed conflict in that region. This is a major concern to the electronics industry, among others. The recently enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States defines conflict minerals as Tin, Tungsten, Tantalum and Gold (3TG) and any derivatives thereof[1].

Our commitment to sustainable development compels us to address this concern, even though Philips does not directly source minerals from the DRC and the mines are typically seven or more tiers removed from our direct suppliers[2]. Philips has committed not to purchase raw materials, subassemblies, or supplies which we know contain conflict minerals that directly or indirectly finance or benefit armed groups in the DRC or an adjoining country.

The Conflict Free Tin Initiative

Philips is one of the industry partners brought together by the Dutch government that initiated a conflict-free tin sourcing program in South Kivu, an eastern province of the DRC. Although this region has a rich supply of minerals, its economy has collapsed due to decades of ongoing conflict. In an effort to prevent minerals from financing war, many companies worldwide have shielded away from purchasing minerals from the DRC, creating a de facto embargo in the region. To overcome this issue and promote cooperation and economic growth in the region outside the control of the rebels, in September 2012, the Conflict Free Tin Initiative[3] was launched, introducing a tightly controlled conflict-free supply chain of tin outside the influence of the rebels.

For more information on Conflict Minerals and the steps Philips is taking to identify and use conflict free minerals visit our webpage http://www.philips.com/about/company/businesses/suppliers/conflict_minerals.page.

1 Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act requires certain manufacturers to conduct due diligence on the use of conflict minerals in their supply chain and to make annual disclosures to the SEC.

2 The Electronics Industry Citizenship Coalition (EICC), the Global e-Sustainability Initiative (GeSI) and RESOLVE jointly conducted a supply chain study in 2010, "Tracing a Path Forward: A Study of the Challenges of the Supply Chain for Target Metals Used in Electronics," (See www.eicc-gesi.resolv.wikispaces.net). The study found that tin, tungsten and tantalum make up a small percentage of the components and subcomponents in electronic products and the supply chain for these minerals generally contains seven or more layers.

3 Information on the Conflict Free Tin Initiative can be found at http://solutions-network.org/site-cfti/.

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Philips Advance LED Drivers – Versatility Delivered

LED Driver Categories

Long-lasting and low maintenance, LED-based light sources are an excellent solution for all lighting applications. For optimal performance, these solutions require reliable drivers matching the long lifetime of the LEDs. The Philips Advance Xitanium LED Driver portfolio offers a range of products specially designed to operate LED solutions for a variety of lighting applications such as office, retail, industrial and outdoor as well as meet wide variety of customer needs, but they can all provide certain common benefits.

Including:

- Reliable and consistent operation
- High efficiency — >90% in some cases
- Greater than 0.9 PF and Less than 20% THD
- Greater that 50,000 hrs[4] lifetime
- 5-year limited warranty[1]
- ROHS compliance[2]
- Safety approbations (UL, CSA, CE, ENEC, PSE, SELV or CQC)

Based on the features that each driver has to offer the Philips Advance Xitanium LED Drivers can be classified into three main categories: Fixed, Dimmable and Programmable.

Fixed

These are designed to meet the basic needs of LED lighting. Available in either dedicated input voltage or Intellivolt options, these drivers can address wide variety of output current and power requirements.

Dimmable

Along with the benefits of fixed drivers, these drivers are designed to address the growing demand for controllability and flexibility The Adjustable Output Current (AOC) feature enables operation of various LED configurations from different LED manufactures and offers "future proof" solutions for new LED generations. There are specific dimmable versions enabling use of lighting controls to help increase energy saving through a wide variety of protocols, such as 0-10V, Step-Dim, Trailing Edge and Leading Edge. In most of the cases the indoor drivers also integrate a 12V output for active cooling and NTC feedback for LED module temperature protection.

Additional Benefits with Dimmable LED Drivers Include:

- Wide variety of dimming interfaces (0-10V, Phase Cut, Step-Dim)
- Helps you address code requirements for energy efficient buildings
- Offers fixture design flexibility with the AOC feature
- Models offering features such as fan output and module temperature protection

See footnote on page 1-33.

Xitanium LED ELECTRONIC DRIVERS

Philips Advance LED Drivers – Versatility Delivered

LED Driver Categories

Programmable

Optimized to meet the ever evolving needs of today's LED lighting customers, Philips Advance Xitanium Programmable LED Drivers are a one-stop solution for the varying power needs of industrial high-bay, office, or retail lighting. Offering an unparalleled level of flexibility, these drivers provide a large number of features which can be customized based on the desired functionality of the luminaire design with simple programming interface. With multiple choices for current output levels, module temperature control settings and a network-ready DALI interface, this is an easily integrated driver solution. Luminaire designers and manufactures are also able to streamline logistics without compromising on performance.

Additional Benefits with Programmable LED Drivers Include:

- Robust programmable solution that offers ultimate design flexibility with a reliable long lifetime
- Reduced SKU complexity and simplified logistics management (one driver to serve many needs)
- Multiple dimming options provide energy savings and can help reduce light pollution and CO_2 impact
- Easily programmable user interface for onsite customization of driver requirements
- Optimized life expectancies of up to 100,000 hours[3]
- Driver programmability provides features for the ever-evolving improvements in LED efficacy, removing the need to design-in a new LED driver as technology improves or changes

See footnotes on page 1-33.

Current Product Portfolio Positioning

	Point	Linear	Outdoor
Programmable	• Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP	• Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP	• Programmable solution • Reduced SKU complexity • Programmable Features: CLO, AOC, MTP, OTL, AST, Dimming type (0-10V, DALI, AmpDim or Dynadimmer)
Dimmable	• Dimming interface options • AOC • MTP • Fan out for active cooling	• Dimming interface options • AOC • MTP	• 0-10V dimming • AOC • MTP
Fixed	• Fixed output current • 50k Hr. Lifetime[4] • Connectors • Compact Housing • Reliability	• Fixed output current • 50k Hr. Lifetime[4] • Connectors • Linear Housing • Reliability	• Fixed output current • 50k Hr. Lifetime (min)[4] • High surge capability • Reliability

AOC: Adjustable Output Current,
MTP: Module Temperature Protection,
CLO: Constant Light Output,
OTL: Over The Life,
AST: Adjustable Startup Time

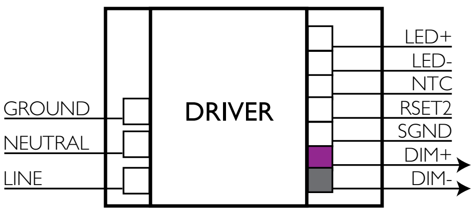
Adjustable Output Current (AOC)

AOC is a means of setting the secondary drive current of the LED driver to a prescribed level. This level is determined by the OEM during fixture design in order to create desired illumination levels, and is not intended for field modification. The desired current level is set by adding an external resistance across two terminals identified on the driver as "RSET" and SGND." The data sheets for applicable drivers include a table and graph that correlate desired drive current to a specific resistance value. Additional specifications on resistor type is also included. Resistors with >0.25W and >20V are typically acceptable.

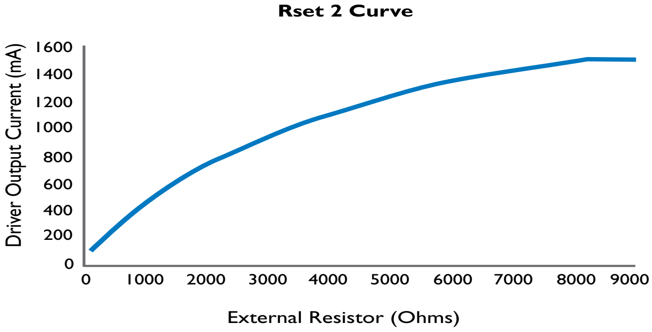
The resistor is furnished by the OEM and can be connected separately or incorporated elsewhere in the system (e.g., on the LED module). Two different current vs. resistance curves are used in these drivers, referred to as RSET1 and RSET2. RSET1 has a maximum current rating of 700mA (no resistance across the specified terminals). RSET2 has a maximum current rating of 2000mA (no resistance across the specified terminals).

AOC enables:

- Flexibility to select specific drive currents to optimize fixture performance
- Ability to consolidate SKUs and use one driver for multiple fixtures
- Ability to upgrade light engines and use the same driver, hence reducing qualification time and cost



Typical AOC application: 54W Linear Driver catalog number XI054C150V054DNT1



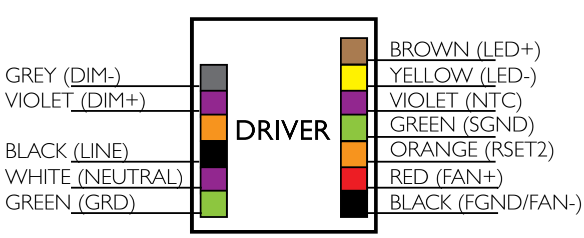
Rset (Ohms)	Current (mA)
100	100
120	111
150	124.5
180	138.2
220	154.6
270	176.4
330	203.7
390	228.3
470	261.0
560	296.5
680	340.2
820	392.1
1000	452.1
1200	514.9
1500	602.3
1800	684.2
2200	779.7
2700	883.5
3300	992.7
3900	1085.5
4700	1191.9
5600	1273.0
6800	1402.1
8200	1503.1
>8200	1503.1

Module Temperature Protection (MTP)

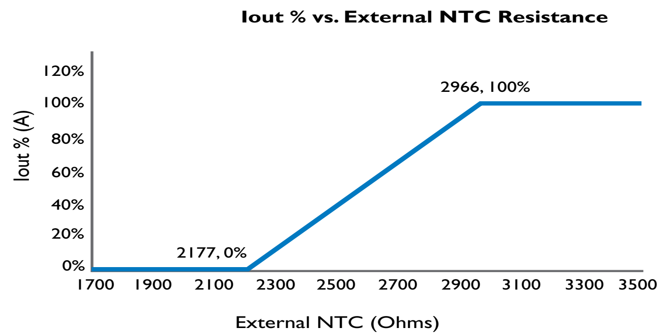
The Module Temperature Protection feature allows the OEM to design the LED system to reduce drive current in the event that the module overheats, hence reducing heating and potentially avoiding failure. This feature is enabled by adding an external Negative Temperature Coefficient (NTC) across two terminals identified on the LED driver as "NTC" and "SGND." When activated in application — by reaching the minimum temperature appropriate for the given NTC — drive current begins reducing according to the temperature-current curve of the specific NTC. The data sheets for applicable drivers include a graph illustrating current output vs. NTC resistance, and also typically include an example graph of module temperature vs. current output using a specific NTC.

Module Temperature Protection enables:

- Enhanced protection of the LED system from misapplication (e.g., day-burning)
- Longer potential life expectancy of the LED system



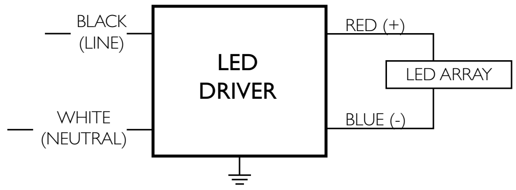
Typical MTP application: 50W Downlight Driver catalog number XI050C100V054DNM1



Remote Mounting

Most LED drivers are utilized in self-contained fixtures where the driver is included within the fixture, which is considered an electrical enclosure. Some applications call for remote mounting of the driver whereby the driver is in a separate electrical enclosure and not within the same enclosure/fixture as the LED light source. In these applications, it is typically acceptable to have the driver mounted remotely but care is required to ensure that voltage drop is minimized to not impact performance of the LED system.

Data sheets for most LED drivers include a table showing recommended maximum remote mounting distances for various wire gauges. In general, larger gauge wires will enable longer maximum distance, and higher LED drive currents will have lower maximum distances. Published maximum wiring distances are typically based on full load and longer distances are usually practical for lower load levels (consult your local sales representative for complete information).



**Typical remote mounting application:
100W Outdoor Driver catalog number
LEDINTA0024V41FO**

Maximum Wiring Distance (at full load)

Wire Size (AWG)	Distance (feet)
26	3
24	4
22	7
20	11
18	18
16	29
14	46
12	71
10	120

Xitanium LED ELECTRONIC DRIVERS

Catalog Number Explanation

LED	INT	A	0700	C	210	DO	M

Packaging:
M = Midpack   I = Individual Pack   B = Bulk Pack

Fixed or Dimming:
FO = Fixed
DO= Dimming (0-10V) Isolated
DN= Dimming (0-10V) NON-Isolated
DL= Dimming (0-10V) NON-Isolated in F-can
F3= Tritap
FL= Fixed in F-can

Max Current or Max Voltage:

210=210V	80=80V	24=24V	18=1.8A	50=5.0A	24=24V
425=425V	33=3.3A	07=0.7A	20=2.0A	30=3.0A	60=60V
140=140V	28=2.8A	21=2.1A	22=2.2A	32=3.2A	80=80V
280=280V	10=1.0A	14=1.4A	36=36V	41=4.1A	

Constant Current or Constant Voltage:
C= Constant Current
V= Constant Voltage

Max Current or Max Voltage:

0350=350mA	0700=700mA	0024=24V	700=700mA	1600=1.6A
0400=400mA	1050=1.05A	0012=12V	0520=520mA	1000=1.0A
0530=530mA	2000=2.0A	0036=36V	1400=1.4A	

Input Voltage:
A=AC Voltage
D=DC Voltage

Input Voltage:
INT= 120 - 277V (UL, CSA)
120 = 120V (UL, CSA)
277 = 277V (UL, CSA)
UNI = 120 - 240V
HCN = 347-480V (UL, CSA)

General
LED= Xitanium LED Driver

Catalog Number Explanation

X	I	075	C070	V105	C	N	Y	1	M

Packaging:
M = Midpack B = Bulk Pack
I = Individual Pack

Version Control:
1 = Version 1 X = Version X
2 = Version 2

Enclosure Designation

Features:
P = Programming
N = Non-Programming

Fixed or Dimming:
F = Fixed
D = Dimming (0-10V) isolated with AOC+NTC
C = Dimming (0-10V) isolated without AOC+NTC
A = AOC Only, no dimming, no NTC
N = Dimming (0-10V) Non Isolated
M = 0-10, DALI, PLS (Programmable LumiStep)
T = Trailing Edge (Triac)
X = TE (Trailing Edge) & 0-10V
Y = TE (Trailing Edge), Touch & DALI
Z = TE (Trailing Edge) & DALI
R = TE (Trailing Edge) & LE (Leading Edge)
L= DALI(TD) only

Max Voltage:
Examples:
012 = 12V
054 = 54V
280 = 280V

Max Current:
Examples:
035 = 350mA
053 = 530mA
070 = 700mA
105 = 1.05A

Max Power:
Examples:
025 = 25W
060 = 60W
300 = 300W

Input Voltage:
I = 120-277 (UL, CSA)
R = 120V (UL, CSA)
V = 277V (UL, CSA)
U = 120-240V
H = 347-480V (UL, CSA)
G = 120-200-230-277 (UL, CE, ENEC, CQC)
E = 220-240V (CE, ENEC) Europe & APR
J = 100-242V (PSE) Japan
K = 200-242V (PSE) Japan
A = 220-240V (CQC, CE)

General
X= Xitanium LED Driver

Most date codes are stamped on the back of the driver (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 driver was manufactured. Depending upon which Philips Lighting factory manufactured the driver, the date stamp can vary slightly, in terms of its position on the driver and the number sequence.

For plastic case drivers the date code will appear as a label

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.

Xitanium LED ELECTRONIC DRIVERS

Xitanium LED driver Tc points

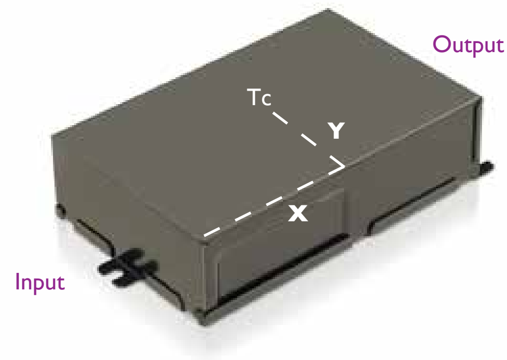
The lifetime of LED drivers depends on the temperature during operation. This means there is a relationship between the Tc point on the LED driver and its lifetime. With this in mind, several diagrams have been made to aid in pinpointing the general area of the Tc point on the driver(s). Each driver has a designated diagram. See below to identify where the Tc point is.

F Can

Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
LED Driver 48W/2.0A-24V 0-10V Intellivolt	LEDINTA0024V20DLO	42	19	(+/-) 5
LED Driver 48W/2.0A-24V Intellivolt	LEDINTA0024V20FLO	42	19	(+/-) 5
LED Driver 72W/3.0A-24V 0-10V Intellivolt	LEDINTA0024V30DLO	42	19	(+/-) 5
LED Driver 72W/3.0-24V Intellivolt	LEDINTA0024V30FLO	42	19	(+/-) 5
LED Driver 100W 4.1A-24V Intellivolt	LEDINTA0024V41FLO	42	19	(+/-) 5
LED Driver 100W/4.1A-24V/DIM Intellivolt	LEDINTA0024V41DLO	42	19	(+/-) 5
Xitanium Int 75W Programmable Sxt	929000702302	80	19	(+/-) 5
Xitanium Int 150W Programmable Sxt	929000702202	80	19	(+/-) 5
Xitanium 75W 0.35-0.70 GL Prog+SD Sxt	929000704913	80	19	(+/-) 5
Xitanium 150W 0.35-0.70 GL Prog+SD Sxt	929000705113	80	19	(+/-) 5
LED Driver 100W 0.7/0.5/.35A 120-277	LEDINTA700C140F3O	80	19	(+/-) 5
LED Driver 115W/0.40A-280V 347-480V	LEDHCNA0400C280FO	80	19	(+/-) 5
LED Driver 150W 0.35A Intellivolt	LEDINTA0350C425FO	80	19	(+/-) 5
LED Driver 150W 350mA 425V Fixed 347-480V	LEDHCNA0350C425FO	80	19	(+/-) 5
LED Driver 150W 350mA 425V 0-10V 347-480V	LEDHCNA0350C425DN	80	19	(+/-) 5
Xitanium 150W 0.35A 425V 0-10V 120-277V	LEDINTA0350C425DO	80	19	(+/-) 5
Xitanium 150W 0.53A 0-10V OTD	LEDINTA0530C280DO	80	19	(+/-) 5
Xitanium 150W 0.53A 280V 0-10V 347-480V	LEDHCNA0530C280DN	80	19	(+/-) 5
LED Driver 150W 0.70A Intellivolt	LEDINTA0700C210FO	80	19	(+/-) 5
Xitanium 150W/700mA-210V 347-480V OTD	LEDHCNA0700C210FO	80	19	(+/-) 5
LED Driver 150W/ 700mA 210V 0-10V 347-480V	LEDHCNA0700C210DN	80	19	(+/-) 5
LED Driver 150W/0.70A DIM Intellivolt	LEDINTA0700C210DO	80	19	(+/-) 5
Xitanium 150W 1.05A 140V 0-10V 120-277V	LEDINTA1050C140DO	80	19	(+/-) 5
Xitanium 150W 1.5A 100V 0-10V 120-277V	LEDINTA1500C100DO	80	19	(+/-) 5
Xitanium 100W 24V 4.1A 347-480 OTD	LEDHCNA0024V41FLO	35	19	(+/-) 5
LED Driver 100W 24V 4.1A 0-10V 347-480V	LEDHCNA0024V41DLO	35	19	(+/-) 5

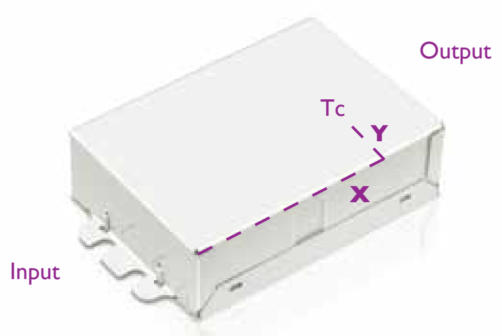
Xitanium LED ELECTRONIC DRIVERS

H Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
Xitanium 150W 0.20-0.35A GL Programmable + Sxt	XI150C035V425MPH1	70	44	(+/-) 5

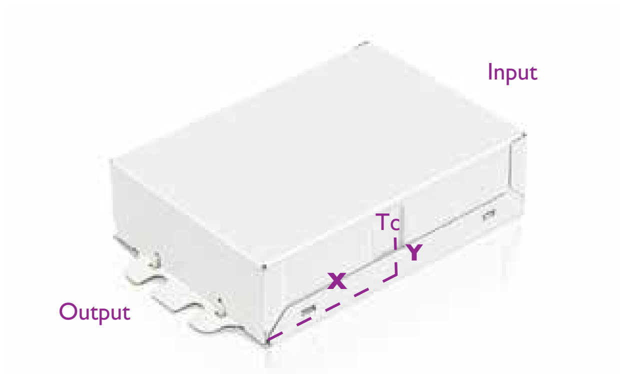
M2 Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
Xitanium 25W 0.2-0.5A 54V TE/0-10V 120V	XR025C050V054XPM1	84	12	(+/-) 5
Xitanium 25W 0.3-1.0A 36V TE/0-10V 120V	XR025C100V036XPM1	84	12	(+/-) 5
Xitaniium 25W 0.3-1.0A 36V TD 120V	XR025C100V036LPM1	84	12	(+/-) 5
Xitanium 25W 0.3-1.0A36V 0-10V 277V	XV025C100V036DPM1	84	12	(+/-) 5
Xitanium 25W 0.2-0.5A 54V 0-10V 277V	XV025C050V054DPM1	84	12	(+/-) 5
Xitanium 50W 0.3A-1A 54V 0-10V 277V	XR050C100V054XPM1	84	12	(+/-) 5
Xitanium 50W 0.3-1A 54V 0-10V 277V	XV050C100V054DPM1	84	12	(+/-) 5
Xitanium 60W 0.3-1A 80V TE/0-10V 120V	XR060C100V080XPM1	84	12	(+/-) 5

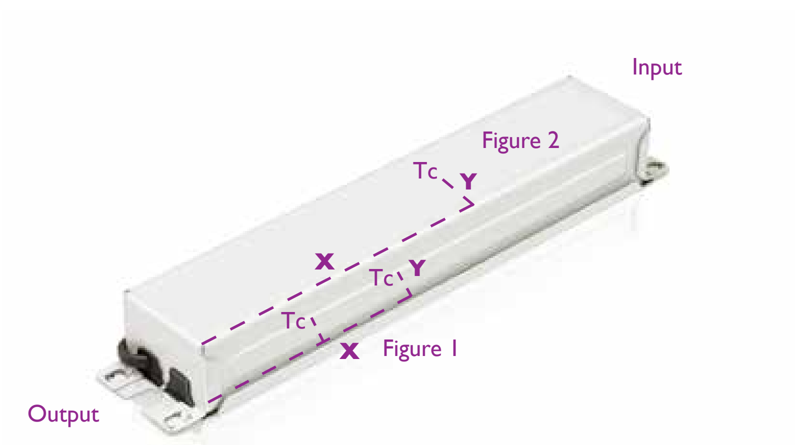
Xitanium LED ELECTRONIC DRIVERS

M5 Can



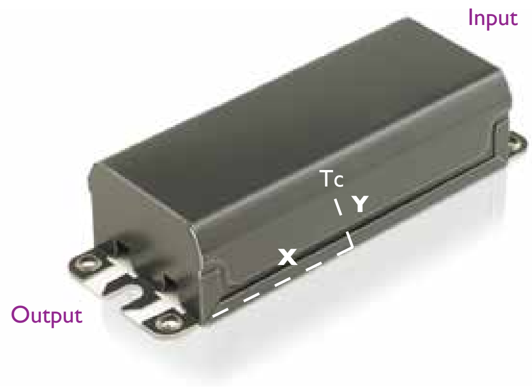
Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
LED Driver 120-277V 0-10V DIM	913701213402	58	15	(+/-) 5
LED Driver 23W 520MA-60V/DIM Intellivolt	LEDINTA0520C60DB	58	15	(+/-) 5
LED Driver 45W 520MA-80V/DIM Intellivolt	LEDINTA0520C80DB	58	15	(+/-) 5
LED Driver 50W 1.0A-60V/DIM Intellivolt	LEDINTA1000C60DB	58	15	(+/-) 5

S Can



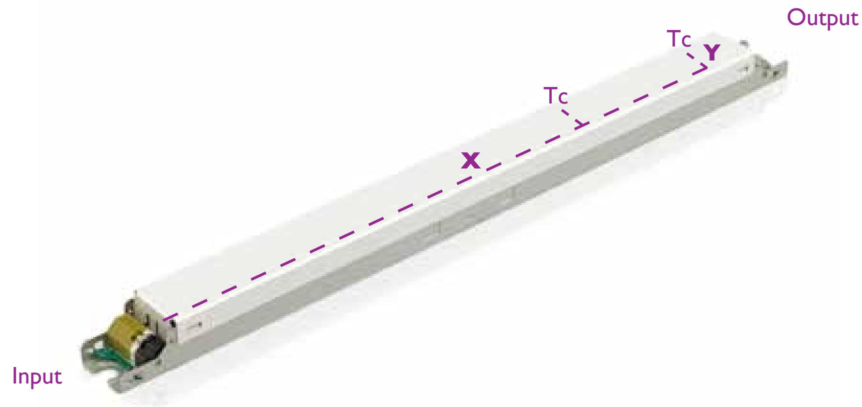
Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)	Figure
LED Driver 67W/2.8A-24V Intellivolt	LEDINTA0024V28FO	42	14	(+/-) 5	1
Xitanium 58W 1.6A 36V 120-277 Outdoor	LEDINTA1600C36FO	42	14	(+/-) 5	1
LED Driver 53W/2.2A-24V Intellivolt	LEDINTA0024V22FO	42	14	(+/-) 5	1
LED Driver 60W 12V Intellivolt	LEDINTA0012V50FO	42	14	(+/-) 5	1
LED Driver 77W/3.2A-24V Intellivolt	LEDINTA0024V32FO	42	14	(+/-) 5	1
LED Driver 100W 4.1A-24V Intellivolt	LEDINTA0024V41FO	81	14	(+/-) 5	1
LED Driver 60W /12V 120V 60HZ	LED120A0012V50F	118	14	(+/-) 5	2
LED Driver 80W/24V 120V 60HZ	LED120A0024V33F	118	14	(+/-) 5	2

Y Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
Xitanium 75W 0.20-0.70A GL-Y 1-10V SxT	XI075C070V105CNY1	39	21	(+/-) 5
Xitanium 75W 0.20-0.70A GL AOCM SxT	XI075C070V105DNY1	39	21	(+/-) 5

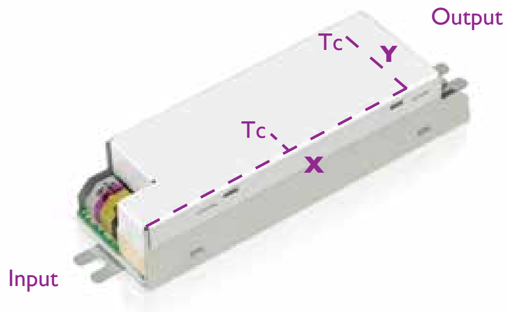
T Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
Xitanium 48W 2.0A 24V 120-277V 0-10V DIM	LEDINTA2000C24DO	257.5	12.5	(+/-) 5
Xitanium 75W 0.7-2.0A 54V TE/0-10V INT	XI075C200V054XPT1	302.5	12.5	(+/-) 5
Xitanium 75W 0.7-2.0A 54V DALI 120-277V	XI075C200V054YPT1	302.5	12.5	(+/-) 5

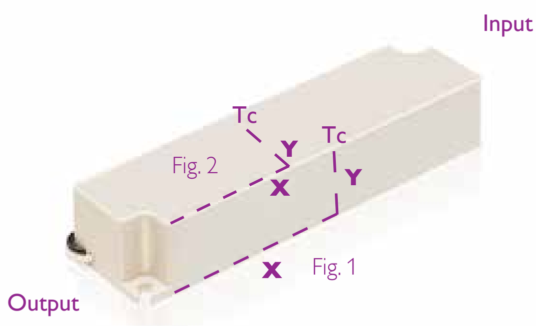
Xitanium LED ELECTRONIC DRIVERS

L Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)
Xitanium 25W 0.3-1.0A 36V TE/0-10V INT	XI025C100V036XPL1	92	30	(+/-) 5
Xitanium 50W 0.3-1A 54V TE/0-10V 120-277	XI050C100V054XPL1	60	15	(+/-) 5

V Can



Description	Driver Number	X (mm)	Y (mm)	Tolerance (mm)	Figure
LED Driver 10W/0.35A-28V 120V Outdoors	LED120A0350C28FO	36	12	(+/-) 5	1
LED Driver 12W/12V 120V 60HZ	LED120A0012V10F	36	12	(+/-) 5	1
LED Driver 17W/0.7A 120V 60Hz Outdoors	LED120A0700C24FO	36	12	(+/-) 5	1
LED Driver 20W/0.7A/DIM 120V Outdoors	LED120A0700C28DO	36	12	(+/-) 5	1
LED Driver 20W/0.7A 277V Outdoors	LED277A0700C28FO	36	12	(+/-) 5	1
Xitanium 21W 0.70A 30V 0-10V DIM 277V	LED277A0700C30DO	48	25	(+/-) 5	2

Outdoor LED Drivers

Xitanium LED Drivers for outdoor applications are available in three types:

Fixed Output

These drivers perform the basic necessary function for outdoor application, setting the standard for reliability and performance needed for outdoor lighting.

Dimming

These drivers include 0-10V dimming as well as Adjustable Output Current (AOC) and Module Temperature Protection (MTP), typically. These features help address the growing demand for controllability and flexibility. 0-10V dimming allows the lighting system to be used with various controls to help increase energy savings. AOC enables the OEM to help increase performance of the fixture and provides flexibility for use in multiple fixtures. MTP further enhances life and reliability in the event of misapplication.

Programmable

These drivers offer unparalleled flexibility with the ultimate feature set managed through a programmable interface. This allows the OEM to create a fixture portfolio to meet specific needs for a wide range of applications, using a minimum number SKUs to reduce complexity and simplify logistics.

Xitanium LED Drivers for outdoor applications are specifically designed for use in:

- Area
- Roadway
- Parking garage
- Gas station canopy
- Wallpacks
- Floodlights

These drivers are available in wattages of 10W to 150W for hard-wired integration into outdoor luminaires for the most rugged applications. They operate to specification under wide temperature and electrical ranges to ensure reliability. Specific features of this series are:

- Standard drive currents 350, 530, 700, 1050 and 1500mA
- UL Class 1 or Class 2
- Input voltage ranges of 120-277V or 347-480V
- Surge protection
- High efficiency for maximum payback
- High reliability for low maintenance costs

Xitanium LED ELECTRONIC DRIVERS

Outdoor Drivers

Catalog #	Max Output Power (W)	Output Voltage (V)	Output Current (Amps)	Input Volts	UL/ CSA Class 2	Dimming					Features					Dim./ Wiring Dia.	Max Tcase (°C)
						0-10V	TE	LE	Step Dim	DALI	AOC	MTP	CLO	Fan	Others		
Fixed																	
LED120A0350C28FO	10	2.8 - 28	0.35	120	●											V-Can/1	90
LED120A0012V10F	12	12	1	120	●											V-Can/1	90
LED120A0700C24FO	17	2.8 - 24	0.7	120	●											V-Can/1	90
LED120A0700C28FO	20	2.8 - 28	0.7	120	●											V-Can/1	90
LED277A0700C28FO	20	2.8 - 28	0.7	277	●											V-Can/1	90
LED120A0024V14FO	34	2.8 - 24	1.4	120	●											J-Box/1	90
LED120A0024V18FO	40	2.8 - 24	1.75	120	●											J-Box/1	90
LEDINTA0024V20FLO	48	24	0.10 - 2.0	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V22FO	53	24	2.2	120 - 277	●											S-Can/1	90
LEDINTA1600C36FO	58	9 - 36	1.6	120 - 277	●											S-Can/1	90
LED120A0012V50F	60	12	0.8 - 5.0	120	●											S-Can/1	90
LEDINTA0012V50FO	60	12	0.10 - 5.0	120 - 277	●											S-Can/1	90
LEDINTA0024V28FO	67	24	0.10 - 2.8	120 - 277	●											S-Can/1	90
LEDINTA0024V30FLO	72	24	0.10 - 3.0	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V32FO	77	24	3.2	120 - 277	●											S-Can/1	90
LED120A0024V33F	80	24	0.8 - 3.3	120	●											S-Can/1	90
LEDHCNA0024V41FLO	100	3.5 - 24	0.10 - 4.16	347 - 480	●											F-Can Bump/1	85
LEDINTA0024V41FLO	100	3.5 - 24	0.10 - 4.16	120 - 277	●											F-Can Bump/1	85
LEDINTA0024V41FO	100	3.5 - 24	0.10 - 4.16	120 - 277	●											S-Can/1	90
LEDINTA700C140F3O	100	60 - 140	0.35/0.53/ 0.70	120 - 277												F-Can Bump/6	80
LEDHC-NA0350C425FO	150	120 - 425	0.35	347 - 480												F-Can Bump/1	80
LEDINTA0350C425FO	150	120 - 425	0.35	120 - 277												F-Can Bump/1	80
LEDHC-NA0700C210FO	150	60 - 210	0.7	347 - 480												F-Can Bump/1	80
LEDINTA0700C210FO	150	60 - 210	0.7	120 - 277												F-Can Bump/1	90
Dimmable																	
LED120A0700C28DO	20	10 - 28	0.7	120	●	●										V-Can/2	90
LED277A0700C30DO	21	15 - 30	0.7	277	●	●										V-Can/2	80
XI040C070V056CNJ1	40	12 - 54	0.7	120 - 277	●	●										J-Can/2	80
XI040C120V035CNJ1	40	12 - 36	1.2	120 - 277	●	●										J-Can/2	80
LEDINTA0024V20DLO	48	24	2	120 - 277	●	●										F-Can Bump/2	85
XI050C150V038CNH1	50	19 - 38	1.5	120 - 277	●	●										H-Can/2	80
LEDINTA0024V30DLO	72	24	3	120 - 277	●	●										F-Can Bump/2	85
XI075C053V140CNY1	75	71 - 143	0.53	120 - 277		●										Y-Can/2	80
XI075C053V140DNY1	75	71 - 143	0.10 - 0.53	120 - 277		●					●					Y-Can/3	80
XI075C070V105CNY1	75	54 - 107	0.7	120 - 277		●										Y-Can/2	80

Outdoor Drivers

Catalog #	Max Output Power (W)	Output Voltage (V)	Output Current (Amps)	Input Volts	UL/ CSA Class 2	Dimming					Features					Dim./ Wiring Dia.	Max Tcase (°C)
						0-10V	TE	LE	Step Dim	DALI	AOC	MTP	CLO	Fan	Others		
XI075C070V105DNY1	75	54 - 107	0.10 - 0.70	120 - 277		●					●					Y-Can/3	80
929000708003	75	54 - 107	0.10 - 0.70	120 - 277		●					●					Y-Can/3	80
XI075C105V070CNY1	75	36 - 72	1.05	120 - 277		●										Y-Can/2	80
XI100C150V038CNH1	100 (2x50)	19 - 38	1.5	120 - 277	●	●									●	H-Can/4	80
LEDINTA0024V41DLO	100	15 - 24	4.1	120 - 277	●	●										F-Can Bump/2	85
LEDHCNA0024V41D-LO	100	15 - 24	4.1	347 - 480	●	●										F-Can Bump/2	85
LEDINTA0350C425DO	150	120 - 425	0.35	120 - 277		●										F-Can Bump/2	80
LEDHC-NA0350C425DN	150	120 - 425	0.35	347 - 480		●										F-Can Bump/2	80
LEDINTA0530C280DO	150	120 - 280	0.53	120 - 277		●										F-Can Bump/2	80
LEDHC-NA0530C280DN	150	120 - 280	0.53	347 - 480		●										F-Can Bump/2	80
LEDINTA0700C210DO	150	60 - 210	0.7	120 - 277		●										F-Can Bump/2	90
LEDHC-NA0700C210DN	150	60 - 210	0.7	347 - 480		●										F-Can Bump/2	80
LEDINTA1050C140DO	150	40 - 140	1.05	120 - 277		●										F-Can Bump/2	80
LEDINTA1500C100DO	150	30 - 100	1.5	120 - 277		●										F-Can Bump/2	80
Programmable																	
929000708803	40	29 - 57	0.10 - 0.70	120 - 277		●				●	●	●	●		●	J-Can/5	80
929000710303	40	38 - 76	0.10 - 0.53	120 - 277		●				●	●	●	●		●	J-Can/5	80
929000702302	75	80 - 152	0.35 - 0.70	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80
929000704913	75	80 - 152	0.35 - 0.70	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80
929000710103	75	54 - 107	0.10 - 0.70	120 - 277		●				●	●	●	●		●	Z-Can/5	80
929000708903	75	36 - 75	0.10 - 1.05	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80
929000710403	100	94 - 189	0.10 - 0.53	120 - 277		●				●	●	●	●		●	Z-Can/5	80
929000708703	100	71 - 143	0.10 - 0.70	120 - 277		●				●	●	●	●		●	Z-Can/5	80
XI150C035V425MPH1	150	212 - 425	0.2 - 0.35	120 - 277		●				●	●	●	●		●	H-Can/5	80
929000702202	150	125 - 280	0.35 - 0.70	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80
929000705113	150	125 - 280	0.35 - 0.70	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80
929000709003	150	70 - 148	0.10 - 1.05	120 - 277		●				●	●	●	●		●	F-Can Flat/5	80

Xitanium LED ELECTRONIC DRIVERS

Outdoor Drivers Dimensions

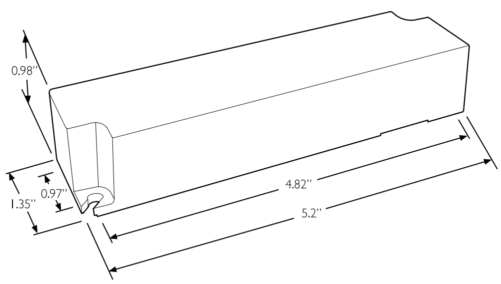


Fig. V-can Outdoor

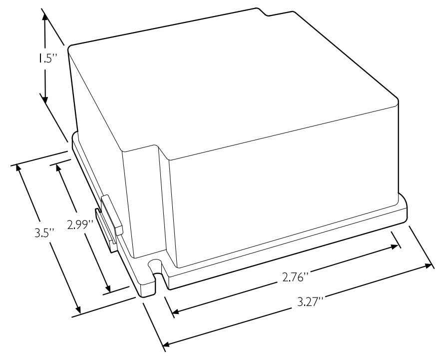


Fig. J-Box Outdoor

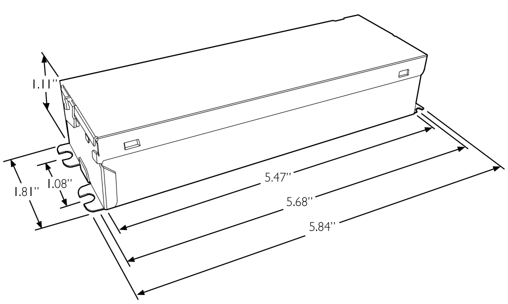


Fig. J-can

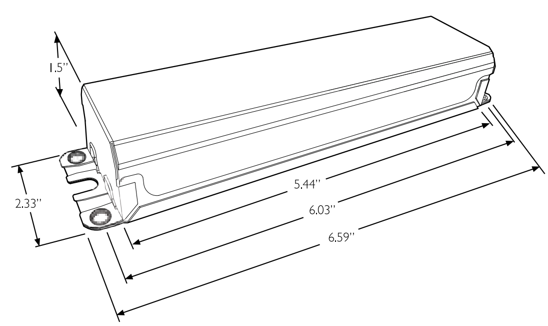


Fig. Y-can

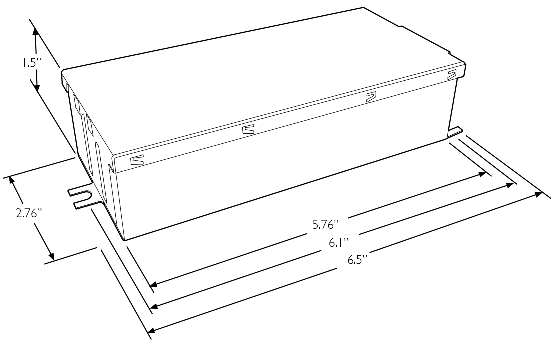


Fig. Z-can Outdoor

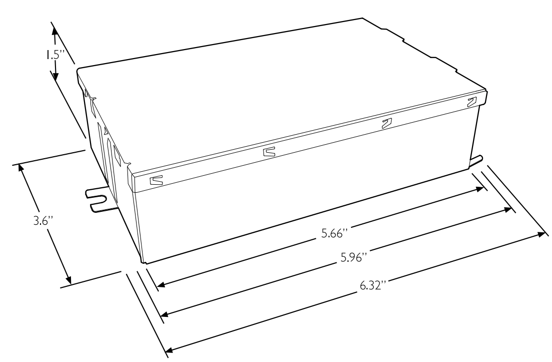


Fig. H-can

Outdoor Drivers Dimensions

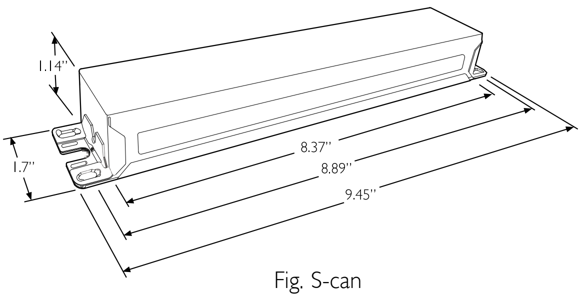


Fig. S-can

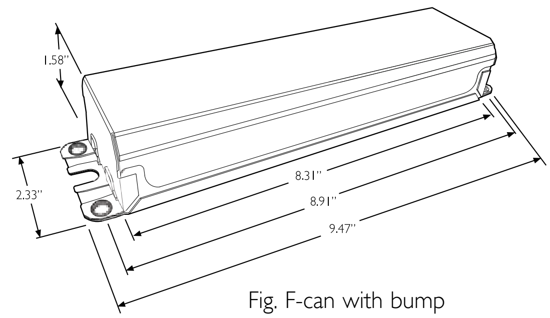


Fig. F-can with bump

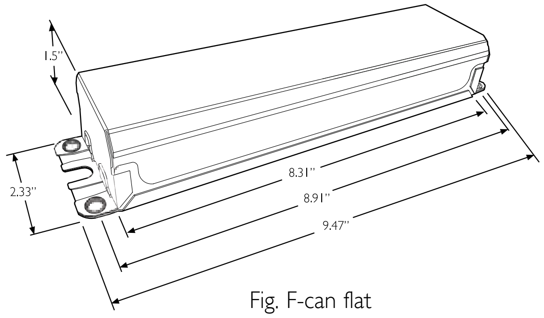
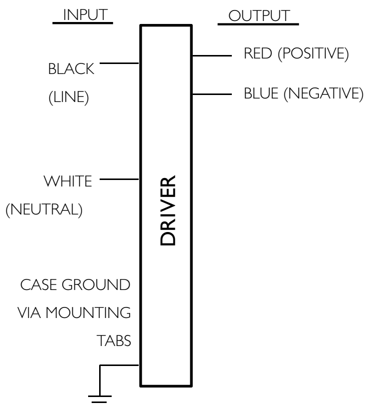


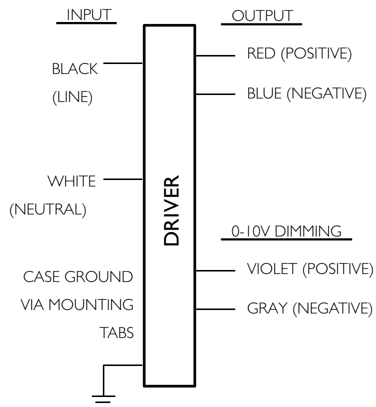
Fig. F-can flat

Xitanium LED ELECTRONIC DRIVERS

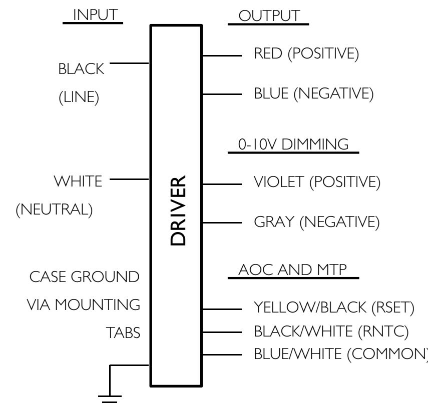
Outdoor Drivers Wiring Diagrams



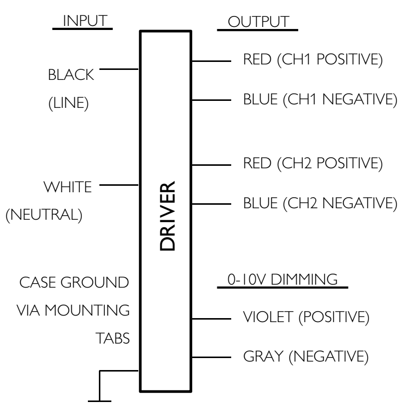
Diag. 1



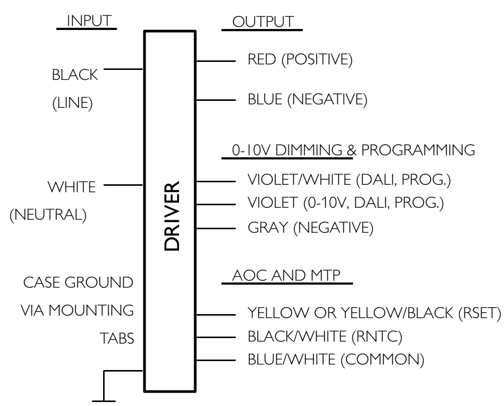
Diag. 2



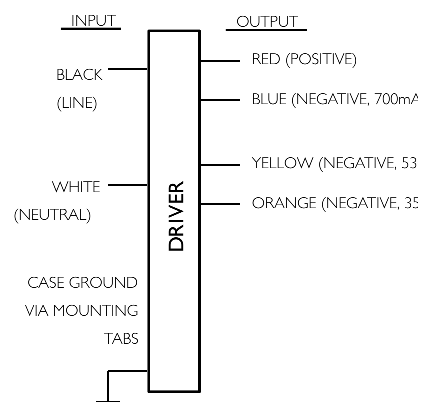
Diag. 3



Diag. 4



Diag. 5



Diag. 6

Downlight/Track Drivers

Xitanium LED Drivers for downlight and track applications are available in three types:

Fixed Output

These drivers perform the basic necessary function for the application, setting the standard for reliability and performance expected for commercial lighting.

Dimming

These drivers include 0-10V or leading/trailing-edge dimming to integrate into common dimming systems used in commercial applications. Dimming enables increased energy savings and helps facilitate worker comfort.

Programmable

These drivers offer unparalleled flexibility with the ultimate feature set managed through a programmable interface. This allows the OEM to create a fixture portfolio to meet specific needs for a wide range of applications, using a minimum number SKUs to reduce complexity and simplify logistics.

Xitanium LED Drivers for downlight and track applications are specifically designed for use in:

- Office
- Retail
- Hospitality
- Meeting rooms

These drivers are available in wattages of 4W to 50W for hard-wired integration into recessed downlights and track light fixtures. The available form factors are ideally suited for these applications: The familiar Smart-Mate housing for junction-box mounting in downlights and slim housings for incorporation into track housings. Specific features of this series are:

- Adjustable output current to set output current to desired level
- Wide operating windows
- UL Class 1 or Class 2
- Input voltage range of 120-277V
- High efficiency for maximum payback
- High reliability for low maintenance costs

Xitanium LED ELECTRONIC DRIVERS

Downlight/Track Drivers

Catalog #	Max Output Power (W)	Output Voltage (V)	Output Current (Amps)	Input Volts	UL/ CSA Class 2	Dimming					Features					Dim./ Wiring Dia.	Max Tcase (°C)
						0-10V	TE	LE	Step Dim	DALI	AOC	MTP	CLO	Fan	Others		
Fixed																	
LEDUNIA0350C12F	4	2.8 - 12	0.35	120 - 230	•											8W/1	69
LEDUNIA0700C12F	8	2.4 - 12	0.7	120 - 230	•											8W/1	69
LED120A0024V07F	17	24	0.10 - 0.70	120	•											V-Can Indoor/ 13	80
LED120A0700C24F	17	2.8 - 24	0.7	120	•											V-Can Indoor/ 13	85
LED120A1400C24F	34	2.8 - 24	1.4	120	•											J-Box Indoor/ 21	85
Dimmable																	
XI020V070V030RNP1	20	15 - 30	0.4/0.5/ 0.6/0.7	120 - 277	•		•	•			•					P-Can/13	80
XI025C070V036DNM1	25	18 - 36	0.2 - 0.7	120 - 277	•	•					•	•				M5-Can/17	90
XI025C100V036DNM1	25	18 - 36	0.3 - 1.0	120 - 277	•	•					•	•				M1-Can/15	90
LEDINTA0520C60DB	30	25 - 56	0.35 - 0.52	120 - 277	•	•					•	•				M5-Can/17	77
913701213402	39	20 - 56	0.20 - 0.70	120 - 277	•	•					•	•		•		M5-Can/16	90
LEDINTA0520C80DB	40	40 - 77	0.35 - 0.52	120 - 277		•					•	•				M5-Can/17	74
XI050C100V054DNM1	50	27 - 54	0.3 - 1.0	120 - 277	•	•					•	•		•		M2-Can/14	75
LEDINTA1000C60DB	50	25 - 48	0.7 - 1.05	120 - 277	•	•					•	•				M5-Can/17	86
XI050C105V052DNM1	50	25 - 52	0.7 - 1.05	120 - 277	•	•					•	•				M5-Can/17	86
Programmable																	
XV025C100V036DPM1	25	18 - 36	0.3 - 1.0	277	•	•					•	•	•	•		M2-Can/18	75
XR025C100V036XPM1	25	18 - 36	0.3 - 1.0	120	•	•	•				•	•	•	•		M2-Can/18	75
XR025C100V036LPM1	25	18 - 36	0.3 - 1.0	120	•					•	•	•	•	•		M2-Can/19	75
XI025C100V036XPL1	25	18 - 36	0.3 - 1.0	120 - 277	•	•	•				•	•	•	•		25W LH-Can/ 20	75
XV050C100V054DPM1	50	27 - 54	0.3 - 1.0	277	•	•					•	•	•	•		M2-Can/18	75
XR050C100V054XPM1	50	27 - 54	0.3 - 1.0	120	•	•	•				•	•	•	•		M2-Can/18	75
XI050C100V054XPL1	50	27 - 54	0.3 - 1.0	120 - 277	•	•	•				•	•	•	•		50W LH-Can/ 20	75

Downlight/Track Drivers Dimension

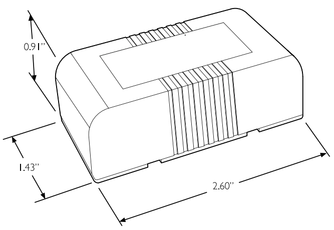


Fig. 8W

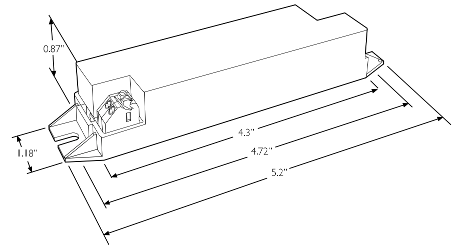


Fig. V-can Indoor

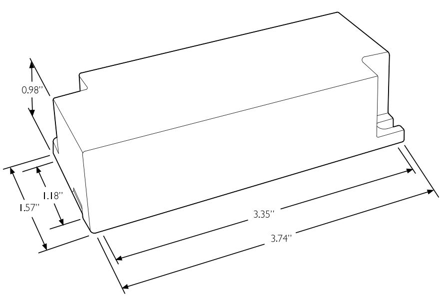


Fig. P-can

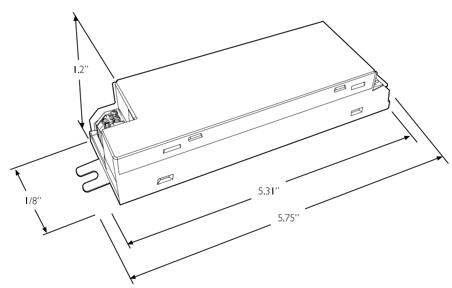


Fig. 25W LH-can

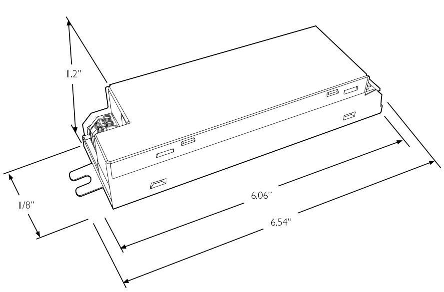


Fig. 50W LH-can

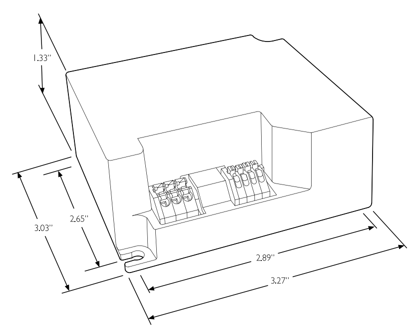
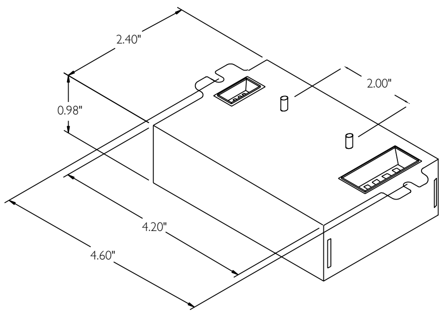


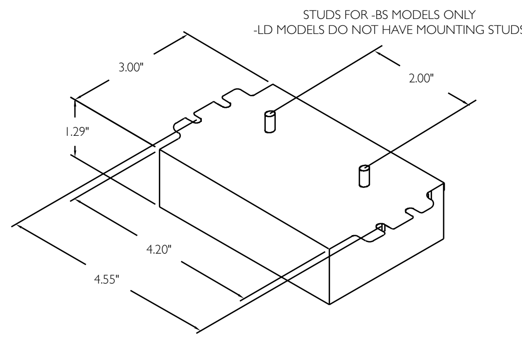
Fig. J-Box Indoor

Xitanium LED ELECTRONIC DRIVERS

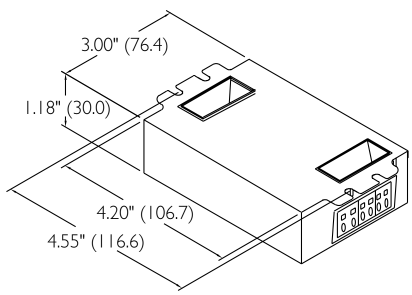
Downlight/Track Drivers Dimension



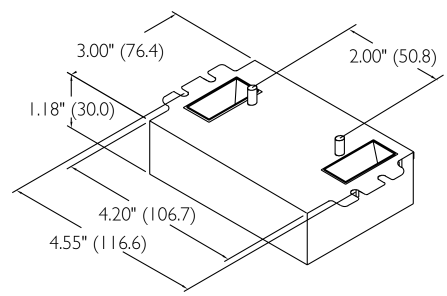
Size 1 Enclosure
Studs for -BS models only



Size 2 Enclosure



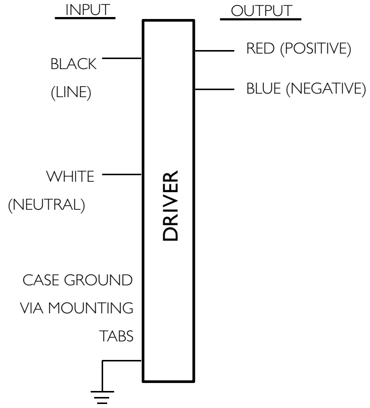
-LD



-BS

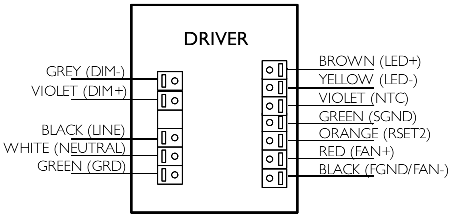
Size 5 Enclosure

Downlight/Track Drivers Wiring Diagrams



Diag. 1

Diag. 13



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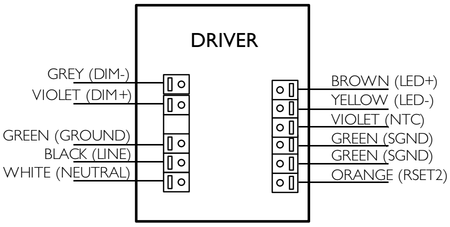

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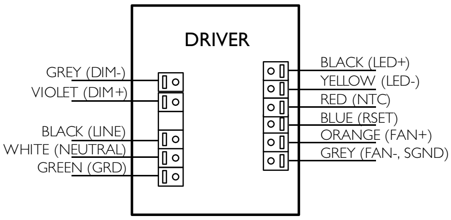
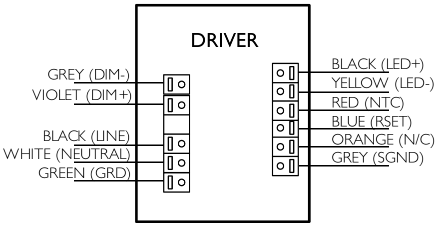
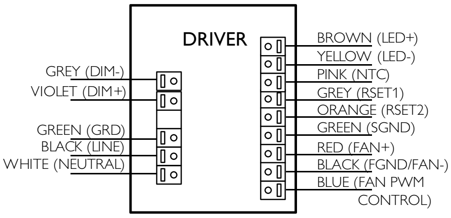


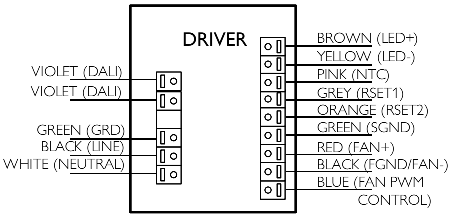
Diag. 16



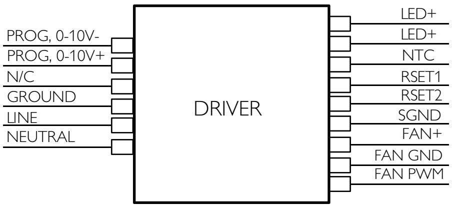
Diag. 17



Diag. 18



Diag. 19



Diag. 20

Xitanium LED ELECTRONIC DRIVERS

Linear LED Drivers

Xitanium LED Drivers for linear applications applications are available in three types:

Fixed Output

These drivers perform the basic necessary function for the application, setting the standard for reliability and performance expected for commercial lighting.

Dimming

These drivers include 0-10V or leading-edge dimming to integrate into common dimming systems used in commercial applications. Dimming enables increased energy savings and helps facilitate worker comfort.

Programmable

These drivers offer unparalleled flexibility with the ultimate feature set managed through a programmable interface. This allows the OEM to create a fixture portfolio to meet specific needs for a wide range of applications, using a minimum number SKUs to reduce complexity and simplify logistics.

Xitanium LED Drivers for linear applications are specifically designed for use in:

- Office
- Retail
- Hospitality
- Meeting rooms

These drivers are available in wattages of 48W to 75W or hard-wired integration into linear fluorescent-style fixtures (troffers). The form factor is perfectly suited to these applications and enables quick time to market by utilizing mechanical aspects familiar in traditional fluorescent fixtures. Specific features of this series are:

- Adjustable output current to set output current to desired level
- Wide operating windows
- UL Class 2
- Input voltage range of 120-277V
- High efficiency for maximum payback
- High reliability for low maintenance costs

Linear Drivers

Catalog #	Max Output Power (W)	Output Voltage (V)	Output Current (Amps)	Input Volts	UL/ CSA Class 2	Dimming					Features					Dim./ Wiring Dia.	Max Tcase (°C)
						0-10V	TE	LE	Step Dim	DALI	AOC	MTP	CLO	Fan	Others		
Dimmable																	
LEDINTA2000C24DO	48	12 - 24	1.0 - 2.0	120 - 277	•	•					•					T-425/7	80
XI054C150V054DNT1	54	27 - 54	0.7 - 1.5	120 - 277	•	•					•	•				T-360/8	85
XI054C150V054SNT1	54	27 - 54	0.7 - 1.5	120 - 277	•				•		•	•				T-360/9	85
XR054C150V054RNT1	54	27 - 54	0.7 - 1.5	120	•			•			•	•				T-360/10	85
XV054C150V054RNT1	54	27 - 54	0.7 - 1.5	277	•			•			•	•				T-360/10	85
Programmable																	
XI075C200V054XPT1	75	27 - 54	0.7 - 2.0	120 - 277	•	•					•	•	•			T-425 /11	75
XI075C200V054YPT1	75	27 - 54	0.7 - 2.0	120 - 277	•					•	•	•	•			T-425 /12	75

Linear Drivers Dimension

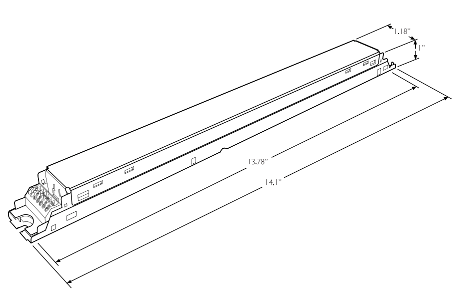


Fig. T-360

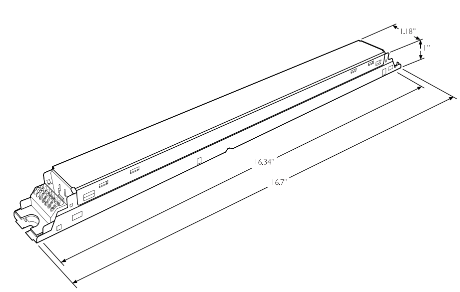


Fig. T-425

Xitanium LED ELECTRONIC DRIVERS

Linear Drivers Wiring Diagrams

Diag. 7

Diag. 8

Diag. 9

Diag. 10

Diag. 11

Diag. 12

Accessories

Philips Outdoor Surge Protection Devices

Rapidly increasing acceptance of LED-based light sources for outdoor applications brings with it new challenges on system durability. In order to ensure the lifetime of the solution, it is vital to protect the light engine against surges on the mains line. Even the most robust LED drivers offer a limited level of surge protection, not enough to defend against high surges, e.g. (indirect) lightning strikes. Applications such as road lighting and parking lots are especially susceptible. The Surge Protection Devices from Philips offer a reliable solution for protecting all outdoor power supplies from excessive surge voltages.

Why not make a LED driver with built-in surge protection?

In theory it is possible to design a driver with sufficient spacings internally to survive a 10kV surge voltage from lines to case (ground) without clamping the voltage so that hi-pot testing is not affected. This concept was implemented on some electronic HID control gear (Xtreme range). However, in a typical LED system, the LEDs are mounted to a heat sink which is connected to earth ground for thermal reasons. A common mode surge voltage of 10kV would break over the insulation between the LEDs and the heat sink in most installations and, therefore, voltage clamping is required. The typical breakdown of the LEDs to the heat sink is in the order of 2kV, so clamping below this level is necessary even if the driver is designed to handle the higher voltages. This is why a driver design that can handle 10kV surges does not help the system pass 10kV. The voltages must be clamped to a level that the LED-to-heat sink insulation can safely withstand to prevent LED failure. Also, not clamping the common mode surges would put a large burden on the wiring inside the fixture as everything would need to be designed to withstand 10kV (wires, connectors, wire nuts, etc.). An external surge protection device provides the necessary clamping eliminating the need for high voltage surge protection within the driver and at the same time protects the LEDs from common voltage surges.

Accessories

Philips Outdoor Surge Protection Devices

Philips 277V Surge Protection Device

The Philips Surge Protection Device (SPD) 277V is the ideal solution to the challenge of using LEDs in Outdoor lighting. The SPD clamps the voltage at the terminals of the luminaire, protecting the complete system against multiple nominal surges of up to 10kV / 5kA. For maximum-level of protection, the SPD can withstand a single hit of 10kV /10kA. The device also eliminates the need for all luminaire internal components – wires, connectors, wire nuts, etc. – to be designed to withstand 10kV. Essential for LED systems installed in high-risk areas, the advantages of using the SPD are not limited only to LED systems. The product can be used in any new or existing lighting solution, regardless of technology.

Benefits

- Help maximize the lifetime value of outdoor lighting applications
- No down-time due to calamities (storms, lightning strikes, etc.)
- Lower maintenance cost due to fewer failures
- Easy to apply in new or existing installations
- Peace of mind on product performance

Features

- Resistant to peaks and surges of up to 10kA / 10kV
- Suitable for European Class I and Class II luminaires
- Xtreme standard: Long lifetime, robust protection against moisture, vibration and temperature extremes
- Can be used with all lighting technologies

Philips 277V Surge Protection Device

Type	Line voltage (V)	Protection level Up (L-N) (kV)	Protection level Up (LN-earth) (kV)	Open circuit voltage (kV)	Nominal surge current IN (kA)	Number of surges, nominal current (Comm/Diff. mode)
Surge Protection Device 277V	100-277	≤ 1.6	≤ 2.5	10	1	100 / 100
					3	100 / 100
					5	45 / 35

Type	Maximum surge current IMAX (kA)	Number of surges, maximum current	Isolation classification	Lifetime @ Tc life, 90% survivals (hrs)	Suitable for Outdoor use?
Surge Protection Device 277V	10	Comm. mode: 1 Diff. mode: 1	Suitable for Class I & Class II	100,000	Yes

General product characteristics

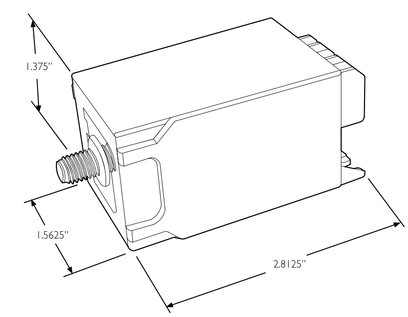
T ambient (°C): -40 to +70 °C

Tcase life (°C): +70 °C

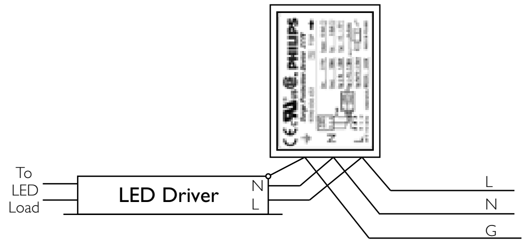
Compliances and approvals

ANSI/UL 1449

Dimensions



Mounting screw type: M8



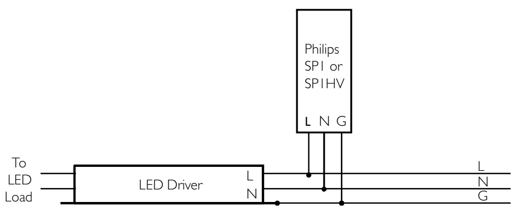
Ordering & packing data

Type	12NC	EOC	Minimum order quantity
Surge Protection Device 277V	9290 006 65202	8718291 161806 00	10

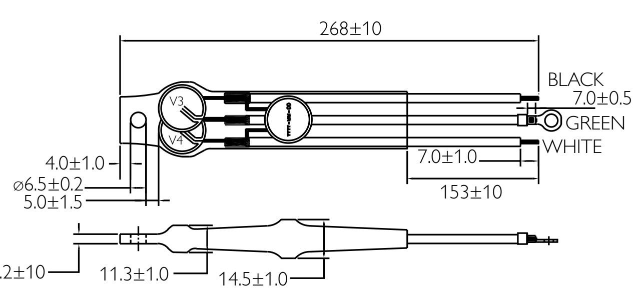
SP1

Surge Protection Device

Adapted to LED outdoor lighting, the Philips SP1 surge protection device provides single phase protection for line/neutral, line/ground and neutral/ground in accordance with IEEE C62.41 2002 C High. The SP1 small size corresponds to the current design requirements for the new technology luminaires, like a LED light engine in outdoor lighting.



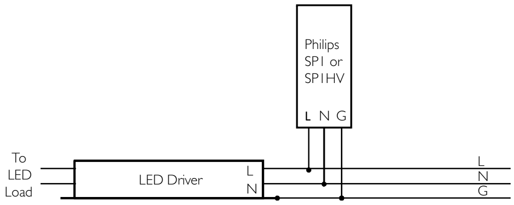
Catalog#:	SP1
Voltage Input:	120V-277V (+/- 10%)
Frequency:	50Hz-60Hz
Maximum Continuous RMS Voltage AC:	320V
Maximum Energy:	430 Joules
Maximum Peak Current:	10kA (8/20μs standard wave)
Wiring:	14 Gauges stranded wires, 105°C, 600V
Wire Connections:	Black and white: 12mm skinned and thin platted Green: 12mm skinned with terminal malt
Mounting hole:	5.5mm
Ambient Temperature (Operating):	-55°C to 85°C



SP1HV

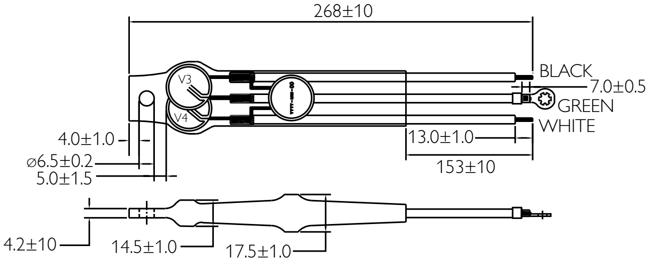
Surge Protection Device

Adapted to LED outdoor lighting, the Philips SP1HV surge protection device provides all phases protection for line/neutral, line/ground and neutral/ground in accordance with IEEE C62.41.2-2002 C High. The SP1HV small size corresponds to the current design requirements for the new technology luminaires, like a LED light engine in outdoor lighting.



Catalog#:	SP1HV
Voltage Input:	347V-480V (+/- 10%)
Frequency:	50Hz-60Hz
Maximum Continuous RMS Voltage AC:	520V
Maximum Clamping Voltage (8/20µs):	1500V
Maximum Energy:	570 Joules
Maximum Peak Current:	10kA (8/20µs standard wave)
Wiring:	14 Gauges stranded wires, 105°C, 600V
Wire Connections:	Black and white: 12mm skinned and thin platted Green: 12mm skinned with terminal malt
Mounting hole:	6.5mm
Ambient Temperature (Operating):	-55°C to 85°C

In order to protect the surrounding environment, this surge protection device must be enclosed in a luminaire that can contain flames and sparks, which may occur in case of malfunction, such as overvoltage power connection (ex:600V).



Xitanium LED ELECTRONIC DRIVERS

MultiOne configurator

A single intuitive system that configures the different functions in multiple lighting solutions

Today's customer demands more flexibility and customization possibilities than "physical configurations" can offer.

Programmable drivers from Philips offer a full range of controls, enabling customizable luminaire design and performance. It is possible to control light output levels, preset dimming protocols and set system specifications in the factory and even in the completed installations. The MultiOne configurator is the unique, intuitive tool that unlocks the full potential of all programmable drivers from Philips, ensuring driver performance matches the lighting solution needs.

Key benefits:

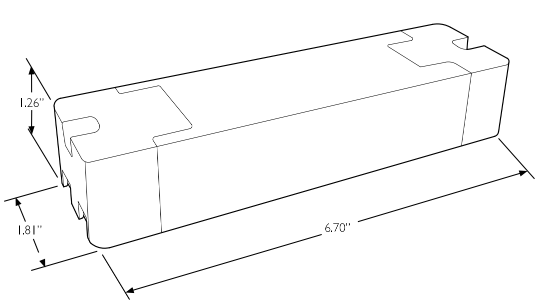
1. One tool for all the Philips DALI products (see supported product list)

2. Future proof platform for new feature deployment

3. Unique-in-the-market proposition of configuration and debugging tool

4. Offers unprecedented flexibility, before, during and after the product installation

Supporting software can be downloaded from: www.philips.com/multione



Footnotes:

1 See www.philips.com/ledmodulesna and click on the appropriate product for complete warranty details

2 Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products. For products used in North America compliance to RoHS is voluntary and self-certified

3 Minimum 90% survivals based on MTBF modeling

4. Philips Advance Xitanium LED Drivers are designed and manufactured to engineering standards correlating to an average life expectancy of 50,000 hours of operation at maximum rated case temperature.

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/ledmodulesna

Philips Fortimo LED Systems

For today, for tomorrow

LED is really here to stay and is already delivering break-throughs in regular lighting applications. And what currently are still unthinkable lighting applications will soon become reality. The Philips Fortimo LED portfolio is already today, and will also be tomorrow, the LED module range for an extensive variety of applications.

The world of lighting is moving faster than ever. Creating light is something we, at Philips have done for many years and, creating light with LED is something that excites us enormously. There are so many more possibilities with LED lighting but equally as many challenges. Despite these challenges, we truly believe LED lighting is now ready to be used effectively in almost all lighting applications, varying from accent lighting in a retail environment to general lighting in office spaces as well as a variety of outdoor lighting applications.

Five Fortimo Building Blocks

High Quality of White Light

A luminaire that delivers high quality light is something that luminaire manufacturers, specifiers, and end users nowadays all aim for, either in design, specification or in usage. Not so long ago the quality of LED light was inferior compared to other sources lighting such as incandescent or halogen. However, the Philips Fortimo LED modules have been leading the way when it comes to LED lighting, Continuous upgrades have allowed improvements in the three critical measures that determine quality of white light; color-rendition (CRI), color consistency and beam uniformity.

Leading in Energy Efficiency

It is well recognized that LED lighting is significantly more energy efficient when compared to traditional lighting sources. New generations of Fortimo LED modules are introduced every nine to twelve months applying the latest innovations in LED technology that will maintain consistency in light output, but that aim to deliver even lower energy consumption versus the previous generation. Total cost of ownership is not only reflected in the actual energy consumption but also in the initial cost of the total LED system. Ensuring that system costs come down will help to stimulate a more competitive total cost ownership proposition.

Future Proof System

It is apparent that many lighting companies struggle to develop, manufacture and sell LED luminaires when the LED technology itself is changing so dramatically and so fast. Stable building blocks are required. Philips recognized this already at an early stage and started to develop our so called "future proof " modules five years ago. The vision of Philips Fortimo LED Systems is constant innovation within fixed dimension formats with a fixed optical interfaces. As long as this defined format is used, luminaire manufacturers can easily implement the latest Fortimo LED modules taking advantage of the latest advances in LED energy efficiency. This means performance upgrades can be introduced, but luminaire manufacturers do not have to worry about changing the design of the luminaire as module dimensions remain
constant along with the required light output.

Smart System Approach

Philips Fortimo LED systems always include a choice of Xitanium drivers. Xitanium drivers offer many advantages for luminaire manufacturers. One of the key features of Xitanium LED drivers is the adjustable output current, which enables a luminaire manufacturer to set the lumen output and efficiency of a Fortimo LED Module to their own specification. The output current can be set with a resistor inside the module, or with a programmable Xitanium DALI driver. Xitanium drivers work within operating windows, whereby a particular driver can be used across different Fortimo Module families and across different lumen outputs. Another smart feature of the Xitanium driver is the NTC (negative temperature coefficient) which regulates the light output down if certain critical temperature points have been exceeded. A Fortimo Module in combination with a Xitanium driver is a truly smart system choice.

Reliability and High Quality

Quality has already been the cornerstone for all Philips products for decades. Philips stands for high quality standards in all products and services brought to the market, including our Fortimo LED Systems. Extensive research and testing is done prior to market introduction, but also during the lifetime of a product. Over the past 120 years Philips has built on those basic principles, with its experience in electronics, optics, thermal engineering and more. And today, all of these disciplines play a crucial role in the success of LED lighting solutions. It is a legacy of pioneering expertise that has led to Philips becoming one of the leading drivers of the LED lighting industry's standardization activities.

For manufacturing, Philips deploys state-of-the-art production techniques, not just in our own facilities but also at our subcontractors. These are constantly monitored by extensive process control and tested by Philips engineers. All these processes and combined expertise have resulted in a very high quality performance of the Fortimo LED systems portfolio.

LED MODULES – Indoor Linear

Zhaga Consortium

An industry-wide initiative for developing specifications for LED light sources. The global lighting industry joins forces, in the Zhaga consortium, to speed up the adoption of LED technology.

In 2010, Philips was one of the leading initiators behind the Zhaga initiative. Zhaga is an industry-wide cooperation aimed at the development of standard specifications for the mechanical and electrical interfaces of LED light engines. An LED light engine is a LED module with defined interfaces, that do not depend on the type of LED technology used inside the light engine. Zhaga will enable interchangeability between similar products made by several manufacturers.

More than 200 companies from three continents and a future-oriented sector, on one clearly defined common mission: Zhaga's overriding aim is to develop specifications for interchangeability of LED light engines.

For more information go to www.zhagastandard.org

Zhaga#

Philips is a member of the Zhaga consortium

OEM 'Design-in' assistance

Philips dedicated engineering team offering support, analysis and evaluation.

Philips is proud to offer North American OEMs Design-In assistance in the use of Philips LED Modules. Solely dedicated to the North American market, the team is comprised of talented lighting industry engineers ready to support fixture manufacturers in the integration of Philips LED Modules into their finished products.

Located in our Rosemont, Illinois facility, our dedicated Philips engineering team offers support, analysis and evaluation for key integration issues including thermal, electrical, mechanical and optical—with the intent of lowering OEM development costs and speeding OEM time to market.

Available capabilities include:

1. Comprehensive design-in thermal support and testing
2. Optical design support and photometric evaluation
3. Mechanical design assistance and engineering support
4. Electrical/system level verification
5. UL approbation support
6. Surge testing
7. EMI and sound testing

Please contact your account manager for more information as well as details on how to immediately take advantage of this value-added resource.

Fortimo LED Line Low Voltage System

LEDs in general lighting? Now you can!

Fortimo LED Line systems are designed to replace conventional lighting in both fixed and dimmable luminaires. They are characterized by breakthrough high energy efficiency levels, up to 144 Lm/W. Fortimo LED Line systems also offer high quality white light in terms of color rendition and color consistency and are part of the Fortimo future proof promise.

The Fortimo LED Line portfolio consists of both a three (3R) and a one (1R) row LED module and a Philips Advance Xitanium driver. The Fortimo LED Line 3R system has been designed to produce high efficacy, pure white light, for applications where diffuse lighting is desired. This is ideal for incorporating into luminaires for use in general office lighting, where energy efficiency and glare control are important.

The Fortimo LED Line 1R system has been designed with higher lumen output when compared to the 3R version, which makes it a better choice for higher ceiling applications. This enables the use of a wide variety of optics resulting in beams ranging from batwing to tight beam distribution, making it the better choice for the illumination of vertical surfaces or areas where high lighting levels are desired.

RoHS COMPLIANT[1] [2] Zhaga[3]

Benefits for the end users

- Flexible, configurable system allowing ease of upgrading conventional technology luminaires with LEDs.
- Minimal heatsink required often achieved within the luminaire design
- Average rated lifetime of 50,000 hours[6]
- 5-year limited system warranty[4]
- Driver options include various output power levels (25W, 54W, 75W) and dimming protocols (0-10, step, Mark 10, DALI)

Applications

- Open plan offices and meeting rooms
- Reception areas and corridors
- Public spaces and General retail applications
- Industrial areas

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

Philips InteGrade LED Engine System

Compact linear LED lighting for maximum freedom of design

The InteGrade LED engine system is an energy-efficient way to create an enjoyable shopping experience for customers. The system can be used for display case and linear accent lighting. With the dedicated InteGrade connectors it is easy to create longer lightlines. Thanks to the system's compact dimensions, it can be aesthetically integrated into the store interior.

The unique asymmetrical optics direct the light to where you want it, thus making optimum use of the light and energy. The products or background you want lit will be presented uniformly, while reducing glare and dark spots. Our LEDs have minimal output degradation and color shift, so the light remains consistent throughout their long service life. InteGrade LED is, quite simply, an ideal solution for high-quality lighting without flicker or color differences. Mounting accessories, cables and LED power driver are available separately.

Benefits for the end users

- Energy savings of up to 65%[5]
- Supurb asymmetrical optics
- InteGrade cabling allows connection to own connector system
- InteGrade LED System in combination with Philips cables and Xitanium power driver and dimming protocols

Applications

- Display case lighting:
    - Retail (refrigerated and ambient temperature)
    - Hospitality

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

Philips InteGrade LED Fixture System

Compact linear LED lighting for standard-size display case (3 and 4 foot)

The InteGrade LED fixture system is a pre-assembled fixture in 34" and 46". The fixture consists of a profile and InteGrade engines (combination of 6" & 23" module) and inline locks.

Benefits for the end users

- Energy savings of up to 65%[5]
- Supurb asymmetrical optics
- InteGrade cabling allows connection to own connector system
- InteGrade LED System in combination with Philips cables and Philips LED power driver

Applications

- Display case lighting:
    - Retail (refrigerated and ambient temperature)
    - Hospitality

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

LED MODULES – Indoor Spot

Fortimo LED Downlight Module (TDLM) System – Twistable

Quality white light with a simple twist

The Philips Fortimo Twistable module is the first Philips serviceable high-performance integrated LED module for general lighting. The complete system, comprising a Philips Twistable LED DownLight Module (TDLM) with integrated driver and a lamp holder, delivers energy efficient, low maintenance and high-quality lighting.

Easy to experience

Thanks to its dedicated socket and integrated driver, the system is easy to design in, install and maintain. The modules can be easily replaced with the latest upgrades at the end of their life – or earlier if you want a different color temperature for a change of ambience – without having to remove the reflector or open the ceiling. This results in a truly easily upgradable and replaceable LED Technology. The Fortimo LED TDLM module is equipped with a special remote phosphor technology, enabling very high levels of LED efficacy. Also, the excellent lumen maintenance and long lifetime of up to 50,000 hours[6] make frequent relamping a thing of the past: A promise that is backed up by a Philips three-year limited warranty[4].

RoHS COMPLIANT[1] [2] Zhaga[3]

Benefits for the end users

- Maintenance at ease - simply twist and replace without the use of tools
- Energy efficient LED design for improved total cost of ownership
- Easy to install with integrated driver
- Available in different color temperatures for simple change of ambiance
- Powerline Dimming
- Long life significantly reduces relamping cycles[6]
- 1100 and 2000 lumen, 120 volt and 277 volt available

Applications

- Hospitality:
  Corridors, service areas, lobbies, lounges and restaurants
- Retail:
  Corridors and changing room
- Healthcare:
  Corridors, reception areas and waiting rooms

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

Fortimo LED Spotlight Module (SLM)

Quality of light, minimum maintenance

The second generation of Fortimo LED Spotlight Module Systems offers a wider range of tools for both accent lighting and downlighting applications. Merchandise of all kinds can look more attractive and desirable under a Fortimo LED Spotlight Module. What's more, the excellent lumen maintenance and rated average life of 50,000 hours[6] make frequent relamping a thing of the past: a promise that is backed up by the Philips five-year limited warranty[4].

Future proof system

The new Spotlight modules offers fixed and dimmable lumen output, light distribution, standardized optical, mechanical, electrical and thermal interfaces. The module design is backwards compatible with previous generation modules and drivers. In expanding the portfolio, the second generation Fortimo LED SLM includes an additional color temperature of 2700K and the choice for high quality of light range products.

High quality of white light and energy efficiency

The second generation Fortimo LED Spotlight Module, provides high quality white light, and is also very energy efficient.

RoHS COMPLIANT[1] Zhaga[3]

Benefits for the end users

- Ease of design-in via the use of a new optical dome ensuring clean light distribution
- Operating temperature Tc 75°C enabling more passive cooling solutions
- Color consistency 3 SDCM
- Excellent lumen maintenance of 70% at 50K hours

Applications

- Retail:
  Accent, display, track lighting, and general downlighting
- Hospitality:
  Lobbies, reception areas, and restaurants
- Recreation:
  Museums, galleries, and theatres

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

LED MODULES – Indoor Spot

Fortimo LED Downlight Module (DLM) System

Downlighting systems simplified

The Fortimo LED Downlight Module is equipped with a special remote phosphor technology, that enables very high levels of LED efficacy. This general lighting solution continues on the idea of LED Systems Simplified. Additionally the excellent lumen maintenance and long lifetime of up to 50,000 hours[6] make frequent re-lamping a thing of the past – a promise that is backed up by a Philips five-year limited warranty[4].

Peace of mind for manufacturers

The lamp and driver have been developed and rigorously tested in combination with each other, including key enhancements like thermal protection for the module. Additionally, the module has been successfully implemented using LM-80 guidelines. As a result, they provide a great lumen output and light distribution, while efficacy upgrades can be implemented when available.

Furture-proof modules

As energy efficiency advances in LEDs are made and new bins become available, they will be incorporated into the Fortimo LED Modules, offering higher efficacies, without changing the dimensions, shape or lumen output of the system. This allows luminaire manufacturers to plan and design new luminaire ranges for the coming years.

RoHS COMPLIANT [1] [2]

Benefits for the end users

- CRI increased to a minimum of 80
- Color consistency increased to 3 SDCM
- Dimming options include 0-10V, TE and DALI
- Lumen Package upgrades

Applications

General lighting in:

- Offices (areas such as hallways, receptions, boardrooms, etc.)
- Hotel lobbies and receptions areas
- Retail high-end shops

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

Fortimo LED High Brightness Module (HBMT) System

A design-friendly, compact LED module for outdoor, high bay or industrial white light applications

The Fortimo LED High Brightness Module (HBMT) System is a high efficacy, easy to design-in, future-proof solution for OEMs looking to incorporate LEDs into their outdoor, high bay or industrial luminaire portfolios. With a compact rectangular light engine and non-integrated driver, the Fortimo LED HBMt System allows for creation of different light distributions using a metal reflector, similar to HID lamps. OEMs with experience in traditional luminaire design can easily leverage that expertise in developing a LED-based luminaire.

RoHS COMPLIANT [1] UL® [2]

Benefits for the end users

- LED Module that provides high lumen output from a small area
- Cost-effective LED light engine
- Luminaire design based on traditional reflector optics
- Interchangeability of light engines from different manufacturers

For more information regarding this product, please contact your local sales representative or agent.

See footnote on page 2-10.

LED MODULES

Footnotes:

1 Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products. For products used in North America compliance to RoHS is voluntary and self-certified

2. Indicates that the LEDs are components recognized with UL and complies with UL8750 Standard for LEDs

3. Philips Fortimo Module is a Zhaga certified light engine. For more information visit www.zhagastandard.org

4 See www.philips.com/ledmodulesna and click on the appropriate product for complete warranty details

5 When comparing energy consumption of two InteGrade engine value 575mm(23") 830 with a Philips 28W T5 lamp (28W).

6 Rated average life is based on engineering data testing and probability analysis. The hours are at the B50, L70 point — 50,000 hours life with 70% lumen maintenance at Tc point of 65° C.

7 SDCM +/- 0.2 variance with a minimum CRI of 80

Notes

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

Note: Refer to page 9-7 to 9-14 for Ballast Specifications

Fluorescent Ballasts - Electronic - Centium

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

Reliable and robust, this broad line of Centium high frequency electronic ballasts for T5, T5HO, T8 and T12 fluorescent lamps offers all of the necessary commercial grade specifications plus the added benefits of lamp striation reduction technology making these ballasts compatible with energy saving T8 lamps. This provides your customers with a better energy saving solution than when using standard T8 ballast.

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.

Ballasts for T5 Fluorescent Lamps Are Now Available in a Smaller Can

Philips Advance Centium ballasts for T5 lamps are now available with our industry leading N-can at 9.5"L x 1.3"W x 1.0"H or T-can at 14.17"L x 1.18"W x 1.06"H, which provides fixture manufacturers increased versatility in their newer generation fixture designs.

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.

NEMA Premium

The following ballasts are NEMA Premium®:
ICN1P32N
ICN2P32N
ICN3P32N
ICN4P32N

As a licensee in the NEMA Premium Ballast Program, Philips Lighting Electronics N.A. 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 applicable to you or your customers.

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.

The following ballasts are NEMA Premium®:

IOP-1P32-N	IOP-3P32-HL-N	IOPA-2P32-HL-N
IOP-1P32-LW-N	IOP-4P32-N	IOPA-3P32-N
IOP-2P32-N	IOP-4P32-LW-N	IOPA-3P32-LW-N
IOP-2P32-LW-N	IOP-4P32-HL-SC	IOPA-3P32-HL-N
IOP-2P32-HL-N	IOPA-1P32-N	IOPA-4P32-N
IOP-3P32-N	IOPA-1P32-LW-N	IOPA-4P32-LW-N
IOP-3P32-LW-N	IOPA-2P32-N	IOP-4P32-HL-SC

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

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.

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

Help maximize energy savings with improved ballast efficiency

* When operating standard non-energy saving lamps

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 3-20 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 Protection Circuit

Removes power to lamps upon lamp failure

ELECTRONIC FLUORESCENT BALLASTS

Fluorescent Ballasts - Electronic - AmbiStar

Residential Ballasts for 4-pin CFL, 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 ENERGY STAR Luminaires Specification.

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.

Class B FCC EMI Rating

Requirement for ENERGY STAR Luminaires Specification for 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

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 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

ELECTRONIC FLUORESCENT BALLASTS

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 and programmed start for T8 lamps. Each requires a special ballast design to operate the lamps in the circuit properly.

Instant start electronic ballasts start lamps without delay (<0.1 second) 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 helps maximize energy savings — typically saving 2W per lamp compared to rapid start ballasts[1]. 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 second) 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 helps minimize electrode stress and depletion of emitter material, thereby maximizing lamp life. Lamps operated by programmed start ballasts typically operate up to 100,000 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.

.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".

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

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.

Ballast Luminous Efficiency (BLE) is the ratio of total lamp arc power to input watts. This is a new metric based solely on electrical measurements.

$$BLE = \frac{\text{Total Lamp Arc Power}}{\text{Input Watts}}$$

See footnote on page 3-65

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

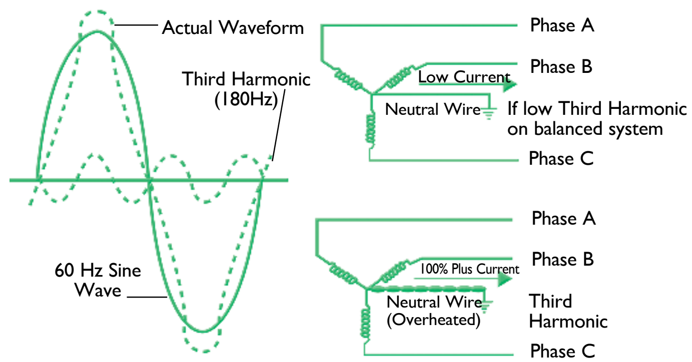
Power factor measurements pertain only to the effective use of power supplied to the ballast. They are not an indication of the ballast's ability to supply light through the lamps. Because low power factor ballasts require about twice the current needed by high power factor ballasts, they allow fewer 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-international.org 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
347V to 480V	H	Purple

RoHS COMPLIANT

Indicates ballast complies with directive 2002/95/EC Restriction of Hazardous Substances

ELECTRONIC FLUORESCENT BALLASTS

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 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 not 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 Total Harmonic Distortion 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.

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

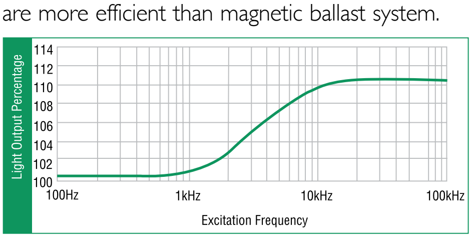
Ballast Life

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[2]. 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

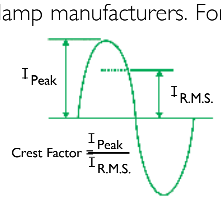
Electromagnetic ballasts and the lamps connected to them operate at an input voltage frequency of 60 Hertz (Hz), 60 cycles per second — which is the standard alternating voltage/current frequency provided in North America. Electronic ballasts, on the other hand, convert this 60 Hz input to operate lamps 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 electromagnetic 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 four families of electronic controllable ballasts — ROVR, Mark 7 *0-10V*, Mark 10 *Powerline,* PowerSpec HDF.

Compatibility With Powerline Carrier Systems

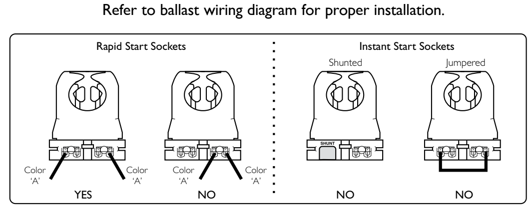
A powerline carrier system (PLC) uses electronic wiring devices to send information via a high frequency signal over the 120V or 277V electrical power distribution system of a building. For example, PLC systems are used in automatic clock systems (master time systems) to synchronize all of the clocks 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 of compact fluorescent lamp sources do require a 100 hour burn-in prior to dimming. Consult your lamp manufacturer for their latest requirements.

See footnote on page 3-65

ELECTRONIC FLUORESCENT BALLASTS

Ordering Information

How to Order

Philips Lighting 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
LD = Length mounting feet with SmartMate® dual entry color coded connectors
QS = QuikStart

Linear Fluorescent Mounting/Connector Options
2LS = 2 Level Switching
SD = Step Dimming

CFL Can Description
H1 = Hybrid metal / plastic case, size 1
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

Linear Fluorescent Can Description
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
N = 'N' can
SC = Small can
T = 'T' 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
EZ = Mark 10® *Powerline*
OP = Optanium
ZT = Mark 7® *0-10V*
CN = Centium
DL = ROVR
ELB = AmbiStar
MB = AmbiStar
UV = PureVolt

Input Voltage

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

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

- 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 9-7 to 9-14) will be useful in obtaining bids from electrical contractors.
- Contact your local Philips Lighting 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.

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.

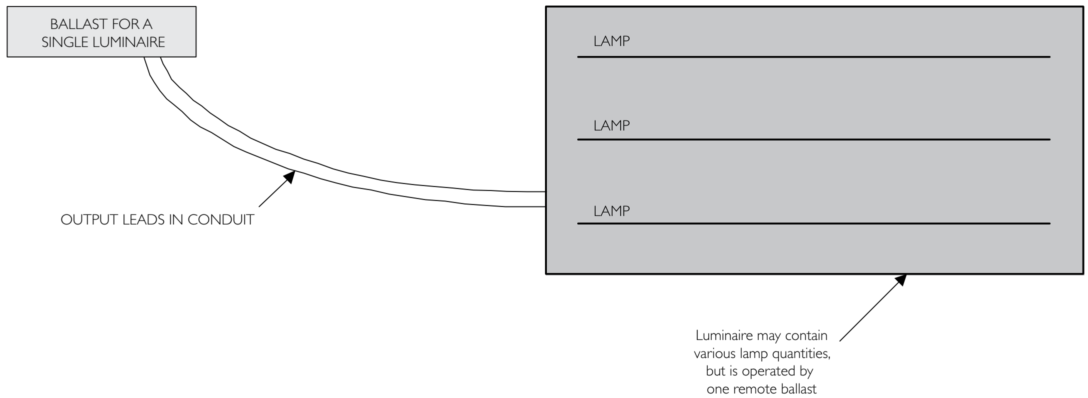
Second, if the lamp is capable of ignition, the increased capacitance will cause a loss in the current to the lamp. The added capacitance creates what is known as a "shunt" around the lamp; in other words the current will leak from the red wire (or blue) to the yellow, completely bypassing the lamp. 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,* PowerSpec HDF, 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 Customer Care (Warranty/Technical Service).

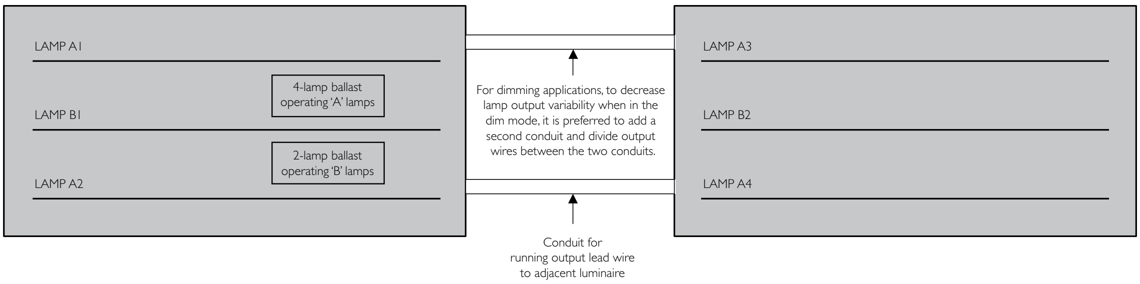
Remote Wiring



Note: Recommended output lead lengths and remote mounting distances should not be exceeded.

ELECTRONIC FLUORESCENT BALLASTS

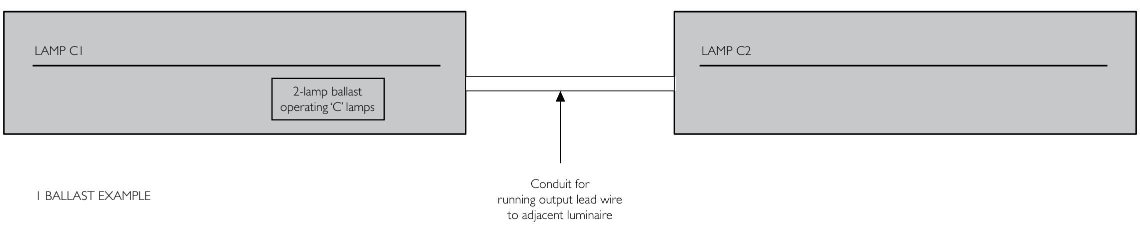
Tandem Wiring



2 BALLAST EXAMPLE

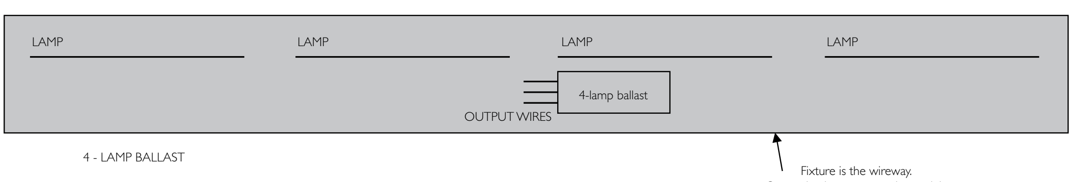
BALLAST 'A' OPERATES OUTBOARD LAMPS
BALLAST 'B' OPERATES INBOARD LAMPS

(2) 3-lamp luminaires shown as an example, but this would also be applicable for any luminaire containing 2-lamps or more

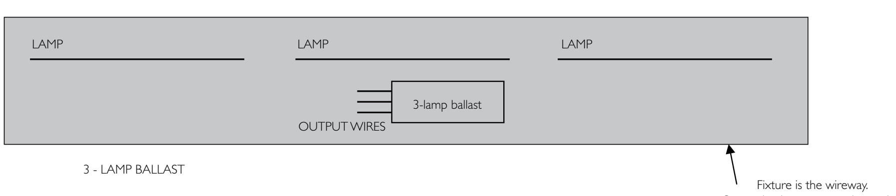


1 BALLAST EXAMPLE

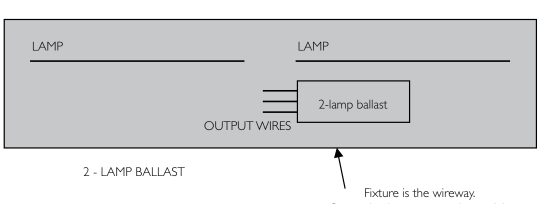
Through Wiring



4 - LAMP BALLAST



3 - LAMP BALLAST



2 - LAMP BALLAST

Note: Ballast should be mounted at center of fixture to minimize lead lengths. Recommended output lead lengths and remote mounting distances (pages 3-14 to 3-18) should not be exceeded.

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.

Philips Fluorescent Dimming Ballast Application Usage

- While installing a Philips fluorescent dimming ballast in a fixture, care should be taken that the output lead lengths do not exceed the specified maximum permissible limits. These limits are specified in the Remote, Tandem or Through Wiring Distance table on the next page.
- If excessive output lead lengths (outside the specification) are maintained for a Philips fluorescent dimming ballast then the ballast may behave undesirably or abnormally at low dim levels.
- If output lead wire lengths are not specified for linear Philips fluorescent dimming ballasts, then it implies that the output lead length should not be extended any more than what was provided with the dimming ballast.
- For Philips CFL dimming ballasts, the output lead length between the ballast and the lamp socket should be maintained as short as possible. It is recommended that this lead length should not exceed 24''.
- Before using a Philips fluorescent dimming ballast in remote mounting applications or for applications with emergency power supplies, please refer to the Remote, Tandem or Through Wiring Distance table on the next page and verify whether the ballast supports remote mounting application.
- If the Philips fluorescent dimming ballast supports remote mounting, then
    - o For non emergency application, the remote mounting distance should not exceed the specified limit.
    - o For applications with emergency power supplies, the total output lead wire length measured from the fluorescent dimming ballast to the lamps sockets (including the emergency ballast wiring) should not exceed the specified limit of the Remote, Tandem or Through Wiring Distance table on the next page.
- If the Philips fluorescent dimming ballast does not support remote mounting, then
    - o For non emergency application, the output lead length should not be extended any further than what was provided with the dimming ballast.
    - o For applications with emergency power supplies, the total output lead wire length measured from the dimming ballast to the lamp sockets (including the emergency ballast wiring) should not exceed the lead length that was provided with the fluorescent dimming ballast. If maintaining the lead lengths within the specification is not possible then it is recommended to use a Philips fluorescent dimming ballast that supports remote mounting. The example below can be used as a reference for an appropriate application usage of a Philips fluorescent dimming ballast.

Example:

A luminaire contains (1) IZT3S32SC Philips Mark 7 *0-10V* fluorescent dimming ballast and (1) emergency ballast in a three lamp, single lamp cross-section, 12' fixture. This application will have issues because of the excessive wire lengths that result in capacitive losses which may cause short lamp life, uneven lamp performance, or even inability to ignite the lamp(s). In such an application it is preferred to use one of the following approaches:

* One IZT2S32SC ballast to control two lamps (can be remote mounted up to 6') and one IZT132SC ballast in conjunction with the emergency ballast to control one lamp. The total output lead length measured from the dimming ballast to the lamps sockets (including the emergency ballast wiring) should be less than 6'.
* One IZT132SC ballast to control one lamp (can be remote mounted up to 6') and one IZT2S32SC ballast in conjunction with emergency ballast to control two lamps. The total output lead length measured from the dimming ballast to the lamps sockets (including the emergency ballast wiring) should be less than 6' (This approach will provide 2 lamps to be turned ON during emergency).

- For additional application support, contact technical support at Philips Lighting.

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	
GCN-2S28-L		20'	Yes	Yes	10'	10'	10'				2 (f)
GOP-2PSP32-LW-SC		20'	Yes	Yes	20'	20'	18'				1 (e)
GOP-2PSP32-SC		20'	Yes	Yes	20'	20'	18'				1 (e)
GOP-3PSP32-SC		20'	Yes	Yes	20'	20'	18'	18'			1 (e)
GOP-4PSP32-LW-SC		20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
GOP-4PSP32-SC		20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
GOPA-1P32-LW-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-1P32-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-2P32-LW-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-2P32-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-3P32-LW-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-3P32-SC		8'	Yes	Yes	8'	8'					1 (c)
GOPA-4P32-LW-SC		8'	Yes	Yes	8'	8'	8'				1 (c)
GOPA-4P32-SC		8'	Yes	Yes	8'	8'	8'				1 (c)
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
HDF128T5		6'	NA	NA							4
HDF132T8		6'	NA	NA							4
HDF140T5		6'	NA	NA							4
HDF154T5		No	NA	NA							5
HDF224T5		6'	Yes	Yes	6'	6'	6'				1
HDF226T4		No	No	No							5
HDF228T5		6'	Yes	Yes	6'	6'	6'				1
HDF232T8		6'	Yes	Yes	6'	6'	6'				1
HDF239T5		6'	Yes	Yes	6'	6'	6'				1
HDF240T5		6'	No	No							4
HDF242T5		No	No	No							5
HDF254T5		No	No	Yes	5'	4'	4'				3
HDF332T8		No	No	No							5
HDF432T8		No	No	Yes	1'	1.25'	5.2'	1.25'	4.2'		3
HOP-2PSP54-L		20'	Yes	Yes	20'	20'	15'				1
HOP-2PSP32-HL-L		20'	Yes	Yes	20'	20'	18'	18'			1 (e)
HOP-4PSP54-2LS-G		20'	Yes	Yes	20'	20'	15'	15'	15'		1
HOP-4PSP32-HL-G		20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
ICF-1D38-H1-LD		15'	NA	NA							4
ICF-2S13-H1-LD	1-Lamp	15'	NA	NA							4
ICF-2S13-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
ICF-2S18-H1-LD	1-Lamp	15'	NA	NA							4
ICF-2S18-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
ICF-2S26-H1-LD	1-Lamp	15'	NA	NA							4
ICF-2S26-M1-BS	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
ICF-2S42-M2-BS	1-Lamp	15'	NA	NA							4
ICF-2S42-M2-LD	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
ICF-2S42-90C-M2-BS	1-Lamp	15'	NA	NA							4
ICF-2S42-90C-M2-LD	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
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-T		20'	NA	NA							4
ICN-1TTP40-SC		20'	NA	NA							4
ICN-2M32-MC		20'	Yes	Yes	20'	20'					1

For nominal input voltage and 25°C ambient temperature. See all notes on page 3-18.

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-2P32-N	20'	Yes	Yes	20'	20'					1 (e)
ICN-2P60-SC	20'	Yes	Yes	20'	20'					1
ICN-2S24-T	20'	Yes	Yes	20'	4'	20'				3
ICN-2S24-N	20'	Yes	Yes	20'	4'	20'				3
ICN-2S28-T	10'	Yes	Yes	10'	10'	10'				3
ICN-2S28-N	10'	Yes	Yes	10'	10'	10'				3
ICN-2S39-T	20'	Yes	Yes	20'	4'	20'				3
ICN-2S39-N	20'	Yes	Yes	20'	4'	20'				3
ICN-2S40-N	20'	Yes	Yes	4'	10'	10'				2
ICN-2S54-T	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-N	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-90C-N	20'	Yes	Yes	20'	4'	20'				3
ICN-2S54-90C-T	20'	Yes	Yes	20'	4'	20'				3
ICN-2S86	12'	Yes	Yes	12'	4'	12'				3 (b)
ICN-2S110-SC	20'	Yes	Yes	4'	20'	20'				2
ICN-2TTP40-SC	20'	Yes	Yes	20'	20'					1
ICN-3P32-N	20'	Yes	Yes	20'	20'					1 (e)
ICN-3S14-T	No	No	No							5
ICN-3TTP40-SC	20'	Yes	Yes	20'	20'					1
ICN-4P32-N	20'	Yes	Yes	20'	20'	20'				1 (e)
ICN-4S54-90C-2LS-G	20'	Yes	Yes	20'	4'	4'	20'	20'	20'	7
IDA-128-D	6'	NA	NA							4
IDA-132-SC	No	NA	NA							5
IDA-154	No	NA	NA							5
IDA-2S28-D	6'	Yes	Yes	6'	6'	6'				1
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-124-D	6'	NA	NA							5
IEZ-128-D	6'	NA	NA							5
IEZ-2S24-D	No	No	Yes	3'	2'	2'				3
IEZ-2S28-D	6'	Yes	Yes	6'	6'	6'				3
IOP-1P32-HL-SC	20'	NA	Yes							1 (e)
IOP-1P32-LW-N	20'	NA	NA							1 (e)
IOP-1P32-N	20'	Yes	NA							1 (e)
IOP-1PSP32-LW-N	20'	NA	NA							4
IOP-1PSP32-N	20'	NA	NA							4
IOP-2P32-HL-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-2P32-LW-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-2P32-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-2P59-SC	20'	Yes	Yes	20'	20'					1 (e)
IOP-2PSP32-HL-N	20'	Yes	Yes	20'	20'	18'				1 (e)
IOP-2PSP32-LW-N	20'	Yes	Yes	20'	20'	18'				1 (e)
IOP-2PSP32-N	20'	Yes	Yes	20'	20'	18'				1 (e)

For nominal input voltage and 25°C ambient temperature. See all notes on page 3-18.

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	
IOP-2PSP54-SC	20'	Yes	Yes	20'	20'	15'				1
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-SC-SD	7'	Yes	Yes	7'	7'	7'				1
IOP-3P32-HL-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-3P32-LW-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-3P32-N	20'	Yes	Yes	20'	20'					1 (e)
IOP-3PSP32-HL-SC	20'	Yes	Yes	20'	20'	18'	18'			1 (e)
IOP-3PSP32-LW-SC	20'	Yes	Yes	20'	20'	18'	18'			1 (e)
IOP-3PSP32-SC	20'	Yes	Yes	20'	20'	18'	18'			1 (e)
IOP-4P32-HL-SC	20'	Yes	Yes	20'	20'	8'				1 (e)
IOP-4P32-LW-N	20'	Yes	Yes	20'	20'	8'				1 (e)
IOP-4P32-N	20'	Yes	Yes	20'	20'	8'				1 (e)
IOP-4PSP32-HL-G	20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
IOP-4PSP32-LW-SC	20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
IOP-4PSP32-SC	20'	Yes	Yes	20'	20'	18'	18'	18'		1 (e)
IOP-4PSP54-2LS-G	20'	Yes	Yes	20'	20'	15'	15'	15'		1 (e)
IOPA-1P32-HL-N	20'	Yes	Yes	20'	20'					1 (e)
IOPA-1P32-LW-N	20'	Yes	Yes	20'	20'					1 (e)
IOPA-1P32-N	20'	Yes	Yes	20'	20'					1 (e)
IOPA-2P32-HL-N	20'	Yes	Yes	20'	20"					1 (e)
IOPA-2P32-LW-N	20'	Yes	Yes	20'	20'					1 (e)
IOPA-2P32-N	20'	Yes	Yes	20'	20"					1 (e)
IOPA-3P32-HL-N	20'	Yes	Yes	20'	20"					1 (e)
IOPA-3P32-LW-N	20'	Yes	Yes	20'	20'					1 (e)
IOPA-3P32-N	20'	Yes	Yes	20'	20"					1 (e)
IOPA-4P32-LW-N	20'	Yes	Yes	20'	20'	8'				1 (e)
IOPA-4P32-N	20'	Yes	Yes	20'	20'	8'				1 (e)
IZT-124-D	6'	NA	NA							5
IZT-128-D	6'	NA	NA							4
IZT-132-SC	6'	NA	NA							4
IZT-154-D	No	NA	NA							5
IZT-180-D	No	NA	NA							5
IZT-2S26-M5-BS IZT-2S26-M5-LD	No	No	No							5
IZT-2S24-D	No	No	Yes	3'	2'	2'				3
IZT-2S28-D	6'	Yes	Yes	6'	6'	6'				1
IZT-2S32-SC	6'	Yes	Yes	6'	6'	6'				1
IZT-2S54-D	No	No	Yes	5'	4'	4'				3
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	1'	1.25'	5.2'	1.25'	4.2'		3
IZT-4PSP32-G	No	No	Yes	5'	5'	1'	5'	R/W=5'		3
RCF-2S13-M1-BS-QS 1-Lamp	15'	No	No							4
RCF-2S13-M1-BS-QS 2-Lamp	6'	Yes	Yes	2'	6'	6'				2

For nominal input voltage and 25°C ambient temperature. See all notes on page 3-18.

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	
RCF-2S18-M1-BS-QS	1-Lamp	15'	No	No							4
	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
RCF-2S26-H1-LD-QS RCF-2S26-M1-BS-QS	1-Lamp	15'	No	No							4
	2-Lamp	6'	Yes	Yes	2'	6'	6'				2
REB-2P32-SC		20"	Yes	Yes	20'	20'					1
REB-4P32-SC		20"	Yes	Yes	20'	20'	20'				1
RELB-2S40-N		20"	Yes	Yes	4'	10'	10'				2
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 REZ-1T42-M2-LD		No	NA	NA							5
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-2S32-TP		20'	Yes	Yes	4'	20'	20'				2 (a)
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	Yes	6'	6'	6'				1
VEZ-2S54		No	No	Yes	5'	4'	4'				5
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-2S32-TP		20'	Yes	Yes	4'	20'	20'				2 (a)
VZT-4S32-HL		No	No	Yes	1'	1.25'	5.2'	1.25'	4.2'		3

For nominal input voltage and 25°C ambient temperature. See all notes on page 3-18.

ELECTRONIC FLUORESCENT BALLASTS

Notes

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
(f) Energy-saving lamps not allowed for Tandem wiring

Use 18 AWG wire or larger

DOE Legislation

The US Department of Energy (DOE) issued amended standards for fluorescent lamp ballasts on November 14, 2011. The new standards go into effect on November 14, 2014 and all covered fluorescent ballasts manufactured or imported into the United States must comply. For more information on this amended standard please visit http://www1.eere.energy.gov/femp/technologies/eep_fluor_ballast.html.

The new amended standards cover fluorescent ballasts operating T12, T8, T5, T5HO and sign ballasts. These standards will require fluorescent ballasts to meet a minimum Ballast Luminous Efficiency (BLE) that is determined by the type of lamp operated and the arc power of the lamps. It is essentially a minimum efficiency standard based on lamp power compared to input watts.

Philips Advance expects minimal changes to electronic fluorescent ballasts, however many magnetic ballasts will no longer be able to be imported or manufactured into the United States after November 14, 2014. Please see www.philips.com/advance for more information on ballasts affected by the amended standard.

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 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:

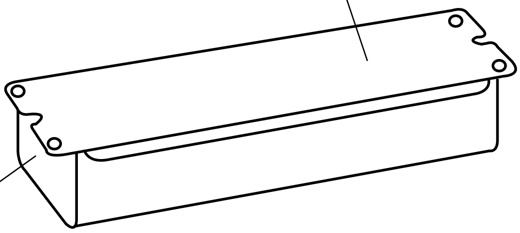
937N1B
B41893
The date code is the 18th week of 1993, stamped one line over the other.

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 24th 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 • Enables 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 3-21 through 3-28 and 4-6

- 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

For 13-18W T4 Quad Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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	RS	AmbiStar	RCF-2S13-M1-BS-QS	16	1.00	10	0.13	0/-18	Size 1	160
	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	RS	AmbiStar	RCF-2S13-M1-BS-QS	29	1.00	10	0.25	0/-18	Size 1	159
	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	RS	AmbiStar	RCF-2S18-M1-BS-QS	19	1.00	10	0.16	0/-18	Size 1	160
	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	RCF-2S18-M1-BS-QS	35	0.95	10	0.30	0/-18	Size 1	159
	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							

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

Refer to page 3-26 for dimensions and wiring diagrams

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 26W Quad and 13W Triple T4 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	RS	AmbiStar	RCF-2S26-H1-LD-QS	27	1.00	10	0.23	0/-18	Size 1	160
				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 ❿							
				ICF-2S26-M1-BS							
2	120	RS	AmbiStar	RCF-2S26-H1-LD-QS	51	1.00	10	0.43	0/-18	Size 1	159
				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 ❿							
				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 ❿							
				ICF-2S42-90C-M2-BS	52	1.00	10	0.43-0.19			
				ICF-2S42-90C-M2-LD							
CFTR13W/GX24q - 13W CFL Triple Tube Lamp (F13TBX/4P, CF13DT/E)											
1	120	RS	AmbiStar	RCF-2S13-M1-BS-QS	16	1.00	10	0.13	0/-18	Size 1	160
	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	RS	AmbiStar	RCF-2S13-M1-BS-QS	29	1.00	10	0.25	0/-18	Size 1	159
	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							

❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

Refer to page 3-26 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 18-26W Triple T4 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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	RS	AmbiStar	RCF-2S18-M1-BS-QS	20	1.05	10	0.17	0/-18	Size 1	160
	120-277		SmartMate	ICF-2S18-M1-BS-QS	20	1.05	10	0.17-0.08			
		PS		ICF-2S18-H1-LD							
				ICF-2S18-H1-LD-K ⑩							
				ICF-2S18-M1-BS							
2	120	RS	AmbiStar	RCF-2S18-M1-BS-QS	39	1.05	10	0.33	0/-18	Size 1	159
	120-277		SmartMate	ICF-2S18-M1-BS-QS	39	1.05	10	0.33-0.14			
		PS		ICF-2S18-H1-LD							
				ICF-2S18-H1-LD-K ⑩							
				ICF-2S18-M1-BS							
CFTR26W/GX24q - 26W CFL Triple Tube Lamp (PL-T26W, F26TBX/4P, CF26DT/E)											
1	120	RS	AmbiStar	RCF-2S26-H1-LD-QS	29	1.10	10	0.24	0/-18	Size 1	160
				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 ⑩							
				ICF-2S26-M1-BS							
2	120	RS	AmbiStar	RCF-2S26-H1-LD-QS	54	1.00	10	0.45	0/-18	Size 1	159
				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 ⑩							
				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 ⑩							
				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 3-20 for details.

Refer to page 3-26 for dimensions and wiring diagrams

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 32-70W Triple T4 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.
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 ⑩							
				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 ⑩							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
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 ⑩							
				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 ⑩							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
CFTR57W/GX24q - 57W CFL Lamp (PL-T57W, F57QBX/4P, CF57DT/E)											
1	120-277	PS	SmartMate	ICF-2S42-M2-BS	59	0.94	10	0.50-0.21	0/-18	Size 2	160
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⑩							
				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	0/-18	Size 2	160
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⑩							
				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

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

Refer to page 3-26 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 10-38W 2D Lamps

HIGH POWER FACTOR SOUND RATED A

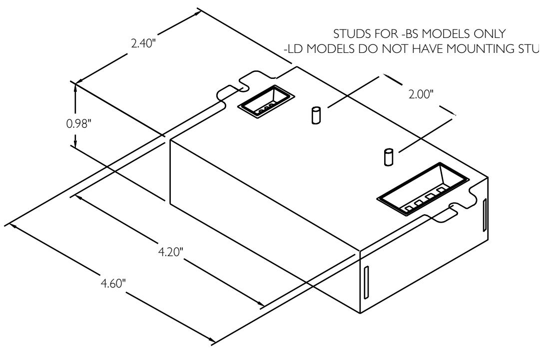
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
CFS10W/GR10q - 10W 2D Lamp (F10 2D/4P)											
1	120-277	PS	SmartMate	ICF-2S13-H1-LD ICF-2S13-H1-LD-K ❿ ICF-2S13-M1-BS	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			
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
2	120-277	PS	SmartMate	ICF-2S42-M2-BS ICF-2S42-M2-LD ICF-2S42-M2-LD-K ❿ ICF-2S42-90C-M2-BS ICF-2S42-90C-M2-LD	57	1.00	10	0.48-0.21	0/-18	Size 2	159
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
2	120-277	PS	SmartMate	ICF-2S42-M2-BS ICF-2S42-M2-LD ICF-2S42-M2-LD-K ❿ ICF-2S42-90C-M2-BS ICF-2S42-90C-M2-LD	62	0.80	10	0.55-0.23	0/-18	Size 2	159

❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

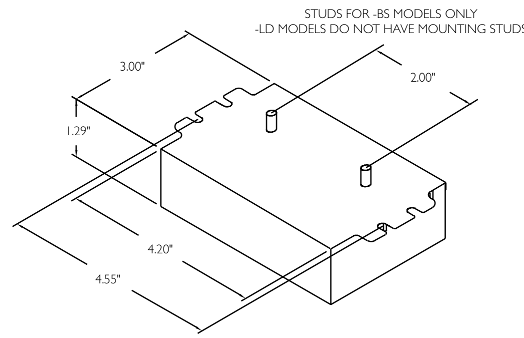
Refer to page 3-26 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

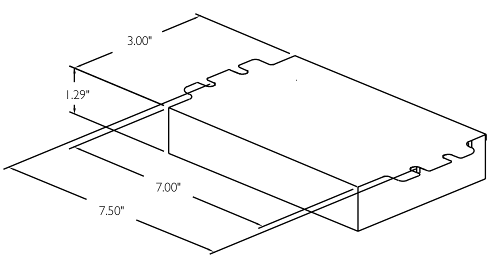
CFL Wiring Diagrams and Dimensions



Size 1 Enclosure

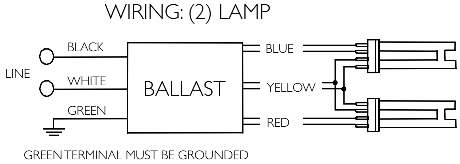


Size 2 Enclosure



Size 4 Enclosure

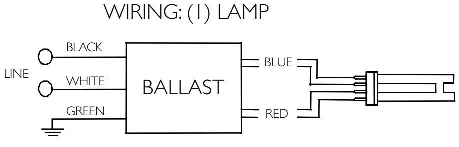
WIRING: (2) LAMP



Diag. 159

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

WIRING: (1) LAMP



Diag. 160

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 24-36W FT5 Lamps

HIGH POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

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.
FT24W/2G11 - 24/27W (PL-L24W, F27BX/RS, FT24DL)											
1	120-277	PS	Centium	ICN-2S24-N	26	0.99	20	0.21-0.10	0/-18	N	73
				ICN-2S24-T		1.02	10	0.22-0.10		T	
				ICN-2S39-N	29	1.11	15	0.24-0.13		N	
				ICN-2S39-T		1.12	10	0.24-0.12		T	
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 ⑩							
				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 ⑩							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
			Centium	ICN-2S24-N	51-50	1.01	10	0.43-0.18		N	74A
				ICN-2S24-T	51	1.00		0.42-0.18		T	
				ICN-2S39-N	56-55	1.11		0.47-0.21		N	
				ICN-2S39-T	54	1.10		0.46-0.20		T	
FT36W/2G11 - 36/39W (PL-L36W, F39BX/RS, FT36DL)											
1	120-277	PS	Centium	ICN-2S24-N	31	0.84	15	0.26-0.12	0/-18	N	73
				ICN-2S24-T	33	0.90	10	0.28-0.12		T	
				ICN-2S39-N	34-33	0.90	15	0.28-0.15		N	
				ICN-2S39-T	36	0.96	10	0.30-0.13		T	
				ICN-2S54-N	45	1.24	20	0.37-0.17	-20/-29	N	
				ICN-2S54-T	44	1.20	10	0.37-0.16		T	
				ICN-2S54-90C-N	45	1.24	20	0.37-0.17		N	
				ICN-2S54-90C-T	44	1.20	10	0.37-0.16		T	
			Optanium	IOP-2PSP54-SC	46	1.20	10	0.39-0.18		B	77
	347-480		Centium	HCN-2S54-90C-WL	46	1.22	15	0.13-0.10		L	73
			Optanium	HOP-2PSP54-L	46	1.00	10	0.13-0.10			77
2	120-277	PS	Centium	ICN-2S39-N	66-65	0.90	10	0.55-0.24	0/-18	N	74A
				ICN-2S39-T	69	0.94		0.59-0.25		T	
				ICN-2S54-N	88-87	1.24		0.74-0.32	-20/-29	N	
				ICN-2S54-T	82-81	1.16		0.68-0.29		T	
				ICN-2S54-90C-N	88-87	1.24		0.74-0.32		N	
				ICN-2S54-90C-T	82-81	1.16		0.68-0.29		T	
			Optanium	IOP-2PSP54-SC	88-85	1.20	10	0.73-0.31		B	78
	347-480		Centium	HCN-2S54-90C-WL	89	1.20	10	0.26-0.19		L	74A
			Optanium	HOP-2PSP54-L	87	1.00	10	0.25-0.18			78
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	133-132	1.20	10	1.11-0.49	-20/-29	G	75A
			Optanium	IOP-4P2P54-2LS-G	128-127	1.20	10	1.07-0.31			80
	347-480		Centium	HCN-4S54-90C-2LS-G	137-135	1.20	10	0.40-0.29			75A
			Optanium	HOP-4PSP54-2LS-G	129	1.00	10	0.38-0.28			80
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	176-173	1.20	10	1.47-0.64	-20/-29	G	75
			Optanium	IOP-4P2P54-2LS-G	170-167	1.20	10	1.42-0.61			79
	347-480		Centium	HCN-4S54-90C-2LS-G	182-180	1.20	10	0.53-0.38			75
			Optanium	HOP-4PSP54-2LS-G	172	1.00	10	0.50-0.37			79

Refer to page 3-37 for dimensions
Refer to pages 3-26, 3-35 & 3-36 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

ELECTRONIC FLUORESCENT BALLASTS

For 40W & 50W FT5 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-N	42	0.94	15	0.36-0.16		N	73
				ICN-2S24-T	46	1.00	10	0.39-0.17		T	
				ICN-2S39-N	45	0.99		0.37-0.17		N	
				ICN-2S39-T	50	1.10		0.42-0.19		T	
			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
FT50W/2G11/RS - 50W (PL-L50W, F50BX/RS)											
1	120-277	PS	Centium	ICN-2S54-N	61	1.12	15	0.51-0.23	-20/-29	N	73
				ICN-2S54-T	60	1.11	10	0.50-0.22		T	
				ICN-2S54-90C-N	61	1.12	15	0.51-0.23		N	
				ICN-2S54-90C-T	60	1.11	10	0.50-0.22		T	
			Optanium	IOP-2PSP54-SC	61	1.10	10	0.51-0.23		B	77
	347-480		Centium	HCN-2S54-90C-WL	61	1.12	10	0.18-0.13		L	73
			Optanium	HOP-2PSP54-L	60	1.00	10	0.17-0.13			77
2	120-277	PS	Centium	ICN-2S54-N	118-115	1.07	10	0.99-0.43	-20/-29	N	74A
				ICN-2S54-T	111-109	1.03	10	0.92-0.39		T	
				ICN-2S54-90C-N	118-115	1.07	10	0.99-0.43		N	
				ICN-2S54-90C-T	111-109	1.03	10	0.92-0.39		T	
			Optanium	IOP-2PSP54-SC	117-114	1.10	10	0.97-0.42		B	78
	347-480		Centium	HCN-2S54-90C-WL	118	1.10	10	0.34-0.25		L	74A
			Optanium	HOP-2PSP54-L	116	1.00	10	0.33-0.24			78
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	178-175	1.10	10	1.49-0.65	-20/-29	G	75A
			Optanium	IOP-4PSP54-2LS-G	172-169	1.10	10	1.44-0.62			80
	347-480		Centium	HCN-4S54-90C-2LS-G	185-183	1.10	10	0.54-0.39			75A
			Optanium	HOP-4PSP54-2LS-G	177	1.00	10	0.51-0.38			80
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	235-230	1.10	10	1.96-0.84	-20/-29	G	75
			Optanium	IOP-4PSP54-2LS-G	228-223	1.10	10	1.90-0.81			79
	347-480		Centium	HCN-4S54-90C-2LS-G	236-234	1.10	10	0.68-0.49			75
			Optanium	HOP-4PSP54-2LS-G	238	1.00	10	0.69-0.50			79

❿ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

Refer to page 3-37 for dimensions
Refer to pages 3-26, 3-35 & 3-36 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 55-80W FT5 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-N	58	0.98	15	0.49-0.22	-20/-29	N	73
				ICN-2S54-T	58	0.92	10	0.49-0.21		T	
				ICN-2S54-90C-N	58	0.98	15	0.49-0.22		N	
				ICN-2S54-90C-T	58	0.92	10	0.49-0.21		T	
			Optanium	IOP-2PSP54-SC	58	0.90	10	0.49-0.22		B	77
	347-480		Centium	HCN-2S54-90C-WL	58	0.92	10	0.17-0.13		L	73
			Optanium	HOP-2PSP54-L	56	1.00	10	0.16-0.12			77
2	120-277	PS	Centium	ICN-2S54-N	112-109	0.93	10	0.94-0.41	-20/-29	N	74A
				ICN-2S54-T	108-105	0.90	10	0.90-0.38		T	
				ICN-2S54-90C-N	112-109	0.93	10	0.94-0.41		N	
				ICN-2S54-90C-T	108-105	0.90	10	0.90-0.38		T	
			Optanium	IOP-2PSP54-SC	110-108	0.90	10	0.92-0.40		B	78
	347-480		Centium	HCN-2S54-90C-WL	112	0.90	10	0.33-0.24		L	74A
			Optanium	HOP-2PSP54-L	109	1.00	10	0.32-0.23			78
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			80
	347-480		Centium	HCN-4S54-90C-2LS-G	178-176	0.90	10	0.52-0.37			75A
			Optanium	HOP-4PSP54-2LS-G	165	1.00	10	0.48-0.35			80
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
			Optanium	HOP-4PSP54-2LS-G	222	1.00	10	0.64-0.47			79
FT80W/2G11 - 80W (PL-L80W, FT80DL)											
1	120-277	PS	Centium	ICN-1S80-T	90-88	1.00	10	0.74-0.32	0/-18	T	73

Refer to pages 3-35 to 3-37 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 14-25W T5 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	120-277	PS	Centium	ICN-2S28-N	17	1.07	10	0.14-0.07	0/-18	N	73
				ICN-2S28-T	17	1.07	15	0.14-0.07		T	
			Optanium	IOP-2S28-115-SC	19	1.15	15	0.15-0.08		B	
	347		Centium	GCN-2S28-L	18	1.09	15	0.06		L	
2	120-277	PS	Centium	ICN-2S28-N	33	1.04	10	0.28-0.13	0/-18	N	74
				ICN-2S28-T	32	1.06	10	0.27-0.12		T	
				ICN-3S14-T	35	1.10	10	0.29-0.13		T	172
			Optanium	IOP-2S28-95-SC	30	0.95	15	0.25-0.11		B	74
				IOP-2S28-115-SC	37	1.15	10	0.30-0.14			
	347		Centium	GCN-2S28-L	33	1.10	15	0.10		L	
3	120-277	PS	Centium	ICN-3S14-T	48	1.00	10	0.40-0.17	0/-18	T	171
F21T5 (21W)											
1	120-277	PS	Centium	ICN-2S28-N	25	1.06	10	0.22-0.10	0/-18	N	73
				ICN-2S28-T	23	1.03	15	0.19-0.09		T	
			Optanium	IOP-2S28-95-SC	23	0.95	15	0.19-0.08		B	
				IOP-2S28-115-SC	27	1.15	15	0.22-0.10			
	347		Centium	GCN-2S28-L	25	1.05	15	0.08		L	
2	120-277	PS	Centium	ICN-2S28-N	49	1.02	10	0.43-0.19	0/-18	N	74
				ICN-2S28-T	46-45	1.02	10	0.38-0.17		T	
			Optanium	IOP-2S28-95-SC	44	0.95	10	0.37-0.16		B	
				IOP-2S28-115-SC	52	1.15	10	0.44-0.19			
	347		Centium	GCN-2S28-L	47	1.05	15	0.14		L	
F28T5 (25W)											
1	120-277	PS	Centium	ICN-2S28-N	30	1.05	10	0.25-0.11	32/0	N	73
				ICN-2S28-T	28	1.00	10	0.24-0.11		T	
			Optanium	IOP-2S28-95-SC	27	0.95	10	0.22-0.10		B	
				IOP-2S28-115-SC	33	1.15	10	0.27-0.12			
	347		Centium	GCN-2S28-L	30	1.03	10	0.09		L	
2	120-277	PS	Centium	ICN-2S28-N	58-57	1.00	10	0.49-0.21	32/0	N	74
				ICN-2S28-T	56-55	1.00	10	0.47-0.20		T	
			Optanium	IOP-2S28-95-SC	54	0.95	10	0.45-0.20		B	
				IOP-2S28-115-SC	64-63	1.15	10	0.54-0.23			
	347		Centium	GCN-2S28-L	56	1.03	10	0.16		L	

Refer to page 3-35 to 3-37 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 28-35W T5 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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.
F28T5 (28W)											
1	120-277	PS	Centium	ICN-2S28-N	31	1.05	10	0.29-0.12	0/-18	N	73
				ICN-2S28-T	31	1.00	10	0.27-0.12		T	
			Optanium	IOP-2S28-95-SC	30	0.95	15	0.25-0.11		B	
				IOP-2S28-115-SC	36	1.15	10	0.30-0.13			
	347		Centium	GCN-2S28-L	34	1.08	10	0.10		L	
2	120-277	PS	Centium	ICN-2S28-N	61-60	1.00	10	0.59-0.23	0/-18	N	74
				ICN-2S28-T	62-61	1.00	10	0.51-0.23		T	
			Optanium	IOP-2S28-95-SC	59-58	0.95	15	0.55-0.22		B	
				IOP-2S28-115-SC	71-69	1.15	10	0.60-0.26			
	347		Centium	GCN-2S28-L	60	1.01	10	0.17		L	
F35T5 (35W)											
1	120-277	PS	Centium	ICN-2S28-N	40	1.01	10	0.34-0.15	0/-18	N	73
				ICN-2S28-T	39	1.00	10	0.34-0.15		T	
			Optanium	IOP-2S28-95-SC	37	0.95	10	0.31-0.14		B	
				IOP-2S28-115-SC	44	1.15	10	0.37-0.17			
	347		Centium	GCN-2S28-L	41	1.06	15	0.12		L	
2	120-277	PS	Centium	ICN-2S28-T	77-75	1.00	10	0.64-0.28	0/-18	T	74

Refer to page 3-35 to 3-37 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 22-55W T5 & T5HO Lamps

HIGH POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

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	120-277	PS	SmartMate	ICF-1D38-H1-LD	25	1.00	15	0.21-0.09	0/-18	Size 1	73
			Centium	ICN-2S24-N	28	0.98	20	0.22-0.11		N	73
				ICN-2S24-T	26	1.02	10	0.22-0.10		T	
				ICN-2S39-N	29	1.09	20	0.24-0.11		N	
				ICN-2S39-T	29	1.12	15	0.24-0.12		T	
2	120-277	PS	Centium	ICN-2S24-N	49	0.98	10	0.41-0.18	0/-18	N	74
				ICN-2S24-T	51	1.00	10	0.42-0.18		T	
				ICN-2S39-N	54	1.07	15	0.45-0.20		N	
				ICN-2S39-T	54	1.10	10	0.46-0.20		T	
FC12T5 (40W Circline)											
1	120-277	PS	SmartMate	ICF-1D38-H1-LD	38	0.95	10	0.32-0.14	0/-18	Size 1	73
			Centium	ICN-2S24-N	39-38	0.84	15	0.32-0.14		N	73
				ICN-2S24-T	40	0.84	10	0.33-0.15		T	
				ICN-2S39-N	45	1.03	15	0.38-0.17		N	
				ICN-2S39-T	42	0.92	10	0.35-0.16		T	
2	120-277	PS	Centium	ICN-2S39-N	81	0.91	10	0.68-0.30	0/-18	N	74
				ICN-2S39-T	79	0.90	10	0.66-0.29		T	
(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	159
				ICF-2S42-M2-LD							
				ICF-2S42-M2-LD-K ⑩							
				ICF-2S42-90C-M2-BS							
				ICF-2S42-90C-M2-LD							
			Centium	ICN-2S39-N	66	0.94	10	0.56-0.24		N	74
				ICN-2S39-T	68	1.00	10	0.57-0.25		T	
FC12T5/HO (55W Circline)											
1	120-277	PS	Centium	ICN-2S54-N	58	0.95	15	0.49-0.22	-20/-29	N	73
				ICN-2S54-T	58	0.92	10	0.49-0.21		T	
				ICN-2S54-90C-N	58	0.95	15	0.49-0.22		N	
				ICN-2S54-90C-T	58	0.92	10	0.49-0.21		T	
	347-480			HCN-2S54-90C-WL	55	0.87	10	0.16-0.12		L	
2	120-277	PS	Centium	ICN-2S54-N	109-107	0.90	10	0.91-0.39	-20/-29	N	74
				ICN-2S54-T	110-108	0.88	10	0.92-0.39		T	
				ICN-2S54-90C-N	109-107	0.90	10	0.91-0.39		N	
				ICN-2S54-90C-T	110-108	0.88	10	0.92-0.39		T	
	347-480			HCN-2S54-90C-WL	106	0.85	10	0.31-0.22		L	

⑩ Replacement/Retrofit ballast kits indicated with suffix K are available to distributors. Refer to page 3-20 for details.

Refer to page 3-37 for dimensions
Refer to pages 3-26, 3-35 & 3-36 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 24-44W T5HO 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-N	27	1.03	10	0.23-0.10	0/-18	N	73
				ICN-2S24-T	26	1.02	10	0.22-0.10		T	
				ICN-2S39-N	30	1.14	15	0.25-0.12		N	
				ICN-2S39-T	29	1.13	15	0.25-0.11		T	
2	120-277	PS	Centium	ICN-2S24-N	54-53	1.04	10	0.45-0.19	0/-18	N	74
				ICN-2S24-T	52	1.00	10	0.44-0.19		T	
				ICN-2S39-N	59-58	1.14	10	0.49-0.22		N	
				ICN-2S39-T	57	1.12	10	0.48-0.21		T	
F39T5/HO (39W)											
1	120-277	PS	Centium	ICN-2S24-N	41	0.96	15	0.34-0.15	0/-18	N	73
				ICN-2S24-T	40	0.90	10	0.33-0.15		T	
				ICN-2S39-N	43	1.00	15	0.36-0.16		N	
				ICN-2S39-T	44	1.02	10	0.37-0.16		T	
2	120-277	PS	Centium	ICN-2S39-N	85-83	1.00	10	0.71-0.30	0/-18	N	74
				ICN-2S39-T	86-85	1.00	10	0.72-0.31		T	
F54T5/HO (44W)											
1	120-277	PS	Centium	ICN-2S54-N	52	1.07	15	0.44-0.20	5/-15	N	73
				ICN-2S54-T	50	1.04	10	0.42-0.18		T	
				ICN-2S54-90C-N	52	1.07	15	0.44-0.20		N	
				ICN-2S54-90C-T	50	1.04	10	0.42-0.18		T	
			Optanium	IOP-2PSP54-SC	46	1.00	10	0.39-0.18		B	77
	347-480		Centium	HCN-2S54-90C-WL	54	1.00	10	0.16-0.12		L	73
			Optanium	HOP-2PSP54-L	53	1.00	10	0.15-0.11			77
2	120-277	PS	Centium	ICN-2S54-N	101	1.05	10	0.84-0.37	5/-15	N	74
				ICN-2S54-T	98	1.00	10	0.83-0.36		T	
				ICN-2S54-90C-N	101	1.05	10	0.84-0.37		N	
				ICN-2S54-90C-T	98	1.00	10	0.83-0.36		T	
			Optanium	IOP-2PSP54-SC	91	1.00	10	0.77-0.34		B	78
	347-480		Centium	HCN-2S54-90C-WL	102	1.00	10	0.30-0.22		L	74
			Optanium	HOP-2PSP54-L	98	1.00	10	0.28-0.21			78
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	149	1.00	10	1.25-0.54	5/-15	G	75A
			Optanium	IOP-4PSP54-2LS-G	142-140	1.00	10	1.18-0.52			80
	347-480		Centium	HCN-4S54-90C-2LS-G	152	1.00	10	0.44-0.32			75A
			Optanium	HOP-4PSP54-2LS-G	145	1.00	10	0.42-0.31			80
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	200-197	1.00	10	1.66-0.71	5/-15	G	75
			Optanium	IOP-4PSP54-2LS-G	185-182	1.00	10	1.55-0.67			79
	347-480		Centium	HCN-4S54-90C-2LS-G	200	1.00	10	0.58-0.42			75
			Optanium	HOP-4PSP54-2LS-G	192-191	1.00	10	0.56-0.41			79

Refer to page 3-35 to 3-37 for dimensions and wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 49-80W T5HO Lamps

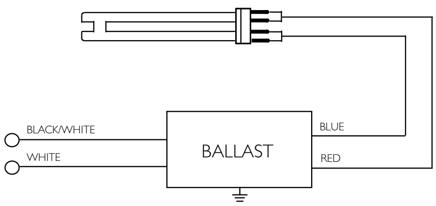
HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

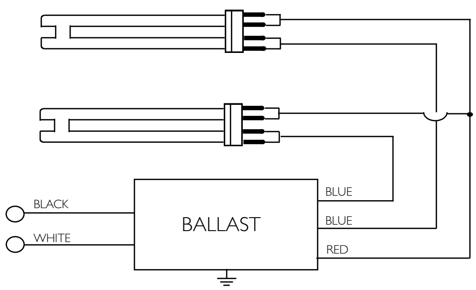
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F54T5/HO (49W)											
1	120-277	PS	Centium	ICN-2S54-N	60	1.10	15	0.50-0.22	-20/-29	N	73
				ICN-2S54-T	57	1.04	10	0.48-0.21		T	
				ICN-2S54-90C-N	60	1.10	15	0.50-0.22		N	
				ICN-2S54-90C-T	57	1.04	10	0.48-0.21		T	
			Optanium	IOP-2PSP54-SC	57	1.00	10	0.47-0.21		B	77
	347-480		Centium	HCN-2S54-90C-WL	58	1.02	10	0.18-0.13		L	73
			Optanium	HOP-2PSP54-L	54-51	1.00	10	0.16-0.10			77
2	120-277	PS	Centium	ICN-2S54-N	110	1.04	10	0.93-0.40	-20/-29	N	74
				ICN-2S54-T	107-104	1.00	10	0.90-0.38		T	
				ICN-2S54-90C-N	110	1.04	10	0.93-0.40		N	
				ICN-2S54-90C-T	107-104	1.00	10	0.90-0.38		T	
			Optanium	IOP-2PSP54-SC	109-105	1.00	10	0.91-0.38		B	78
	347-480		Centium	HCN-2S54-90C-WL	112-109	1.00	10	0.35-0.25		L	74
			Optanium	HOP-2PSP54-L	106-100	1.00	10	0.32-0.20			78
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	168-165	1.00	10	1.52-0.66	-20/-29	G	75A
			Optanium	IOP-4PSP54-2LS-G	162-159	1.00	10	1.35-0.58			80
	347-480		Centium	HCN-4S54-90C-2LS-G	175-172	1.00	10	0.54-0.39			75A
			Optanium	HOP-4PSP54-2LS-G	160-154	1.00	10	0.47-0.32			80
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	222-216	1.00	10	2.00-0.86	-20/-29	G	75
			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			75
			Optanium	HOP-4PSP54-2LS-G	214-206	1.00	10	0.62-0.43			79
F54T5/HO (54W)											
1	120-277	PS	Centium	ICN-2S54-N	62	1.02	10	0.52-0.23	-20/-29	N	73
				ICN-2S54-T	62	1.04	10	0.53-0.23		T	
				ICN-2S54-90C-N	62	1.02	10	0.52-0.23		N	
				ICN-2S54-90C-T	62	1.04	10	0.53-0.23		T	
			Optanium	IOP-2PSP54-SC	60	1.00	10	0.50 - 0.22		B	77
	347-480		Centium	HCN-2S54-90C-WL	62	1.02	10	0.18-0.13		L	73
			Optanium	HOP-2PSP54-L	62-57	1.00	10	0.18-0.12			77
2	120-277	PS	Centium	ICN-2S54-N	120-116	1.00	10	1.00-0.43	-20/-29	N	74
				ICN-2S54-T	118-115	1.00	10	0.98-0.42		T	
				ICN-2S54-90C-N	120-116	1.00	10	1.00-0.43		N	
				ICN-2S54-90C-T	118-115	1.00	10	0.98-0.42		T	
			Optanium	IOP-2PSP54-SC	117-114	1.00	10	0.98 - 0.41		B	78
	347-480		Centium	HCN-2S54-90C-WL	120-119	1.00	10	0.35-0.25		L	74
			Optanium	HOP-2PSP54-L	116-113	1.00	10	0.35-0.23			78
3	120-277	PS	Centium	ICN-4S54-90C-2LS-G	182-179	1.00	10	1.52-0.66	-20/-29	G	75A
			Optanium	IOP-4PSP54-2LS-G	176-174	1.00	10	1.47-0.83			80
	347-480		Centium	HCN-4S54-90C-2LS-G	188-186	1.04	10	0.54-0.39			75A
			Optanium	HOP-4PSP54-2LS-G	180-174	1.00	10	0.53-0.36			80
4	120-277	PS	Centium	ICN-4S54-90C-2LS-G	240-234	1.00	10	2.00-0.86	-20/-29	G	75
			Optanium	IOP-4PSP54-2LS-G	235-229	1.00	10	1.96-0.83			79
	347-480		Centium	HCN-4S54-90C-2LS-G	239-237	1.00	10	0.69-0.50			75
			Optanium	HOP-4PSP54-2LS-G	240-234	1.00	10	0.70-0.48			79
F80T5/HO (80W)											
1	120-277	PS	Centium	ICN-1S80-T	90-88	1.00	10	0.74-0.32	0/-18	T	73

Refer to page 3-35 to 3-37 for dimensions and wiring diagrams. Refer to pages 9-23 to 9-27 for lead lengths and shipping data

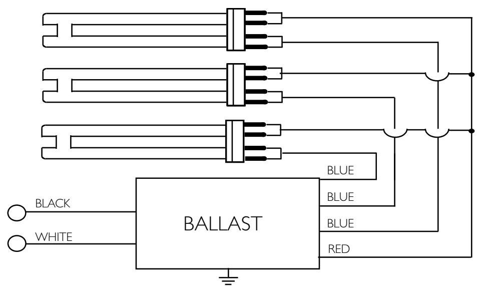
T5 and T5HO Wiring Diagrams



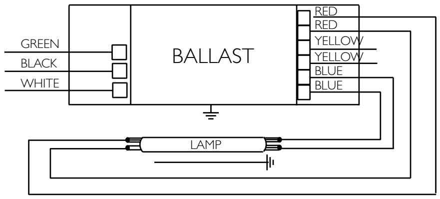
Diag. 70



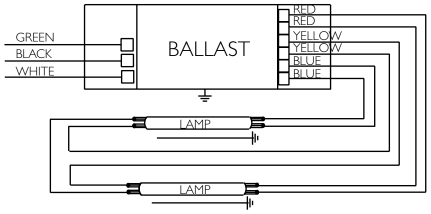
Diag. 71



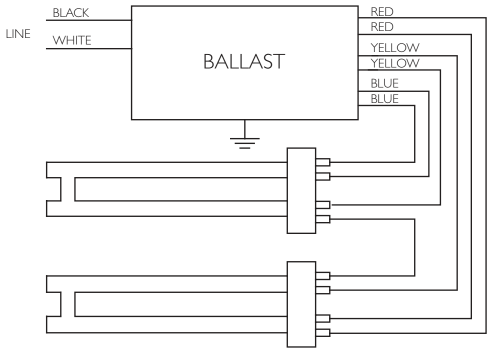
Diag. 72



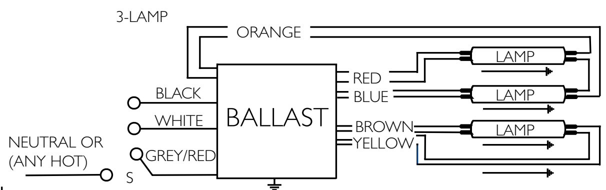
Diag. 73



Diag. 74

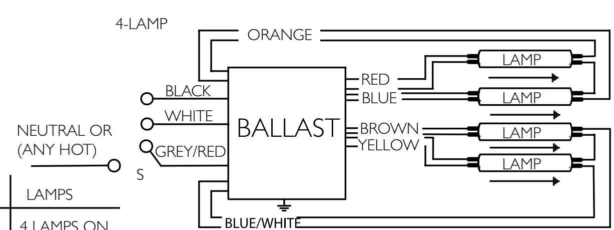


Diag. 74A



S	LAMPS
ON	3 LAMPS ON
OFF	2 LAMPS ON

Diag. 75A

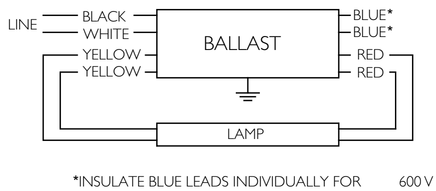


S	LAMPS
ON	4 LAMPS ON
OFF	2 LAMPS ON

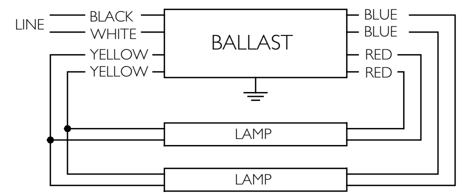
Diag. 75

ELECTRONIC FLUORESCENT BALLASTS

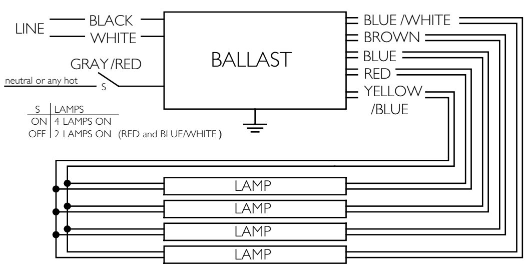
T5 and T5HO Wiring Diagrams



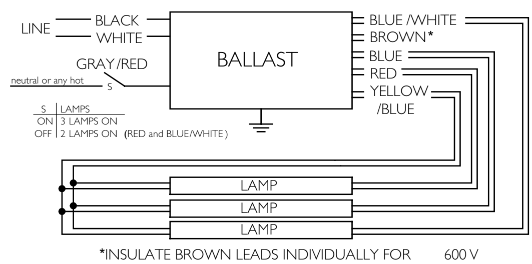
Diag. 77



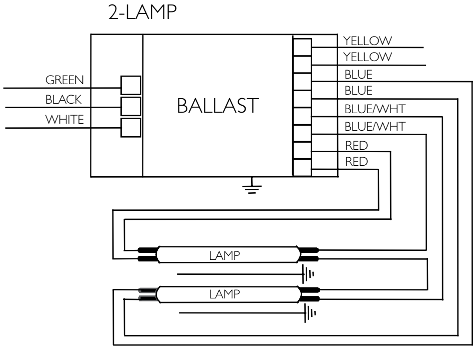
Diag. 78



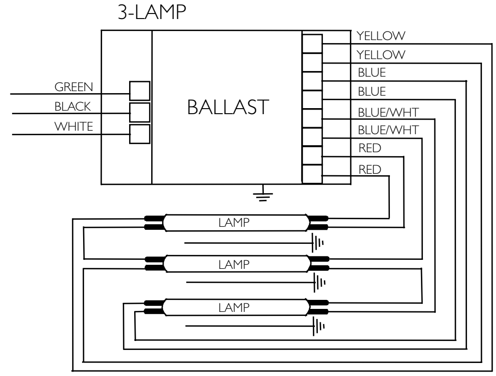
Diag. 79



Diag. 80



Diag. 172



Diag. 171

T5 and T5HO Dimensions

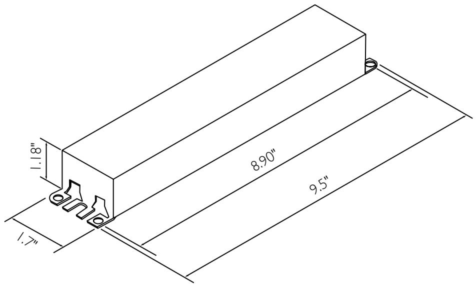


Fig. B

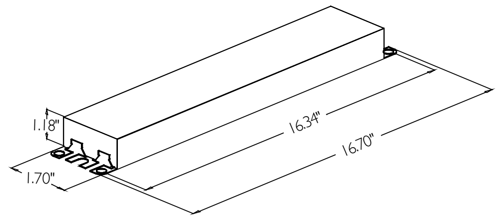


Fig. G

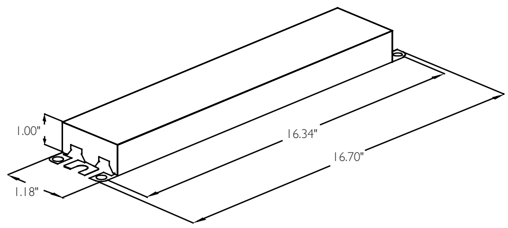


Fig. L

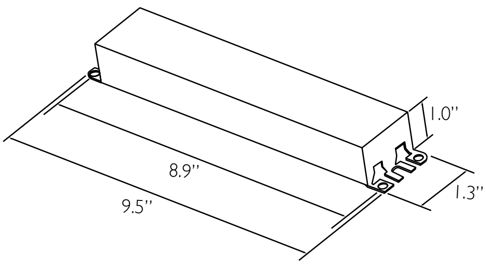


Fig. N

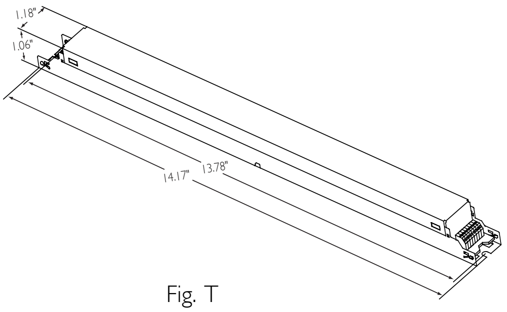
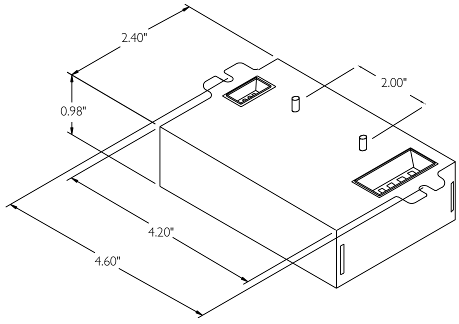
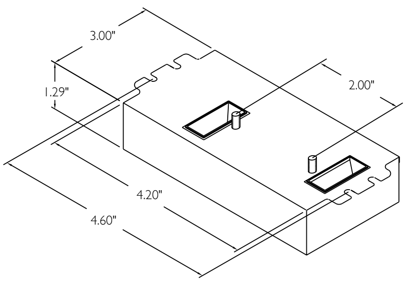


Fig. T
Includes connectors with no leads



Size 1



Size 2

ELECTRONIC FLUORESCENT BALLASTS

For 17W T8 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
	120-277	IS	Centium	ICN-132-MC	17	0.88	20	0.14-0.06	0/-18	A2	63
				ICN-1P32-N	19	0.93	15	0.16-0.07		N	
				ICN-2P32-N	22	1.07	15	0.18-0.09			*64
			Optanium	IOP-1P32-LW-N	15	0.80	10	0.13-0.06	-20/-29	N	63
				IOPA-1P32-LW-N							
				IOP-1P32-N	16	0.90	10	0.14-0.07		N	
				IOPA-1P32-N							
				IOP-1P32-HL-SC	22	1.23	15	0.19-0.08		B	
				IOPA-1P32-HL-N						N	
				IOP-2P32-LW-N	18	0.90	20	0.15-0.07		N	*64
				IOPA-2P32-LW-N							
				IOP-2P32-N	19	1.06	15	0.17-0.08			
				IOPA-2P32-N							
				IOP-2P32-HL-N	25	1.42	20	0.21-0.10			
				IOPA-2P32HL-N							
		PS		IOP-1PSP32-LW-N	14	0.79	10	0.12-0.05	0/-18	N	20
				IOP-1PSP32-N	16	0.97	10	0.14-0.07			
				IOP-2PSP-32-LW-N	16	0.79	10	0.13-0.06			77
				IOP-2PSP32-N	19	1.00	10	0.16-0.07			
				IOP-2PSP32-HL-N	39	1.34	10	0.20-0.11			
	347	IS	Optanium	GOPA-1P32-LW-SC	15	0.80	10	0.05	-20/-29	B	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			
		PS		GOP-2PSP32-LW-SC	20	0.78		0.06	0/-18		77
				GOP-2PSP32-SC	19	1.08		0.06			
	347-480			HOP-2PSP32-HL-L	40	1.30		0.12-0.10		L	

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

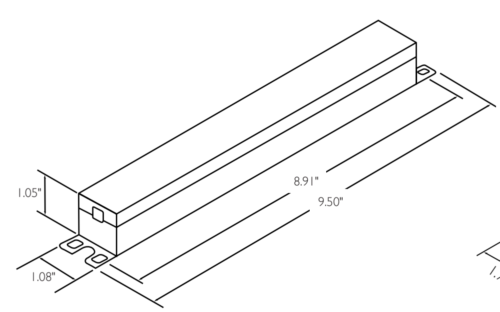


Fig. A2

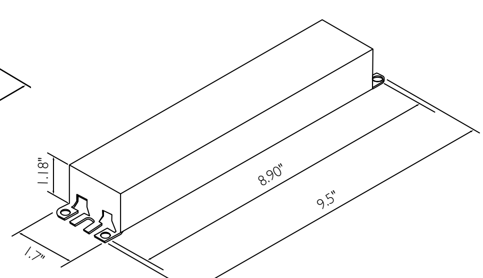


Fig. B

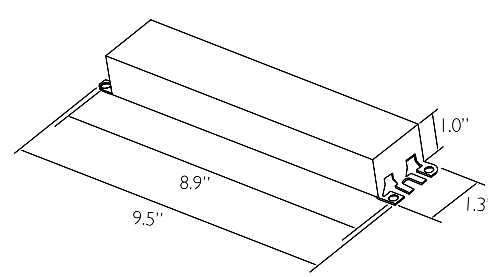


Fig. N

Refer to page 3-40 and 3-41 for wiring diagrams

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 17W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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
	120-277	IS	Centium	ICN-2M32-MC	31	0.88	10	0.26-0.11	0/-18	A2	64
				ICN-2P32-N	33	0.93	15	0.28-0.13		N	
				ICN-3P32-N	38	1.07	15	0.32-0.14			*65
			Optanium	IOP-2P32-LW-N	27	0.80	10	0.23-0.10	-20/-29	N	64
				IOPA-2P32-LW-N							
				IOP-2P32-N	31	0.90	10	0.26-0.11			
				IOPA-2P32-N							
				IOP-2P32-HL-N	41	1.23	15	0.34-0.15			
				IOPA-2P32HL-N							
				IOP-3P32-LW-N	31	0.87	20	0.26-0.12		N	*65
				IOPA-3P32LW-N							
				IOP-3P32-N	35	1.01	15	0.30-0.14			
				IOPA-3P32-N							
				IOP-3P32-HL-N	47	1.37	10-30	0.39-0.20			
				IOPA-3P32-HL-N							
		PS		IOP-2PSP-32-LW-N	25-24	0.71	10	0.20-0.09	0/-18	N	21
				IOP-2PSP32-N	30	0.88	10	0.25-0.11			
				IOP-2PSP32-HL-N	66-64	1.17	10	0.33-0.15			
	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			
		PS		GOP-2PSP32-LW-SC	30	0.71		0.09	0/-18	B	21
				GOP-2PSP32-SC	31	0.88		0.09			
	347-480			HOP-2PSP32-HL-L	67	1.20		0.21-0.15		L	

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

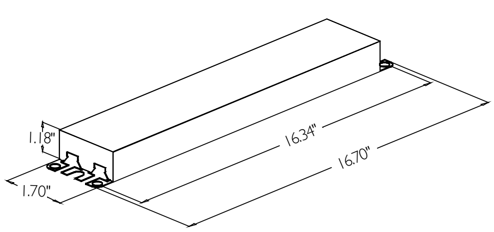


Fig. G

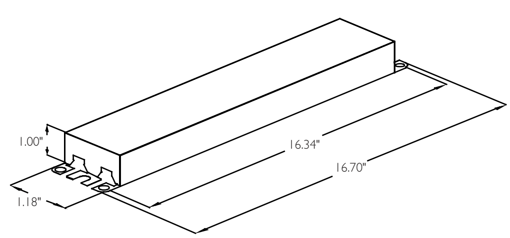


Fig. L

Refer to page 3-38 for additional dimensions
Refer to page 3-40 and 3-41 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

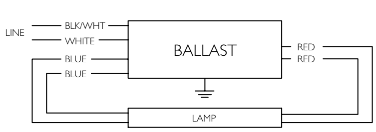
ELECTRONIC FLUORESCENT BALLASTS

For 17W T8 Lamps

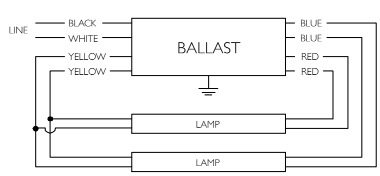
HIGH POWER FACTOR SOUND RATED A

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
	120-277	IS	Centium	ICN-3P32-N	48	0.92	15	0.39-0.17	0/-18	N	65
				ICN-4P32-N	53	1.04	15	0.45-0.20			*66
			Optanium	IOP-3P32-LW-N	40	0.81	10	0.34-0.15	-20/-29	N	65
				IOPA-3P32LW-N							
				IOP-3P32-N	45	0.90	10	0.38-0.17			
				IOPA-3P32-N							
				IOP-3P32-HL-N	59	1.22	10-15	0.49-0.22			
				IOPA-3P32-HL-N							
				IOP-4P32-LW-N	43	0.85	20	0.36-0.17		N	*66
				IOPA-4P32-LW-N							
				IOP-4P32-N	49	1.00	15	0.41-0.18			
				IOPA-4P32-N							
				IOP-4P32-HL-SC	69	1.28	10	0.56-0.26		B	
				IOPA-4P32-HL-SC							
		PS		IOP-3PSP32-LW-SC	39	0.72	10	0.33-0.15	0/-18		178
				IOP-3PSP32-SC	47	0.90	10	0.39-0.17			
				IOP-3PSP32-HL-SC	62	1.22	10	0.52-0.23			
				IOP-4PSP32-LW-SC	40	0.81	10	0.34-0.15			
				IOP-4PSP32-SC	47	1.00	10	0.40-0.18			
				IOP-4PSP32-HL-G	69	1.35	10	0.57-0.26		G	
	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			
		PS		GOP-3PSP32-SC	46	0.88		0.14	0/-18		178
				GOP-4PSP32-LW-SC	46	0.74		0.14			
				GOP-4PSP32-SC	46	0.93		0.14			
	347-480			HOP-4PSP32-HL-G	69	1.32		0.21-0.15		G	

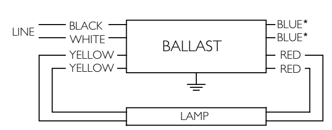
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'



Diag. 20



Diag. 21



*INSULATE BLUE LEADS INDIVIDUALLY FOR 600 V

Diag. 77

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-41 for additional wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

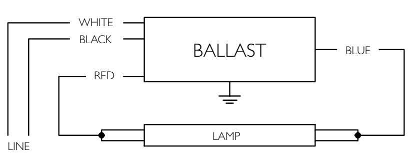
For 17W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

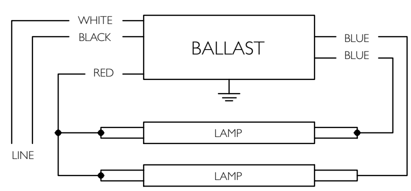
RoHS COMPLIANT

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
	120-277	IS	Centium	ICN-4P32-N	64	0.93	10	0.54-0.23	0/-18	N	66
			Optanium	IOP-4P32-LW-N	53	0.81	10	0.45-0.20	-20/-29	N	
				IOPA-4P32-LW-N							
				IOP-4P32-N	58	0.90	10	0.49-0.22		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	80	1.22	10	0.67-0.30		B	
				IOPA-4P32-HL-SC							
		PS		IOP-4PSP-32-LW-SC	54	0.76	10	0.45-0.20	0/-18	B	177
				IOP-4PSP32-SC	60	0.90	10	0.50-0.22			
				IOP-4PSP32-HL-G	82	1.24	10	0.68-0.29		G	
	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			
		PS		GOP-4PSP32-LW-SC	54	0.71		0.16	0/-18		177
				GOP-4PSP32-SC	54	0.88		0.16			
	347-480			HOP-4PSP32-HL-G	82	1.22		0.24-0.18		G	

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

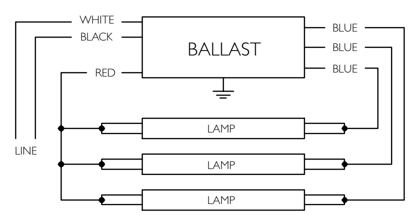


Diag. 63



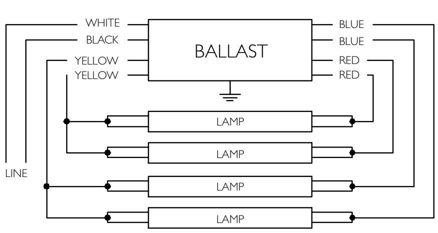
*FOR SINGLE LAMP OPERATION,
INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



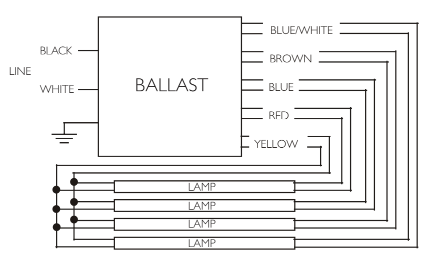
*FOR TWO LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65

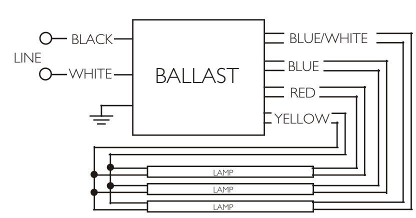


*FOR THREE LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66



Diag. 177



Diag. 178

Refer to page 3-38 and 3-39 for dimensions
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 25W-36" T8 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
	120-277	IS	Centium	ICN-132-MC	23	0.88	15	0.19-0.09	0/-18	A2	63
				ICN-1P32-N	26	0.91	10	0.22-0.10		N	
				ICN-2P32-N	29	1.06	15	0.24-0.11			*64
			Optanium	IOP-1P32-LW-N	21	0.78	10	0.17-0.08	-20/-29	N	63
				IOPA-1P32-LW -N							
				IOP-1P32-N	23	0.88	10	0.20-0.09		N	
				IOPA-1P32-N							
				IOP-1P32-HL-SC	30	1.22	10	0.26-0.11		B	
				IOPA-1P32-HL-N						N	
				IOP-2P32-LW-N	24	0.90	10	0.20-0.09		N	*64
				IOPA-2P32-LW-N							
				IOP-2P32-N	28	1.05	10	0.23-0.10			
				IOPA-2P32-N							
				IOP-2P32-HL-N	35	1.40	20	0.29-0.13			
				IOPA-2P32HL-N							
		PS		IOP-1PSP32-LW-N	20	0.74	10	0.16-0.07	0/-18	N	20
				IOP-1PSP32-N	22	0.92	10	0.19-0.08			
				IOP-2PSP32-LW-N	21	0.77	10	0.17-0.08			77
				IOP-2PSP32-N	25	0.97	10	0.21-0.10			
				IOP-2PSP32-HL-N	35	1.35	10	0.29-0.13			
	347	IS	Optanium	GOPA-1P32-LW-SC	20	0.80	10	0.07	-20/-29	B	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			
		PS		GOP-2PSP32-LW-SC	26	0.77		0.08	0/-18		77
				GOP-2PSP32-SC	26	1.05		0.08			
	347-480			HOP-2PSP32-HL-L	35	1.30		0.11-0.09		L	

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

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-40 and 3-41 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 25W-36" T8 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
	120-277	IS	Centium	ICN-2M32-MC	44	0.88	15	0.37-0.16		A2	64
				ICN-2P32-N	48	0.91	10	0.40-0.18		N	
				ICN-3P32-N	51	1.03	15	0.43-0.19			*65
			Optanium	IOP-2P32-LW-N	39	0.78	10	0.32-0.14	-20/-29	N	64
				IOPA-2P32-LW-N							
				IOP-2P32-N	43	0.88	10	0.37-0.16			
				IOPA-2P32-N							
				IOP-2P32-HL-N	57	1.20	10	0.48-0.21			
				IOPA-2P32-HL-N							
				IOP-3P32-LW-N	43	0.86	10	0.36-0.16		N	*65
				IOPA-3P32LW-N							
				IOP-3P32-N	49	1.00	10	0.42-0.18			
				IOPA-3P32-N							
				IOP-3P32-HL-N	64	1.32	10-15	0.54-0.24			
				IOPA-3P32-HL-N							
		PS		IOP-2PSP32-LW-N	35-34	0.71	10	0.29-0.13	0/-18	N	21
				IOP-2PSP32-N	43	0.88	10	0.36-0.16			
				IOP-2PSP32-HL-N	58-57	1.16	10	0.48-0.21			
	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			
		PS		GOP-2PSP32-LW-SC	41	0.71		0.12	0/-18		21
				GOP-2PSP32-SC	43	0.88		0.13			
	347-480			HOP-2PSP32-HL-L	59	1.20		0.18-0.13			

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

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-40 and 3-41 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 25W-36" T8 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
	120-277	IS	Centium	ICN-3P32-N	67	0.90	10	0.56-0.24		N	65
				ICN-4P32-N	74	1.01	10	0.62-0.27		N	*66
			Optanium	IOP-3P32-LW-N	57	0.79	10	0.48-0.21	-20/-29	N	65
				IOPA-3P32LW-N							
				IOP-3P32-N	64	0.88	10	0.54-0.24		N	
				IOPA-3P32-N							
				IOP-3P32-HL-N	84	1.20	10	0.70-0.31		N	
				IOPA-3P32-HL-N							
				IOP-4P32-LW-N	62	0.85	10	0.52-0.22		N	*66
				IOPA-4P32-LW-N							
				IOP-4P32-N	71	0.97	10	0.59-0.26		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	94	1.28	10	0.80-0.35		B	
				IOPA-4P32-HL-SC							
		PS		IOP-3PSP32-LW-SC	57	0.72	10	0.48-0.21	0/-18	B	178
				IOP-3PSP32-SC	66	0.89	10	0.55-0.24			
				IOP-3PSP32-HL-SC	88	1.20	10	0.73-0.32			
				IOP-4PSP32-LW-SC	56	0.80	10	0.47-0.21			
				IOP-4PSP32-SC	65	0.99	10	0.55-0.24			
				IOP-4PSP32-HL-G	96	1.32	10	0.80-0.35		G	
	347	IS	Optanium	GOPA-3P32-LW-SC	56	0.77	10	0.16	-20/-29	B	65
				GOPA-3P32-SC	63	0.90	10	0.18			
				GOPA-4P32-LW-SC	62	0.81	10	0.18			*66
				GOPA-4P32-SC	70	0.96	10	0.20			
		PS		GOP-3PSP32-SC	67	0.88	10	0.20	0/-18	B	178
				GOP-4PSP32-LW-SC	65	0.74	10	0.19			
				GOP-4PSP32-SC	66	0.93	10	0.19			
	347-480			HOP-4PSP32-HL-G	96	1.30	10	0.29-0.21		G	

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

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-40 and 3-41 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 25W-36" T8 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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
	120-277	IS	Centium	ICN-4P32-N	89	0.91	10	0.74-0.32		N	66
			Optanium	IOP-4P32-LW-N	76	0.79	10	0.64-0.27	-20/-29	N	
				IOPA-4P32-LW-N							
				IOP-4P32-N	85	0.88	10	0.72-0.31		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	113	1.20	10	0.96-0.41		B	
				IOPA-4P32-HL-SC							
		PS		IOP-4PSP32-LW-SC	73	0.72	10	0.62-0.27	0/-18	B	177
				IOP-4PSP32-SC	85	0.90	10	0.71-0.31			
				IOP-4PSP32-HL-G	115	1.22	10	0.96-0.42		G	
	347	IS	Optanium	GOPA-4P32-LW-SC	74	0.79	10	0.22	-20/-29	B	66
				GOPA-4P32-SC	86	0.91	10	0.25			
		PS		GOP-4PSP32-LW-SC	75	0.71	10	0.22	0/-18		177
				GOP-4PSP32-LW-SC	80	0.88	10	0.23			
	347-480			HOP-4PSP32-HL-G	115	1.20	10	0.34-0.25		G	

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

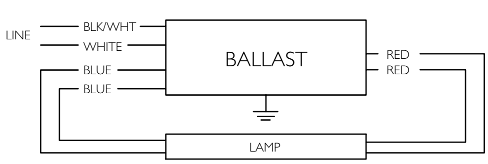
Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-40 and 3-41 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

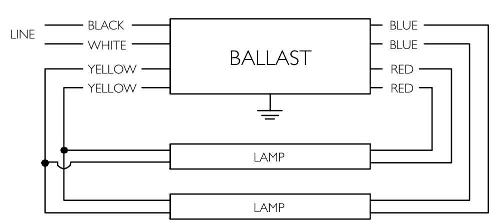
For 25W-48" T8/ES Lamps

HIGH POWER FACTOR SOUND RATED A

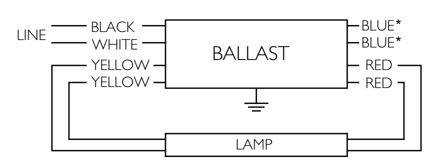
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F32T8/ES (25W - 48")											
I	120-277	IS	Optanium	IOP-1P32-LW-N	21	0.77	10	0.17-0.07	60/16	N	63
				IOPA-1P32-LW-N							
				IOP-1P32-N	23	0.87	10	0.20-0.09		N	
				IOPA-1P32-N							
				IOP-1P32-HL-SC	32	1.21	10	0.26-0.12		B	
				IOPA-1P32-HL-N						N	
				IOP-2P32-LW-N	24	0.90	10	0.20-0.09		N	*64
				IOPA-2P32-LW-N							
				IOP-2P32-N	27	1.05	10	0.23-0.10			
				IOPA-2P32-N							
				IOP-2P32-HL-N	37	1.40	15	0.31-0.14			
				IOPA-2P32HL-N							
		PS		IOP-1PSP32-LW-N	21	0.72	10	0.17-0.07		N	20
				IOP-1PSP32-N	24	0.88	10	0.20-0.08			
				IOP-2PSP32-LW-N	22	0.77	10	0.18-0.08			77
				IOP-2PSP32-N	27	0.94	10	0.23-0.10			
				IOP-2PSP32-HL-N	36	1.28	10	0.30-0.14			
	347	IS	Optanium	GOPA-1P32-LW-SC	21	0.77	10	0.06	60/16	B	63
				GOPA-1P32-SC	23	0.88		0.06			
				GOPA-2P32-LW-SC	25	0.88		0.07			*64
				GOPA-2P32-SC	27	1.04		0.09			
		PS		GOP-2PSP32-LW-SC	27	0.77		0.08			77
				GOP-2PSP32-SC	28	1.04		0.08			
	347-480			HOP-2PSP32-HL-L	37	1.28		.12-0.09		L	



Diag. 20



Diag. 21



*INSULATE BLUE LEADS INDIVIDUALLY FOR 600 V

Diag. 77

Refer to page 3-38 and 3-39 for dimensions

Refer to page 3-47 for additional wiring diagrams

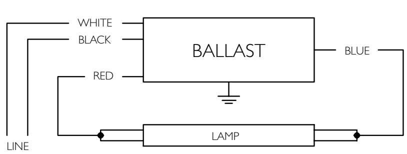
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 25W-48" T8/ES Lamps

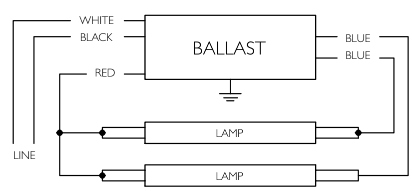
HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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")											
2	120-277	IS	Optanium	IOP-2P32-LW-N	38	0.77	10	0.32-0.14	60/16	N	64
				IOPA-2P32-LW-N							
				IOP-2P32-N	44-43	0.87	10	0.37-0.06			
				IOPA-2P32-N							
				IOP-2P32-HL-N	60	1.19	10	0.50-0.22			
				IOPA-2P32HL-N							
				IOP-3P32-LW-N	43	0.86	10	0.36-0.16		N	*65
				IOPA-3P32LW-N							
				IOP-3P32-N	49	1.00	10	0.42-0.18			
				IOPA-3P32-N							
				IOP-3P32-HL-N	70	1.32	10-20	0.59-0.27			
				IOPA-3P32-HL-N							
		PS		IOP-2PSP32-LW-N	37-36	0.71	10	0.31-0.13		N	21
				IOP-2PSP32-N	46-45	0.88	10	0.39-0.17			
				IOP-2PSP32-HL-N	61-59	1.18	10	0.51-0.22			
	347	IS	Optanium	GOPA-2P32-LW-SC	39	0.78	10	0.12	60/16	B	64
				GOPA-2P32-SC	44	0.88		0.13			
				GOPA-3P32-LW-SC	43	0.86		0.13			*65
				GOPA-3P32-SC	48	1.00		0.14			
		PS		GOP-2PSP32-LW-SC	43	0.71		0.08			21
				GOP-2PSP32-SC	46	0.88		0.14			
	347-480			HOP-2PSP32-HL-L	62	1.18		0.18-0.14		L	

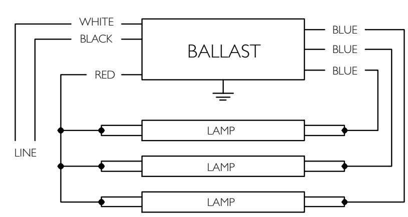


Diag. 63



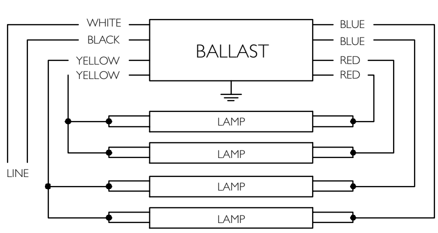
*FOR SINGLE LAMP OPERATION,
INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



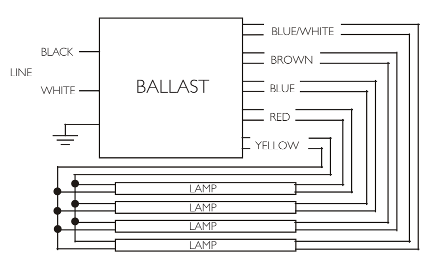
*FOR TWO LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65

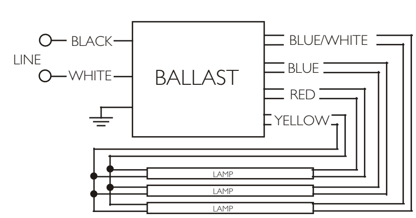


*FOR THREE LAMP OPERATION,
INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 66



Diag. 177



Diag. 178

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-46 for additional wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 25W-48" T8/ES Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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-N	58-57	0.77	10	0.49-0.21	60/16	N	65
				IOPA-3P32LW-N							
				IOP-3P32-N	65-64	0.87	10	0.55-0.24			
				IOPA-3P32-N							
				IOP-3P32-HL-N	95-93	1.20	10	0.79-0.35			
				IOPA-3P32-HL-N							
				IOP-4P32-LW-N	62-61	0.85	10	0.52-0.22		N	*66
				IOPA-4P32-LW-N							
				IOP-4P32-N	70-69	0.97	10	0.59-0.26		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	100	1.28	10	0.85-0.37		B	
				IOPA-4P32-HL-SC							
		PS		IOP-3PSP32-LW-SC	57	0.70	10	0.48-0.21		B	178
				IOP-3PSP32-SC	70	0.88	10	0.58-0.26			
				IOP-3PSP32-HL-SC	92	1.18	10	0.76-0.33			
				IOP-4PSP32-LW-SC	59	0.81	10	0.50-0.22			
				IOP-4PSP32-SC	69	0.98	10	0.59-0.26		G	
				IOP-4PSP32-HL-G	101	1.32	10	0.84-0.37			
	347	IS	Optanium	GOPA-3P32-SC	64	0.88	10	0.19	60/16	B	65
				GOPA-4P32-LW-SC	65	0.81		0.19			*66
				GOPA-4P32-SC	74	0.95		0.21			
		PS		GOPA-3P32-LW-SC	58	0.77	10	0.17			178
				GOP-3PSP32-SC	67	0.88	10	0.15			
				GOP-4PSP32-LW-SC	63	0.74	10	0.18			
				GOP-4PSP32-SC	69	0.93	10	0.20			
	347/480			HOP-4PSP32-HL-G	100	1.24	10	0.28-0.21		G	
4	120-277	IS	Optanium	IOP-4P32-LW-N	77-75	0.77	10	0.65-0.28	60/16	N	66
				IOPA-4P32-LW-N							
				IOP-4P32-N	87-85	0.87	10	0.73-0.31		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	124-122	1.19	10	1.05-0.45		B	
				IOPA-4P32-HL-SC							
		PS		IOP-4PSP32-LW-SC	75	0.71	10	0.63-0.28		B	177
				IOP-4PSP32-SC	90	0.88	10	0.75-0.33			
				IOP-4PSP32-HL-G	121-120	1.21	10	1.07-0.44		G	
	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			
		PS		GOP-4PSP32-LW-SC	75	0.71		0.22			177
				GOP-4PSP32-SC	86	0.88		0.25			
	347-480			HOP-4PSP32-HL-G	122	1.17		0.36-0.26		G	

Refer to page 3-38 and 3-39 for dimensions
Refer to page 3-47 for wiring diagramss
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 28W-48" T8/ES Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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-N	22	0.77	10	0.19-0.08	60/16	N	63
				IOPA-1P32-LW-N							
				IOP-1P32-N	25	0.87	10	0.22-0.10		N	
				IOPA-1P32-N							
				IOP-1P32-HL-SC	33	1.21	10	0.28-0.12		B	
				IOPA-1P32-HL-N						N	
				IOP-2P32-LW-N	26	0.90	10	0.22-0.10		N	*64
				IOPA-2P32-LW-N							
				IOP-1P32-N	31	1.05	10	0.26-0.11			
				IOPA-2P32-N							
				IOP-2P32-HL-N	39	1.38	10	0.33-0.15			
				IOPA-2P32HL-N							
		PS		IOP-1PSP32-LW-N	21	0.72	10	0.18-0.07		N	20
				IOP-1PSP32-N	25	0.88	10	0.20-0.09			
				IOP-2PSP32-LW-N	23	0.74	10	0.19-0.09			77
				IOP-2PSP32-N	30-28	0.94	10	0.23-0.10			
				IOP-2PSP32-HL-N	39	1.28	10	0.33-0.15			
	347	IS	Optanium	GOPA-1P32-LW-SC	22	0.77	10	0.07	60/16	B	63
				GOPA-1P32-SC	25	0.88	10	0.07			
				GOPA-2P32-LW-SC	26	0.88	10	0.08			*64
				GOPA-2P32-SC	29	1.04	10	0.09			
		PS		GOP-2PSP32-LW-SC	28	0.74	10	0.08			77
				GOP-2PSP32-SC	30	1.03	10	0.09			
	347-480			HOP-2PSP32-HL-L	41	1.28	10	0.13-0.10	60/16	L	

Refer to page 3-52 and 3-53 for dimensions
Refer to page 3-46 and 3-47 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 28W-48" T8/ES Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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")											
2	120-277	IS	Optanium	IOP-2P32-LW-N	42	0.77	10	0.35-0.15	60/16	N	64
				IOPA-2P32-LW-N							
				IOP-2P32-N	48-47	0.87	10	0.41-0.18			
				IOPA-2P32-N							
				IOP-2P32-HL-N	65-64	1.19	10	0.55-0.24			
				IOPA-2P32HL-N							
				IOP-3P32-LW-N	47	0.86	10	0.40-0.18		N	*65
				IOPA-3P32LW-N							
				IOP-3P32-N	55-54	1.00	10	0.46-0.20			
				IOPA-3P32-N							
				IOP-3P32-HL-N	74-73	1.31	10-15	0.62-0.27			
				IOPA-3P32-HL-N							
		PS		IOP-2PSP32-LW-N	39	0.71	10	0.33-0.14		N	21
				IOP-2PSP32-N	51-49	0.88	10	0.42-0.18			
				IOP-2PSP32-HL-N	66-64	1.18	10	0.55-0.24			
	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			
		PS		GOP-2PSP32-LW-SC	45	0.71		0.13			21
				GOP-2PSP32-SC	50	0.88		0.15			
	347-480			HOP-2PSP32-HL-L	69	1.16		0.20-0.15		L	21

Refer to page 3-52 and 3-53 for dimensions
Refer to page 3-46 and 3-47 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 28W-48" T8/ES Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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-N	64-63	0.77	10	0.54-0.23	60/16	N	65
				IOPA-3P32LW-N							
				IOP-3P32-N	72-71	0.87	10	0.61-0.26			
				IOPA-3P32-N							
				IOP-3P32-HL-N	99-97	1.20	10	0.83-0.36			
				IOPA-3P32-HL-N							
				IOP-4P32-LW-N	69-68	0.85	10	0.58-0.25		N	*66
				IOPA-4P32-LW-N							
				IOP-4P32-N	79-78	0.97	10	0.66-0.28		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	106	1.28	10	0.90-0.39		B	
				IOPA-4P32-HL-SC							
		PS		IOP-3PSP32-LW-SC	63	0.70	10	0.52-0.23		B	178
				IOP-3PSP32-SC	75	0.88	10	0.62-0.27			
				IOP-3PSP32-HL-SC	99	1.18	10	0.83-0.36			
				IOP-4PSP32-LW-SC	64	0.80	10	0.54-0.24			
				IOP-4PSP32-SC	75	0.98	10	0.63-0.28			
				IOP-4PSP32-HL-G	110	1.31	10	0.92-0.41		G	
	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			
		PS		GOP-3PSP32-SC	73	0.88		0.17			178
				GOP-4PSP32-LW-SC	65	0.74		0.19			
				GOP-4PSP32-SC	74	0.93		0.22			
	347-480			HOP-4PSP32-HL-G	111	1.24		0.32-0.23		G	
4	120-277	IS	Optanium	IOP-4P32-LW-N	84-82	0.77	10	0.71-0.30	60/16	N	66
				IOPA-4P32-LW-N							
				IOP-4P32-N	96-94	0.87	10	0.81-0.35		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	130-129	1.19	10	1.10-0.47		B	
				IOPA-4P32-HL-SC							
		PS		IOP-4PSP32-LW-SC	83	0.71	10	0.69-0.30		B	177
				IOP-4PSP32-SC	97	0.88	10	0.81-0.35			
				IOP-4PSP32-HL-G	132-130	1.20	10	1.11-0.48		G	
	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			
		PS		GOP-4PSP32-LW-SC	77	0.71		0.23			177
				GOP-4PSP32-SC	91	0.88		0.27			
	347-480			HOP-4PSP32-HL-G	133	1.16		0.39-0.28		G	

Refer to page 3-52 and 3-53 for dimensions
Refer to page 3-46 and 3-47 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 32W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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)											
I	120	IS	AmbiStar‡	REB-2P32-SC	33	1.00	140	0.48	0/-18	B	*64
	120-277	IS	Centium	ICN-132-MC	30	0.88	10	0.25-0.11	0/-18	A2	63
				ICN-1P32-N	31	0.90	10	0.26-0.12		N	
				ICN-2P32-N	36	1.03	15	0.30-0.14			*64
			Optanium	IOP-1P32-LW-N	25	0.77	10	0.22-0.10	-20/-29	N	63
				IOPA-1P32-LW-N							
				IOP-1P32-N	28	0.87	10	0.25-0.11		N	
				IOPA-1P32-N							
				IOP-1P32-HL-SC	39-38	1.18	10	0.33-0.14		B	
				IOPA-1P32-HL-N						N	
				IOP-2P32-LW-N	31	0.90	10	0.26-0.11		N	*64
				IOPA-2P32-LW-N							
				IOP-2P32-N	35	1.05	10	0.30-0.13			
				IOPA-2P32-N							
				IOP-2P32-HL-N	45	1.37	10	0.37-0.17			
				IOPA-2P32HL-N							
		PS		IOP-1PSP32-LW-N	25	0.72	10	0.20-0.09	0/-18	N	20
				IOP-1PSP32-N	28	0.88	10	0.24-0.10			
				IOP-2PSP32-LW-N	26	0.73	10	0.22-0.10			77
				IOP-2PSP32-N	32	0.94	10	0.27-0.12			
				IOP-2PSP32-HL-N	44	1.33	10	0.38-0.17			
	347	IS	Optanium	GOPA-1P32-LW-SC	26	0.77	10	0.08	-20/29	B	63
				GOPA-1P32-SC	30	0.88	10	0.09			
				GOPA-2P32-LW-SC	31	0.88	10	0.09			*64
				GOPA-2P32-SC	34	1.03	10	1.03			
		PS		GOP-2PSP32-LW-SC	32	0.73	10	0.08	0/-18		77
				GOP-2PSP32-SC	34	1.03	10	0.09			
	347-480			HOP-2PSP32-HL-L	45	1.30	10	0.14-0.10		L	

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

NEMA Premium

See pages 3-1 and 3-2 for specific SKU's that meet the NEMA Premium Standard

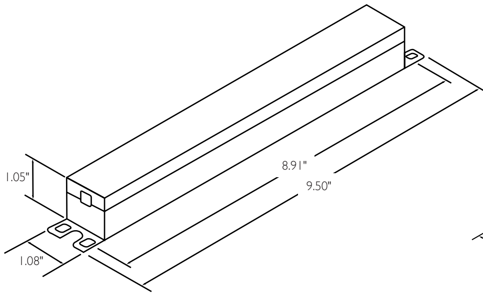


Fig. A2

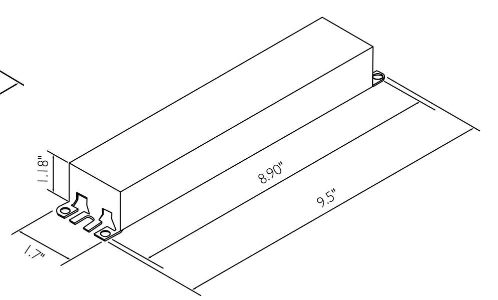


Fig. B

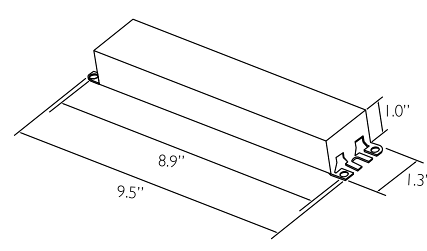


Fig. N

Refer to page 3-53 for additional dimensions
Refer to page 3-54 and 3-55 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 32W T8 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
		RS	PowrKut	RK-2S32-TP	66	0.86	15	0.60	50/10	A	21
	277	RS	PowrKut	VK-2S32-TP	66	0.85	15	0.26			
	120-277	IS	Centium	ICN-2M32-MC	59	0.88	10	0.50-0.21	0/-18	A2	64
				ICN-2P32-N	59	0.88	10	0.49-0.22		N	
				ICN-3P32-N	65	1.01	10	0.54-0.24			*65
			Optanium	IOP-2P32-LW-N	48	0.77	10	0.41-0.17	-20/-29	N	64
				IOPA-2P32-LW-N							
				IOP-2P32-N	55-54	0.87	10	0.47-0.20			
				IOPA-2P32-N							
				IOP-2P32-HL-N	74-72	1.18	10	0.62-0.26			
				IOPA-2P32HL-N							
				IOP-3P32-LW-N	55-54	0.85	10	0.46-0.20		N	*65
				IOPA-3P32LW-N							
				IOP-3P32-N	63-62	1.00	10	0.53-0.23			
				IOPA-3P32-N							
				IOP-3P32-HL-N	80-79	1.38	10	0.67-0.29			
				IOPA-3P32-HL-N							
		PS		IOP-2PSP32-LW-N	46-45	0.71	10	0.40-0.17	0/-18	N	21
				IOP-2PSP32-N	58	0.85	10	0.48-0.21			
				IOP-2PSP32-HL-N	78-75	1.18	10	0.66-0.28			
	347	IS	Optanium	GOPA-2P32-LW-SC	48	0.78	10	0.14	-20/-29	B	64
				GOPA-2P32-SC	54	0.88	10	0.16			
				GOPA-3P32-LW-SC	55	0.86	10	0.16			*65
				GOPA-3P32-SC	63	1.00	10	0.18			
		PS		GOP-2PSP32-LW-SC	51	0.76	10	0.15	0/-18		21
				GOP-2PSP32-SC	57	0.88	10	0.17			
	347-480			HOP-2PSP32-HL-L	79	1.20	10	0.23-0.17		L	

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

See pages 3-1 and 3-2 for specific SKU's that meet the NEMA Premium Standard

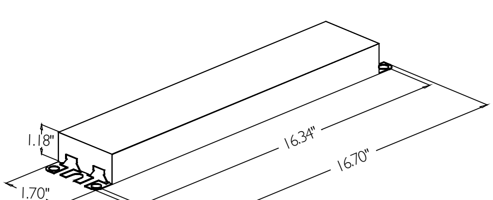


Fig. G

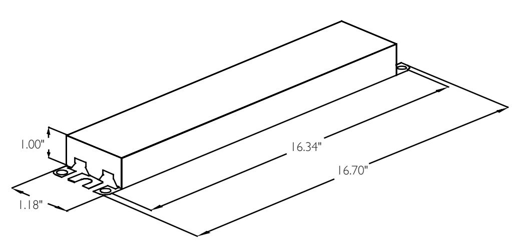


Fig. L

Refer to page 3-54 and 3-55 for wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 32W T8 Lamps

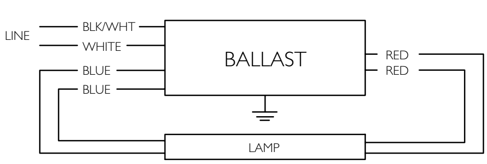
HIGH POWER FACTOR SOUND RATED A

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
	120-277	IS	Centium	ICN-3P32-N	85	0.88	10	0.71-0.31		N	65
				ICN-4P32-N	93	1.00	10	0.78-0.33		N	*66
			Optanium	IOP-3P32-LW-N	73-71	0.77	10	0.62-0.27	-20/-29	N	65
				IOPA-3P32LW-N							
				IOP-3P32-N	82-80	0.87	10	0.70-0.30			
				IOPA-3P32-N							
				IOP-3P32-HL-N	110-107	1.18	10	0.91-0.39			
				IOPA-3P32-HL-N							
				IOP-4P32-LW-N	80-79	0.84	10	0.67-0.29		N	*66
				IOPA-4P32-LW-N							
				IOP-4P32-N	90-88	0.97	10	0.75-0.32		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	122-120	1.29	10	1.02-0.44		B	
				IOPA-4P32-HL-SC							
		PS		IOP-3PSP32-LW-SC	74	0.71	10	0.63-0.27	0/-18	B	178
				IOP-3PSP32-SC	85	0.88	10	0.71-0.37			
				IOP-3PSP32-HL-SC	113-110	1.18	10	0.94-0.40			
				IOP-4PSP32-LW-SC	77	0.71	10	0.65-0.28			
				IOP-4PSP32-SC	90	0.88	10	0.76-0.33			
				IOP-4PSP32-HL-G	126-122	1.29	10	1.05-0.45		G	
	347	IS	Optanium	GOPA-3P32-LW-SC	74	0.77	10	0.21	-20/-29	B	65
				GOPA-3P32-SC	84	0.88	10	0.24			
				GOPA-4P32-LW-SC	77	0.81	10	0.23			*66
				GOPA-4P32-SC	89	0.96	10	0.26			
		PS		GOP-3PSP32-SC	84	0.87	10	0.25	0/-18		178
				GOP-4PSP32-LW-SC	80	0.74	10	0.23			
				GOP-4PSP32-SC	93	0.93	10	0.23			
	347-480			HOP-4PSP32-HL-G	124	1.17	10	0.36-0.26		G	

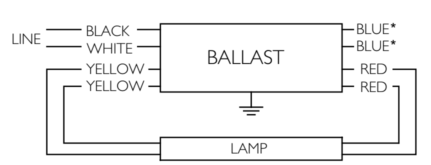
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

NEMA Premium

See pages 3-1 and 3-2 for specific SKU's that meet the NEMA Premium Standard

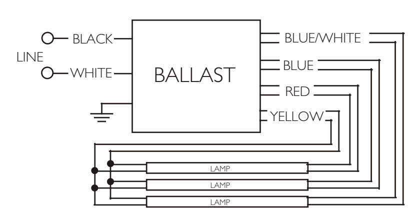


Diag. 20



*INSULATE BLUE LEADS INDIVIDUALLY FOR 600 V

Diag. 77



Diag. 178

Refer to page 3-52 and 3-53 for dimensions
Refer to page 3-55 for additional wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 32W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

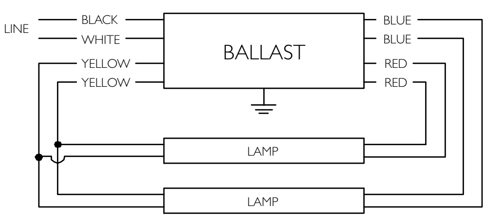
RoHS COMPLIANT

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
	120-277	IS	Centium	ICN-4P32-N	112	0.88	10	0.94-0.41		N	66
			Optanium	IOP-4P32-LW-N	96-94	0.77	10	0.81-0.35	-20/-29	N	
				IOPA-4P32-LW-N							
				IOP-4P32-N	109-106	0.87	10	0.92-0.39		N	
				IOPA-4P32-N							
				IOP-4P32-HL-SC	150-146	1.18	10	1.26-0.54		B	
				IOPA-4P32-HL-SC							
		PS		IOP-4PSP32-LW-SC	94	0.71	10	0.78-0.33	0/-18	B	177
				IOP-4PSP32-SC	110	0.88	10	0.93-0.40			
				IOP-4PSP32-HL-G	153-149	1.18	10	1.28-0.55		G	
	347	IS	Optanium	GOPA-4P32-LW-SC	92	0.78	10	0.27	-20/-29	B	66
				GOPA-4P32-SC	107	0.88	10	0.31			
		PS		GOP-4PSP32-LW-SC	92	0.70	10	0.27	0/-18		177
				GOP-4PSP32-SC	114	0.88	10	0.33			
	347-480			HOP-4PSP32-HL-G	152	1.17	10	0.44-0.32		G	

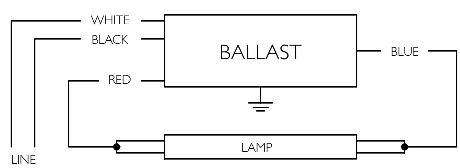
‡ The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'

NEMA Premium

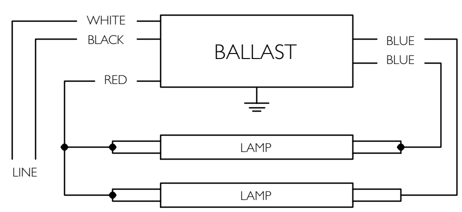
See pages 3-1 and 3-2 for specific SKU's that meet the NEMA Premium Standard



Diag. 21

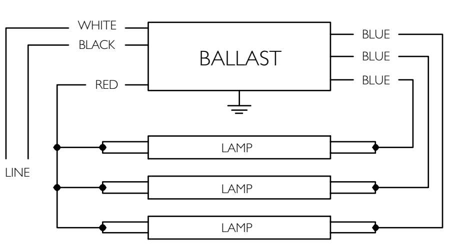


Diag. 63



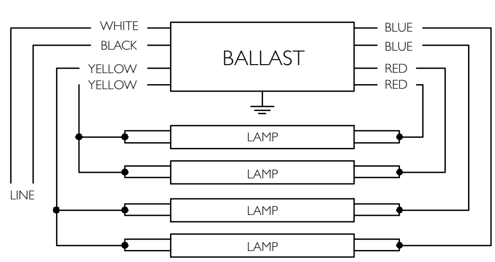
*FOR SINGLE LAMP OPERATION, INSULATE UNUSED BLUE LEAD FOR 600V

Diag. 64



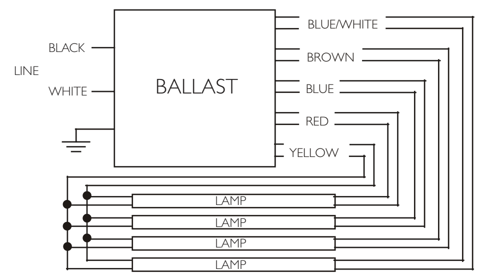
*FOR TWO LAMP OPERATION, INSULATE UNUSED BLUE LEADS INDIVIDUALLY FOR 600V

Diag. 65



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

Diag. 66



Diag. 177

Refer to page 3-52 and 3-53 for dimensions
Refer to page 3-54 for additional wiring diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 40W T8 Lamps

HIGH POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

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-N	42	1.00	10	0.35-0.15	32/0	N	*64
			Optanium	IOP-2P32-LW-N	35	0.87	10	0.29-0.13			
				IOPA-2P32-LW-N							
				IOP-2P32-N	41	1.01	10	0.35-0.15			
				IOPA-2P32-N							
				IOP-2P32-HL-N	55-54	1.35	10	0.46-0.20			
				IOPA-2P32HL-N							
	347	IS	Optanium	GOPA-2P32-LW-SC	37	0.86	10	0.11		B	
				GOPA-2P32-SC	42	1.02		0.12			
2	120-277	IS	Centium	ICN-3P32-N	77	1.00	10	0.65-0.28	32/0	N	*65
			Optanium	IOP-3P32-LW-N	67-66	0.85	10	0.58-0.25			
				IOPA-3P32LW-N							
				IOP-3P32-N	74-72	1.01	10	0.64-0.27			
				IOPA-3P32-N							
				IOP-3P32-HL-N	102-100	1.30	10	0.85-0.37			
				IOPA-3P32-HL-N							
	347	IS	Optanium	GOPA-3P32-LW-SC	65	0.85	10	0.19		B	
				GOPA-3P32-SC	75	1.00		0.22			

Refer to page 3-57 for wiring diagrams and dimensions
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 40W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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-N	112	0.97	10	0.94-0.40	32/0	N	*66
			Optanium	IOP-4P32-LW-N	98-96	0.84	10	0.82-0.35			
				IOPA-4P32-LW-N							
				IOP-4P32-N	110-107	0.93	10	0.92-0.38			
				IOPA-4P32-N							
				IOP-4P32-HL-SC	150-147	1.25	10	1.27-0.54		B	
				IOPA-4P32-HL-SC							
	347	IS	Optanium	GOPA-4P32-LW-SC	97	0.84	10	0.28		B	
				GOPA-4P32-SC	113	0.93		0.28			

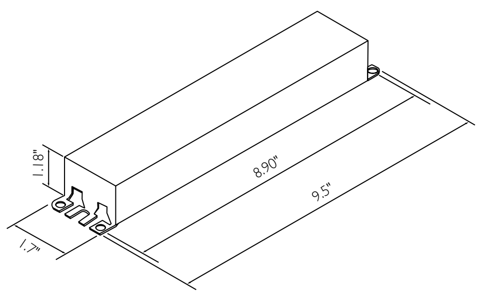


Fig. B

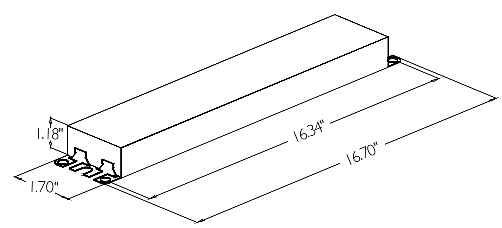


Fig. G

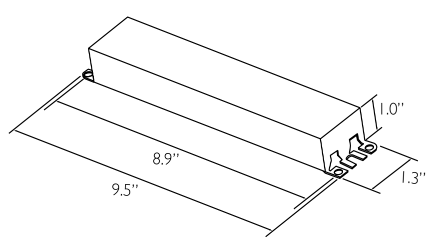
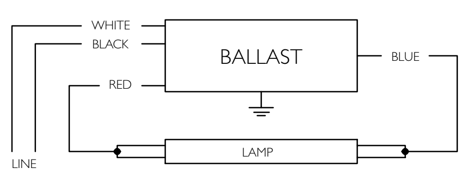
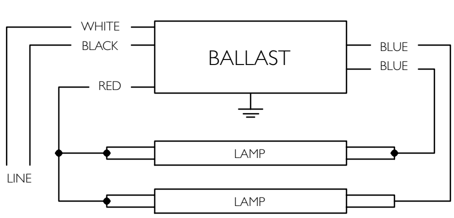


Fig. N

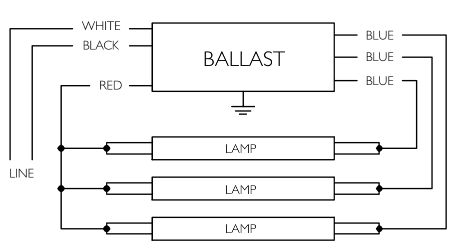


Diag. 63



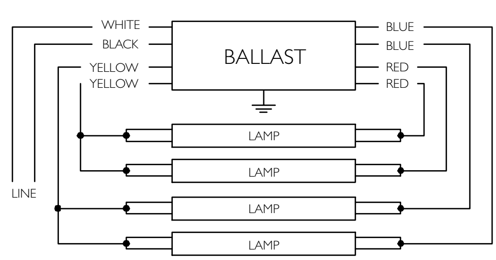
*FOR SINGLE LAMP OPERATION,
INSULATE UNUSED BLUE LEAD FOR 600V

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 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 46-59W T8 Slimline 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	0.54-0.24	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

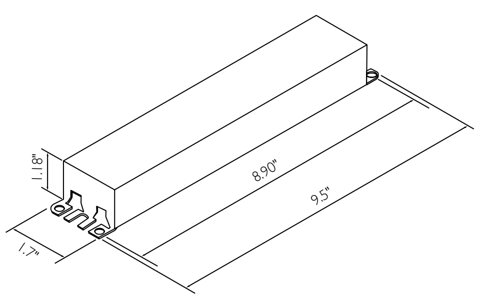
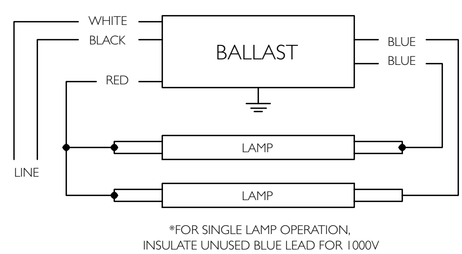


Fig. B



Diag. 64A

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

For 44-86W T8HO 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

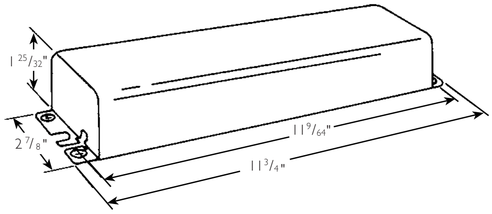
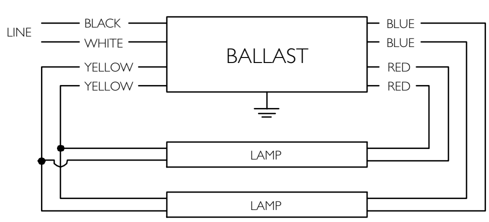
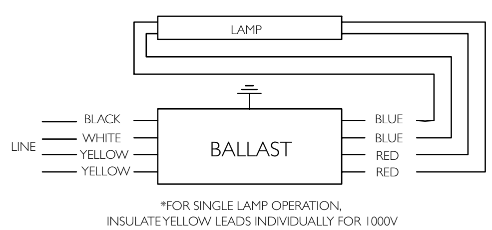


Fig C



Diag. 21



Diag. 39A

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT BALLASTS

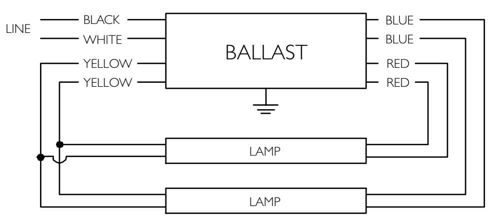
For 30-40W T12 Lamps

HIGH POWER FACTOR SOUND RATED A

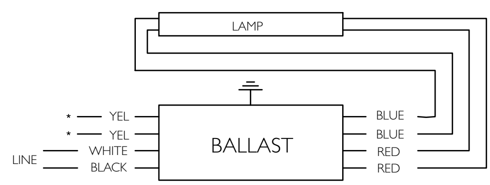
RoHS COMPLIANT

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-2S40-N	30	0.95	20	0.25	50/10	N	39
1	120-277	RS	Centium	ICN-2S40-N	30	0.95	10	0.25-0.11			
2	120	RS	AmbiStar	RELB-2S40-N	58	0.93	20	0.48	50/10	N	21
2	120-277	RS	Centium	ICN-2S40-N	58	0.93	10	0.48-0.20			
F40T12, F40T12/U (40W)											
1	120	RS	AmbiStar	RELB-2S40-N	35	0.88	20	0.30	50/10	N	39
1	120-277		Centium	ICN-2S40-N	35	0.88	10	0.30-0.13			
2	120	RS	AmbiStar	RELB-2S40-N	72	0.85	20	0.62	50/10	N	21
2	120-277		Centium	ICN-2S40-N	72	0.85	10	0.62-0.26			

* Normal Power Factor



Diag. 21



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

Diag. 39

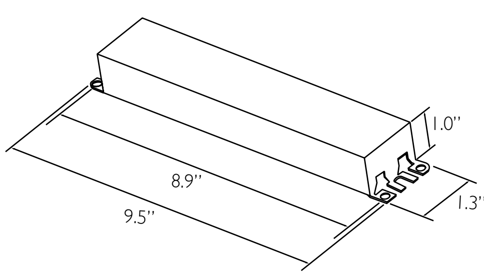


Fig. N

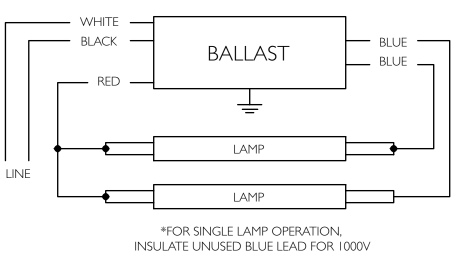
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 55-75W T12 Slimline Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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

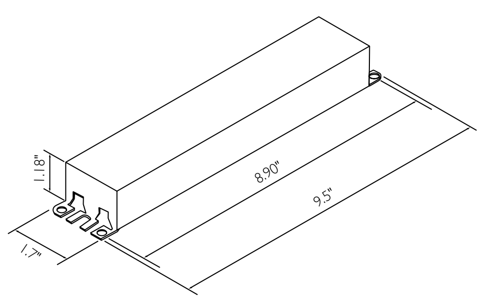


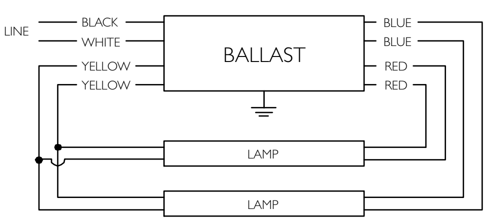
Fig. B

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

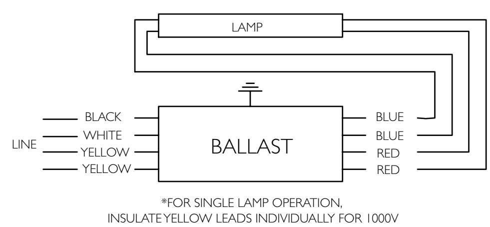
ELECTRONIC FLUORESCENT BALLASTS
For 95 - 110W T12/HO Lamps

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.
F48T12/HO (48W)											
2	120-277	RS	Centium	ICN-2S110-SC	93-92	0.90	10	0.82-0.35	-20/-29	B	21
F60T12/HO (60W)											
2	120-277	RS	Centium	ICN-2S110-SC	116-114	1.00	10	0.98-0.42	-20/-29	B	21
F72T12/HO (72W)											
2	120-277	RS	Centium	ICN-2S110-SC	140-138	0.90	10	1.19-0.51	-20/-29	B	21
F96T12/HO (95W)											
1	120-277	RS	Centium	ICN-2S110-SC	78-77	0.91	10	0.68 - 0.29	60/16	B	39A
2	120-277				154-151	0.89	10	1.30 - 0.56			21
F96T12/HO (110W)											
1	120-277	RS	Centium	ICN-2S110-SC	100-92	0.91	10	0.88 - 0.35	-20/-29	B	39A
2	120-277				194-190	0.89	10	1.64 - 0.70			21



Diag. 21



Diag. 39A

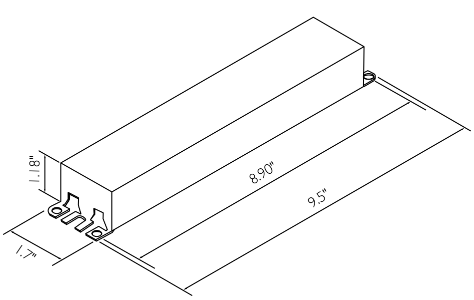


Fig. B

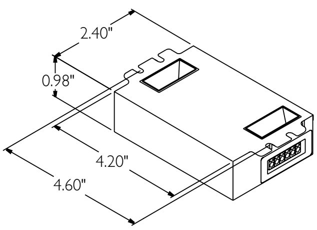
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 18 - 145W UV Disinfection Lamps

HIGH POWER FACTOR SOUND RATED A

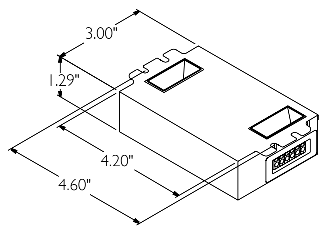
RoHS COMPLIANT

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



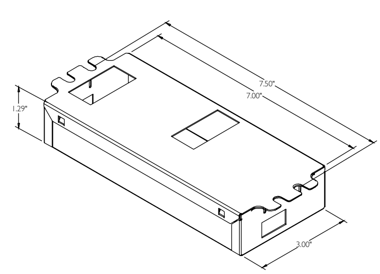
-LD

Size 1



-LD

Size 2



Size 4

Refer to pages 3-64 for wiring diagrams

ELECTRONIC FLUORESCENT BALLASTS

For 58 - 70W Refrigeration Lamps

HIGH POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

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-N	60	1.08	15	0.51 - 0.23	-20/-29	N	73
				ICN-2S54-T	59	1.04	10	0.49- 0.22		T	
				ICN-2S54-90C-N	60	1.08	15	0.51 - 0.23		N	
				ICN-2S54-90C-T	59	1.04	10	0.49 - 0.22		T	
2	120 - 277	PS	Centium	ICN-2S54-N	112-108	1.00	10	0.94 - 0.40	-20/-29	N	74
				ICN-2S54-T	110-109	1.00	10	0.92 - 0.39		T	
				ICN-2S54-90C-N	112-108	1.00	10	0.94 - 0.40		N	
				ICN-2S54-90C-T	110-109	1.00	10	0.92 - 0.39		T	
3	120 - 277	PS	Centium	ICN-4S54-90C-2LS-G	171	1.00	10	1.43 - 0.62	-20/-18	G	75A
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-T	72-71	1.12	10	0.60-0.26	0/-18	T	73

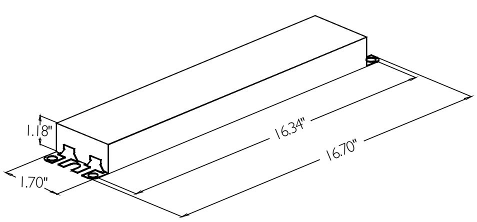


Fig. G

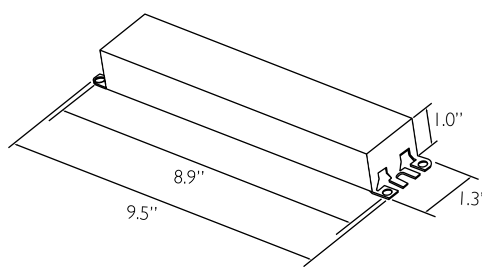


Fig. N

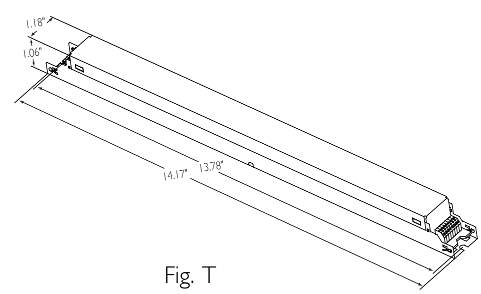
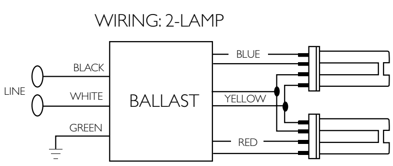
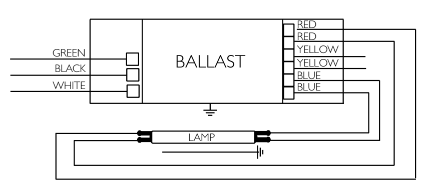


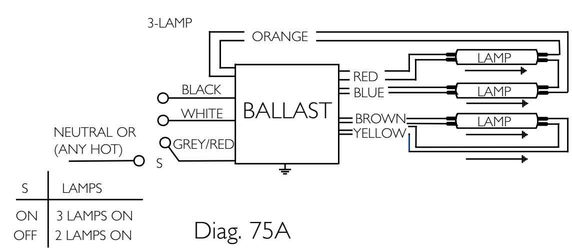
Fig. T
Includes connectors with no leads



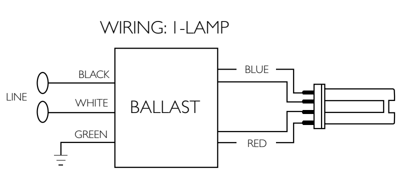
Diag. 159
Green Terminal must be Grounded



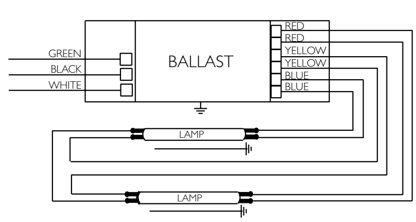
Diag. 73
For 1 lamp operation, do not use yellow leads



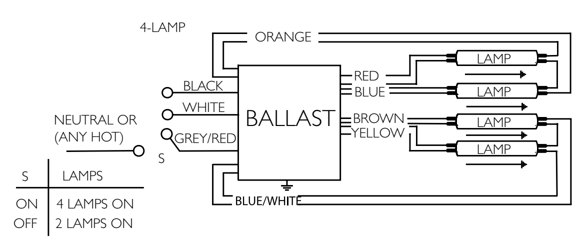
Diag. 75A



Diag. 160
Green Terminal must be Grounded



Diag. 74



Diag. 75

Footnotes:

1 Based on input watts of IOP-2PSP32N (58W) and IOP-2P32-N (54W)

2 Based on engineering data testing and probability analysis. The criteria are 50,000 hours of operation with 90% surviving when operated at the ballast maximum Tc point, typically 70°C.

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

Note: Refer to page 9-15 to 9-19 for ballast specifications

Fluorescent Ballasts - Electronic - Optanium Step-Dim

High Efficiency Electronic Ballast with Step-Dim Capability for T5, T5HO* and T8 Fluorescent Lamps.

Philips Advance Optanium ballasts with step-dim capability for T5 and T8 fluorescent lamps represent an affordable, energy-efficient, and versatile lighting solution designed to help meet energy codes such as California's Title 24 and ASHRAE 90.1-2010 that require end users to reduce lighting power consumption by 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 or motion detectors making this product the sustainable choice for many commercial applications. The ballast additionally features IntelliVolt multiple voltage technology as well as safety features including auto restart, ballast shutdown mode, Type CC protection and T5 and T5HO lamp End-Of-Life (EOL) protection circuitry which safely removes power from the lamp upon failure to minimize maintenance concerns. Offering the flexibility of step-dimming* with the high-efficiency of Optanium electronic ballast technology, our ballasts represent an optimal lighting solution for a wide variety of professional applications.

Reduces input power by 50% to help meet energy codes
- 50% control step

Dims all the lamps together providing equal burn hours on all lamps reducing uneven lifetimes as experienced with on-off switching systems
- Adjustable light levels — 100% power, 50% power, and off

Ensures ease of use and system compatibility across a broad range of applications
- Operation from any line voltage switching device (such as standard toggle switches and occupancy sensors)

NEMA Premium®

The following ballasts meet NEMA Premium®:
IOP-2S32-SC-SD

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

* See www.philips.com/advance for information on the IOP-2S54-L-SD step-dimming ballast for 54W T5HO lamps

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 14 - 35W T5* Lamps

HIGH POWER FACTOR SOUND RATED A

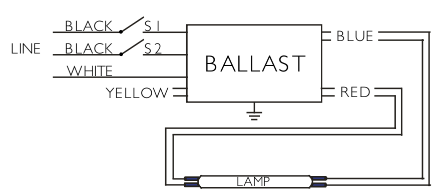
RoHS COMPLIANT

Optanium Step-Dim Ballast

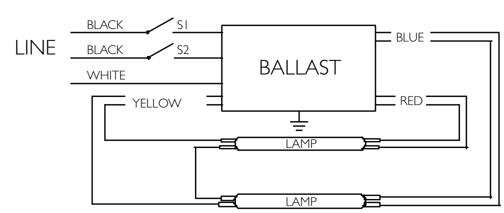
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F14T5 (14W)											
2	120-277	PS	Optanium	IOP-2S28-115-SC-SD	38/20	1.15/0.48	15	0.32	0/-18	B	173
F21T5 (21W)											
2	120-277	PS	Optanium	IOP-2S28-95-SC-SD	45/22	0.95/0.35	10	0.38	0/-18	B	173
				IOP-2S28-115-SC-SD	55/27	1.15/0.48		0.46			
F28T5 (25W)											
1	120-277	PS	Optanium	IOP-2S28-115-SC-SD	34/18	1.15/0.48	15	0.31	0/-18	B	170
2				IOP-2S28-95-SC-SD	57/27	0.95/0.35	10	0.47			173
				IOP-2S28-115-SC-SD	67/33	1.15/0.48		0.55			
F28T5 (28W)											
1	120-277	PS	Optanium	IOP-2S28-115-SC-SD	37/19	1.15/0.48	15	0.31	0/-18	B	170
2				IOP-2S28-95-SC-SD	62/30	0.95/0.35	10	0.52			173
				IOP-2S28-115-SC-SD	72/35	1.15/0.48		0.60			
F35T5 (35W)											
1	120-277	PS	Optanium	IOP-2S28-95-SC-SD	38/19	0.95/0.35	15	0.32	0/-18	B	170
				IOP-2S28-115-SC-SD	45/23	1.15/0.48		0.38			

For fixed output version see page 3-30 & 3-31

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



Diag. 170
Line (black) inputs must be connected to the same phase of the line voltage



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

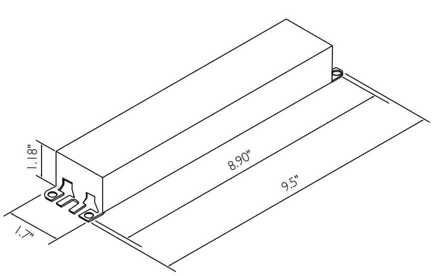


Fig. B

* Also available in a fixed light output version. See pages 3-30 and 3-31.

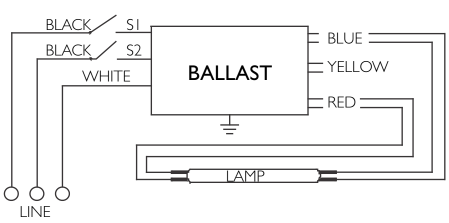
For 17 - 32W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

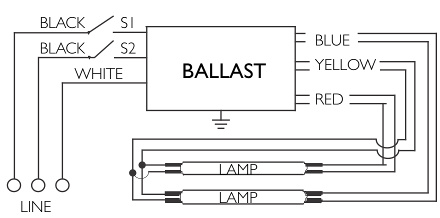
Optanium Step-Dim Ballast

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.
F17T8, FBO16T8 (17W)											
1	120-277	PS	Optanium	IOP-2S32-SC-SD	15/9	0.87/0.28	10	0.13-0.07	0/-18	B	170A
2				IOP-2S32-SC-SD	28/16	0.87/0.28	10	0.24-0.11	0/-18	B	173A
F25T8, FBO24T8 (25W)											
1	120-277	PS	Optanium	IOP-2S32-SC-SD	22/11	0.87/0.28	10	0.18-0.09	0/-18	B	170A
2				IOP-2S32-SC-SD	40/20	0.87/0.28	10	0.34-0.15	0/-18	B	173A
F32T8/ES (25W - 48")											
1	120-277	PS	Optanium	IOP-2S32-SC-SD	45/22	0.87/0.28	10	0.38-0.17	60/16	B	173A
F32T8/ES (28W - 48")											
1	120-277	PS	Optanium	IOP-2S32-SC-SD	48/23	0.87/0.28	10	0.40-0.18	60/16	B	173A
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120-277	PS	Optanium	IOP-2S32-SC-SD	29/14	0.87/0.28	10	0.24-0.21	0/-18	B	170A
2				IOP-2S32-SC-SD	55/25	0.87/0.28	10	0.47-0.24	0/-18	B	173A

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



Diag. 170A
Line (black) inputs must be connected to the same phase of the line voltage



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

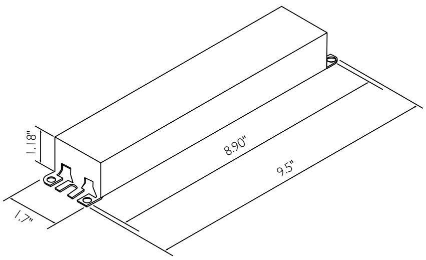


Fig. B

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

Fluorescent Ballasts - Dimming - Mark 10 *Powerline*

Mark 10 *Powerline* Electronic Dimming Ballasts make converting your existing fixtures easy

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.

Compatible with controls from numerous manufacturers without using separate control leads
Powerline dimming interface

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

Ideal for frequent switching applications such as occupancy ensors and daylight harvesting
Programmed start operation

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

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 N.A. has determined that these products meet the NEMA Premium specification for premium energy efficiency.

For 18 - 70W T4 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.
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 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to page 4-6 for ballast dimensions and page wiring diagram
Refer to pages 4-29 to 4-30 for compatible Mark 10 Powerline controls
Refer to pages 9-23 to 9-27 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 page 3-20 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

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

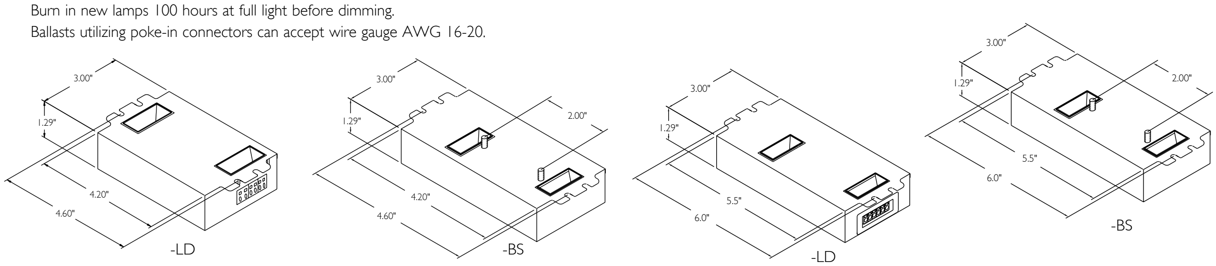
For 24 - 55W FT5 Lamps

HIGH POWER FACTOR SOUND RATED A

Mark 10 Powerline Electronic Dimming Ballast

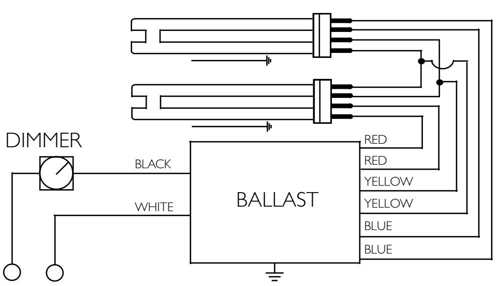
No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Max/Min Ballast Factor	Full Light Output THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
FT24W/2G11 - 24/27W Long Twin Tube Lamp (PL-L24W, F27BX/RS, FT24DL)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-124-D	25/8	1.00/0.03	10	0.21-0.09	50/10	D	152
2				IEZ-2S24-D	53/11	1.00/0.03	10	0.44-0.18	50/10	D	153
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	43/13	1.00/0.05	10	0.32	50/10	B	134
	277			VEZ-1TTS40-SC				0.15			
2	120			REZ-2TTS40-SC	90/17			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.

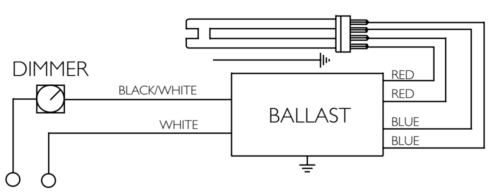


Size 2 Enclosure

Size 3 Enclosure



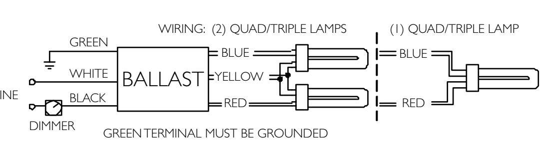
Diag. 132



Diag. 134

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to page 4-7 for ballast wiring diagrams and 152 and 153 dimensions
Refer to pages 4-29 to 4-30 for compatible Mark 10 Powerline controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data



Diag. 138

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 14 - 28W T5 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.
F14T5 (14W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-128-D	17/6	1.03/0.03	15	0.14-0.06	50/10	D	152
2				IEZ-2S28-D	32/9	1.03/0.03	10	0.27-0.12	50/10	D	153
F21T5 (21W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-128-D	24/6	1.00/0.03	10	0.21-0.08	50/10	D	152
2				IEZ-2S28-D	48/9	1.00/0.03	10	0.38-0.16	50/10	D	153
F28T5 (25W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-128-D	29/6	1.00/0.03	10	0.25-0.10	50/10	D	152
2				IEZ-2S28-D	59/10	1.00/0.03	10	0.49-0.20	50/10	D	153
F28T5 (28W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-128-D	31/6	1.00/0.03	10	0.26-0.11	50/10	D	152
2				IEZ-2S28-D	63/10	1.00/0.03	10	0.53-0.22	50/10	D	153

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.

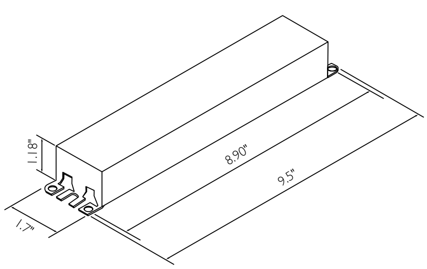
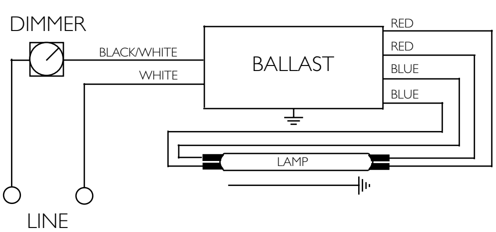


Fig. B



Diag. 152

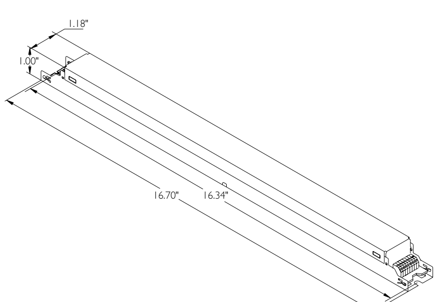
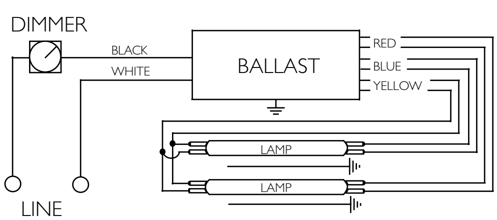


Fig. D
Includes connectors with no leads



Diag. 153

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 to 4-30 for compatible Mark 10 Powerline controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 24 - 55W T5/HO Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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.
F24T5/HO (24W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-124-D	25/8	1.00/0.03	10	0.21-0.09	50/10	D	152
2				IEZ-2S24-D	53/11	1.00/0.03	10	0.44-0.18	50/10	D	153
F39T5/HO (39W)											
1	120-277	PS	Mark 10 *Powerline*	IEZ-124-D	40/8	0.92/0.03	10	0.34-0.14	50/10	D	152
2				IEZ-2S24-D	84/11	0.85/0.03	10	0.70-0.29	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.

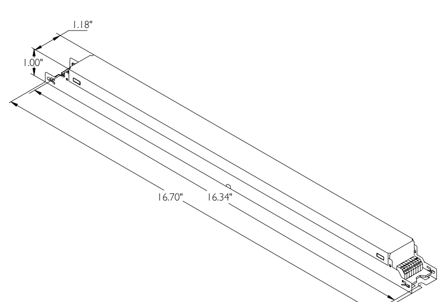
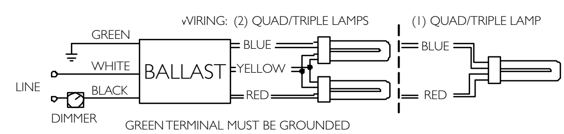
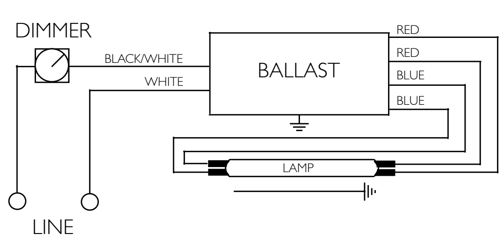


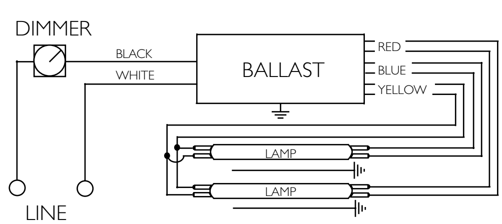
Fig. D
Includes connectors with no leads



Diag. 138



Diag. 152



Diag. 153

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 to 4-30 for compatible Mark 10 Powerline controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 17 - 32W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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	96/20	0.97/0.05		0.80			155
	277			VEZ-3S32-SC				0.35			

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

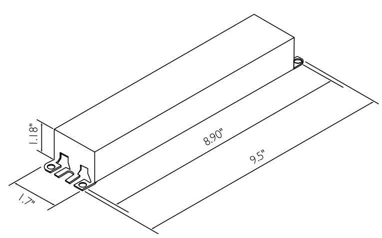
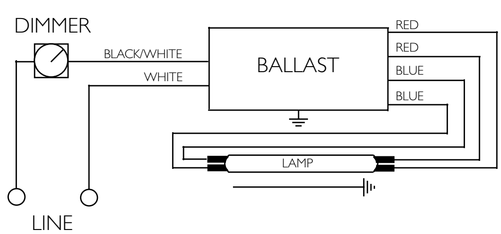
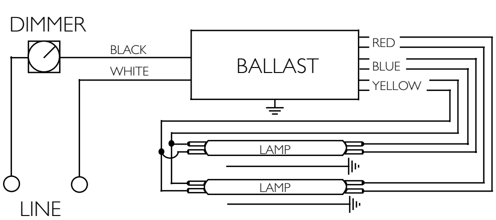


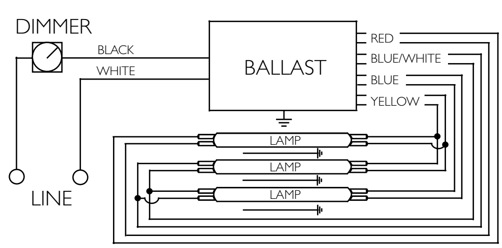
Fig. B



Diag. 152



Diag. 153



Diag. 155

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension

Refer to pages 4-29 to 4-30 for compatible Mark 10 Powerline controls

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

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

0-10V Electronic Dimming Ballasts provide maximum versatility with low voltage dimming

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 40 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

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

Helps reduce maintenance costs as more lamps remain on when lamps reach end-of-life minimizing wasteful re-lamping
Independent Light Operation (4-Lamp)

Ideal for frequent switching applications such as occupancy sensors and daylight harvesting
Programmed start operation

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

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

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

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

Note: Easy way to test dimming functionality of 0-10V dimming ballasts 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 T4 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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)			
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.

ONLY USE 4-PIN RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-12 for wiring diagrams and dimensions
Refer to pages 4-29 to 4-30 for compatible low voltage controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 36 - 80W FT5 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		Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
					Input Power ANSI (Watts)	Ballast Factor	THD %				
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	90/16	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	120-277	PS	Mark 7 *0-10V*	IZT-154-D	49/9	0.80/0.03	10	0.33-0.14	50/10	D	58A
2				IZT-2S54-D	108/16			0.90-0.38			59A
FT80W/2G11 - 80W Long Twin Tube Lamp (PL-L80W, FT80DL)											
1	120-277	PS	Mark 7 *0-10V*	IZT-180-D	94/16	1.00/0.03	10	0.79-0.33	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.

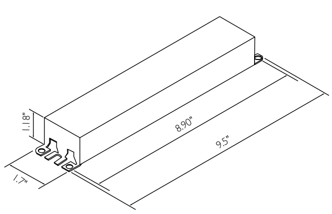


Fig. B

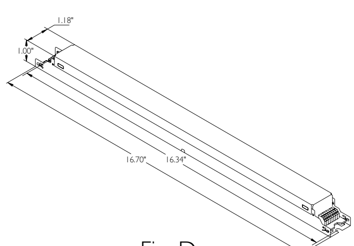
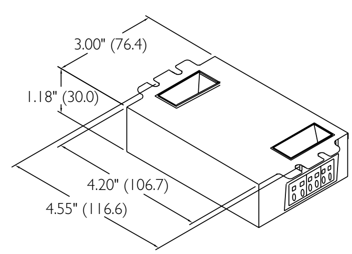
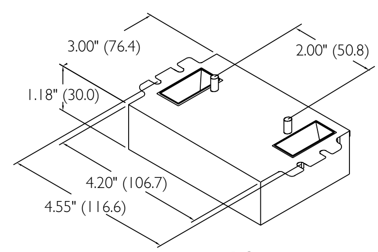


Fig. D
Includes connectors with no leads

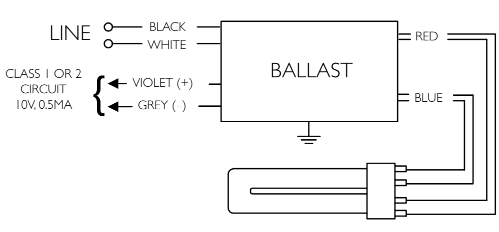


-LD

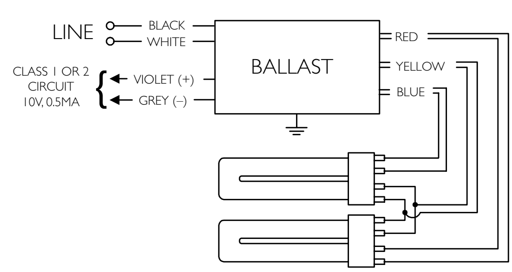


-BS

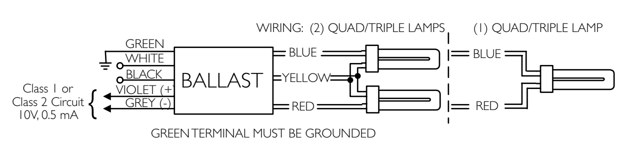
Size 5 Enclosure



Diag. 58A



Diag. 59A



Diag. 166

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 to 4-30 for compatible low voltage controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 14 - 28W T5 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.
F14T5 (14W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-128-D	19/6	1.00/0.03	10	0.15-0.07	50/10	D	55A
2				IZT-2S28-D	34/9			0.29-0.12			56A
F21T5 (21W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-128-D	25/6	1.00/0.03	10	0.20-0.09	50/10	D	55A
2				IZT-2S28-D	49/10			0.42-0.18			56A
F28T5 (25W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-128-D	30/7	1.00/0.03	10	0.25-0.11	50/10	D	55A
2				IZT-2S28-D	59/12			0.51-0.21			56A
F28T5 (28W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-128-D	32/7	1.00/0.03	10	0.27-0.12	50/10	D	55A
2				IZT-2S28-D	63/12			0.57-0.22			56A

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

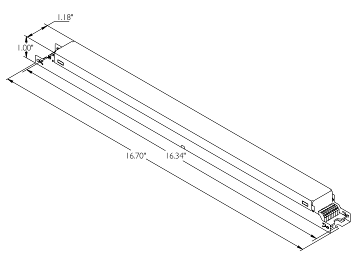
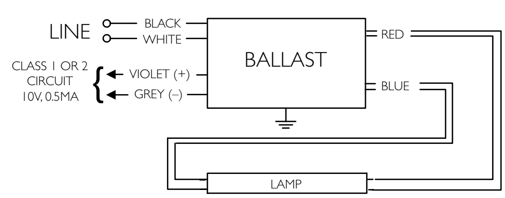
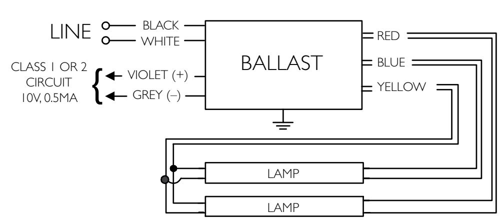


Fig. D
Includes connectors with no leads



Diag. 55A



Diag. 56A

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 to 4-30 for compatible low voltage controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 24 - 80W T5/HO Lamps

HIGH POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

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.
F24T5/HO (24W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-124-D	25/8	1.00/0.03	10	0.21-0.09	50/10	D	55A
2	120-277			IZT-2S24-D	53/11			0.44-0.18			56A
F39T5/HO (39W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-124-D	40/8	1.00/0.03	10	0.34-0.14	50/10	D	55A
2				IZT-2S24-D	84/11			0.70-0.29			56A
F54T5/HO/ES (49W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-154-D	54/9	1.00/0.03	10	0.46-0.19	60/16	D	55A
2				IZT-2S54-D	109/16			0.91-0.38			56A
F54T5/HO (54W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-154-D	56/10	1.00/0.03	10	0.46-0.20	50/10	D	55A
2				IZT-2S54-D	118/16			0.98-0.41			56A
F80T5/HO (80W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-180-D	94/18	1.00/0.03	10	0.73-0.30	50/10	D	55A
FC12T5/HO (55W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-154-D	47/9	0.90/0.03	10	0.40-0.17	50/10	D	55A
2				IZT-2S54-D	98/18			0.82-0.35			56A

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 RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to Page 4-16 for ballast wiring diagrams and dimensions
Refer to pages 4-29 to 4-30 for compatible low voltage controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

For 17 - 32W T8 Lamps

Mark 7 0-10V Electronic Dimming Ballast

RoHS COMPLIANT

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
	347			GZT-2S32-SC	32/14	0.90/0.05		0.10			
3	120-277			IZT-3S32-SC	56/18	1.00/0.03		0.46-0.20			57A
	347			GZT-3S32-SC	48/19	0.90/0.05		0.14			57C
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
	347			GZT-2S32-SC	47/14	0.90/0.05		0.14			
3	120-277			IZT-3S32-SC	79/19	1.00/0.03		0.65-0.28			57A
	347			GZT-3S32-SC	68/18	0.90/0.05		0.20			57C
4	120-277			IZT-4S32	96/22	0.88/0.05		0.77-0.35		D	16A
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120-277	PS	Mark 7 *0-10V*	IZT-132-SC	35/8	1.00/0.03	10	0.30-0.13	50/10	B	55A
2				IZT-2S32-SC	68/14			0.57-0.24			56A
	347			GZT-2S32-SC	61/15	0.90/0.05		0.18			
3	120-277			IZT-3S32-SC	96/18	1.00/0.03		0.86-0.37			57A
	347			GZT-3S32-SC	90/19	0.90/0.05		0.27			57C
4	277			VZT-4S32-HL	149/27	1.00/0.03		0.54		G	16A
	120-277			IZT-4PSP32-G	111/24	0.88/0.05		0.95-0.40			174A
				IZT-4S32	116/25	0.88/0.05		0.98-0.42		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.

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-16 for ballast wiring diagrams and dimensions
Refer to pages 4-29 and 4-30 for compatible low voltage controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ONLY USE RAPID-START SOCKETS

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 32W T8 Lamps

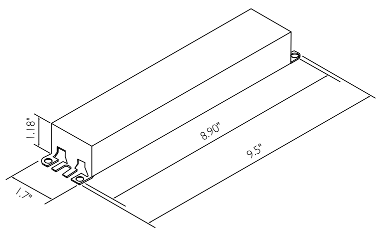


Fig. B

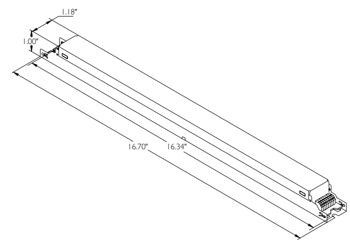


Fig. D
Includes connectors with no leads

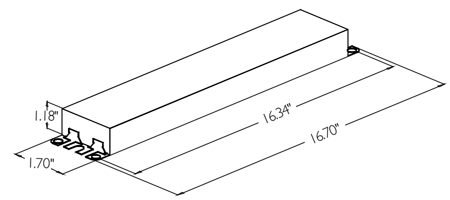
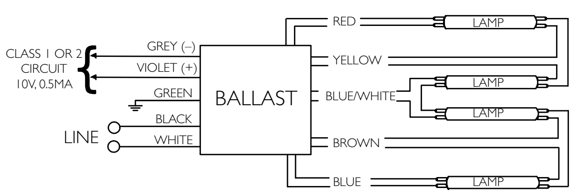
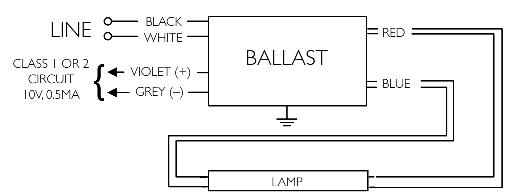


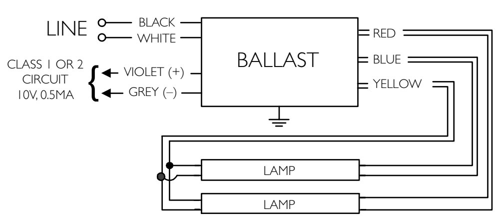
Fig. G



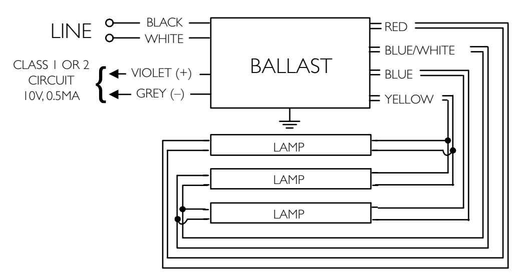
Diag. 16A



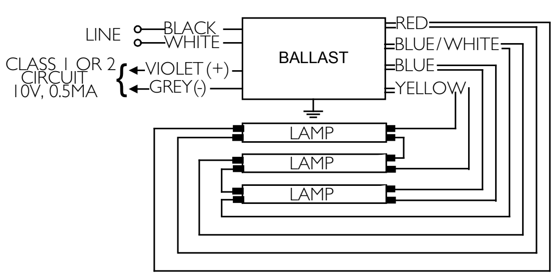
Diag. 55A



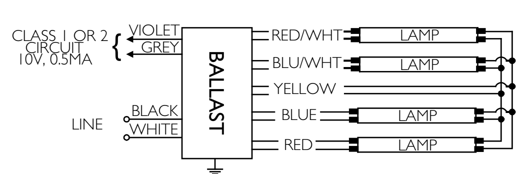
Diag. 56A



Diag. 57A



Diag. 57C



Diag. 174A

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension

Refer to pages 4-29 and 4-30 for compatible low voltage controls

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

Fluorescent Ballasts - Dimming - ROVR

Digital Addressable Ballasts provide intelligent control through the DALI protocol.

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, and have the ability to dim and switch individual ballasts through the control signal.

These features allow for virtually unlimited design flexibility while creating sustainable lighting systems. 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.

NEMA Premium

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

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

Ideal for a variety of applications
Available in linear fluorescent and 4-pin compact fluorescent models

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

Ideal for frequent switching applications such as occupancy sensors and daylight harvesting
Programmed start operation

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 13 - 70W T4 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

ROVR Digital Addressable 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)			
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.

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-19 for wiring diagrams and dimensions
Refer to pages 4-29 and 4-30 for compatible ROVR controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ONLY USE 4-PIN RAPID-START SOCKETS

For 55W FT5 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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	58B
2				IDA-2S54	114/24			0.96-0.42			59B

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.

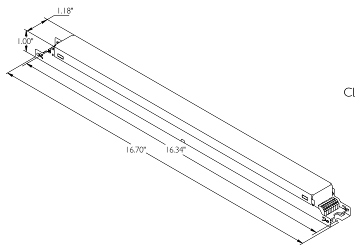
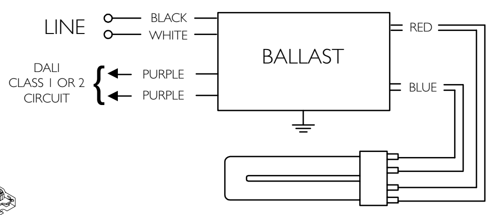
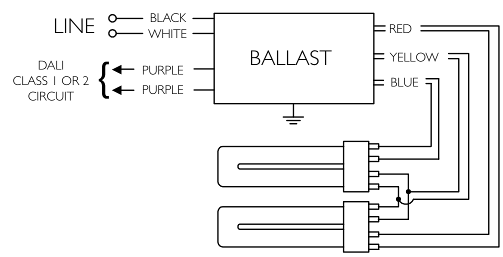


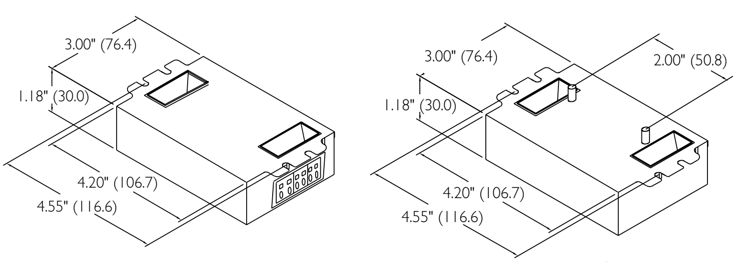
Fig. D
Includes connectors with no leads



Diag. 58B



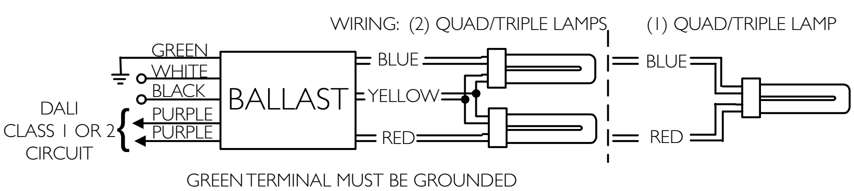
Diag. 59B



-LD

-BS

Size 5



Diag. 165

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 and 4-30 for compatible ROVR controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 14 - 28W T5 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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.
F14T5 (14W)											
1	120-277	PS	ROVR	IDA-128-D	19/6	1.00/0.03	10	0.15-0.07	50/10	D	55B
2				IDA-2S28-D	34/9			0.29-0.12			56B
F21T5 (21W)											
1	120-277	PS	ROVR	IDA-128-D	25/6	1.00/0.03	10	0.20-0.09	50/10	D	55B
2				IDA-2S28-D	49/10			0.42-0.18			56B
F28T5 (25W)											
1	120-277	PS	ROVR	IDA-128-D	30/7	1.00/0.03	10	0.25-0.11	50/10	D	55B
2				IDA-2S28-D	59/12			0.51-0.21			56B
F28T5 (28W)											
1	120-277	PS	ROVR	IDA-128-D	32/7	1.00/0.03	10	0.27-0.12	50/10	D	55B
2				IDA-2S28-D	63/12			0.57-0.22			56B

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

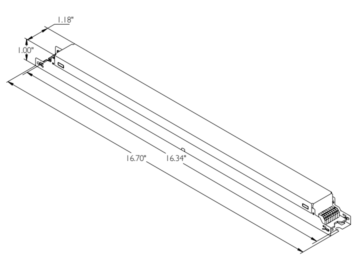
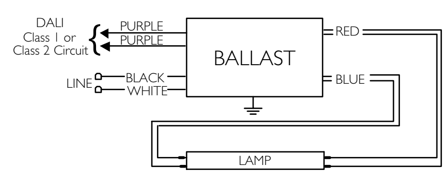
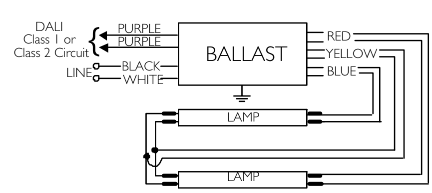


Fig. D
Includes connectors with no leads



Diag. 55B



Diag. 56B

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 and 4-30 for compatible ROVR controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 49 - 55W T5/HO 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.

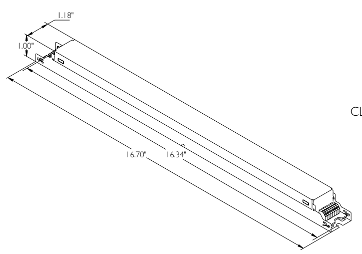
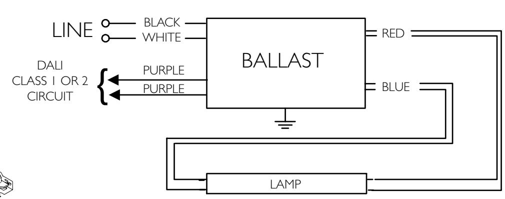
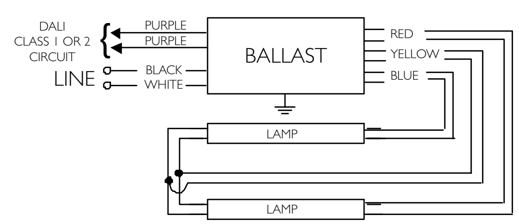


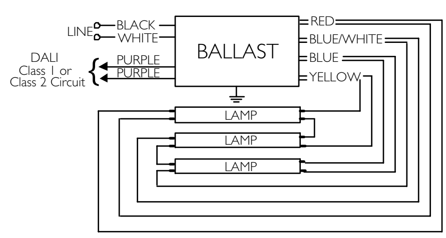
Fig. D
Includes connectors with no leads



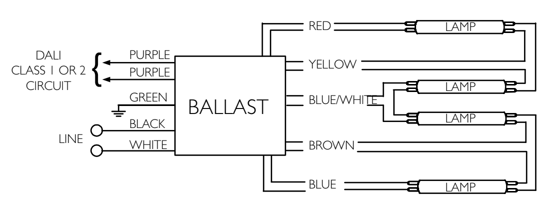
Diag. 55B



Diag. 56B



Diag. 57B



Diag. 167

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-29 and 4-30 for compatible ROVR controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 17 - 32W T8 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			0.57-0.24			56B
3				IDA-3S32-G	99/20			0.87-0.37		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.

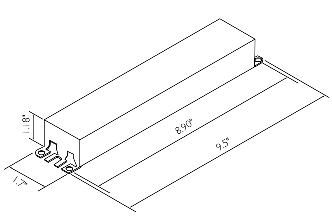


Fig. B

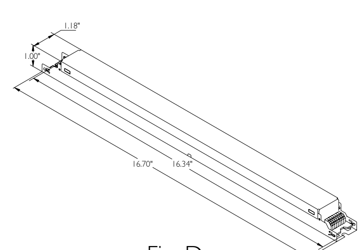


Fig. D
Includes connectors with no leads

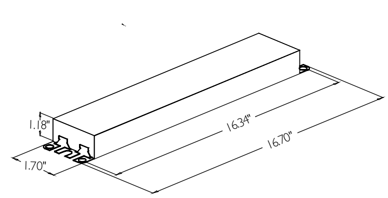


Fig. G

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to pages 4-21 for wiring diagrams
Refer to pages 4-29 and 4-30 for compatible ROVR controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

PowerSpec HDF ballasts

PHILIPS

Fluorescent Dimming

Philips PowerSpec HDF ballasts provide high-performance, full-range dimming of linear and compact fluorescent light sources. PowerSpec HDF is ideal for aesthetic and architectural dimming in commercial spaces, as well as sophisticated, energy-oriented applications. PowerSpec HDF smoothly dims linear T5 lamps to 1% of full output, and T8, compact T5, T4, Triple Tube and Quad Tube, and circular T5 fluorescent lamps to 3% of full output.

Ideal for a variety of applications
Available in linear fluorescent and 4-pin compact fluorescent models

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

Ideal for frequent switching applications such as occupancy sensors and daylight harvesting
Programmed start operation

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 13W - 70W T4 Lamps

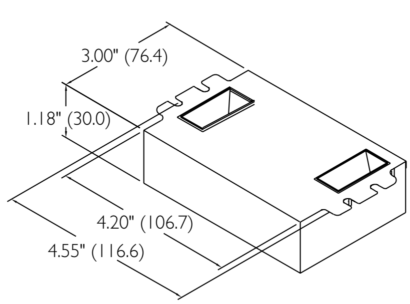
HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

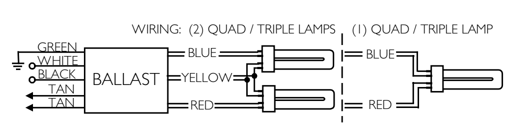
PowerSpec HDF Electronic Dimming Ballast

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)			
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	PowerSpec HDF	HDF226T4	18/6	1.00 - 0.03	10	0.15 - 0.07	50/10	Size 5	165GTG
2					33/19			0.28 - 0.12			
CFQ18W/G24q - 18W CFL Quad Tube Lamp (PL-C18W/4P, F18DBX/4P, CF18DD/E) CFTR18W/GX25q - 18W CFL Triple Tube Lamp (PL-T18W, F18TBX/4P, CF18DT/E)											
1	120-277	PS	PowerSpec HDF	HDF226T4	23/7	1.00 - 0.03	10	0.19 - 0.09	50/10	Size 5	165GTG
2					41/11			0.34 - 0.15			
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	PowerSpec HDF	HDF226T4	30/8	1.00 - 0.03	10	0.25 - 0.11	50/10	Size 5	165GTG
2					55/13			0.46 - 0.20			
CFTR32W/GX24q - 32W CFL Triple Tube Lamp (PL-T32W, F32TBX/4P, CF32DT/E)											
1	120-277	PS	PowerSpec HDF	HDF226T4	36/9	1.00 - 0.03	10	0.30 - 0.13	50/10	Size 5	165GTG
2				HDF242T4	75/19			0.63 - 0.21			
CFTR42W/GX24q - 42W CFL Triple Tube Lamp (PL-T42W, F42TBX/4P, CF42DT/E)											
1	120-277	PS	PowerSpec HDF	HDF226T4	47/9	1.00 - 0.03	10	0.39 - 0.17	50/10	Size 5	165GTG
2				HDF242T4	98/18			0.82 - 0.36			
CFTR57W/GX24q - 57W CFL Triple Tube Lamp (PL-T57W, F57QBX/4P, CF57DT/E)											
1	120-277	PS	PowerSpec HDF	HDF242T4	65/16	1.00 - 0.03	10	0.55 - 0.24	50/10	Size 5	165GTG
CFTR70W/GX24q - 70W CFL Triple Tube Lamp (F70QBX/4P, CF70DT/E)											
1	120-277	PS	PowerSpec HDF	HDF242T4	75/16	1.00 - 0.03	10	0.63 - 0.27	50/10	Size 5	165GTG

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.



-LS Size 5



Diag. 165GTG

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to the Indoor Switches and Dimmers section at www.philips.com/lightingcontrolsna for compatible PowerSpec HDF controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 36W - 55W FT5 Lamps

HIGH POWER FACTOR   SOUND RATED A

PowerSpec HDF 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.
FT36W/2G11 - 36/39W Long Twin Tube Lamp (PL-L36W, F39BX/RS, FT36DL)											
1	120-277	PS	PowerSpec HDF	HDF140T5	39/12	1.00/0.05	10	0.33 - 0.14	50/10	B	58GTG
2				HDF240T5	75/16	1.00/0.05		0.64 - 0.27			59GTG
FT40W/2G11/RS - 40W Long Twin Tube Lamp (PL-L40W, F40BX, FT40DL/RS)											
1	120-277	PS	PowerSpec HDF	HDF140T5	43/13	1.00/0.05	10	0.38 - 0.16	50/10	B	58GTG
2				HDF240T5	90/16	1.00/0.05		0.64 - 0.28			59GTG
FT55W/2G11 - 55W Long Twin Tube Lamp (PL-L55W, F55BX, FT55DL)											
1	120-277	PS	PowerSpec HDF	HDF154T5	59/13	0.90 - 0.03	10	0.50 - 0.23	50/10	D	58GTG
2				HDF254T5	114/24			0.96 - 0.42			59GTG

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.

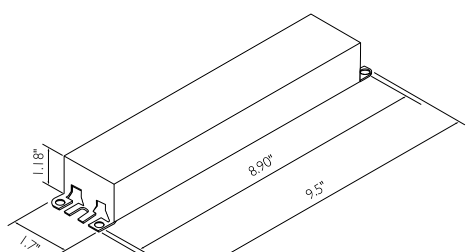
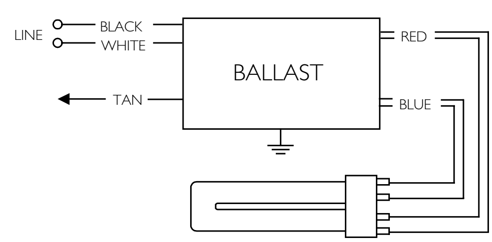


Fig. B



Diag. 58GTG

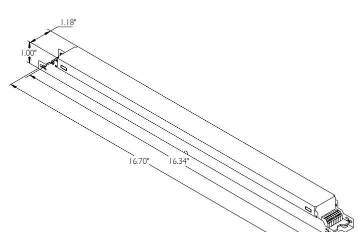
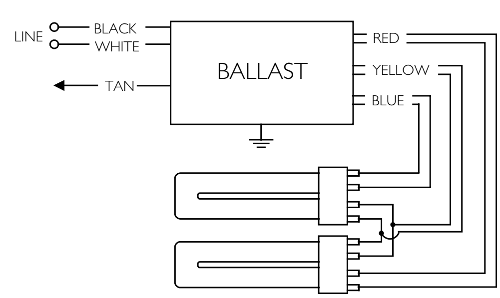


Fig. D
Includes connectors with no leads



Diag. 59GTG

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to the Indoor Switches and Dimmers section at www.philips.com/lightingcontrolsna for compatible PowerSpec HDF controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 14W - 28W T5 Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

PowerSpec HDF 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)			
F14T5 (14W)											
1	120-277	PS	PowerSpec HDF	HDF128T5	19/6	1.00 - 0.03	10	0.15 - 0.07	50/10	D	55GTG
2				HDF228T5	34/9			0.29 - 0.12			56GTG
F21T5 (21W)											
1	120-277	PS	PowerSpec HDF	HDF128T5	25/6	1.00 - 0.03	10	0.20 - 0.09	50/10	D	55GTG
2				HDF228T5	49/10			0.42 - 0.18			56GTG
F28T5 (25W)											
1	120-277	PS	PowerSpec HDF	HDF128T5	30/7	1.00 - 0.03	10	0.25 - 0.11	50/10	D	55GTG
2				HDF228T5	59/12			0.51 - 0.21			56GTG
F28T5 (28W)											
1	120-277	PS	PowerSpec HDF	HDF128T5	32/7	1.00 - 0.03	10	0.27 - 0.12	50/10	D	55GTG
2				HDF228T5	63/12			0.57 - 0.22			56GTG

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.

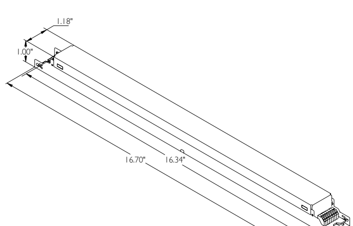
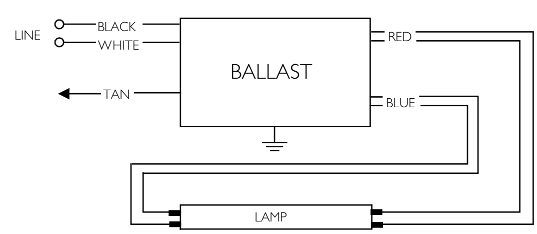
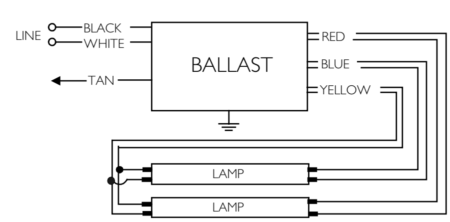


Fig. D
Includes connectors with no leads



Diag. 55GTG



Diag. 56GTG

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to the Indoor Switches and Dimmers section at www.philips.com/lightingcontrolsna for compatible PowerSpec HDF controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 24W - 55W T5/HO Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

PowerSpec HDF 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.
F24T5/HO											
1	120-277	PS	PowerSpec HDF	HDF224T5	30/9	1.00 - 0.03	10	0.25 - 0.13	50/10	D	55GTG
2					57/14			0.47 - 0.21			56GTG
F39T5/HO											
1	120-277	PS	PowerSpec HDF	HDF239T5	50/11	1.00 - 0.03	10	0.41 - 0.19	50/10	D	55GTG
2					87/16			0.73 - 0.31			56GTG
F54T5/HO/ES (49W)											
1	120-277	PS	PowerSpec HDF	HDF154T5	55/11	1.00 - 0.03	10	0.46 - 0.21	50/10	D	55GTG
2				HDF254T5	102/16			0.91 - 0.37			56GTG
F54T5/HO (54W)											
1	120-277	PS	PowerSpec HDF	HDF154T5	65/12	1.00 - 0.03	10	0.54 - 0.23	50/10	D	55GTG
2				HDF254T5	125/24			1.05 - 0.45			56GTG
FC12T5/HO (55W)											
1	120-277	PS	PowerSpec HDF	HDF154T5	59/13	0.90 - 0.03	10	0.50 - 0.23	50/10	D	55GTG
2				HDF254T5	114/24			0.96 - 0.42			56GTG

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.

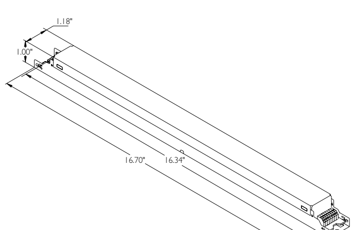
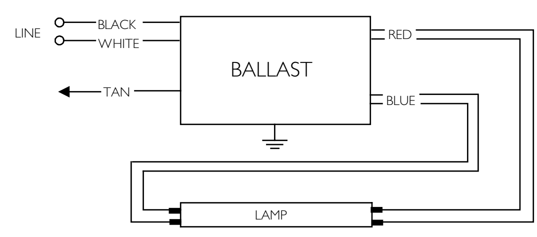
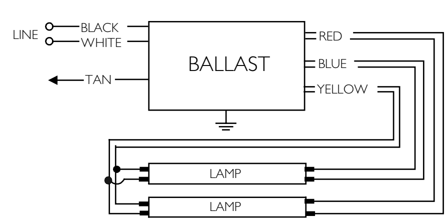


Fig. D
Includes connectors with no leads



Diag. 55GTG



Diag. 56GTG

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to the Indoor Switches and Dimmers section at www.philips.com/lightingcontrolsna for compatible PowerSpec HDF controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTRONIC FLUORESCENT CONTROLLABLE BALLASTS

For 17W - 32W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

PowerSpec HDF Electronic Dimming Ballast

RoHS COMPLIANT

No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Max/Min Input Power ANSI (Watts)	Ballast Factor	THD %	Full Light Output Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.
F17T8, FBO16T8 (17W)											
1	120-277	PS	PowerSpec HDF	HDF132T8	20/7	1.00 - 0.03	10	0.16 - 0.07	50/10	B	55GTG
2				HDF232T8	36/11			0.30 - 0.13			56GTG
3				HDF332T8	56/18			0.46 - 0.20			57GTG
F25T8, FBO24T8 (25W)											
1	120-277	PS	PowerSpec HDF	HDF132T8	28/8	1.00 - 0.03	10	0.24 - 0.11	50/10	B	55GTG
2				HDF232T8	52/12			0.43 - 0.19			56GTG
3				HDF332T8	79/19			0.65 - 0.28			57GTG
4				HDF432T8	96/22	0.88 - 0.03		0.77 - 0.35		D	167GTG
F32T8, FBO31T8, F32T8/U6 (32W)											
1	120-277	PS	PowerSpec HDF	HDF132T8	35/8	1.00 - 0.03	10	0.30 - 0.13	50/10	B	55GTG
2				HDF232T8	68/14			0.57 - 0.24			56GTG
3				HDF332T8	100/20			0.86 - 0.37			57GTG
4				HDF432T8	116/25	0.88 - 0.03		0.98 - 0.42		D	167GTG

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.

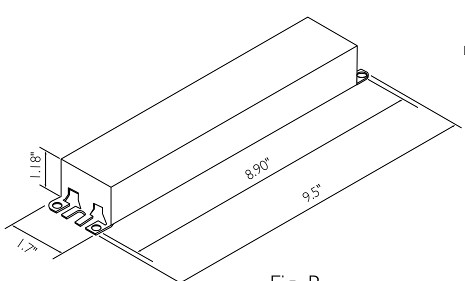
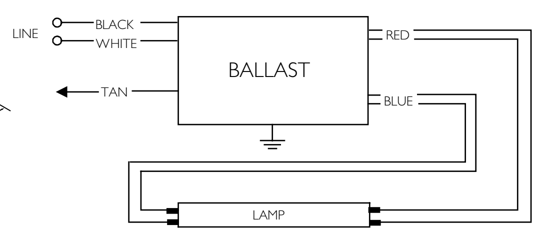
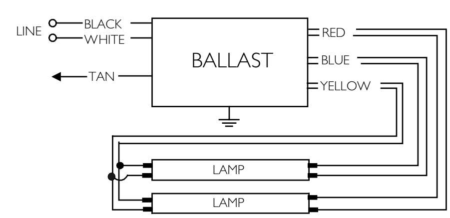


Fig. B



Diag. 55GTG



Diag. 56GTG

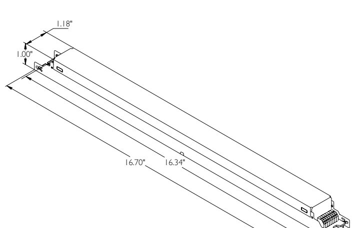
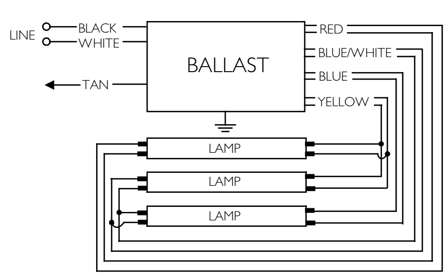
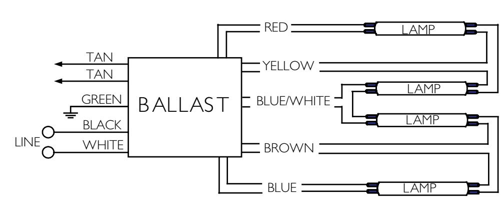


Fig. D
Includes connectors with no leads



Diag. 57GTG



Diag. 167GTG

ONLY USE RAPID-START SOCKETS

Refer to pages 3-13 to 3-18 for information on remote/tandem wiring and lead length extension
Refer to the Indoor Switches and Dimmers section at www.philips.com/lightingcontrolsna for compatible PowerSpec HDF controls
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

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 November 2013

For a more detailed listing please contact your local Philips Sales Representative.

MANUFACTURER	Mark 7 *0-10V* (4-Wire Low Voltage)	Mark 10 *Powerline* (2-Wire Line Voltage)	ROVR (DALI)
AMX Corporation	Radia RDM-DC, RDM-2DC and RDM-3DC	Radia RE-DM4 and RE-DM6 RDM-INC, RDM-2INC and RDM-INC50	
Anigmo	SEM & SEZ	ST2-600LVE	
Automated Logic Corp.	S Line, M Line	S Line, M Line	
Avab America	PWR Series	PWR Series	
CentraLite System, Inc.		StarLite, Elegance, LiteJet	
Colortran, Inc.	Digital Ballast Controller	ENR, I Series, I Series E, and	I Series Quad
Cooper Controls	Greengate, iLumin	Greengate, iLumin	iLumin
Cooper Wiring Devices		SF8AP, DF8AP, 9568 Aspire	
Crestron Electronics	CresLite™ Lighting System	CresLite™ Lighting System	
Digital Lighting Systems	Protocol	Protocol	
DimOnOff	Distributed Lighting Controls	Distributed Lighting Controls	
Douglas Lighting Controls	MC6000, Dilor ALC3, WPC, WPN, WBC, WSP	MC6000, Dilor ALC3, ALC-DCM-12	
Eaton	POW-R-Command System		
ETC (Electronic Theatre Controls)	Unison Paradigm, Unison DRd, SmartLink	Unison Paradigm, Unison DRd, SmartPack, Sensor, SmartLink	Unison Paradigm, Unison DRd, SmartLink
Encelium	Encelium ECS Control System, DSC-500, MYC-RS-500		
Entertainment Technologies, a Philips Company	Tap Glide, IPS, Capio Plus, Oasis	Intelli Set Plus, Tap Glide, U-Set, IPS,	Capio Plus
Exergy Controls	562-981-2127		XRG-200, XRG-300, XRG-400, XRG-1000
Hubbell Building Automation	DLC-7, OMNI, Light Owl, Light Hawk, UVPP	OMNI, Light Owl, Light Hawk, WASP High Bay Sensor, LX Networked	Lighting Controls, UVPP
Hunt Dimming	PS, FD and SSD Simplicity Series	PS, SC, FD and SSD Simplicity Series	PS Series
Intelligent Lighting Controls	Light Master		
Johnson Controls	Application Specific		
Leax Controls	Consult Factory	Consult Factory	
Legrand/Pass and Seymour	Slide-to-Off Titan, Preset Titan	Scene Director, Harmony, Slide-to-Off Titan, Preset Titan, LightSense	
Lehigh Electric Products Co. DCFL Interface	Sentry, Solitaire, DX2, Sunburst, ALX and DX with ACFL Interface	Solitaire, DX2, SlimDim Sunburst, ALX and DX with	

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 N.A. provides this list as a service to our customers and control manufacturers. Philips Lighting Electronics N.A. 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 November 2013

For a more detailed listing please contact your local Philips Sales Representative.

MANUFACTURER	**Mark 7 *0-10V*** (4-Wire Low Voltage)	**Mark 10 *Powerline*** (2-Wire Line Voltage)	**ROVR** (DALI)
Leviton Lighting Control Div.	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)	GR4000	GR4000	
Lutron	See www.lutron.com/advance	See www.lutron.com/advance	
Marlin Controls	HERCULES, MATRIX, SMP, MXI, MXII, MXIV, EFD, Stellar	Starbright Dimming System, HERCULES, MATRIX, SMP, MXI, MXII, MXIV, Stellar	Stellar
NexLight	WR, WRT, Glacier Series 5600	WR, WRT EZ-DALI	
Novar Controls	FDI (Fluorescent Dimming Interface)		
Payne Sparkman Mfg., Inc.	LTRD/4W Series	LTRD/2W Series	
PDM Electrical Products	MC6000, Dilor ALC3, WPC, WPN, WBC, WSP	MC6000, Dilor ALC3 , ALC-DCM-12	
PLC Multipoint	EDSAB and RCD Dial	EDSPR	
Philips	Sunrise Preset, Momentum Preset, Vega Slider, Lytemode module	MultiSet Pro, Sunrise Preset, Momentum Preset, Onset, Vega Slider, Lytemode module	
Philips Dynalite	Dynet Load Controller	Dynet Load Controller	Dynet Load Controller
Philips Teletrol	eBuilding	eBuilding eBuilding	
Sensor Switch, Inc. (an Acuity Brands Controls company)	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	TR217, CoreNet Digital Lighting Control System Digital Lighting	TR217, CoreNet	Control System,
Sterner Controls	BPM-SFL, BPM-DFL series	BPM-SN, BPM-DN series	
Strand Lighting, a Philips Company	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)	Synergy, Sequel, ISD	DSD, Synergy, Sequel, ISD	Synergy
Touch-Plate Lighting	CPD-8000D & MCP Series	MCD-4000 & CPD-4000	
Vantage Lighting Control	SD4008-120, SD9008-277, LVOS	SD4008-120, SD9008-277, Scenepoint, Radiolink Scenepoint, Powerstation 110V, Powerstation 277V	
Watt Stopper, Inc.	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 N.A. provides this list as a service to our customers and control manufacturers. Philips Lighting Electronics N.A. does not support or recommend one manufacturer over another. Please refer to each manufacturer's catalog for a complete product description and performance specifications.

Notes

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

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.

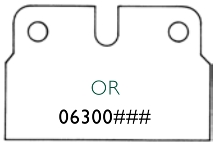
A ballast subjected to higher than nominal voltages will typically operate at increased temperatures. This will result in reduced ballast life. Low voltage can cause premature lamp failures as well as unreliable lamp starting.

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.

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. 74 for Fluorescent-Lamp Ballasts (File No. 007310).

Visit www.csa-international.org 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.

Indicates ballast complies with directive 2002/95/EC Restriction of Hazardous Substances.

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 should not pose a problem.

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.

ELECTROMAGNETIC FLUORESCENT BALLASTS

Ballast Sound

The slight hum present in fluorescent lighting installations originates from the inherent magnetic action in the core and 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 help 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.

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.

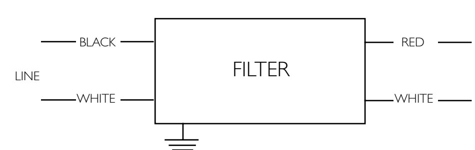
To correct the first cause, it is recommended the radio and aerial circuit be separated at least 10 feet from the fluorescent lamp and the radio provided with a positive ground.

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

ELECTROMAGNETIC FLUORESCENT BALLASTS

T8 & T12 Straight & U-Shaped

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

Rapid Start Lamps

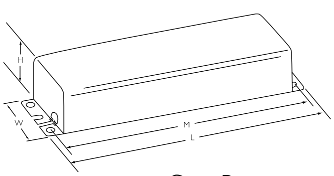
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
F32T8, FBO32T8, F32T8/U (265mA)															
1	32	50	120	R-1P32-TP ✱	✓	✓			0.32	35	0.95	<15	0.91	T-2	20
2	32	50	120	R-2P32-TP ✱	✓	✓		✓	0.61	71	0.99	<10	0.97	T-2	21
			277	V-2P32-TP ✱	✓	✓		✓	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
F34T12 (460mA)															
2	34	60	120	RM-2S35-TP ✪ ❇ ✱	✓				0.61	60	0.66	<20	0.82	T-2	21
4	34	60	120	R-4S40-A-TP-AC ✱	✓	✓			1.26	144	0.88	<20	0.95	D-2	25
F40T12 (430mA)															
1	40	50	120	RL-140-TP ✪ ❖ ❇ ✱	✓	✓			0.53	32	0.63	<15	0.50	R-4	16
2	40	50	120	RM-2S35-TP ✪ ❇ ✱	✓				0.72	70	0.68	<20	0.81	T-2	21
4	40	50	120	R-4S40-A-TP-AC ✱	✓	✓			1.46	172	0.95	<20	0.98	D-2	25

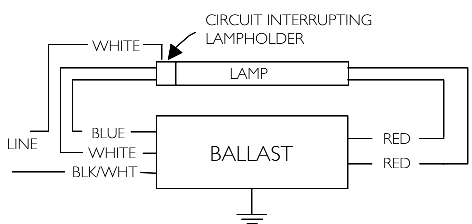
Note: 2-Lamp Ballasts will also operate U-Shaped Lamps

- ❇ Normal Power Factor
- ✪ For Residential Use Only
- ❖ Requires Circuit-Interrupting Lamp Holders
- \+ Mounting dimensions refer to slots only
- ✱ These ballasts rated for use with 4ft rapid start medium bipin lamps cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

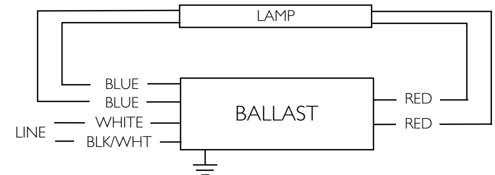
DIMENSIONS

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+

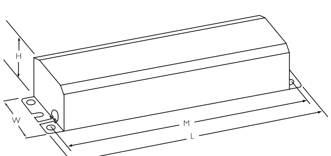

Case R

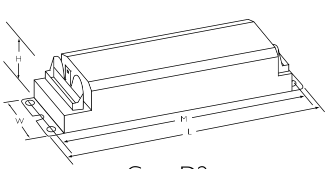


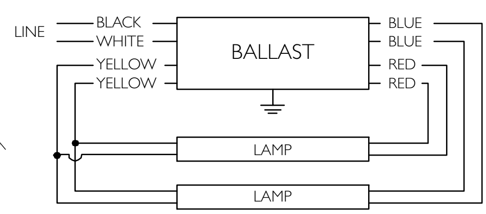
Diag. 16



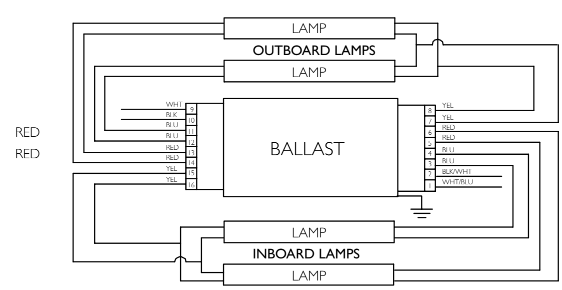
Diag. 20


Case T


Case D2



Diag. 21



Diag. 25

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T12/HO High Output

HIGH POWER FACTOR SOUND RATED C

RoHS COMPLIANT

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								
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
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	R-9	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
4	60	-20	120	RC-4S60-TP ■▲	✓	✓			2.40	288	0.92	<15	0.99	R-9	13

● Sound Rated B

■ Sound Rated D

▲ These ballasts rated for use with 8ft High Output lamps (800mA) cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

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

Refer to pages 5-5 for ballast dimensions and wiring diagrams

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

T12/HO High Output

HIGH POWER FACTOR SOUND RATED C

RoHS COMPLIANT

Rapid Start Lamps

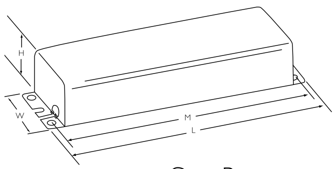
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	Certifications CSA	Certifications E	Certifications	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F60T12/HO (800mA)															
1	75	-20	120	RS-110-TP ●▲	✓	✓			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
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

● Sound Rated B

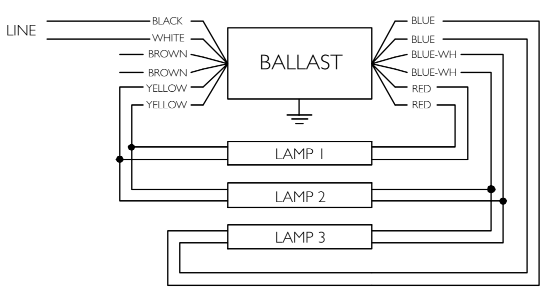
▲ These ballasts rated for use with 8ft High Output lamps (800mA) cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

DIMENSIONS

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

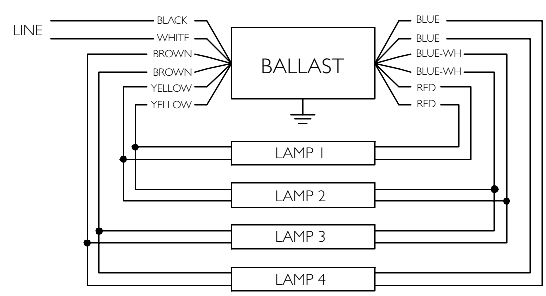


Case R

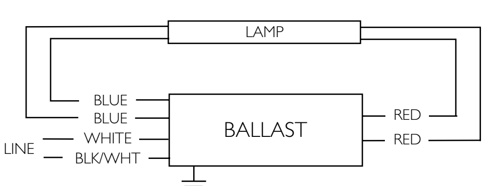


Diag. 8

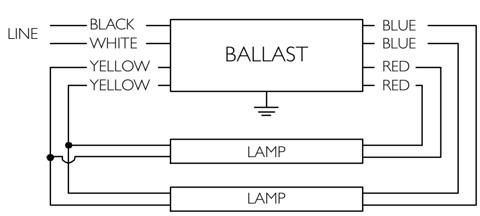
Note: Insulate unused leads individually as shown on a ballast label



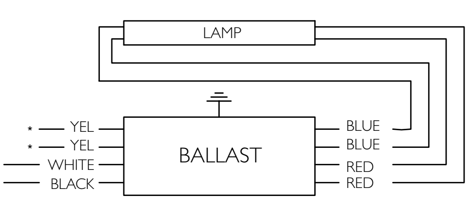
Diag. 13



Diag. 20



Diag. 21



Diag. 39

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

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T12/HO High Output

HIGH POWER FACTOR SOUND RATED C

RoHS COMPLIANT

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.
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 ▲	✓	✓			1.60	193	0.95	<15	0.99		
			277	VC-2S85-TP	✓	✓			0.67	180	0.90	<20	0.97		
				V-2S110-TP ▲	✓	✓			0.75	201	0.98	<20	0.97		
3	85	-20	120	RC-4S60-TP ■▲	✓	✓			2.40	291	0.90	<15	0.99	R-9	8
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		
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 ▲	✓	✓	✓	✓	1.70	203	0.91	<20	0.99	R-9	21
			277	V-2S110-TP ▲	✓	✓	✓	✓	0.79	210	0.93	<25	0.96		
F96T12/HO (800mA)															
1	110	-20	120	RS-110-TP ●▲	✓	✓			1.20	140	0.98	<35	0.97	R-9	20
			277	VS-110-TP ●▲	✓	✓			0.54	145	1.00	<30	0.97		20
2	110	-20	120	R-2S110-TP ▲	✓	✓	✓	✓	2.00	237	0.95	<15	0.99	R-9	21
			277	V-2S110-TP ▲	✓	✓	✓	✓	0.90	245	0.98	<20	0.98		

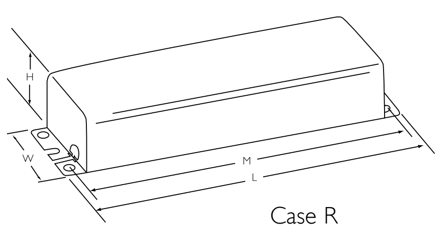
● Sound Rated B

■ Sound Rated D

▲ These ballasts rated for use with 8ft High Output lamps (800mA) cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

DIMENSIONS

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



Case R

Refer to pages 5-5 for wiring diagrams

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

T12/HO High Output

HIGH POWER FACTOR SOUND RATED C

RoHS COMPLIANT

Weatherproof Ballasts

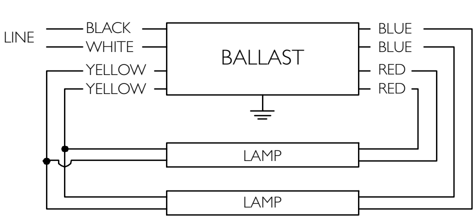
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications: UL	Certifications: CSA	Certifications: E	Certifications: Energy	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F24T12/HO (800mA)															
2	35	-20	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)															
2	110	-20	120	RC-2S110-FO ▲	✓				2.10	248	0.98	<15	0.98	FO	21

▲ These ballasts rated for use with 8ft High Output lamps (800mA) cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

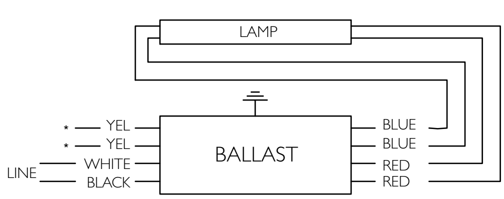
DIMENSIONS

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 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

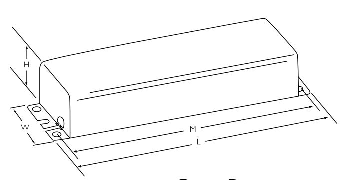
T12/VHO Very High Output

HIGH POWER FACTOR SOUND RATED D

RoHS COMPLIANT

VHO & Powergroove Rapid Start Lamps

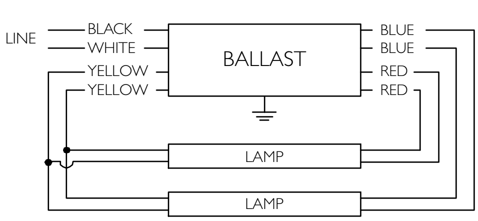
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications: UL	Certifications: CSA	Certifications: E	Certifications: Energy	Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F48T10/VHO (1500mA), F48T12/VHO (1500mA), 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		
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		



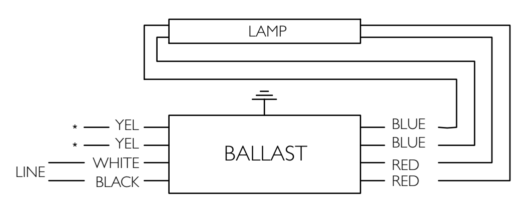
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-11	14 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 9-23 to 9-27 for lead lengths and shipping data

T12 Slimline

HIGH POWER FACTOR SOUND RATED C **RoHS** COMPLIANT

Instant 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.
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		
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		
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		

● Sound Rated B
▲ These ballasts rated for use with 8ft Slimline lamps cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

Refer to pages 5-10 for wiring diagrams and dimensions
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T12 Slimline

HIGH POWER FACTOR SOUND RATED C

RoHS COMPLIANT

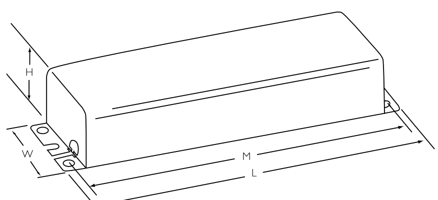
Instant Start Lamps

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								
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		
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		

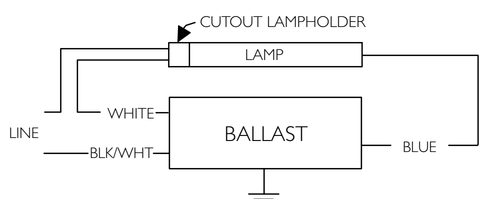
▲ These ballasts rated for use with 8ft Slimline lamps cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)

DIMENSIONS

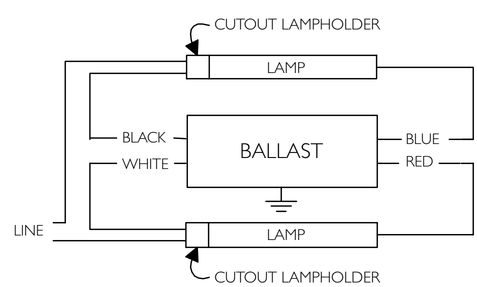
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-6	9½	$3\frac{7}{64}$	$1\frac{25}{32}$	$8\frac{29}{32}$
R-8	11¾	$3\frac{7}{64}$	$1\frac{25}{32}$	$11\frac{9}{64}$



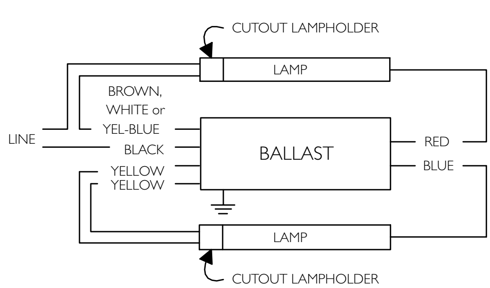
Case R



Diag. 10



Diag. 12



Diag. 36

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

T5 & T8 Preheat Lamps

CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

RoHS COMPLIANT

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	$3\frac{1}{16}$	$1\frac{3}{8}$	$1\frac{19}{32}$	$1\frac{13}{16}$	2¾
X-1	$2\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	2
X-3	$3\frac{1}{16}$	1¼	$1\frac{7}{16}$	$1\frac{13}{16}$	2¾
R-4	6½	–	$1\frac{15}{16}$	$1\frac{3}{8}$	6+

Refer to pages 5-12 for wiring and dimension diagrams
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T12 Preheat Lamps

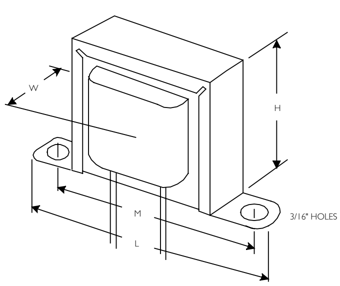
CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

RoHS COMPLIANT

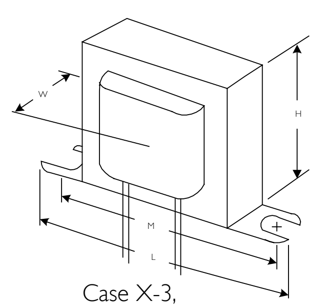
Preheat Ballasts (Starter Required) ☆

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

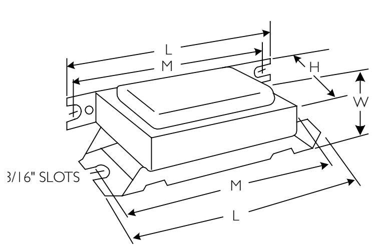
✖ Available with Class P Thermal Protection– Add Suffix -TP to Catalog Number.
★ Core & Coil with Cover, painted white
☆ Ballast Includes Built-in Starter.
† Class A Insulation
+ Mounting dimensions refer to slots only



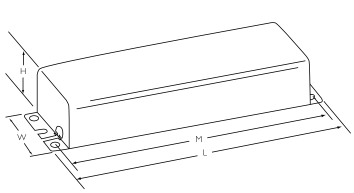
Case X-1



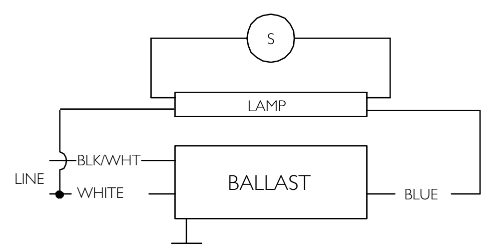
Case X-3, X-5, X-8



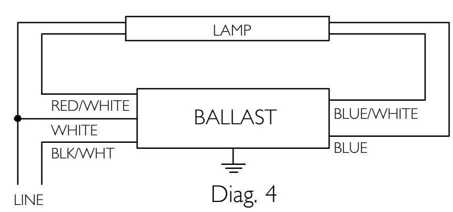
Case C



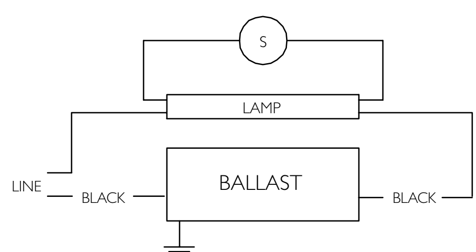
Case R



Diag. 2



Diag. 4



Diag. 116

Refer to pages 5-11 for dimensions
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T8 & T12 Preheat Lamps

HIGH POWER FACTOR SOUND RATED A **RoHS** COMPLIANT

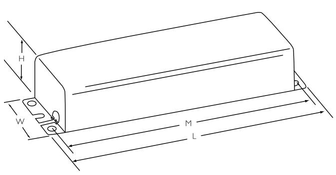
Trigger Start Ballasts

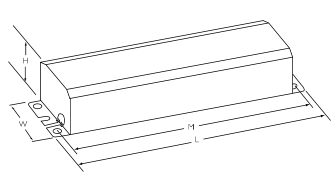
Lamp Data Number	Lamp Data Watts	Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications UL	CSA	E		Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
F13T8															
1	13	20	120	RLQ-120-TP ❖❇	✓	✓			0.54	23	1.00	<10	0.35	R-4	16
2	13	30	120	RL-2SP20-TP❇	✓	✓			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

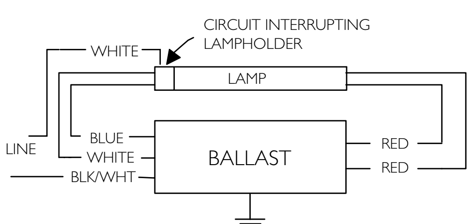
❖ Requires Circuit-Interrupting Lamp Holders
❇ Normal Power Factor
+ Mounting dimensions refer to slots only

DIMENSIONS

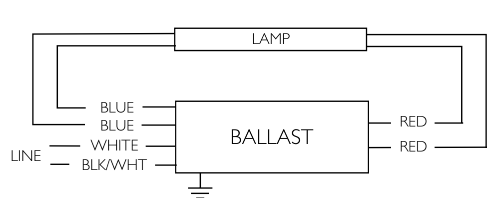
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	$1^{15}/_{16}$	$1^{3}/_{8}$	6+
T-1	6½	$2^{3}/_{8}$	1½	6+
T-2	9½	$2^{3}/_{8}$	6½	$8^{29}/_{32}$


Case R

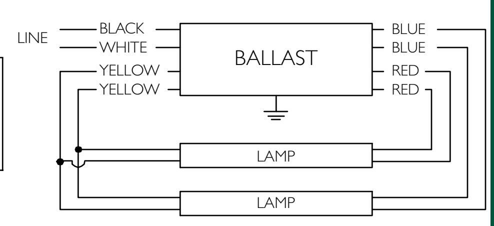

Case T



Diag. 16



Diag. 20



Diag. 21

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T9 Circline Lamps

NORMAL POWER FACTOR   SOUND RATED A

RoHS COMPLIANT

Rapid Start Ballasts

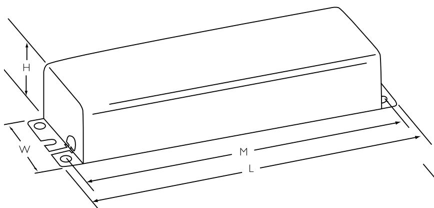
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E								
FC6T9 (20W Circline)															
1	20	50	120	RLQS-122-TP-W	✓	✓			0.56	24	0.76	<10	0.36	R-4	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 and (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 and (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

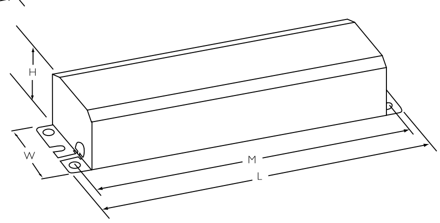
Note: All Ballasts supplied with Circline sockets in white can except RL-140-TP

DIMENSIONS

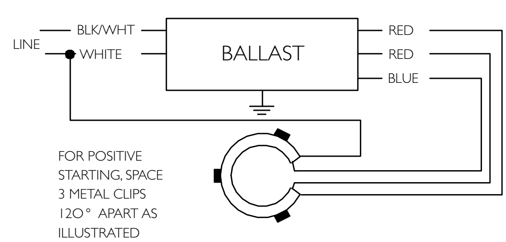
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	1 15/16	1 3/8	6+
T-1	6½	2 3/8	1½	6+



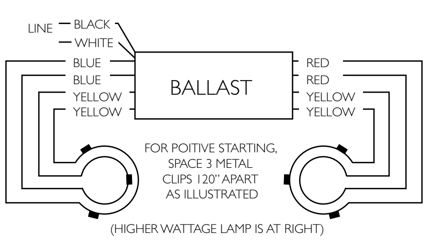
Case R



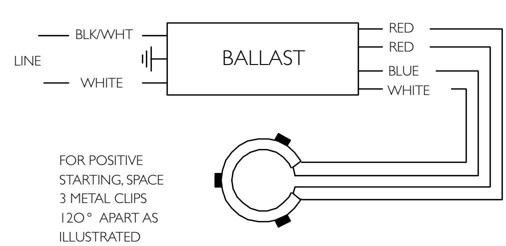
Case T



Diag. 31



Diag. 105



Diag. 32

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

T4 2-Pin Compact & T5 4-Pin Long Twin Tube Lamps

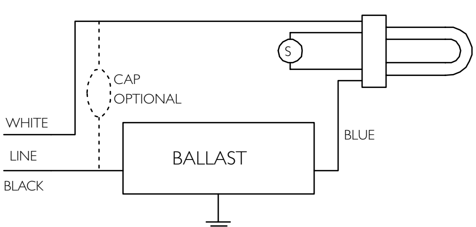
RoHS COMPLIANT

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

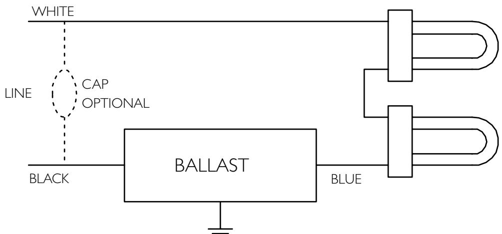
★ Core & Coil with Cover, painted white
f For Outdoor Use Only



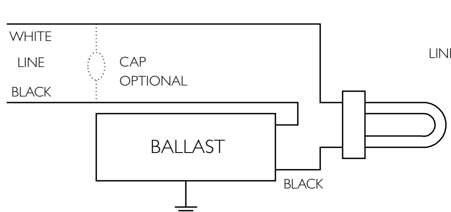
Diag. 44

DIMENSIONS

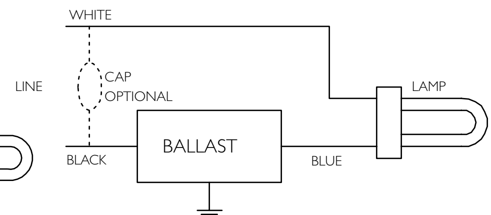
Designation	Length (L) (inches)	Width (W) (inches) Standard	Width (W) (inches) With TP	Height (H) (inches)	Mounting (M) (inches)
C-2	3 1/16	1 3/8	1 19/32	1 13/16	2¾
X-1	2 3/8	1 1/8	1 3/8	1 3/8	2
X-3	3 1/16	1¼	1 7/16	1 13/16	2¾
X-5	3¼	1½	1¾	2	2 3/16
X-6	3 1/16	1½	–	1 13/16	2¾
X-8	4	1 9/16	1 13/16	2¼	3½



Diag. 46



Diag. 107



Diag. 140

Refer to page 5-12 for dimension diagrams.
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T4 2-Pin Compact Lamps

HIGH POWER FACTOR SOUND RATED A

RoHS COMPLIANT

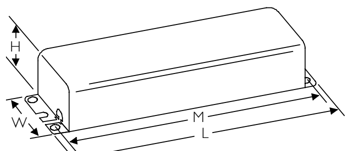
Preheat Ballasts

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)			Input Power ANSI (Watts)	Ballast Factor	THD %	Dim.	Wiring Dia.
Number	Watts				UL	CSA	E		Operating	Starting	Open Circuit					
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	✓	✓			0.30	0.44	–	35	1.02	<30	T-1	51
		0	277	VH-2B13-TP-BLS	✓	✓			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	✓	✓			0.42	0.34	–	50	0.82	<15	R-5	50
			277	VH-2Q26-TP-BLS	✓	✓			0.21	0.32	–	58	0.87	<25	R-5	47

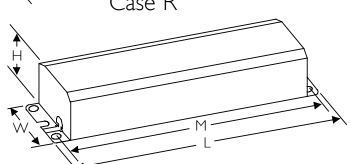
\+ Mounting dimensions refer to slots only

DIMENSIONS

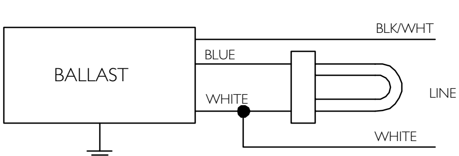
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-1	4¼	2	1 7/16	3 9/16
R-2	4¾	2 7/32	1 5/8	4 3/8+
R-5	9½	2 3/8	1 11/16	8 29/32
T-1	6½	2 3/8	1½	6+



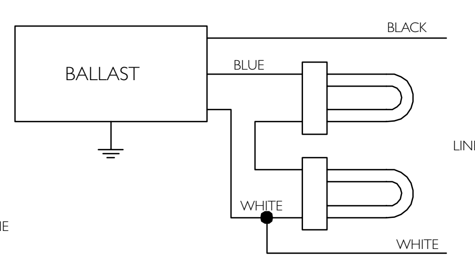
Case R



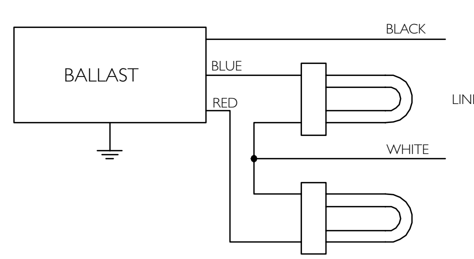
Case T



Diag. 47



Diag. 50



Diag. 51

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

T12/HO High Output Lamps

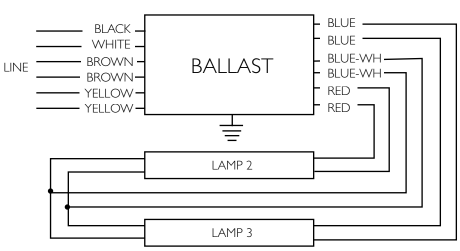
CLASS P BALLAST IN WHITE CAN

RoHS COMPLIANT

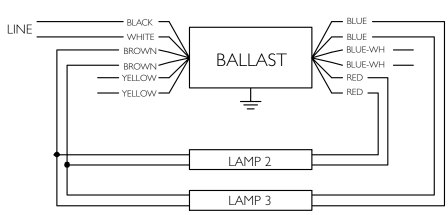
Sign Ballasts

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
2, 3, 4	6	20	-20°F	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	-20°F	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●	-20°F	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	-20°F	120	ASB-2432-34-BL-TP ◆	✓	✓			3.30	370	975	BL-4	8, 13
4, 5, 6	12▼	40▼	-20°F	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■	-20°F	120	ASB-2448-46-BL-TP ◆	✓	✓			5.19	604	720	BL-3	14, 15, 19
				277	VSB-2448-46-BL-TP ◆	✓	✓			2.25				

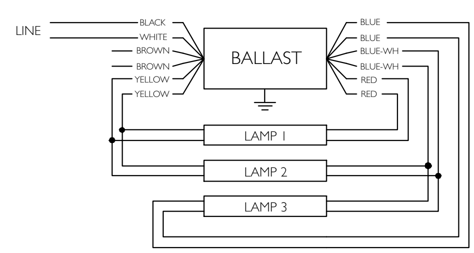
● Total lamp length of each circuit (A) and (B) must not be less than 10 ft. nor more than 20 ft. Circuit (A) is comprised of lamps 1,2. Circuit (B) is comprised of lamps 3,4. (See wiring diagrams).
▼ Total lamp length of each circuit (A) and (B) must not be less than 6 ft. nor more than 20 ft. Circuit (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).
◆ These ballasts rated for use with 8ft high output lamps cannot be manufactured in or imported into the U.S.A. after Nov. 14, 2014 (Does not comply with DOE Fluorescent Ballast Rule EPCA 10 CFR 430 dated 6/22/12)



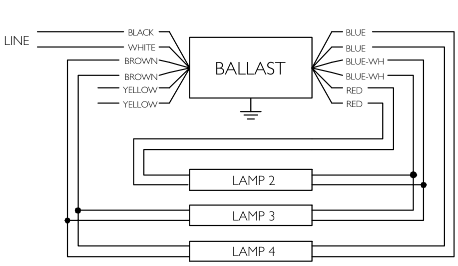
Diag. 5
Note: Insulate unused leads individually as shown on a ballast label



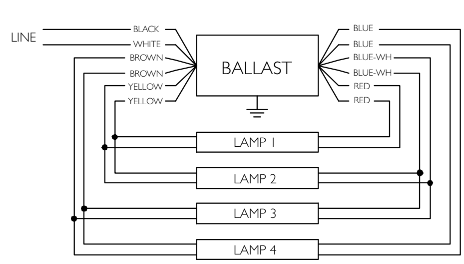
Diag. 7
Note: Insulate unused leads individually as shown on a ballast label



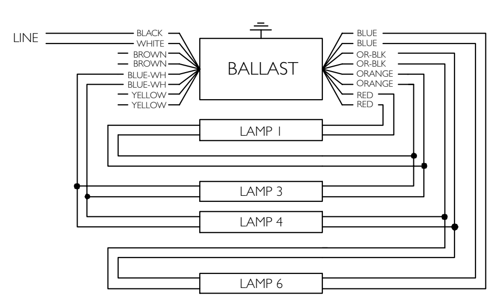
Diag. 8
Note: Insulate unused leads individually as shown on a ballast label



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

Dimensions and wiring diagrams continued on page 5-18
Refer to pages 9-23 to 9-27 for lead lengths and shipping data

ELECTROMAGNETIC FLUORESCENT BALLASTS

T12/HO High Output Lamps

CLASS P BALLAST IN WHITE CAN

RoHS COMPLIANT

Sign Ballasts

Total Lamp Feet

Number of Lamps per Ballast	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
1,2		ASB-0412-12-BL-TP																							
2,3,4			ASB-0620-24-BL-TP VSB-0620-24-BL-TP																						
2,3,4						ASB-1224-24-BL-TP VSB-1224-24-BL-TP																			
2,3,4										ASB-2040-24-BL-TP VSB-2040-24-BL-TP															
3,4												ASB-2432-34-BL-TP													
4,5,6						ASB-1240-46-BL-TP VSB-1240-46-BL-TP																			
4,5,6												ASB-2448-46-BL-TP VSB-2448-46-BL-TP													

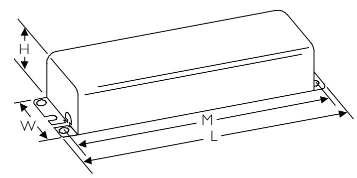
To select the ballast for your particular plastic sign application:

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

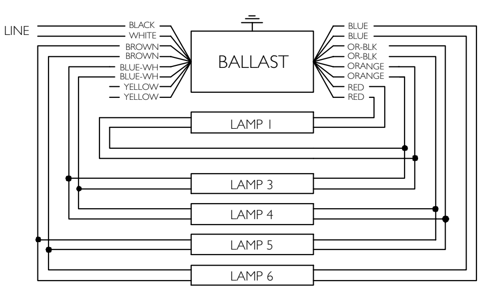
2) The number of lamps per ballast is shown in the far left column, above.

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	$16^{11}/_{16}$	$3^3/_{16}$	$2^5/_8$	$16^9/_{64}$

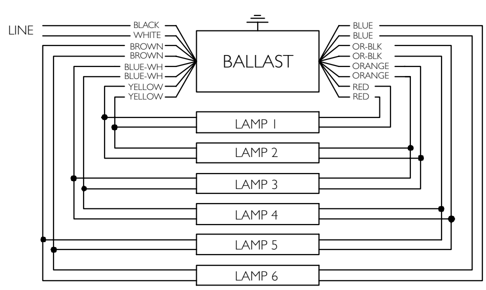


Case BL-1, BL-2, BL-3, BL-4

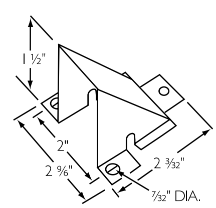


Diag. 15

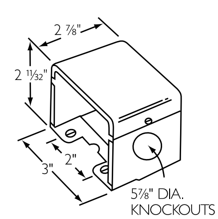
Note: Insulate unused leads individually as shown on a ballast label



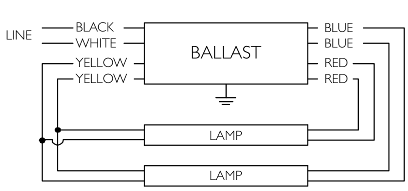
Diag. 19



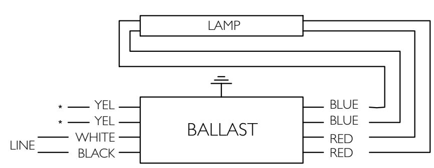
PC-161W



PC-857W



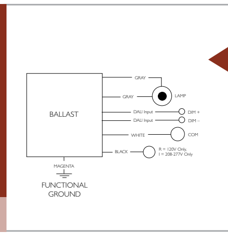
Diag. 21



Diag. 39

Refer to pages 9-23 to 9-27 for lead lengths and shipping data

Notes



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ELECTRONIC HID BALLASTS

Electronic HID Overview

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

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

e-Vision

Low frequency electronic ballasts are recommended by lamp manufacturers to drive the latest 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 ceramic metal halide operated by e-Vision ballasts the premier choice for many applications previously illuminated 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.

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. Designed specifically for outdoor area and roadway lighting applications, these Xtreme ballasts have integral surge protection of 10kV/5kA, and 80,000 hours rated average life.* This highly efficient system provides end users the ability to convert to a warm white light without sacrificing color rendering or system lifetime.

CosmoPolis Programmable

The CosmoPolis Programmable Xtreme ballasts enable digitally based, networked control of CosmoPolis Systems. These ballasts use the DALI digital universal interface for control. The CosmoPolis Programmable System allows the end user maximum flexibility to control the lighting system. Features include:

1. Light sensor or switched supply control.
2. Constant or Adjustable Light Output.
3. Integrated line switch for pilot line or motion sensor control.
4. Line Voltage Dimming.
5. Integrated DynaDimmer allows user to program 5 different lighting levels and durations.
6. Network control and monitoring of each lamp and ballast on the system via powerline or RF using DALI based system such as Philips AmpLight & Starsense.
7. Software upgrades for system.

MasterColor Elite Medium Wattage

The lamp's sparkling white light with 90 CRI 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.** The e-Vision ballast comes with 0-10V control wires that allow for dimming to 50% of lamp power and allow for operation by 0-10V controls such as the Philips DynaDimmer. This system is ideal for indoor lighting in both high-bay and recessed applications, as well as outdoor lighting for street and area installations. The MasterColor CDM Elite Xtreme ballast for 210W operation includes the same 10kV/5kA surge protection and 80,000 hour rated average life* as found in the CosmoPolis Xtreme ballasts.

* Rated average life is based on 90% surviving when operating at 10°C less than the marked maximum case temperature (Tc - 10°C) with one switch per day. Rated average life is based on engineering testing in laboratory conditions and probability data as defined in IEC Norm 60929.

** Based on a comparison of published data of a Philips CDM EliteMW 315/T9/942/U/E lamp operated by Philips Advance IZTMH-210315-R-LF (341 System Watts) to a Philips MS400/BU/ED28/PS operated by a Philips Advance 71A6092AEE ballast (452 system Watts) operated for 30,000 hours (rated average life of 315W CDM Elite lamp).

ELECTRONIC HID BALLASTS

Catalog Number Explanation

I	ZT	MH	_	100	A	BLS	ID

Additional Features:
Blank = None
ID = Integral 120V output to supply power to a 4-Wire 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 (K metal case models 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
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
Q = Plastic case with dim. 5.9" L x 3.5" W x 1.5" 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, ANSI C156/M156
20 = 22 W Lamp^
39 = 39 W Lamp, ANSI C130/M130
P39 = 39W Lamp+
45 = 45W Lamp
50 = 50W Lamp
60 = 60W Lamp
70 = 70W Lamp
90 = 90W Lamp
100 = 100W Lamp
140 = 140W Lamp
150 = 150W Lamp
210315 = 210 W or 315W Lamp
210 = 210W Lamp

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

Primary Lamp Type:
MH = Metal Halide
CW = CosmoPolis Metal Halide

Dimming Scheme: Blank = Fixed Light Output ZT = 0-10V Dimming D = Programmable DALI Interface

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

^ Philips 22W MiniMaster Color Lamp, ANSI C175/M175, with PGj5 base
+ Philips 39W MiniMaster Color Lamp, ANSI C179/M179, with PGj5 base
‡ For CosmoPolis and MasterColor CDM Elite Medium Wattage, Intellivolt is limited to 208 thru 277V

e-Vision Low Frequency Electronic HID Ballasts

For Low Wattage HID Lamps

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	• Helps maximize 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
Lamp Wattage Regulation • Lamp wattage will change less than .5% with a +/-10% change in line voltage	Excellent 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

eHID 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"
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 (Second Lamp On 2-Lamp Ballasts)	11.0" +/- 1.0"	9.0" +3.0"/-2.0"	0.5"
Brown	Lamp Screwshell (Second Lamp On 2-Lamp Ballasts)	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"

ELECTRONIC HID BALLASTS

Metal Halide

Lamp Data		Input Volts	Catalog Number* *Note 1*	Certifications			Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp. *Note 3*	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
Number	Watts			UL	CSA	RoHS¥ COMPLIANT							
20W Lamp, ANSI Code M156/C156 Minimum Starting Temp -20°C/-4°F													
1	20	120 277	IMH-G20-K-LF, IMH-G20-K-LFS or IMH-G20-K-BLS *Note 2*	✓	✓	✓	0.2 0.10	24	90°C	3	K	0.5	4
1	20	120 277	IMH-G20-G-LF IMH-G20-G-BLS	✓	✓	✓	0.2 0.09	24	90°C	3	G	0.9	5
1	20	120 277	IMH-G20-E-LF	✓	✓	✓	0.21 0.09	24	90°C	3	E	0.8	5
22W Lamp, Philips Mini MasterColor, ANSI Code M175/C175, Minimum Starting Temp. -20°C/-4°F													
1	22	120	RMH-20-K-LF, RMH-20-K-LFS or RMH-20-K-BLS *Note 2*	✓	✓	✓	0.23	26	90°C	4	K	0.5	6
39W Lamp, ANSI Code M130/C130, Minimum Starting Temp. -20°C/-4°F													
1	39	120 277	IMH-39-K-LF, IMH-39-K-BLS or IMH-39-K-LFS *Note 2*	✓	✓	✓	0.39 0.18	46 45	90°C	3	K	0.5	4
1	39	120 277	IMH-39-G-LF or IMH-39-G-BLS	✓ ✓	✓ ✓	✓ ✓	0.37 0.17	44 43	90°C	3	G	0.9	3
1	39	120 277	IMH-39-E-LF	✓ ✓	✓ ✓	✓ ✓	0.38 0.16	44 43	90°C	3	E	0.8	5
1	39	120 277	IMH-39-A-BLS-ID×	✓ ✓	✓ ✓	✓ ✓	0.45 0.18	48 47	90°C	8	A	1.5	5
2	39	120 277	IMH-239-A-LF or IMH-239-A-BLS	✓ ✓	✓ ✓	✓ ✓	0.74 0.31	89 86	85°C	5	A	1.7	6
39W Mini MasterColor Lamp, CDM-Tm 35W/930, ANSI Code M179/C179 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
1	39	120	RMH-39-K-LF, RMH-39-K-BLS or RMH-39-K-LFS *Note 2*	✓	✓	✓	0.40	45	90°C	4	K	0.5	6

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 IMH-39-K-LF, RMH-39-K-LF, RMH-20-K-LF and IMH-G20-KLF input and output lead wires exit on opposite sides of ballast. For IMH-39-K-LFS, RMH-39-K-LFS, RMH-20-K-LFS and IMH-G20-K-LFS all lead wires exit the same side of the ballast.
3. 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.

* 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)

¥ Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products

Refer to page 6-3 for lead wire information
Refer to pages 6-10 to 6-11 for ballast dimensions

Metal Halide

Lamp Data Number	Lamp Data Watts	Input Volts	Catalog Number* Note 1	Certifications (E)	Certifications (UL)	Certifications (CSA)	Certifications RoHS¥	Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp. Note 3	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
50W Lamp, ANSI Code M110, or C193(Philips CDM Elite), Minimum Starting Temp. -20°C/-4°F														
1	50	120 277	IMH-50-E-LF		✓	✓	✓	0.48 0.20	57 56	90°C	3	E	0.8	5
1	50	120 277	IMH-50-K-LF, IMH-50-K-BLS or IMH-50-K-LFS *Note 2*		✓	✓	✓	0.48 0.21	57 56	90°C	3	K	0.5	4
1	50	120 277	IMH-50-G-LF or IMH-50-G-BLS		✓	✓	✓	0.47 0.21	56 55	90°C	3	G	0.9	3
70W Lamp, ANSI Code M98/C98 or M139/C139 or M143, Minimum Starting Temp. -20°C/-4°F														
1	70	120 277	IMH-70-G-LF or IMH-70-G-BLS		✓	✓	✓	0.66 0.28	79 76	90°C	3	G	0.9	3
1	70	120 277	IMH-70-E-LF		✓	✓	✓	0.68 0.29	80 78	90°C	3	E	0.8	5
1	70	120 277	IMH-70-D-LF or IMH-70-D-BLS		✓	✓	✓	0.66 0.28	79 76	85°C	3	D	1.6	3
1	70	120 277	IMH-70-A-BLS-ID✖		✓	✓	✓	0.72 0.31	86 84	90°C	8	A	1.6	6
100W Lamp, ANSI Code M90/C90 or M140 or C191, Minimum Starting Temp. -20°C/-4°F														
1	100	120 277	IMH-100-D-LF or IMH-100-D-BLS		✓	✓	✓	0.92 0.40	110 109	85°C	3	D	1.6	5
1	100	120 277	IMH-100-B-LF		✓	✓	✓	0.92 0.40	110 109	85°C	3	B	1.5	5
1	100	120 277	IMH-100-A-BLS-ID✖		✓	✓	✓	0.96 0.42	115 113	90°C	8	A	1.4	6
150W Lamp, ANSI Code M102/C102 or M142/C142, Minimum Starting Temp. -20°C/-4°F														
1	150	120 277	IMH-150-H-LF or IMH-150-H-BLS *Note 4*	✓	✓	✓	✓	1.4 0.6	165 161	85°C	3	H	1.9	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 IMH-39-K-LF, RMH-39-K-LF, RMH-20-K-LF and IMH-G20-KLF input and output lead wires exit on opposite sides of ballast. For IMH-39-K-LFS, RMH-39-K-LFS, RMH-20-K-LFS and IMH-G20-K-LFS all lead wires exit the same side of the ballast.
3. 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.
4. "Circle E" denotes EISA compliance

* 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)

¥ Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products

Refer to page 6-3 for lead wire information
Refer to pages 6-10 to 6-11 for ballast dimensions

ELECTRONIC HID BALLASTS

Fixed Output and Programmable CosmoPolis Xtreme

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 1950s, the light source of choice became mercury vapor, followed by high pressure sodium in the 1960s.

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.

All CosmoPolis ballasts come standard with our Xtreme features of 80,000 hr lifetime[1] and integral 10kV/5kA surge protection.

The Six Performance Features of the CosmoPolis System:

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

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 45W instead of HPS 50W, QMH 70W.
- 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.

Programmable

CosmoPolis Programmable ballasts revolutionize outdoor HID lighting allowing flexible control of the lighting system. Programmable features include:

1. Networked control and monitoring of each individual CosmoPolis luminaire with DALI-compatible systems.
2. Dimming to 60% of Lamp Power.
3. Line voltage dimming.
4. Constant light output, Adjustable light output
5. Integrated Dynadimmer that allows up to fve set periods of light level. More information on Dynadimmer in Controls Section 8.
6. Pilot line switch override control.
7. Bi-level dimming

Applications

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

See footnote on page 6-12.

CosmoPolis Xtreme

	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)	System Lumens/ Watt[3]
	Number	Watts			UL	CSA								
45W CosmoWhite Lamp, ANSI Code C196 Minimum Starting Temp -30°C/-22°F														
New	1	45	208 277	ICW-45-Q-LS[1]	✓	✓	0.25 0.18	51 51	90°C	10	Q	1.8	30	93
New	1	45	208 277	IDCW-45-M-LS[1,2]	✓	✓	0.26 0.20	54 54	90°C	11	M	2.1	30	88
	1	45	120	RCW-45-M-LS	✓	✓	0.43	51	90°C	10	M	2.1	30	93
60W CosmoWhite Lamp, ANSI Code C187 Minimum Starting Temp -30°C/-22°F														
	1	60	208 277	ICW-60-N-LS[1]	✓	✓	0.33 0.24	67 67	90°C	10	N	1.9	30	103
New	1	60	208 277	ICW-60-Q-LS[1]	✓	✓	0.33 0.24	67 67	90°C	10	Q	1.8	30	103
New	1	60	208 277	IDCW-60-M-LS[1,2]	✓	✓	0.33 0.24	67 67	90°C	11	M	2.1	30	103
	1	60	120	RCW-60-M-LS	✓	✓	0.58	68	90°C	10	M	2.1	30	101
90W CosmoWhite Lamp, ANSI Code C188 Minimum Starting Temp -30°C/-22°F														
	1	90	208 277	ICW-90-M-LS[1]	✓	✓	0.49 0.37	99 99	90°C	10	M	2.1	30	103
New	1	90	208 277	ICW-90-Q-LS[1]	✓	✓	0.49 0.37	99 99	90°C	10	Q	1.8	30	103
	1	90	208 277	IDCW-90-M-LS[1,2]	✓	✓	0.49 0.37	99 99	90°C	11	M	2.1	30	103
140W CosmoWhite Lamp, ANSI Code C189 Minimum Starting Temp -30°C/-22°F														
	1	140	208 277	ICW-140-M-LS[1]	✓	✓	0.75 0.57	153 153	90°C	10	M	2.1	30	108
New	1	140	208 277	ICW-140-Q-LS[1]	✓	✓	0.75 0.57	153 153	90°C	10	Q	2.1	30	108
	1	140	208 277	IDCW-140-M-LS[1,2]	✓	✓	0.75 0.57	153 153	90°C	11	M	2.1	30	108
	1	140	120	RCW-140-T-LS	✓	✓	1.3	154	80°C	10	T	3.1	30	109

1 Operates for a voltage range of 208-277V
2 IDCW indicates Programmable ComoPolis ballasts
3 Based on initial lumens of Philips Cosmowhite lamps, CPO-T WHITE 45W, 60W, 90W, 140W/728, respectively

Refer to pages 6-10 to 6-11 for ballast dimensions

ELECTRONIC HID BALLASTS

MasterColor CDM Elite Medium Wattage

The Philips MasterColor Elite MW system offers a high 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 250W or 400W Metal Halide HID system.**

Philips "Green Flagship Product"

- Low mercury, no lead
- Up to 120 lm/W (lamp) or 107 lm/W (system)
- 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

Xtreme

The MasterColor CDM Elite MW Xtreme ballast, IMH-210-T-LS, revolutionizes outdoor HID lighting by extending the features of CosmoPolis Xtreme ballasts into outdoor applications for the 210W MasterColor Elite MW lamp. These include 80,000 hr lifetime[1] and 10kV/5kA integral surge protection.

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 help reduce environmental impact and CO^2 emission.
- Long average rated lamp life from 20,000 to 30,000 hours* 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 Number	Lamp Data Watts	Input Volts	Catalog Number	Certifications E	Certifications UL	Certifications CSA	Line Current (Amps)	Input Power ANSI (Watts)	Max. Case Temp.	Wiring Diag.	Fig.	Weight (lb)	Max. Distance to Lamp (ft)	Slide Switch Setting
210W MasterColor CDM Elite MW Lamp, ANSI Code C183 Minimum Starting Temp -20°C/-4°F														Preset at Factory
1	210	200 277	IZTMH-210315-R-LF[1]	✓	✓	✓	1.2 0.82	229 227	85°C	9	R	4.5	30	210W → 210W →
1	210	208 277	IMH-210-T-LS[1,2]	✓	✓	✓	1.11 0.83	228	90°C	10	T	3.1	30	NA
315W MasterColor CDM Elite MW Lamp, ANSI Code C182 Minimum Starting Temp -20°C/-4°F														
1	315	200 277	IZTMH-210315-R-LF[1]	✓	✓	✓	1.8 1.25	343 341	85°C	9	R	4.5	30	315W ← 315W ←

New

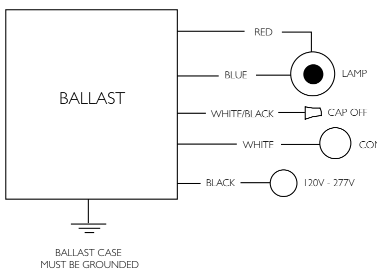
1 Operates for a voltage range of 200-277V
2 Operates for a voltage range of 208-277V. Minimum Starting Temperature -30°C/-22°F.
* Rated average life is the life obtained, on average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps, and allows for individual lamps or group of lamps to vary considerably from the average. CDM Elite MW 210/T12/930/o average rated life is 20,000 hours. CDM Elite MW 315/T9/942/u/e average rated life is 30,000 hours.

** Based on a comparison of published data of a Philips CDM EliteMW 315/T9/942/U/E lamp operated by Philips Advance IZTMH-210315-R-LF (341 System Watts) to a Philips MS400/BU/ED28/PS operated by a Philips Advance 71A6092AEE ballast (452 system Watts) operated for 30,000 hours (rated average life of 315W CDM Elite lamp).

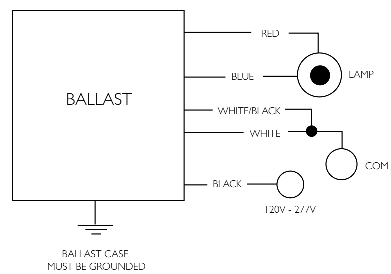
Refer to page 6-3 for lead wire information
Refer to pages 6-10 to 6-11 for ballast dimensions

See footnote on page 6-12.

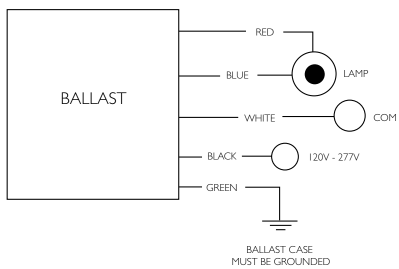
Wiring Diagrams



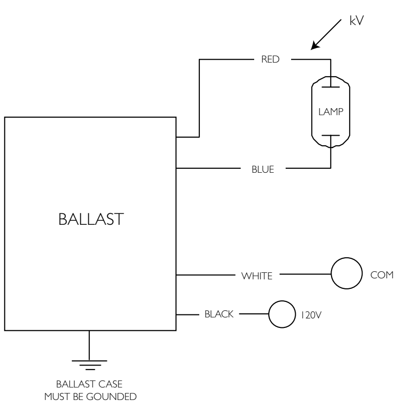
Wiring Diag. 1



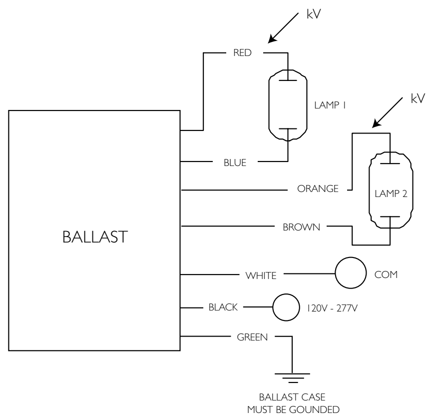
Wiring Diag. 2



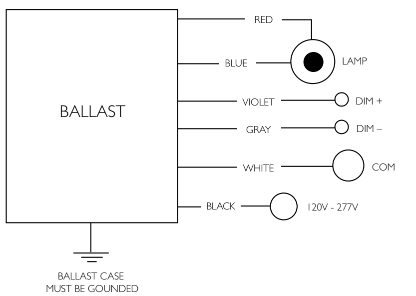
Wiring Diag. 3



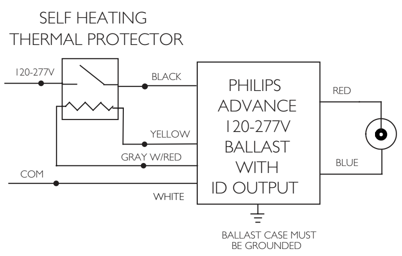
Wiring Diag. 4



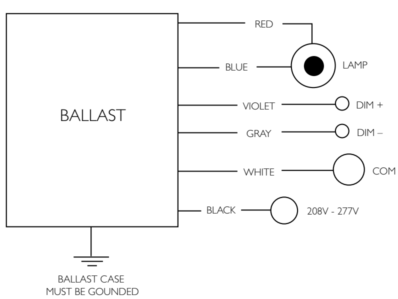
Wiring Diag. 5



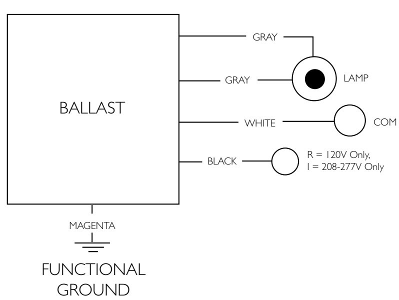
Wiring Diag. 6



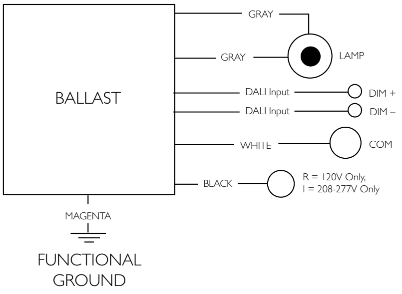
Wiring Diag. 8



Wiring Diag. 9



Wiring Diag. 10



Wiring Diag. 11

ELECTRONIC HID BALLASTS

Dimension Diagrams

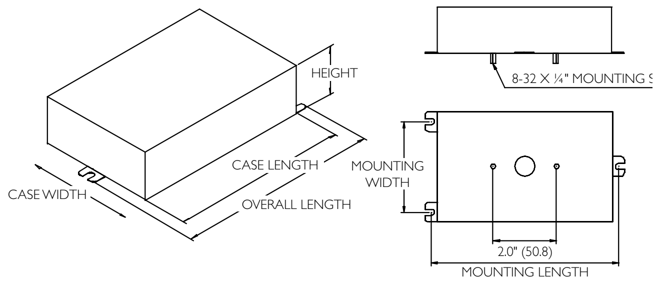


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
A/B	140mm [5.5"]	120mm [4.7"]	92mm [3.6"]	38mm [1.5"]	132mm [5.2"]	73mm [2.9"]
H	161mm [6.3"]	144mm [5.7"]	92mm [3.6"]	38mm [1.5"]	152mm [6.0"]	73mm [2.9"]

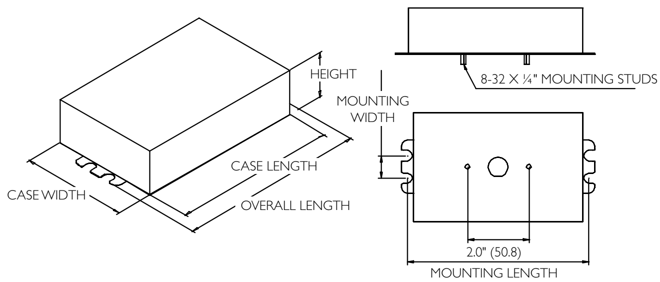


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
D	128mm [5.0"]	108mm [4.3"]	77mm [3.0"]	38mm [1.5"]	118mm [4.6"]	19mm [0.7"]

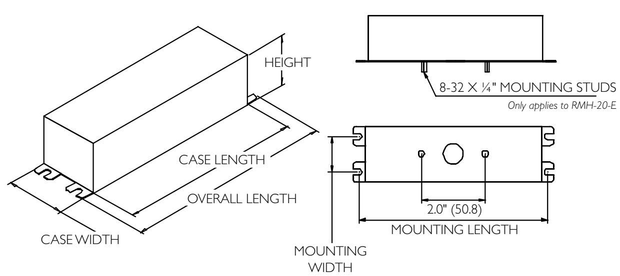


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
E	140mm [5.5"]	127mm [5.0"]	44mm [1.7"]	30mm [1.2"]	135mm [5.3"]	26mm [1.0"]

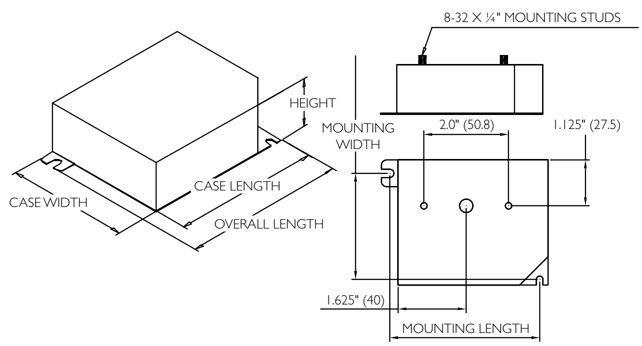


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
G	97mm [3.8"]	90mm [3.5"]	77mm [3.0"]	30mm [1.2"]	87mm [3.4"]	67mm [2.6"]

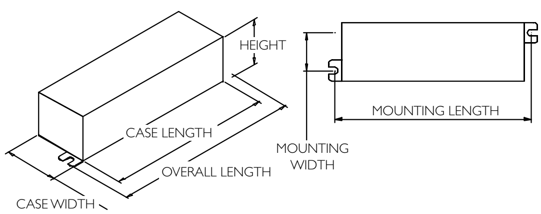
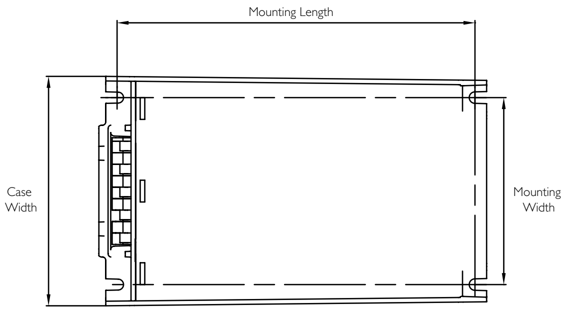


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
K	119mm [4.7"]	104mm [4.1"]	33mm [1.3"]	30mm [1.2"]	114mm [4.5"]	13.5mm [0.5"]

Dimension Diagrams



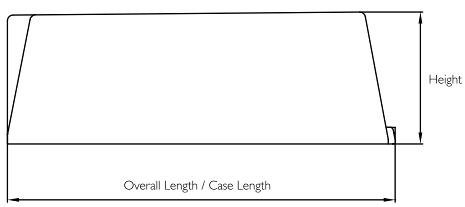
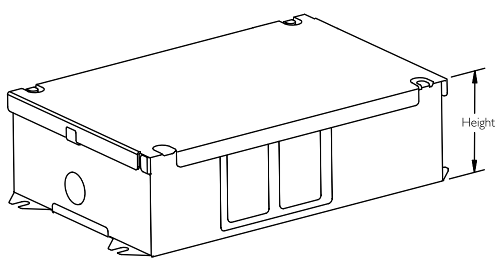


Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
M	150mm [5.9"]	150mm [5.9"]	65mm [2.6"]	65mm [2.6"]	136mm [5.4"]	47mm [1.8"]
N	135mm [5.3"]	135mm [5.3"]	65mm [2.6"]	65mm [2.6"]	126mm [4.9"]	47mm [1.8"]
Q	150mm [5.9"]	150mm [5.9"]	90mm [3.5"]	37mm [1.5"]	129mm [5.1"]	70mm [2.7"]
T	166mm [6.5"]	166mm [6.5"]	100mm [3.9"]	60mm [2.4"]	156mm [6.1"]	81.5mm [3.2"]



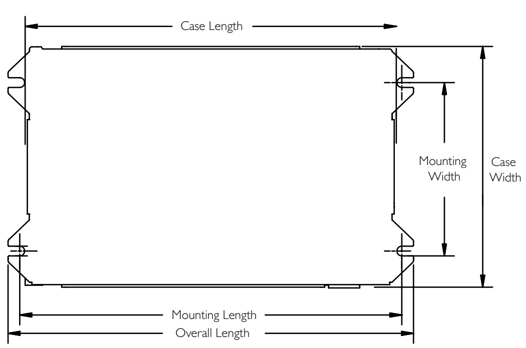


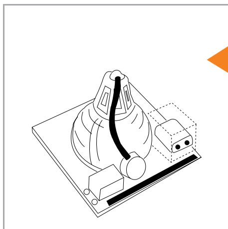
Figure	Overall Length	Length	Width	Height	Mounting Length	Mounting Width
R	208mm [8.2"]	191mm [7.5"]	124mm [4.9"]	56mm [2.2"]	192mm [7.7"]	86.5mm [3.4"]

ELECTRONIC HID BALLASTS

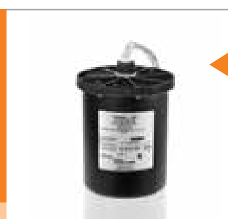
Footnotes:

1 Lifetime is specified as 80,000 Hours with 10% failures at Tcase at 80°C.

Notes



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



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

Note: For Electronic HID Ballasts, See Section 6

MAGNETIC HID 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 Operation

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.

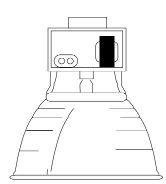
With many luminaires the fuse is physically located in the ballast compartment of the luminaire. The air temperature within this compartment can easily reach 80°C and still be within the design limitations of the luminaire.

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.

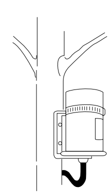
As a result, the fuse rating shown in the HID ballast tables is calculated at 2½ to 3 times the highest current draw of the ballast: lamp operating, starting or open circuit conditions. Typically fast blow fuses should be used. It is not necessary to use current limiting fuses but some applications may require their use. Additional testing is recommended to determine appropriate fuse type.

Ballast Design Applications

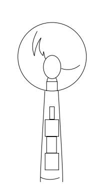
HID lamp ballasts are available in a variety of shapes and sizes for the most popular lighting applications. Six basic designs are in widest use today.



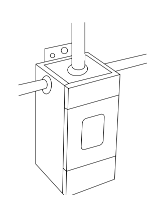
Core & Coil
(71A Series)



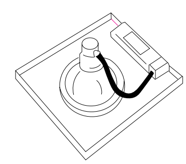
Outdoor Weatherproof
(79W Series)



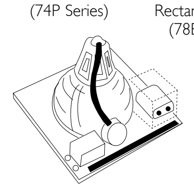
Postline
(74P Series)



Indoor Enclosed
Rectangular Can
(78E Series)



Fluorescent Can
(72C Series)



Encapsulated Core & Coil
(73B Series)

MAGNETIC HID BALLASTS

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. The assembled Philips Advance ballast is vacuum-pressure 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. 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, 170°C for true 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 Coils

We offer a wide range of ballasts that have coils made out of copper and/or aluminum. All Philips Advance ballasts adhere to ANSI specifications and are certified by respective agencies (UL, CSA, etc.). Ballasts with aluminum coil(s) 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 (see page 7-46 and 7-47 for mounting bracket details) 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 <u>weatherproof ballasts are not water-submersible</u>.

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

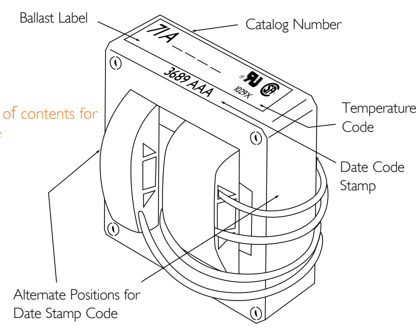
Lantern-type fixtures mounted on slender poles often require ballasts which will fit into these poles. Special, elongated core & coil ballasts are potted in resin in cylindrical cans having a 2.55" outside diameter. All include leads necessary for direct connection to a photocell.

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.

Ballast Date and Tempterature Codes

See catalog table of contents for important change



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 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.

If a fixture is UL listed at a specific wattage such as UL 1029C, all ballasts of the same wattage with an A, B or C temperature classification are acceptable for use within that fixture. A ballast with a higher temperature classification (D, E, F, etc.) is not acceptable for use within that same fixture. A ballast with a higher wattage rating than the listed fixture wattage rating is also not acceptable for use and cannot be installed, regardless of the ballast temperature classification.

Reactor ballasts utilizing integral ignitors are thermally protected to limit the maximum ignitor component temperature within the fixture. They have a lower maximum operating temperature limit than a reactor ballast with an external ignitor. When replacing a reactor ballast using an external ignitor with a reactor ballast using an integral ignitor, it is recommended that in-fixture thermal testing is performed which simulates the application to ensure that the thermally protected reactor does not cycle in the fixture causing the lamp to drop out.

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. (UL File Number E94520)

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.

RoHS COMPLIANT

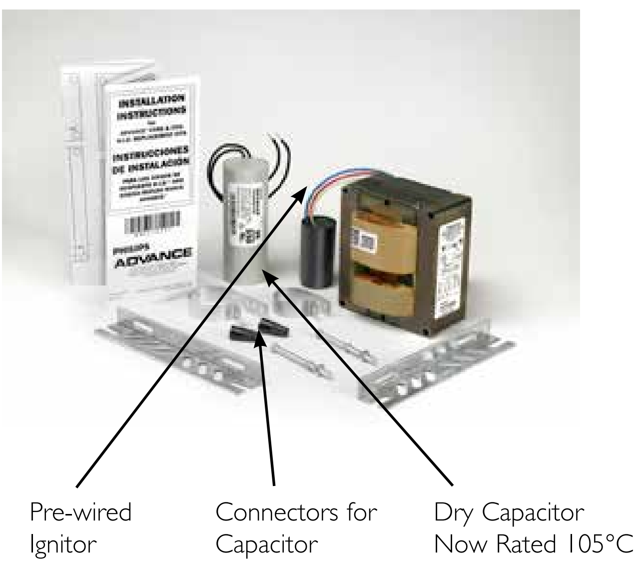
Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products.

Core & Coil Replacement Kits

Distributor Kits and Replacement Ignitors

Philips Lighting furnishes 120/208/240/277 Philips Advance Quadri-Volt core & coil ballasts to allow the stocking distributor to conveniently meet the replacement and retrofit needs of customers. In addition, we now offer 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 7-40 through 7-43.



Dry Capacitors

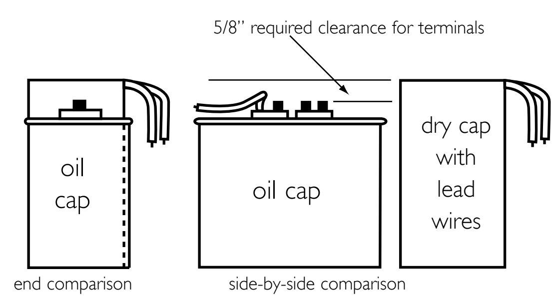
We have extended the operating voltage range of our dry capacitors from 330 to 400V. This means that our most popular HID replacement kits for 175, 250, and 400W metal halide lamps now contain dry capacitors and offer the additional benefits available only with a dry capacitor.

Those benefits are:

- Dry capacitors are typically 25 to 50% smaller than their oil-filled counterparts, allowing the Philips Advance ballast kit to 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 provide 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	RoHS COMPLIANT
35W/39W Lamp, ANSI Code M130 (Pulse Start)						
120/277	71A5081-001D	HX-HPF	3.8	✓	✓	✓
50W Lamp, ANSI Code M110 or M148 (Pulse Start)						
120/277	71A5181-001D	HX-HPF	4.9	✓	✓	✓
120/208/ 240/277	71A5191-001D	HX-HPF	4.0	✓	✓	✓
70W Lamp, ANSI Code M98 or M143 (Pulse Start)						
120/208/ 240/277	71A5292-001D	HX-HPF	5.0	✓	✓	✓
100W Lamp, ANSI Code M90 or M140 (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)						
120/208/ 240/277	71A5692-001D	Super CWA	8.0	✓	✓	✓
250W Lamp, ANSI Code M138 or M153 (Pulse Start)						
120/208/ 240/277	71A5792-001D	Super CWA	9.5	✓	✓	✓
320W Lamp, ANSI Code M132, M154 or M170 (Pulse Start)						
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)						
120/208/ 240/277	71A5993-001D	Super CWA	11.0	✓	✓	✓
400W Lamp, ANSI Code M135 or M155 or M172 (Pulse Start)						
120/208/ 240/277	71A6092-001D	Super CWA	11.0	✓	✓	✓
480/120T	71A6042-001D	Super CWA	15.0	✓	✓	✓
120/208/ 240/277/ 480	71A6052001D	Super CWA	16.0	✓	✓	✓

Pulse Start Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
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	✓	✓	✓
120/208/ 240/277/ 480	71A6553-001	Super CWA	24..0	✓	✓	✓
347/ 480/120T	71A65F3-001	Super CWA	22..0	✓	✓	✓

Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
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 4x4 Core	9.0	✓	✓	✓
120/208/ 240/277/ 480	71A5750-001D		10.0	✓	✓	✓
120/208/ 240/277	71A5771-001D	CWA 3x3 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	✓	✓	✓

MAGNETIC HID BALLASTS

Core & Coil Replacement Kits

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications: UL	CSA	RoHS COMPLIANT
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	✓	✓	✓
120/208/240/277	71A7891-001D	HX-HPF	5.6	✓	✓	✓
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

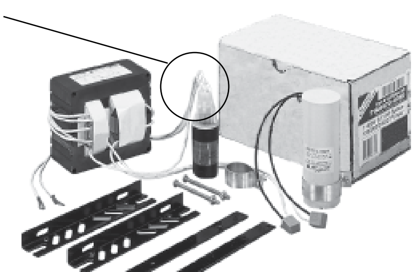
"B" Suffix denotes 120V reactor circuit kits featuring single-coil reactor ballasts with integral ignitors. The kit includes a mounting bracket (PC848S) sized specifically for the small reactor ballasts.

Compact Reactor Core and Bracket

HPS Kits with Plug-In Ignitors

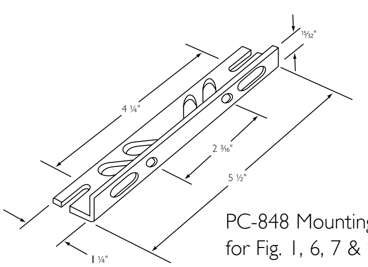
"C" Suffix (p.7-7) denotes standard HPS kit except with plug-in ignitor. A mating receptacle is attached to the core and coil lead wires, ready for immediate connection.

Connectorized ignitor and mating receptable

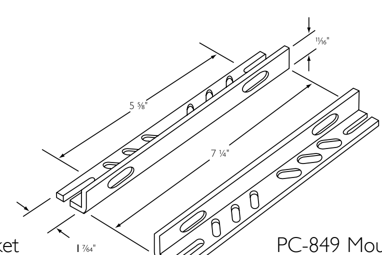


Core & Coil Mounting Brackets

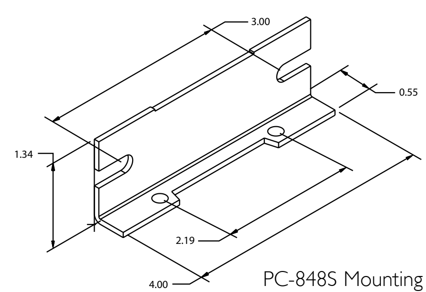
Included with all Replacement Kits



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

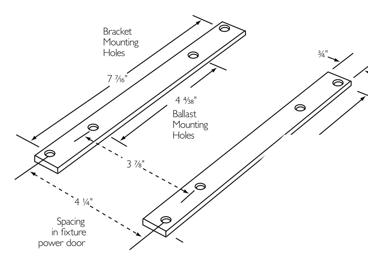


PC-849 Mounting bracket for Fig. 2, 3a, 8, 8a &10.



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, 3a & 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	RoHS COMPLIANT
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	✓	✓	✓
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	✓	✓	✓

Core & Coil Mounting Brackets
Included with all Replacement Kits

Low Pressure Sodium

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

MAGNETIC HID BALLASTS

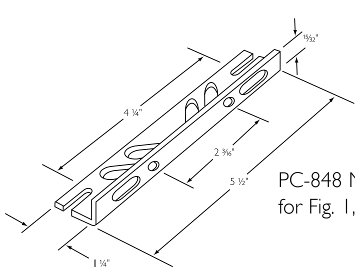
Tri-Tap Replacement Core & Coil Kits for Canada

Metal Halide

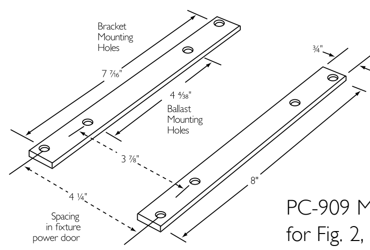
Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
70W Lamp, ANSI Code M98						
120/ 277/347	71A52A2-001D	HX-HPF	5.0	✓	✓	✓
100W Lamp, ANSI Code M90						
120/ 277/347	71A53A0-001D	HX-HPF	5.5	✓	✓	✓
175/150W Lamp, ANSI Code M57/M107						
120/ 277/347	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	✓	✓	✓

High Pressure Sodium

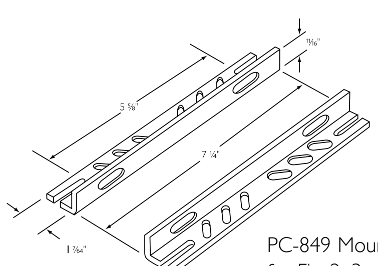
Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
70W Lamp, ANSI Code S62						
120/ 277/347	71A79A1-001D	HX-HPF	5.5	✓	✓	✓
100W Lamp, ANSI Code S54						
120/ 277/347	71A80A1-001D	HX-HPF	7.5	✓	✓	✓
150W Lamp, ANSI Code S55						
120/ 277/347	71A81A2-001D	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	✓	✓	✓



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



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



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

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.

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.

Metal Halide

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
100W Lamp, ANSI Code M90 or M140 (Pulse Start)						
120/208/ 240/277	77L5390-001D	HX-HPF	5.5	✓	✓	✓
150W Lamp, ANSI Code M102 or M142 (Pulse Start)						
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	✓	✓	✓

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 is warranteed by Philips Lighting Electronics N.A.
- **Higher Wattage Options –** Philips Advance Class N (200°C) insulation system on 1000W units provides an additional 20°C margin for high ambient applications

High Pressure Sodium

Input Volts	Catalog Number	Circuit Type	Total Weight (Lbs)	Certifications		
				UL	CSA	RoHS COMPLIANT
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

We have 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, -ML = "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, 100/200V or 230/400/480

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			Non-PCB Capacitor (Page 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
	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
	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	R-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	71A5105-500DP	HX-PFC	67	2.0	275	3	F	6	1.1	1.3	28	120	7C280M12RA	D	2.3	LI533-H4	15	A
	120/277	**71A5181-001D**	HX-HPF	67	1.2/.5	254	3/2	K	1	1.2	2.3	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	2.6	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 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example -500DML). Ballast is branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

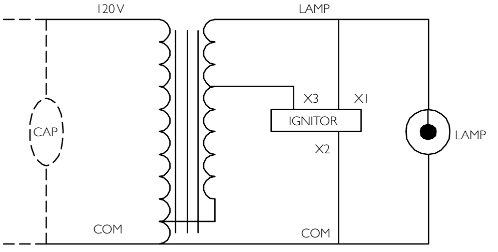


Fig. F

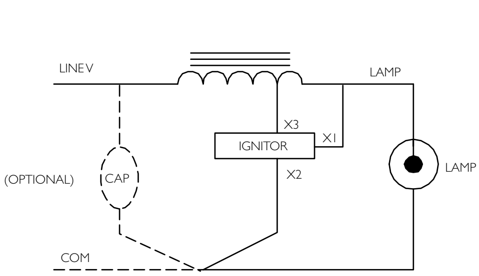


Fig. G

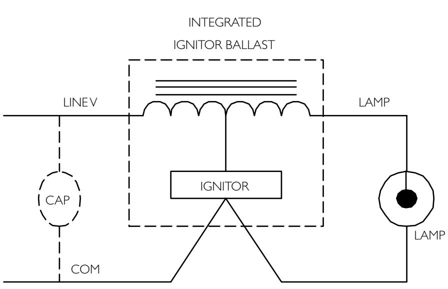


Fig. H

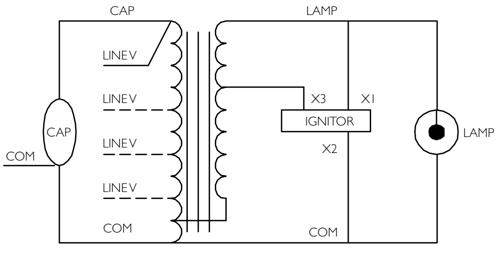


Fig. K

Refer to page 7-12 for dimensions

MAGNETIC HID BALLASTS

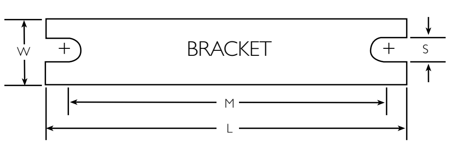
60 Hz Core & Coil Ballasts

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)		
70W Lamp, ANSI Code M98 (Medium Base) or M143 (Pulse Start)																			
120	71A5205-500DP	HX-PFC	94	1.4	255	4	F	6	1.6	2.7	36	120	7C360M12RA	D	3.7	LI533-H4	10	B	✣
127/220	71A52H2-500DML	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	1.7/1.0/ .8/.7	255	4/3/ 2/2	K	14	1.5	2.9	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	71A5280-510D	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



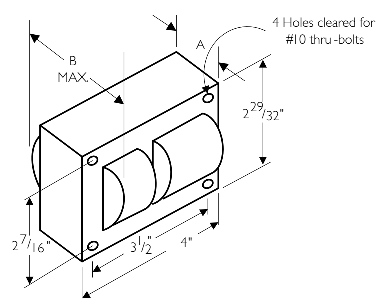


Fig. 14
(3" x 4" Core)

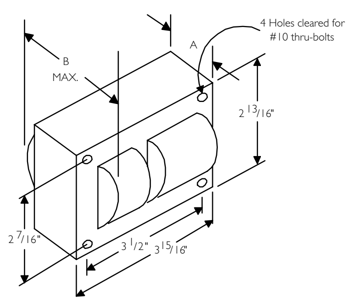


Fig. 1
(3" x 4" Core)

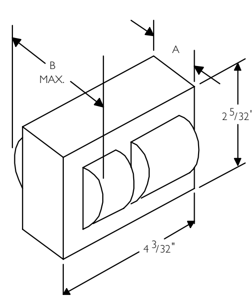


Fig. 6
(2" x 4" Core)

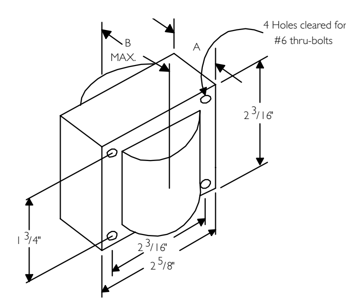


Fig. 9
(2 5/8" x 2 3/16" Reactor Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
	100W Lamp, ANSI Code M90 or M140 (Pulse Start)																		
NOM	127/220	71A53H0-500DML	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	120/208 240/277	71A5390-500D **71A5390-001D**	HX-HPF	129	2.5/1.5/ 1.3/1.1	260	10/5/ 5/4	K	14	1.5	3.1	12	280	7C120M30RA	D	5.5	LI533-H4	20	B/B/ 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	7C100M30RA	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	7C100M30RA	D	3.2	LI533-H4	2	A
✣	277	71A5337-510DBP	R-HPF	118	1.1	277	3	H	9	1.8	3.1	10	280	7C100M30RA	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 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example -500DML).. Ballast is branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

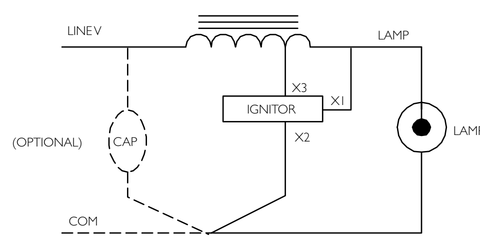


Fig. G

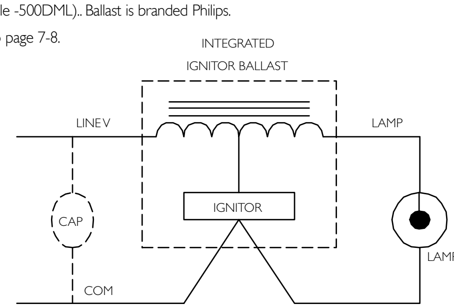


Fig. H

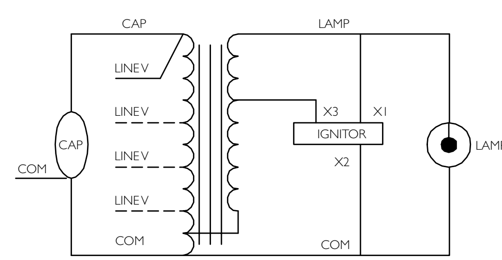


Fig. K

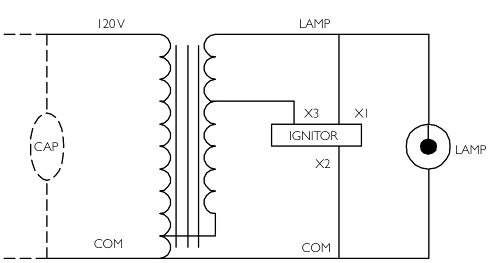


Fig. F

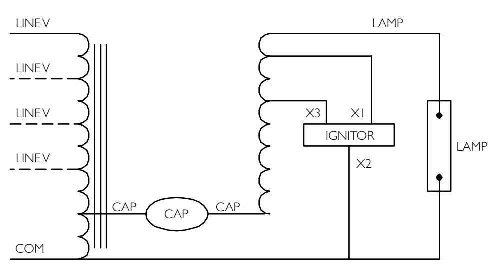


Fig. L

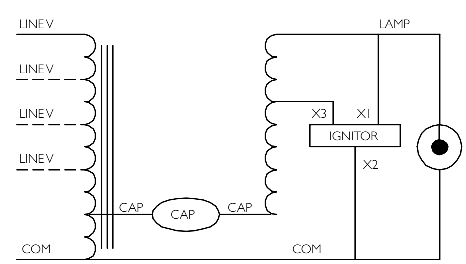


Fig. M

MAGNETIC HID BALLASTS

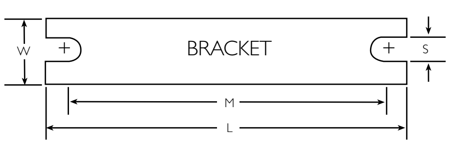
60 Hz Core & Coil Ballasts

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)	
								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	3.5/2.1/ 1.7/1.5	250	10/5/ 5/4	K	14	2.3	3.9	16	280	7C160M30RA	D	7.0	LI533-H4	10	C/B/ B/A	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	71A5443-520DT	Super CWA	185	0.4	215	5	M	1	2.4	3.8	16	300	7C160M30RA	D	7.5	LI501-J4	5	C	
120/208 240/277	71A5493-500D	Super CWA	190	2/1/ .95/.8	215	5/2.5/ 2/2	M	1	2.4	3.8	16	300	7C160M30RA	D	8.3	LI501-J4	5	D/C/ D/C	
120/ 277/347	71A54A3-500D	Super CWA	189	1.7/ .8/.7	187	5/ 2/2	L	1	2.7	4.0	22	240	7C220M24RA	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



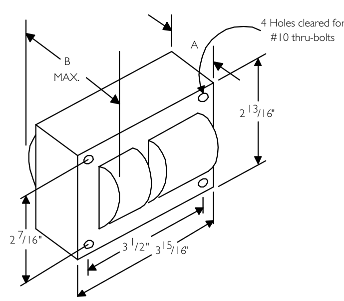


Fig. 1
(3" x 4" Core)

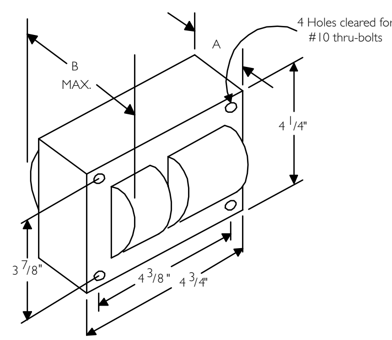


Fig. 2
(4¼" x 4¾" Core)

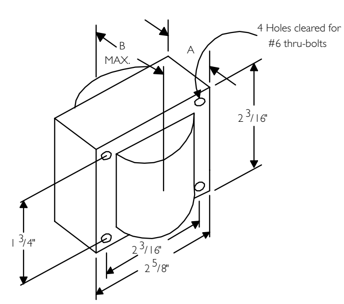


Fig. 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

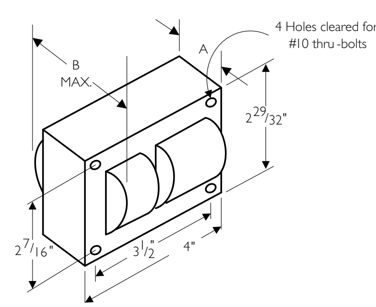


Fig. 14
(3" x 4" Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 7-3)
	175W Lamp, ANSI Code M57 or 150 Watt Lamp, ANSI Code M107 or 145W lamp, ANSI Code C192 (Philips AllStart)**																		
	480	**71A5540-001D**	CWA	210	0.5	305	2	A	1	2.4	4.0	10	400	7C100M40R	D	8.5	NA	NA	D
NOM	127/220	71A55H0-500DML	CWA	210	1.8/1.1	305	5/3	A	14	2.4	3.9	10	400	7C100M40R	D	8.0	NA	NA	B/B
NOM	120/208 240/277	71A5590-500D	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	A	14	2.5	4.0	10	400	7C100M40R	D	7.0	NA	NA	C/D/ D/D
	120/208 240/277	**71A5570-001D**	CWA	210	1.8/1.1/ .9/.8	305	5/3/ 3/2	A	14	2.5	4.0	10	400	7C100M40R	D	7.5	NA	NA	C/D/ D/D
🍁	120/ 277/347	71A55A0-500D **71A55A0-001D**	CWA	213	1.9/ .8/.7	305	5/ 3/2	A	14	2.4	4.0	10	400	7C100M40R	D	7.0	NA	NA	C/ C/D
	175W Lamp, ANSI Code M137 or M152 (Pulse Start) or 145W Lamp, ANSI Code 192 (Philips AllStart)**																		
Ⓔ	480/120T	71A5541-500DTEE	Super CWA	198	0.45	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	0.45	278	2	M	1	3.1	4.2	11	370	7C110M40	D	10.7	LI533-H5	2	A
Ⓔ ◆	120/208 240/277	71A5593-500DEE	Super CWA	198	1.8/1.1/ .9/.8	285	5/3/ 3/2	M	1	3.2	4.4	11	370	7C110M40	D	10.8	LI533-H5	2	A/A/ A/A
NOM	120/208 240/277	71A5593-500DML **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 7-4 to 7-8 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 7-39 to 7-43 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.

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example -500DML). Ballast is branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

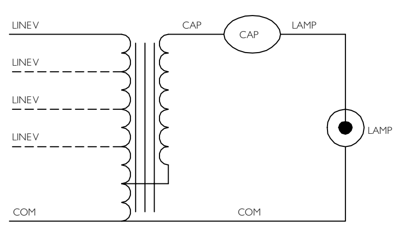


Fig. A

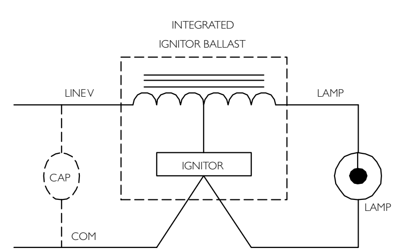


Fig. H

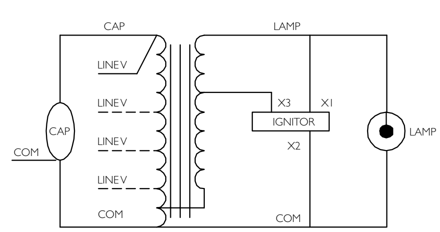


Fig. K

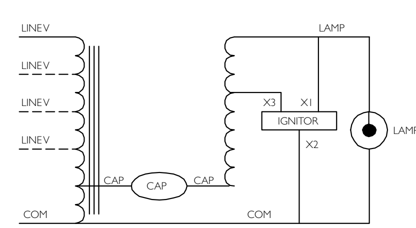


Fig. M

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

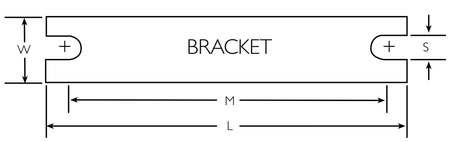
Metal Halide

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)	
								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)																			
480/ 120T	71A5642-500DTEE	Super CWA	227	0.6	240	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	240	6/4/ 3/3	M	1	3.0	4.2	15	330	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	◆ 🍁

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



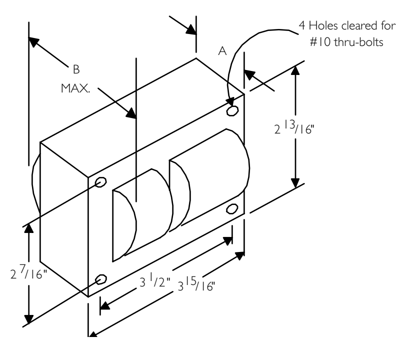


Fig. 1
(3" x 4" Core)

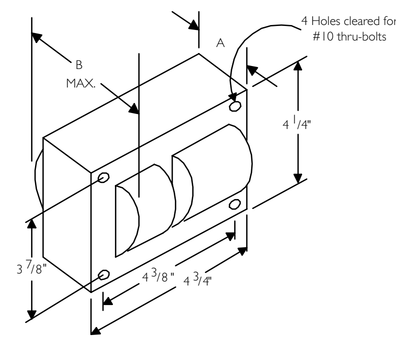


Fig. 2
(4¼" x 4¾" Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
250W Lamp, ANSI Code M58 or 205W Lamp, ANSI Code C184 (Philips AllStart)***																			
	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	**71A5770-001D**	CWA	298	2.5/1.4 1.3/1.1	300	8/5/ 5/3	A	2	1.5	3.2	15	400	7C150P40R	D	10.0	–	–	B/B/ B/B
NOM	120/208 240/277	71A5790-500DMLA	CWA	295	2.5/1.4 1.3/1.1	300	8/5/ 5/3	A	2	1.5	3.2	15	400	7C150P40R	D	9.1	–	–	A/A/ B/A
	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	3.2	15	400	7C150P40R	D	9.1	–	–	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	3.6	15	400	7C150P40R	D	10.0	–	–	A/ A/A
NOM	127/220	71A57H0-500DMLA	CWA	295	2.6/1.5	300	8/5	A	2	1.7	3.2	15	400	7C150P40R	D	10.0	–	–	A/A
◆	480	**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 7-4 to 7-8 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 7-39 to 7-43 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.

** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts. This lamp requires the use of the dedicated AS205W ballast family in order to achieve the 88% efficiency requirement of EISA in new fixtures.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example -500DML). Ballast is branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

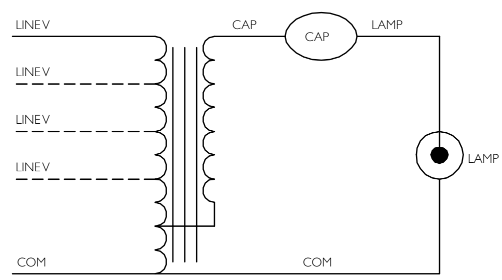


Fig. A

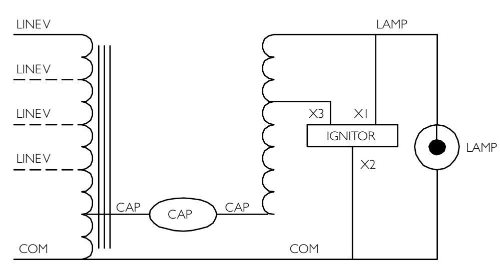


Fig. M

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

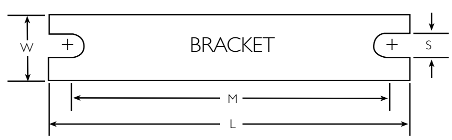
RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)	
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)		
250W Lamp, ANSI Code M138 or M153 (Pulse Start) or 205W Lamp, ANSI Code C184 (Philips AllStart)**																			
480/ 120T	71A5742-500DTEE	Super CWA	283	0.7	290	2	M	2	2.2	4.0	17	340	7C170P40	D	11.0	LI533-H4	2	A	Ⓔ
120/208/ 240/277/ 480	71A5752-500DAEE **71A5752-001D**	Super CWA	284	2.4/1.4/ 1.2/1.1/ 0.6	280	8/5/ 5/3/ 2	M	2	2.2	4.0	17	340	7C170P40	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	7C170P40	D	9.5	LI533-H4	2	A/A/ A/A	Ⓔ
120/208/ 240/277	**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	7C170P40	D	9.5	LI533-H4	5	A/A/ A/B	
120/208/ 240/277	71A5792-500DMLA	Super CWA	291	2.5/1.5/ 1.3/1.1	275	8/5/ 5/3	M	2	1.5	3.1	17	340	7C170P40	D	9.5	LI533-H4	2	A/A/ A/B	NOM
120/ 277/347	71A57A2-500D	Super CWA	291	2.5/ 1.1/.9	272	8/ 3/3	M	2	1.5	3.1	17	340	7C170P40	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



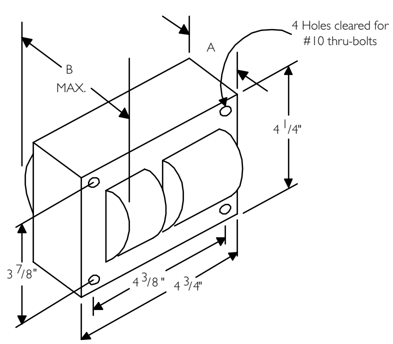


Fig. 2
(4¼" x 4¾" Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 7-3)
320W Lamp, ANSI Code M132 or M154 or M170 (Pulse Start)																			
Ⓔ	480/ 120T	71A5842-500DTAEE	Super CWA	363	0.8	285	3	M	2	2.2	4.1	21	345	7C210P34R	D	11.0	LI533-H4	2	B
Ⓔ	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	4.1	21	345	7C210P34R	D	11.8	LI533-H4	2	A/B/ A/A/ A
Ⓔ	120/208/ 240/277	71A5892-500DAEE	Super CWA	363	3.3/1.9/ 1.7/1.4	280	8/6/ 5/3	M	2	2.1	3.8	21	345	7C210P34R	D	11.0	LI533-H4	2	A/A/ A/A
	480/ 120T	**71A5842-001DT**	Super CWA	368	0.8	275	3	M	2	1.8	3.7	21	345	7C210P34R	D	11.0	LI533-H4	2	D
NOM	120/208/ 240/277	71A5892-500DMLA **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	7C210P34R	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	7C210P34R	D	10.0	LI533-H4	2	C/ C/C

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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.

** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example: -500DML). Ballasts are branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

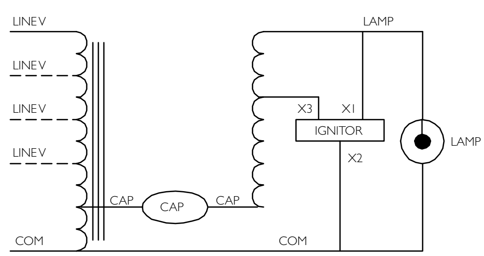


Fig. M

MAGNETIC HID BALLASTS

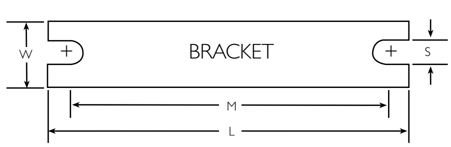
60 Hz Core & Coil Ballasts

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
	350W Lamp, ANSI Code M131 or M171 (Pulse Start)																		
Ⓔ	480/ 120T	71A5943-500DTAEE	Super CWA	397	0.9	280	3	M	2	2.2	4.1	22.5	345	7C225P40	D	11.6	LI533-H4	2	B
Ⓔ	120/208/ 240/277/ 480	71A5953-500DAEE	Super CWA	397	3.4/2.0/ 1.7/1.5/ 0.9	290	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	280	10/7/ 5/5	M	2	2.2	4.1	22.5	345	7C225P40	D	11.6	LI533-H4	2	A/B/ A/A
NOM	120/208/ 240/277	71A5993-500DMLA **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	71A59A3-500DA	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
	400W Lamp, ANSI Code M59, or 360W Lamp, ANSI Code M165, or 330W Lamp, ANSI Code C185 (Philips AllStart)**																		
NOM	480	71A6041-500DMLA	CWA	462	1.0	300	3	A	2	2.2	4.0	24	400	7C240P40R	D	13.0	–	–	E
	480/120T	**71A6041-001D**	CWA	462	1.0	300	3	A	2	2.2	4.0	24	400	7C240P40R	D	12.0	–	–	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	2.4	4.4	24	400	7C240P40R	D	13.1	–	–	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	2.1	4.0	24	400	7C240P40R	D	12.0	–	–	D/E/ D/E
NOM	120/208/ 240/277	71A6091-500DA, 71A6091-500DMLA	CWA	458	4.0/2.3/ 2.0/1.7	300	10/7/ 5/5	A	2	2.1	4.0	24	400	7C240P40R	D	12.0	–	–	D/E/ D/E
	120/ 277/347	71A60A1-500DA **71A60A1-001D**	CWA	460	4.0/ 1.7/1.4	300	10/ 5/4	A	2	2.1	4.0	24	400	7C240P40R	D	12.0	–	–	D/ D/D
NOM	127/220	71A60H1-500DMLA	CWA	454	3.9/2.2	300	10/7	A	2	2.2	4.1	24	400	7C240P40R	D	11.5	–	–	F/F
	120/ 208/240	71A60E6-500	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



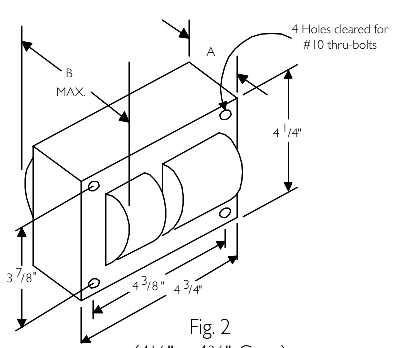


Fig. 2
(4¼" x 4¾" Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 7-3)
	400W Lamp, ANSI Code M135 or M155 or M172 (Pulse Start), or 330W Lamp, ANSI Code C185 (Philips AllStart)**																		
Ⓔ	480/ 120T	71A6042-500DTAEE	Super CWA	452	1.0	270	3	M	2	2.1	3.9	26	330	7C260P33R	D	12.0	LI533-H4	2	D
Ⓔ	120/208/ 240/277/ 480	71A6052-500DAEE **71A6052-001D**	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	12.5	LI533-H4	2	B/D/ D/B/ D
Ⓔ	120/208/ 240/277	71A6092-500DAEE	Super CWA	452	3.8/2.2/ 1.9/1.7	275	10/7/ 5/5	M	2	2.2	4.1	26	330	7C260P33R	D	12.2	LI533-H4	2	D/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	2	D
NOM	120/208/ 240/277	71A6092-500DMLA **71A6092-001D**	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	11.0	LI533-H4	2	C/D/ D/D
🍁	120/ 277/347	71A60A2-500DA	Super CWA	452	3.8/ 1.7/1.4	270	10/ 5/4	M	2	2.0	3.8	26	330	7C260P33R	D	11.0	LI533-H4	2	C D/D
	120/ 208/240	71A61E6-500D	Super CWI	455	4.2/ 2.4/2.1	265	10/ 7/5	V	2	2.2	3.8	26	330	7C260P33R	D	13.0	LI533-H4	2	E/ C/C
	450W Lamp, ANSI Code M144 (Pulse Start)																		
Ⓔ	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

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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.

** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example: -500DML). Ballasts are branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

✣ Includes auto-reset thermal protection.

◆ Compact 3 x 4 core design

Ⓔ Meets EISA 88% efficiency requirements.

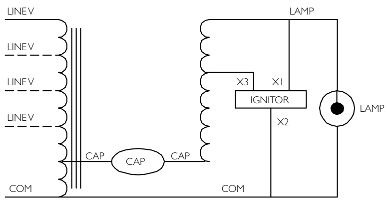


Fig. M

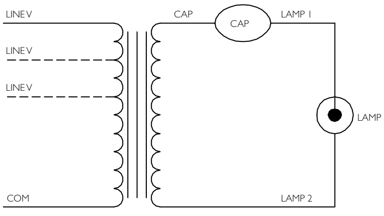


Fig. P

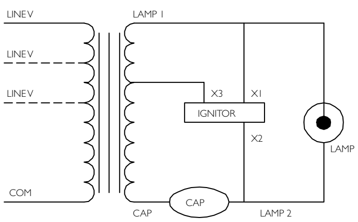


Fig. V

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

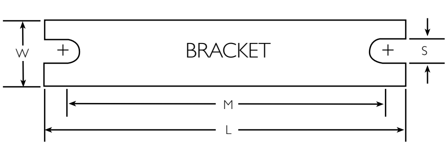
Metal Halide

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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/ 1.8	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/ 240/277	71A6492-500DA	Super CWA	818	6.95/3.9/ 3.5/3.0	355	20/10 10/8	M	8	3.0	5	28	400	7C280S40	D	21.0	LI573-H5	3	B/A/ A/A	A/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	15/9/ 8/8	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	6/4	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



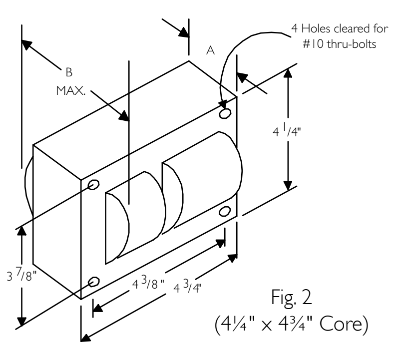


Fig. 2
(4¼" x 4¾" Core)

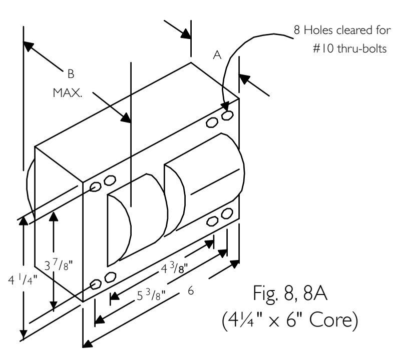


Fig. 8, 8A
(4¼" x 6" Core)

60 Hz Core & Coil Ballasts

Metal Halide

RoHS COMPLIANT

	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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
									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, or 860W Lamp, ANSI Code C194 (Philips AllStart)**																			
NOM	220	71A65J0-500ML	CWA	1080	4.9	415	12	A	2	3.3	5.3	24	480	MD2409-100	O	19.0	–	–	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
NOM	480/120T	71A6542-500TA **71A6542-001**	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
NOM	120/208 240/277	71A6592-500A **71A6572-001**	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	21.0	–	–	D/B/ B/B	A/A/ A/A
	120/208/ 240/277/ 480	71A6552-500 **71A6552-001CU**	CWA	1080	9.0/5.6/ 4.7/4.1/ 2.4	426	22/15/ 12/10/ 6	A	8	3.0	4.7	24	480	MD2409-100	O	23.7	–	–	D/D/ D/C C	A/A/ A/A A
	120/208/ 240/277/ 480	71A6552-500A **71A6552-001**	CWA	1090	9.2/5.8/ 4.8/4.1/ 2.4	430	25/15/ 12/10/ 6	A	8	3.9	5.6	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	5.6	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	7C400P30RA (Two in Series)	D	25.0	–	–	C/D	A/A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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.

** The 860 Watt Lamp, ANSI Code M194 is an energy saving, screw in replacement lamp for the M47 or M141 PS lamp that may reduce input watts up to 18% on existing ballasts.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example: -500DML). Ballasts are branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

◆ Special compact 4¼ x 4¾ core design

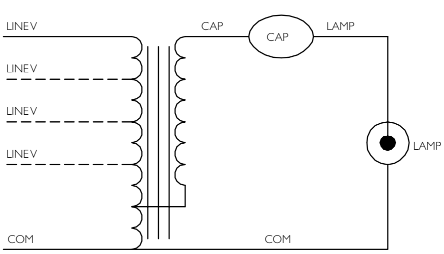


Fig. A

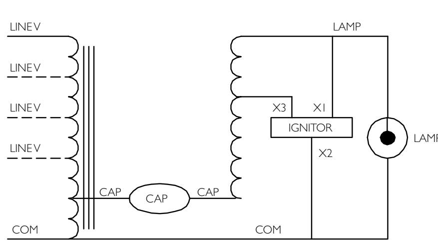


Fig. M

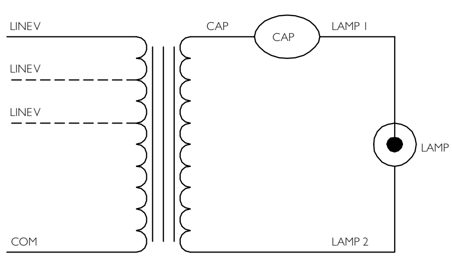


Fig. P

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

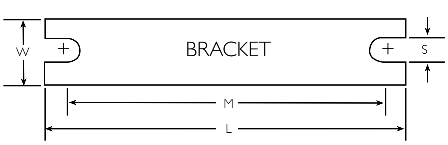
Metal Halide

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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 M141 (Pulse Start), or 860W Lamp, ANSI Code C194 (Philips AllStart)**																			
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	426	22/15/ 12/10/ 6	M	8	3.0	4.7	24	480	MD2409-000	O	22.0	LI572-H5★	5	D/D/ B/B B	A/A/ A/A A
120/208/ 240/277/ 480	**71A6553-001**	Super CWA	1090	9.2/5.8/ 4.8/4.1/ 2.4	430	25/15/ 12/10/ 6	M	8	3.9	5.6	24	480	MD2409-000	O	25.0	LI572-H5★	5	D/D/ C/C C	A/A/ A/A A
120/208/ 240/277	71A6593-500	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
120/208/ 240/277	**71A6593-001**	Super CWA	1080	9.2/5.3/ 4.6/4.0	430	20/15/ 10/10	M	8	3.2	5.2	24	480	MD2409-000	O	25.0	LI571-H5★	5	D/B/ B/B	A/A/ A/A
347/480/ 120T	71A65F3-500T **71A65F3-001**	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
277/347/ 480/120T	71A65F3- 500TA	Super CWA	1080	4.0/3.3/ 2.3	430	10/8/ 6	M	8	3.3	5.3	24	440	MD2409-000	O	21.0	LI571-H5★	5	D/D D	A/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

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



† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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.

** The 860 Watt Lamp, ANSI Code M194 is an energy saving, screw in replacement lamp for the M47 or M141 PS lamp that may reduce input watts up to 18% on existing ballasts.

NOM Certified ballast available for Mexican market. Add "ML" to suffix (example: -500DML). Ballasts are branded Philips.

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

◆ Special compact 4¼ x 4¾ core design

60 Hz Core & Coil Ballasts

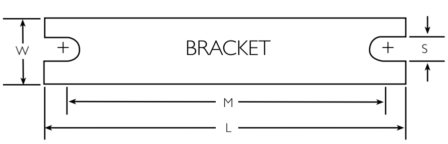
RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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)
1500W Lamp, ANSI Code M48																			
480/120T	71A6742-500T	CWA	1625	3.4	450	10	A	8a	4.2	6.2	32	525	MD3202-100	O	31.0	–	–	E	A
480	71A6742-600A **71A6742-001**	CWA	1610	3.5	460	10	A	8a	4.7	6.7	32	525	MD3202-100	O	30.0	–	–	E	A
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
NOM 120/208 240/277	71A6792-500A **71A6772-001**	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	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

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



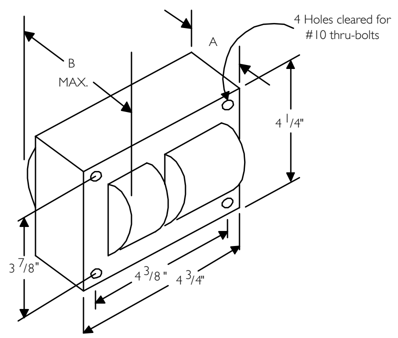


Fig. 2
(4¼" x 4¾" Core)

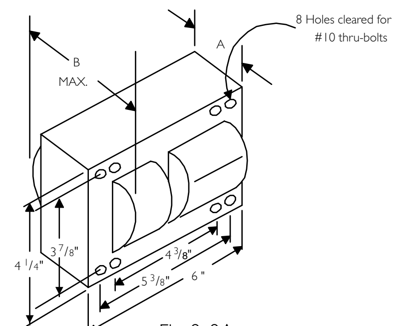


Fig. 8, 8A
(4¼" x 6" Core)

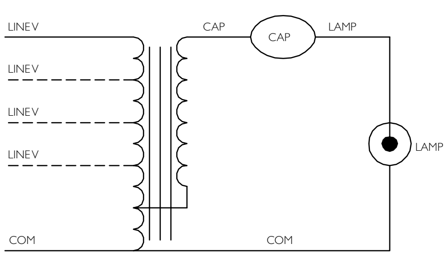


Fig. A

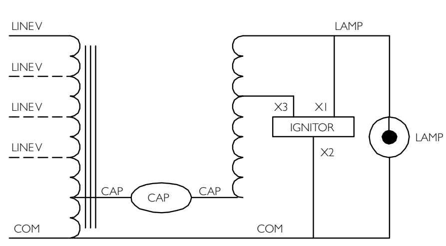


Fig. M

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

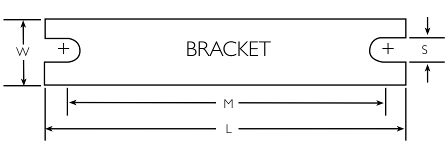
High Pressure Sodium

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
								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	71A7707-500D	R-HPF	46	.8	120	2	G	9	.7	1.8	14	120	7C140L12RA	D	1.3 1.5	LI551-H4	2	A
120	**71A7707-001DB**	R-HPF	46	.8	120	2	H	9	.7	2.2	14	120	7C140L12RA	D	1.3 1.5	Integral Ignitor	2	A
50W Lamp, ANSI Code S68																		
120	71A7807-500D	R-HPF	62	1.0	120	3	G	9	1.0	2.3	20	120	7C200M12RA	D	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	7C050L30RA	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	7C050L30RA	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



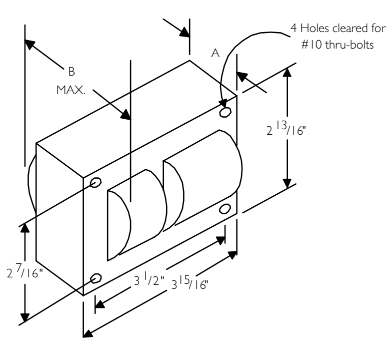


Fig. 1
(3" x 4" Core)

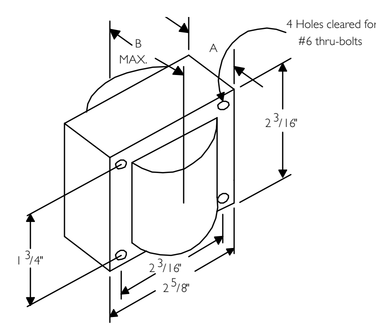


Fig. 9
(2 5/8" x 2 3/16" Reactor Core)

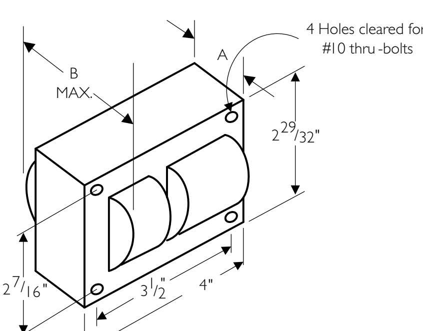


Fig. 14
(3" x 4" Core)

60 Hz Core & Coil Ballasts

High Pressure Sodium

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		Part Number	Max Dist To Lamp (ft)	
70W Lamp, ANSI Code S62																		
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
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	96	1.4/.9 .8/.7	120	5/3/ 2/2	K	14	1.5	2.9	7	300	7C070L30RA	D	5.6	LI551-H4	2	B/C/ B/C
120/208 240/277	**71A7971-001D**	HX-HPF	96	1.4/.9 .8/.7	120	5/3/ 2/2	K	14	1.5	2.9	7	300	7C070L30RA	D	5.6	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 127/220	71A79H8-500DMLA	CWA	100	.8/.47	108	2/2	M	1	1.8	3.4	32.5	300	7C325P30RA	D	5.1	LI551-J4	2	B/C
120/277	71A7988-500D	CWA	95	.9/.4	105	3/1	M	1	1.5	2.8	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/B

† Ordering information:

Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example: -500DML). Ballasts are branded Philips.

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

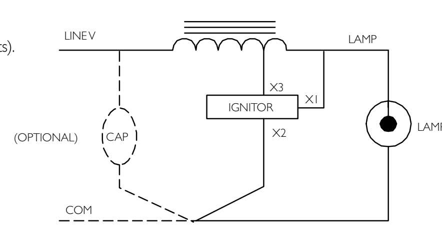


Fig. G

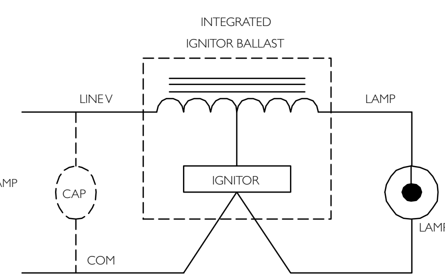


Fig. H

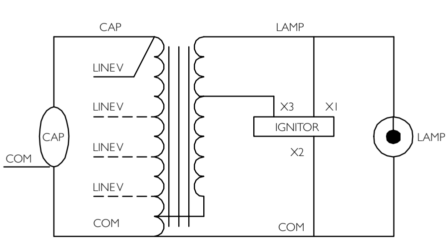


Fig. K

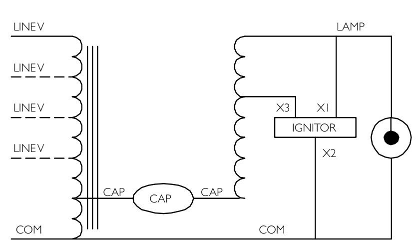


Fig. M

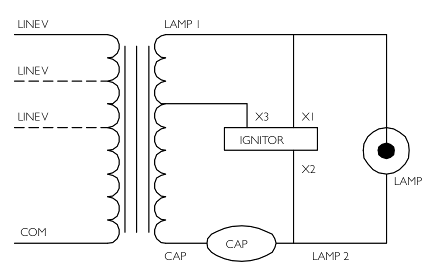


Fig. V

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

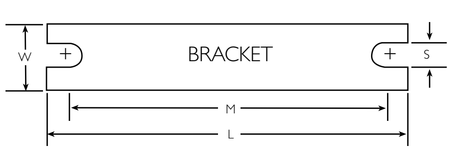
High Pressure Sodium

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
								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	3.0	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	135	2.2/1.3/ 1.1/.9	125	7/5/ 3/3	K	14	2.0	3.5	10	280	7C100M30RA	D	7.0	LI551-H4	2	E/F/ E/D
120/208/ 240/277	**71A8071-001D**	HX-HPF	135	2.2/1.3/ 1.1/.9	125	7/5/ 3/3	K	14	2.0	3.5	10	280	7C100M30RA	D	7.0	LI551-H4	2	E/F/ E/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
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
230	71A80J3-500D	CWA	136	0.61	118	2	M	1	2.0	3.3	34	240	7C340P24RA	D	7.5	LI551-J4	5	E
220/240	71A80J9-500DML	CWA	124	.6/.6	114	2/2	M	14	2.8	4.5	36	180	7C360P24RAT1	D	8.0	LI551-J4	5	A/A
NOM 120/ 208/240	71A80E6-500D	CWI	130	1.2/ .7/.6	108	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



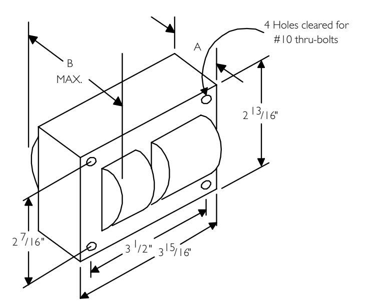


Fig. 1
(3" x 4" Core)

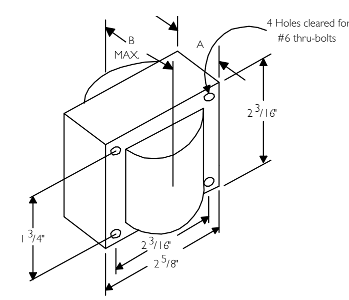


Fig. 9
($2^{5}/_{8}$" x $2^{3}/_{16}$" Reactor Core)

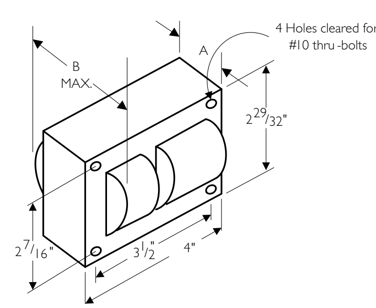


Fig. 14
(3" x 4" Core)

60 Hz Core & Coil Ballasts

RoHS COMPLIANT

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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)	U.L. Bench Top Rise Code 1029 (pg 7-3)
	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	**71A8142-001D**	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
NOM	120/208/ 240/277	71A8192-500D	HX-HPF	190	2.8/1.6/ 1.4/1.3	120	10/5/ 5/4	K	14	2.5	4.2	14	280	7C140M30RA	D	7.7	LI551-H4	2	E/E/ E/E
	120/208/ 240/277	**71A8172-001D**	HX-HPF	190	2.8/1.6/ 1.4/1.3	120	10/5/ 5/5	K	14	2.5	4.2	14	280	7C140M30RA	D	8.2	LI551-H4	2	E/E/ E/E
	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

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example: -500DML). Ballasts are branded Philips.

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

LL Special high efficiency/ low-loss ballast

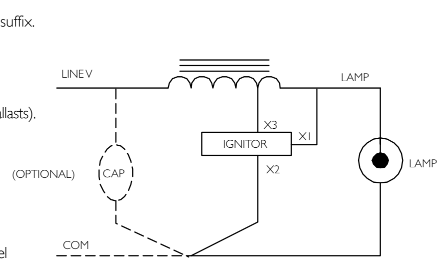


Fig. G

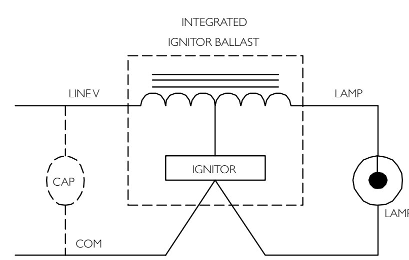


Fig. H

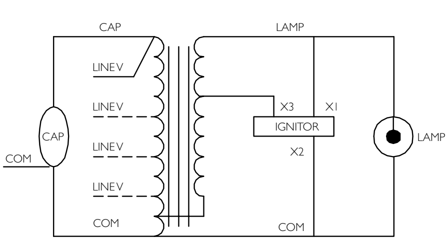


Fig. K

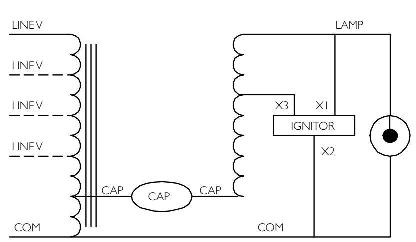


Fig. M

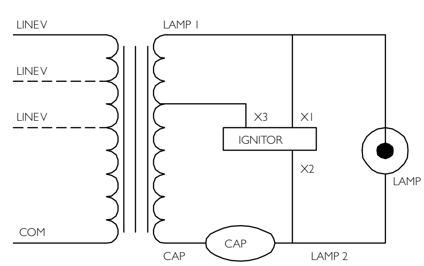


Fig. V

MAGNETIC HID BALLASTS

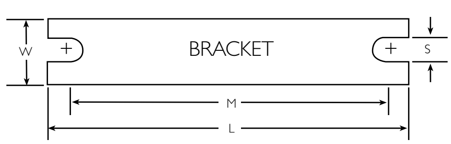
60 Hz Core & Coil Ballasts

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									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)																		
NOM	127/220	71A81H8-500DMLA	CWA	190	1.6/.9	110	5/3	M	14	3.0	4.5	55	170	7C550P24RA	D	9.7	LI551-J4	10	D/C
	480	71A8148-500D	CWA	188	0.5	110	1	M	1	2.5	3.8	55	170	7C550P24RA	D	8.0	LI551-J4	10	E
	230	71A81J3-500D	CWA	183	0.84	110	2	M	1	2.8	4.1	55	240	7C550P24RA	D	8.5	LI551-J4	10	E
LL **NOM**	220/240	71A81J9-500DML	CWA	170	0.8/0.7	110	2/2	M	2	2.2	3.9	60	240	7C600P24RAT1	D	13.5	LI551-J4	2	A/A
	120/ 208/240	71A81E6-500D	CWI	190	1.8 1/.9	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	**71A8146-001D**	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



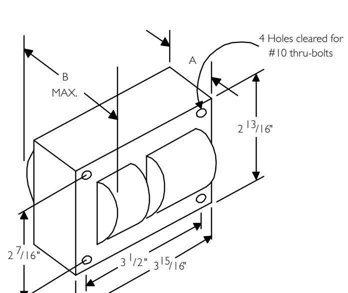


Fig. 1
(3" x 4" Core)

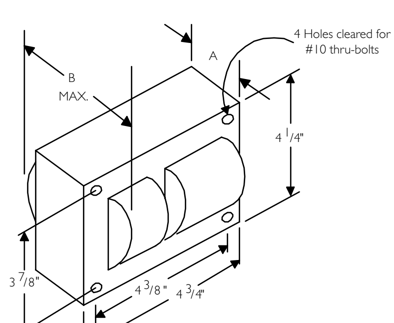


Fig. 2
(4¼" x 4¾" Core)

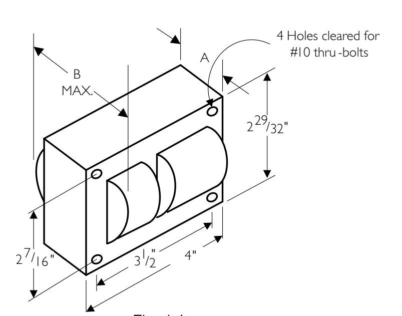


Fig. 14
(3" x 4" Core)

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
								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	7C280P30RA	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	7C280P30RA	D	8.5	LI501-H4	2	E/D/ D/D
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	7C280P30RA	D	8.5	LI501-H4	2	E/D/ D/D
◆ 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 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example: -500DML). Ballasts are branded Philips.

🍁 Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

LL Special high efficiency/ low-loss ballast

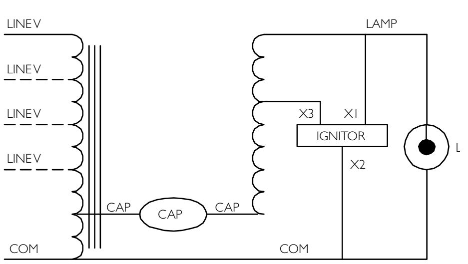


Fig. M

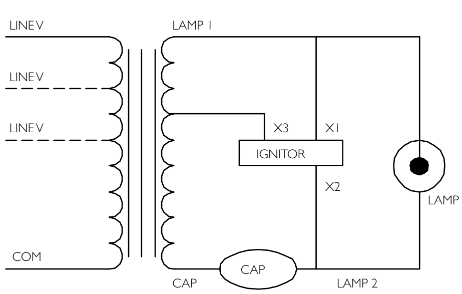


Fig. V

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

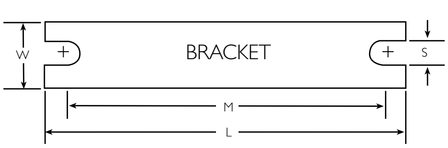
High Pressure Sodium

RoHS COMPLIANT

	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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
									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 (Philips Retro White)																		
NOM	127/220	71A82H1-500DMLA	CWA	295	2.5/1.4	189	7/4	M	2	1.8	3.6	35	240	7C350P24RA	D	10.0	LI501-H4	2	A/A
	480/120T	71A8241-500DT	CWA	310	.7	187	2	M	2	1.8	3.5	35	240	7C350P24RA	D	11.0	LI501-H4	2	B
	480/120T	71A8241-500DTA **71A8241-001D**	CWA	300	.7	189	2	M	2	1.8	3.7	35	240	7C350P24RA	D	11.0	LI501-H4	2	B
NOM	120/208/ 240/277	71A8291-500DA 71A8291-500DMLA	CWA	295	2.5/1.5/ 1.3/1.1	187	7/4/ 4/3	M	2	1.8	3.8	35	240	7C350P24RA	D	11.0	LI501-H4	2	B/B/ B/B
	120/208/ 240/277	**71A8271-001D**	CWA	295	2.5/1.5/ 1.3/1.1	187	7/4/ 4/3	M	2	1.8	3.8	35	240	7C350P24RA	D	11.0	LI501-H4	2	B/B/ B/B
	120/208/ 240/277/ 480	71A8251-500DA **71A8251-001D**	CWA	300	2.7/1.5/ 1.3/1.2/ .7	188	7/4/ 4/3/ 2	M	2	2.0	3.7	35	240	7C350P24RA	D	12.0	LI501-H4	2	C/C/ B/B/ B
🍁	120/ 277/347	71A82A1-500D **71A82A1-001D**	CWA	295	2.7/ 1.2/.9	187	7/ 3/2	M	2	2.0	3.6	35	240	7C350P24RA	D	11.5	LI501-H4	2	C/ C/B
NOM	230	71A82J1-500DML 71A82J3-500D	CWA	293	1.3	188	4	M	2	1.8	3.4	34	240	7C340P24RA	D	11.0	LI501-H4	2	B
LL NOM	220/240	71A82J9-500DML	CWA	285	1.4/1.3	188	4/4	M	2	1.8	3.4	34	240	7C240P24RAT1	D	11.0	LI501-H4	5	A/A
	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	7C280P30RA	D	11.0	LI501-J4	2	D/ D/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



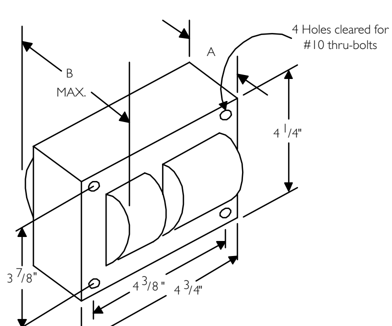


Fig. 2
(4¼" x 4¾" Core)

60 Hz Core & Coil Ballasts

High Pressure Sodium

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (pg 7-3)
								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	7C450P30RA	D	13.5	LI501-H4	2	D/C/ D/B
400W Lamp, ANSI Code S51 or M169 (Philips Retro White)																		
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 **71A8443-001D**	CWA	464	1.0	190	3	M	2	2.8	4.3	55	240	7C550P24RA	D	16.0	LI501-H4	2	D
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 **71A8473-001D**	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/ 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	4.8	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	4.1	55	240	7C550P24RA	D	13.5	LI501-H4	2	D/ D/D
230/ 400/480	71A84Y3-500D	CWA	465	2.0/ 1.0/1.8	190	5/ 3/3	M	2	2.3	4.2	55	300	7C550P24RA	D	14.3	LI501-H4	2	D/ C/C
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	7C480P30RA	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 7-4 to 7-8 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 7-39 to 7-43 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 "ML" to suffix (example: -500DML). Ballasts are branded Philips.

Canadian replacement/retrofit ballast kit indicated by **bold type.** Refer to page 7-8.

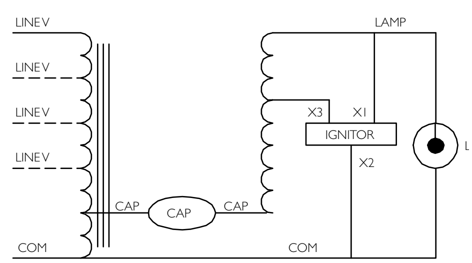


Fig. M

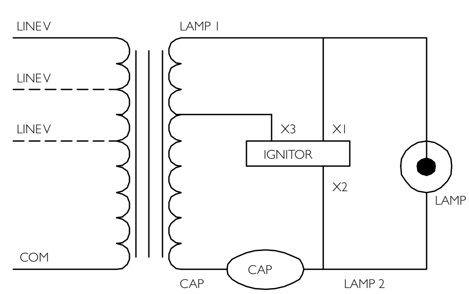


Fig. V

MAGNETIC HID BALLASTS

60 Hz Core & Coil Ballasts

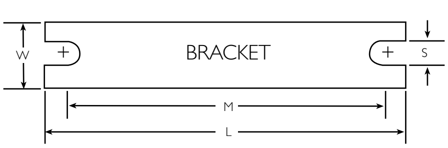
High Pressure Sodium

RoHS COMPLIANT

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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)
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	7C640S28RA	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	228	7/ 5/4	M	8a	3.1	4.9	64	280	7C640S28RA	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	7C750S28RA	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	7C750S28RA	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	MD2602-100	O	28.0	LI571-H5★	15	C	A
480	71A8743-500 **71A8743-001**	CWA	1100	2.3	435	6	M	8a	3.9	5.9	26	525	MD2602-100	O	29.7	LI571-H5★	15	C	A
480/120T	71A8743-600T	CWA	1100	2.3	435	6	M	8a	3.9	5.9	26	525	MD2602-100	O	28.0	LI571-H5★	15	C	A
NOM 120/208 240/277	71A8793-500 71A8793-500ML	CWA	1100	9.5/5.5/ 4.8/4.2	441	25/15/ 10/10	M	8a	3.8	5.8	26	525	MD2602-100	O	28.5	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	441	25/15/ 10/10	M	8a	3.8	5.8	26	525	MD2602-100	O	29.7	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	MD2602-100	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	MD2602-100	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



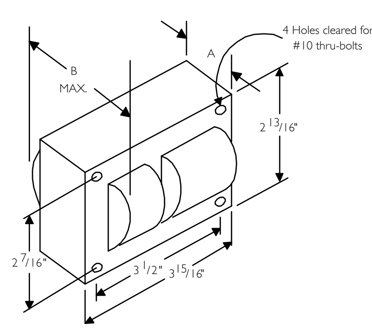


Fig. 1
(3" x 4" Core)

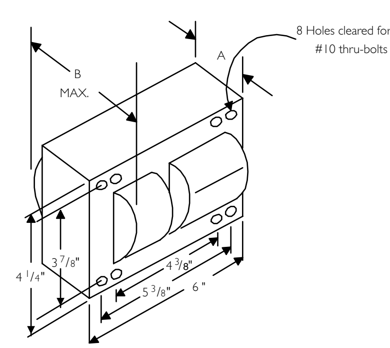


Fig. 8, 8A
(4¼" x 6" Core)

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 7-37 & 7-39)				Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (pg 7-3)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		
18W Lamp, ANSI Code L69																
120/277	71A0280-500D	HX-HPF	30	.9/.4	315	3/2	Q	1	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	1	2.3	3.5	14	240	7C140M30RA	D	8.0	A/A/ A/A

† Ordering information:
Replacement/retrofit ballast kits – indicated by bold type and -001D or -001 suffix. Refer to pages 7-4 to 7-8 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).

• **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.

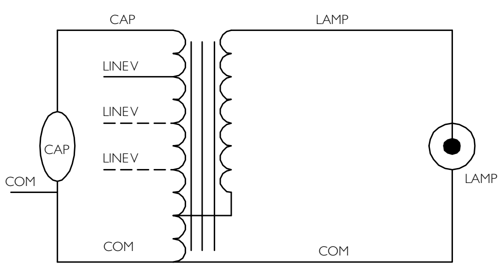


Fig. Q

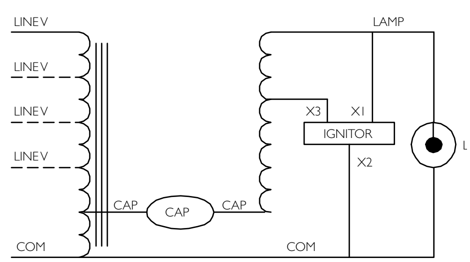


Fig. M

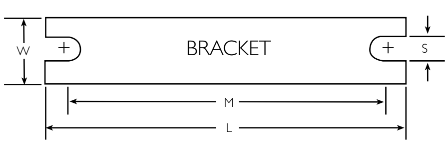
60 Hz Core & Coil Ballasts

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 7-37 & 7-39)				Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (pg 7-3)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		
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	300	7C175M30RA	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	300	7C160M30RA	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	7C160P40	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	7C160P40	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



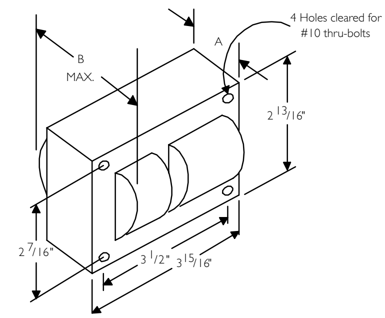


Fig. 1
(3" x 4" Core)

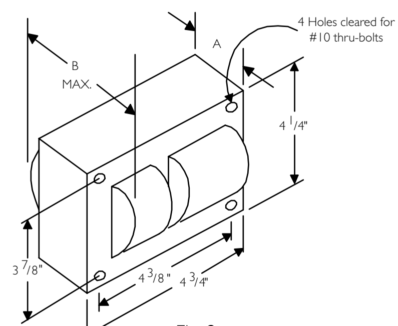


Fig. 2
(4¼" x 4¾" Core)

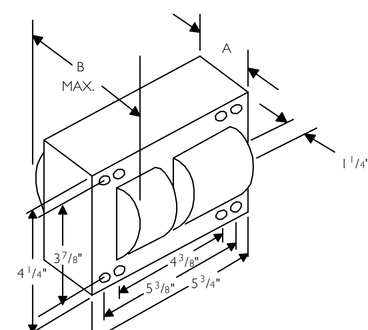


Fig. 3a
(4¼" x 5¾" Core)

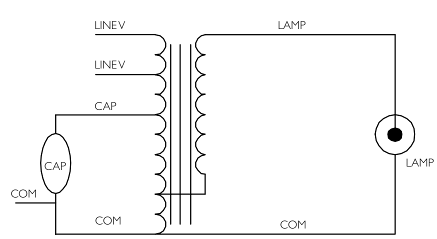


Fig. Q2

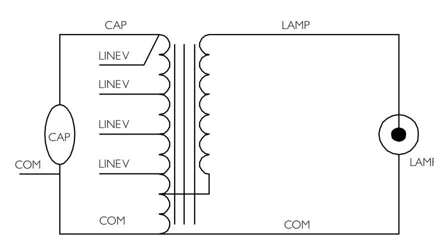


Fig. Q4

Capacitor Specifications

Recommended Capacitors for Bi-level Dimming of Specified HID Lamps on CWA Ballasts*

* For Ceramic Metal Halide lamps, please consult the lamp manufacturer for the recommended dimming level.

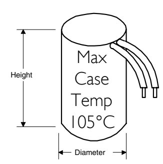
Philips Advance Ballast Family	Nominal Lamp Watts	ANSI Code	Lamp Watts at Low Light	Full Light Capacitance Mfd.	Low Light Capacitance Mfd.	Primary Capacitor	Secondary Capacitor	Capacitor Connection
Quartz Metal Halide 60Hz CWA/Super CWA Ballasts								
71A53_3	100 Pulse-Start	M90/140	60	10.0	8.0	10.0 mfd 400V (7C100M40R)	40.0 mfd, 300V (7C400P30RA)	Series
71A54A3	150 Pulse-Start	M102/ 142	85	22.0	14.0	22.0 mfd, 240V (7C220M24RA)	40.0 mfd, 300V (7C400P30RA)	Series
71A5493	150 Pulse-Start	M102/ 142	80	16.0	12.0	16.0 mfd, 300V (72160M30RA)	40.0 mfd, 300V (7C400P30RA)	Series
71A55_0	175	M57	110	10.0	8.0	10 mfd, 400V (7C100M40-R)	40 mfd, 300V (7C400P30RA)	Series
71A55_3	175 Pulse-Start	M137 or M152	110	11.0	8.5	11 mfd, 400V (7C110M40)	40 mfd, 300V (7C400P30RA)	Series
71A56_2 or 71A56_3	200 Pulse-Start	M136	120	15.0	11.0	15 mfd, 330V (7C150M33)	40 mfd, 300V (7C400P30RA)	Series
71A57_0 or 71A57_1	250	M58	150	15.0	11.0	15 mfd, 400V (7C150P40-R)	40.0 mfd, 300V (7C400P30RA)	Series
71A57_2	250 Pulse-Start	M138 or M153	150	17.0	12.0	17 mfd, 400V (7C170P40)	40 mfd, 300V (7C400P30RA)	Series
71A58_2	320 Pulse-Start	M132 or M154	175	21.0	14.0	21 mfd, 400V (7C210P40R)	40 mfd, 300V (7C400P30RA)	Series
71A59_3	350 Pulse-Start	M131	205	22.5	14.5	22.5 mfd, 400V (7C225P40)	40 mfd, 300V (7C400P30RA)	Series
71A60_1	400	M59	220	24.0	17.0	24 mfd, 400V (7C240P40-R)	48 mfd, 300V (7C480P30RA)	Series
71A60_2	400 Pulse-Start	M135 or M155	210	26.0	18.0	26 mfd, 330V (7C260P33R)	48 mfd, 300V (7C480P30RA)	Series
71A63_3	450 Pulse-Start	M144	235	26.5	20.0	26.5 mfd, 400V (7C265P40R)	75.0 mfd, 280V (7C280S28RA)	Series
71A64_0 or 71A64_2	750 Pulse-Start	M149	420	28.0	18.0	28 mfd, 400V (7C280S40)	48 mfd, 300V (7C480P30RA)	Series
71A64_8	875 Pulse-Start	M166	485	21.0	14.0	21 mfd 480V (MD2100-030)	40.0 mfd, 300V (7C400P30RA)	Series
71A65_0, 71A65_1, 71A65_2, or 71A65_3	1000 Probe or Pulse-Start	M47 or M141	575	24.0	15.0	24 mfd, 480V (MD2409-100)	40 mfd, 300V (7C400P30RA)	Series
High Pressure Sodium 60Hz CWA Ballasts								
71A80_8	100	S54	60	34.0	28.0	28.0 mfd, 300V (7C280P30RA)	6.0 mfd, 300V (7C060L30RA)	Parallel
71A81_8	150	S55	90	55.0	45.0	45 mfd, 300V (7C450P30RA)	10 mfd, 300V (7C100M30RA)	Parallel
71A82_1	250	S50	175	35.0	28.0	28 mfd, 300V (7C280P30-RA)	7 mfd, 300V (7C070L30RA)	Parallel
71A84_3	400	S51	260	55.0	40.0	40 mfd, 300V (7C400P30-RA)	15 mfd, 300V (7C150M30RA)	Parallel
71A86_5	750	S111	570	75.0	64.0	64 mfd, 280V (7C640S28RA)	11 mfd, 400V (7C110M40R)	Parallel
71A87_3	1000	S52	660	26.0	17.7	26 mfd, 525V (MD2602100)	55 mfd, 240V (7C550P24RA)	Series
71A89_1	200	S66	120	24.0	18.0	24 mfd 280V (7C240P30RA)	72 mfd 120V (7C720P12RA)	Series
71A89_1	200	S66	120	24.0	18.0	18 mfd, 400V (7C180P40R)	6 mfd 300V (7C060L30RA)	Parallel

Dry-Film Capacitors

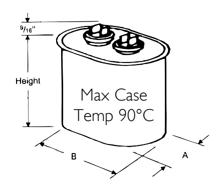
Dimensions (in)		
Letter	Diameter	Height
L	1.18	2.2 or 2.7
M	1.58	2.7 or 3.7
P	1.77	3.7 or 4.9
S	1.97	5.0

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	

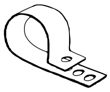


Dry-Film Capacitors
Thermal Plastic Case
Dry-film capacitors contain no oil; are furnished with 8" leads and include integral resistor where required.

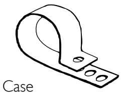


Oil-Filled Capacitor
Furnished with appropriate leads and/or resistors where required. Case must be grounded.

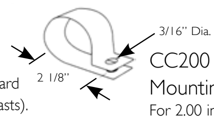
Note: Capacitor boots available, order catalog number CB-100.



CC125
Mounting Clip
For 1.18 thru 1.25 in diameter, Round Case



CC175
Mounting Clip
For 1.25 thru 1.75 in. diameter Round Case (Furnished as standard with -001 and -001 D suffix ballasts).



CC200
Mounting Clip
For 2.00 in. diameter Round Case. Mount in the middle of can.

MAGNETIC HID BALLASTS

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	7C100M40R	1.40	3.75	71A55x0 (60 Hz)
11	400	7C110M40	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	MD1204-100	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	330	7C150M33	1.65	2.75	71A56x2, 56x3
15	400	7C150P40R	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	MD1606-100	1.75	3.90	71A57x4, 82x0
16	525	MD1606-100	1.75	3.90	71A43x0
17	400	7C170P40	1.75	3.75	71A55x4, 5634, 57x2
17	550	MD1701-000	1.75	3.90	71A83x0
17.5	300	7C175M30RA	1.65	3.75	71A0590, 30x2, 53N0, 5837, 81x2 (50 Hz)
18	400	7C180P40R	1.75	3.75	56x3 (50 Hz), 71A57x0 (50 Hz), 89x4
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	7C210P40R	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	7C225P40	1.75	3.75	71A59x3
24	300	7C240P30RA	1.65	3.75	71A79x6, 89x1
24	400	7C240P40R	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	7C280M12RA	1.65	2.75	71A5005, 5105, 7805, 7907
28	300	7C280P30RA	1.75	3.75	71A35R2, 54x2 (50 Hz), 79x8, 82x6, 89x0
28	400	7C280S40	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	MD3202-100	2.00	3.75	71A67x2 (60 Hz)
34	240	7C340P24RA	1.65	3.75	71A80x8
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	7C480P30RA	1.75	4.75	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.

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. When remote mounting the ballast away from the lamp, the ignitor must be located next to the ballast and not next to the remote lamp in order to utilize the full ballast to lamp distance range. If the ignitor is located next to the remote lamp, the usable ballast to lamp remote mounting distance will be cut in half.

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

MAGNETIC HID BALLASTS

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
71A5005	35	M130	HX	LI533-H4-IC	15	Round				
71A5105	50	M110/148	HX	LI533-H4-IC	15	Round				
71A51_I	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_I	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-IC	15	Oval				
71A64_2	750	M149	SuperCWA	LI573-H5-IC	15	Oval				
71A64_8	875	M-166	SuperCWA	LI572-H5-IC★	10	Oval				
71A65_I	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

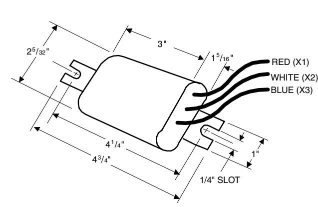
LI533-LR	0 - 50 ft	Oval
LI533-LR3★	0 - 50 ft	Oval

★ Equipped with an auto-rest thermal protector to help prevent ignitor from overheating in the event of lamp failure

Lamp Watts	ANSI Code	Ballast Number	No Bracket	With Welded Bracket
70	M98/143	71A5292	-900D	
100	M90/140	71A5390	-900D	

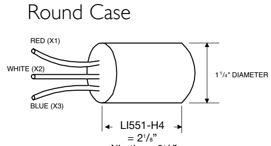
XTENZA Ordering Information
To order in bulk, specify item no. LI533-LR, LI533-LR1 or LI533-LR3. For individual carton, add -IC to item no.

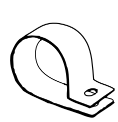
XTENZA is also available packaged with the ballasts shown at right.



Oval Case

Round Case





CC125
MOUNTING CLIP for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

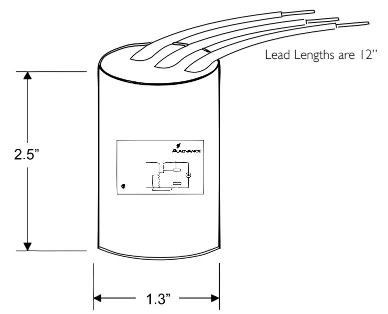
LISOD

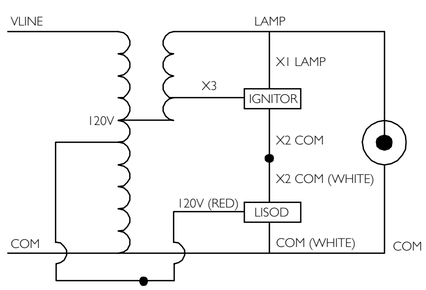
The Philips Advance shut-off device (LISOD) enhances the reliability of High Intensity Discharge (HID) lighting systems where ignitors are utilized to start the HID lamps. This includes all high pressure sodium lamps as well as all low, medium, and high wattage pulse-start metal halide lamps. The LISOD 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
LISOD1-IC	Ignitor shut-off device for HID CWA, HX, and R ballasts with ignitors. Individual carton packaging	1
LISOD1	Ignitor shut-off device for HID CWA, HX and R ballasts with ignitors. Bulk packaging	50



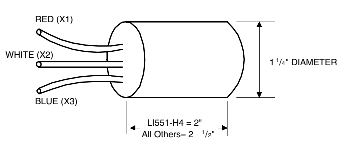


MAGNETIC HID BALLASTS

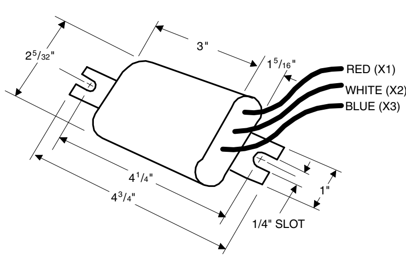
Ignitor Specifications *(Case Temperature Rating 105°C)*

High Pressure Sodium

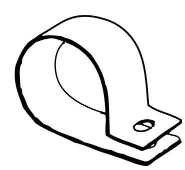
High Pressure Sodium									
Ballast Data				Standard Ignitor			Long Range Ignitor		
Philips Advance Ballast Family	Lamp Watts	ANSI Code	Ballast Circuit Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type	Catalog Number	Max. Dist. (ft.) To Lamp	Case Type
71A7707	35	S76	R	LI551-H4-IC	2	Round	LI551-J4-IC	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

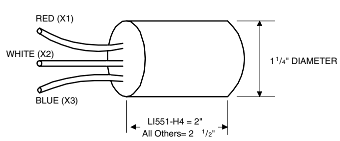

CC125
Mounting Clip for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

Ignitor Specifications *(Case Temperature Rating 105°C)*

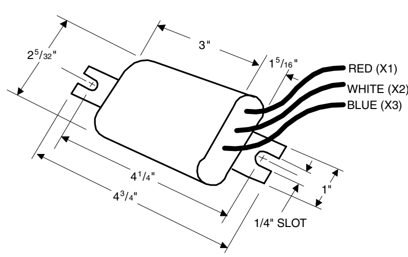
High Pressure Sodium

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

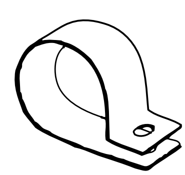
★ Equipped with an auto-rest thermal protector to help prevent ignitor from overheating in the event of lamp failure.



Round Case



Oval Case



CC125
Mounting Clip for Round Case
(Furnished as standard with -001 suffix ballasts and all -IC suffix replacement ignitors.

MAGNETIC HID BALLASTS

Transformers and 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	0.47	125	130	T-2	4	1.9	2.6	6.5
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	350	T-2	9	2.4	3.8	3.7
eHID**	210	480:270	71A9843-600	0.47	227	350	T-2	9	2.4	3.8	3.7
	315	480:270	71A9843-600	0.72	346	350	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

** For use with MasterColor MW ballast: IZTMH-210315-R-LF

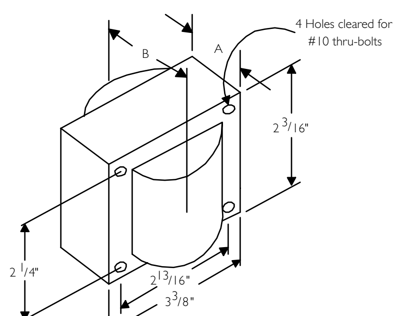


Fig 4
($2^3/_{16}$" x $3^3/_8$" Reactor Core)

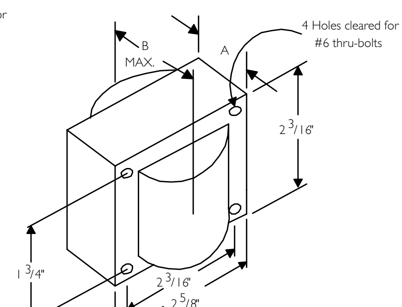


Fig 9
($2^5/_8$" x $2^3/_{16}$" Reactor Core)

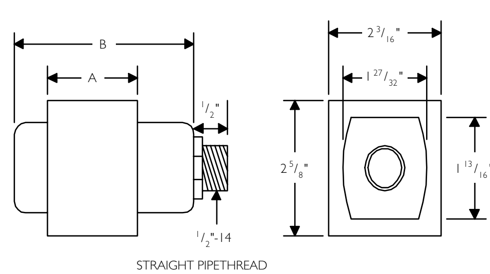


Fig 11
(J-Box Ballast)

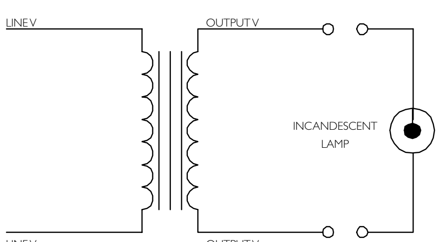


Fig T-1

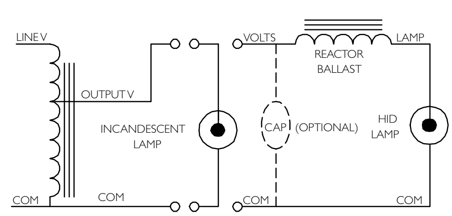


Fig T-2

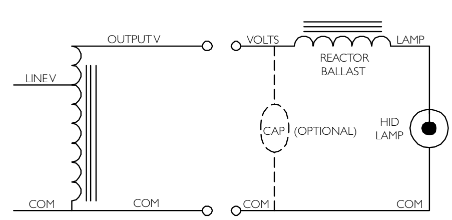


Fig T-4

60 Hz F-Can Ballasts, (Indoor, Outdoor Type 1)

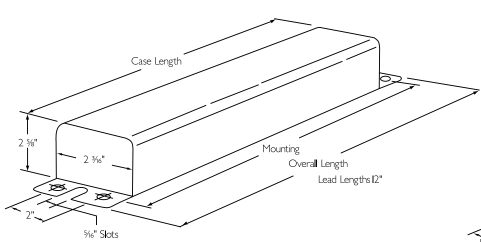
Metal Halide

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	Certifications: RoHS Compliant
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	✓	✓	✓
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	✓	✓	✓
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		✓	✓

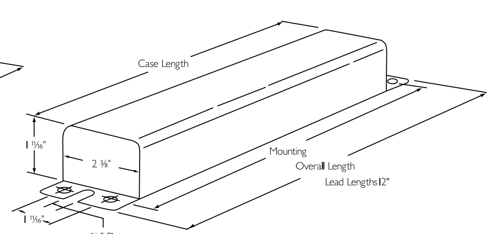
All Philips Advance dual-volt, F-can ballasts include auto-reset thermal protection for both taps.

Replacement ballasts in individual cartons indicated by **bold type** with suffix -001.

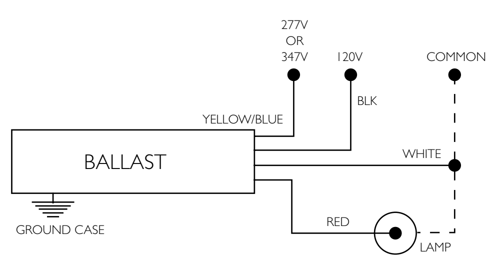
- • Ballasts with suffix -900 include integral XTENXA Long-Range Ignitor for 50ft. max. ballast to lamp distance. Also suitable for shorter distances.
- ° All 150W thru 400W F-Can Ballasts are **not** EISA compliant.



Dimensions



Dimensions
(72C5005-NP)



Wiring Diagram
All lead lengths 12"

MAGNETIC HID BALLASTS

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	RoHS COMPLIANT
175/150W Lamp, ANSI Code M57 or M107 or 145W Lamp, ANSI Code C192 (Philips AllStart)**														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	CWA	1.9/.7	1.9/.7	1.7/.5	208	300	5/2	11.75	10.50	11.13	12.0	✪		✓	✓
175W Lamp, ANSI Code M137 or M152 (Pulse Start) or145W Lamp, ANSI Code C192 (Philips AllStart)**														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 or 205W Lamp, ANSI Code C184 (Philips AllStart)***														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	CWA	2.5/.9	2.0/.7	2.0/.7	290	300	7/3	14.30	13.13	13.75	14.0	✪		✓	✓
250W Lamp, ANSI Code M138 or M153 (Pulse Start) or 205W Lamp, ANSI Code C184 (Philips AllStart)* (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	✓	✓	✓
400W Lamp, ANSI Code M59 or 330W Lamp, ANSI Code C185 (Philips AllStart)****														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) or 330W Lamp, ANSI Code C185 (Philips AllStart)****														SOUND RATING C		
120/277	**72C6182-NP**	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 7-40 of this catalog.

Replacement ballasts in individual cartons indicated by **bold type** with **suffix -001**.

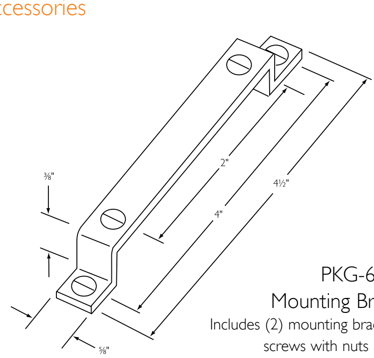
° All 150W thru 400W F-Can Ballasts are **not** EISA compliant.

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

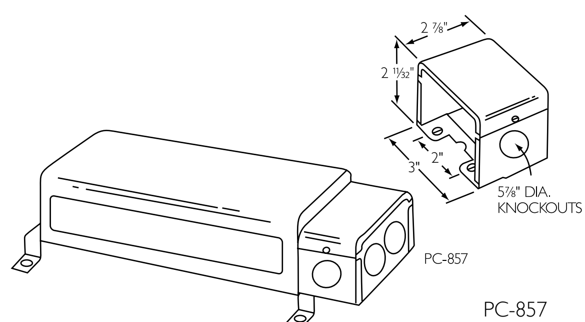
*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

**** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.

Accessories



PKG-625
Mounting Bracket Kit
Includes (2) mounting brackets and (4) #10-32 screws with nuts and washers.

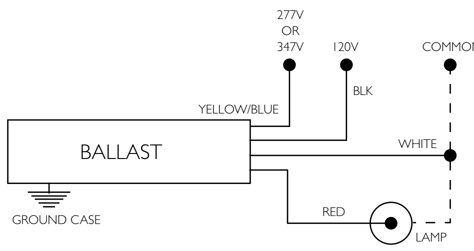


PC-857
Wiring Compartment
For end mounting, includes (5) 7/8" dia. knockouts. May be used with or without PC-625 Mtg. Brkt. Kit

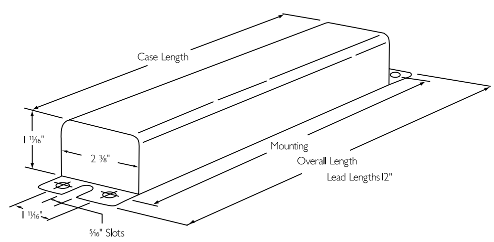
60 Hz F-Can Ballasts, (Indoor, Outdoor Type 1)

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	RoHS COMPLIANT
70W Lamp, ANSI Code S62													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	✓	✓	✓
50W Lamp, ANSI Code S68													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	✓	✓	✓
	72C7984-NP-001															
120/347	72C79C4-NP		.8/.3	.9/.3	1.4/.5	94		4/2							✓	✓
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	✓	✓	✓
	72C8084-NP-001															
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	✓	✓	✓

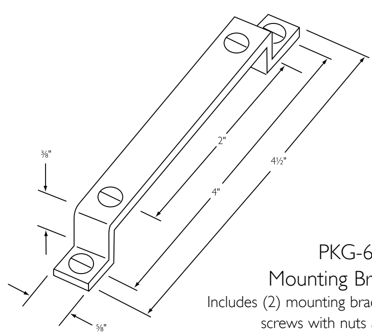


Wiring Diagram
All lead lengths 12"

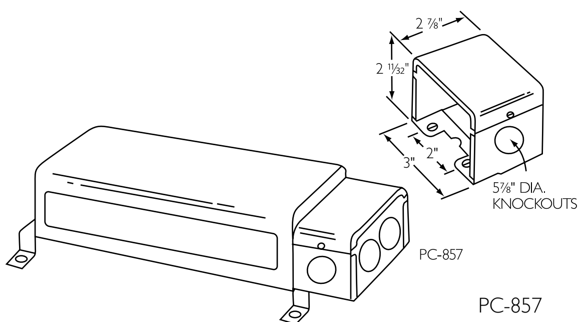


Dimensions

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) 7/8" dia. knockouts. May be used with or without PC-625 Mtg. Brkt. Kit

MAGNETIC HID BALLASTS

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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)	
70W Lamp, ANSI Code M98 (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	235	3/2	M	PC709-4	10	300	7C100M30RA	D	10.0	LI533-H4	2	
150W Lamp, ANSI Code M102 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	7C160M30RA	D	11.0	LI533-H4	10	
175W Lamp, ANSI Code M57 or 145W Lamp, ANSI Code C192 (Philips AllStart)**														SOUND RATING A		
120/208/ 240/277	73B5590-500D	CWA	210	1.8/1.1/ .9/.8	280	5/3/ 3/2	A	PC709-4	10	400	7C100M40-R	D	12.0	–	–	
175W Lamp, ANSI Code M137 or M152 (Pulse Start) or 145W Lamp, ANSI Code C192 (Philips AllStart)**														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) or 205W Lamp, ANSI Code C184 (Philips AllStart)***														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 or 205W Lamp, ANSI Code C184 (Philips AllStart)***														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	–	–	
320W Lamp, ANSI Code M132 or M154 (Pulse Start)														SOUND RATING B		
120/208/ 240/277	73B5892- 500DAEE	Super CWA	363	3.3/1.9/ 1.7/1.4	270	8/6/ 5/3	M	PC767-3	21	345	7C210P40R	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 7-39 to 7-43 for additional information.

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

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

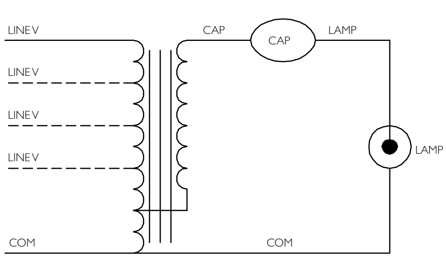


Fig. A

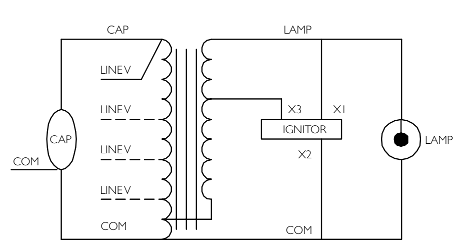


Fig. K

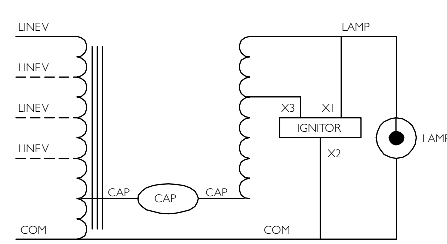


Fig. M

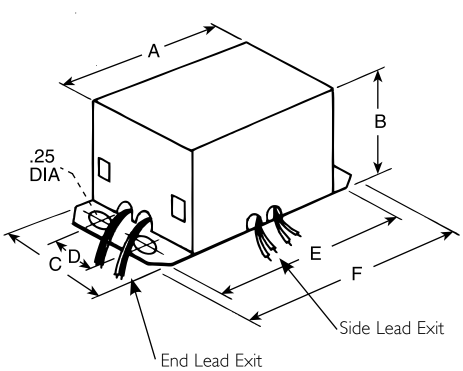
60 Hz Encapsulated Core & Coil Ballasts

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 7-37 & 7-39) Mfd	Min Volt	Cap Catalog Number	Dry or Oil	Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43) Part Number	Max Dist To Lamp (ft)
400W Lamp, ANSI Code M59 or 330W Lamp, ANSI Code C185 (Philips AllStart)**															SOUND RATING B
120/208/ 240/277	73B6091-500DA	CWA	458	4.0/2.3/ 2.0/1.7	305	10/7/ 5/5	A	PC-767-3	24	400	7C240P40-R	D	20.0	–	–
400W Lamp, ANSI Code M135 or M155 (Pulse Start) or 330W Lamps, ANSI Code C185 (Philips AllStart)**															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	2
Ⓔ 120/208/ 240/277 480	73B6052-500DAEE	Super CWA	454	3.8/2.3/ 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

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	6.5	5.0	5.9	2.0	7.0	7.75



MAGNETIC HID BALLASTS

60 Hz Encapsulated 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	Case Style	Non-PCB Capacitor (Page 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)	
									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

† **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 7-39 to 7-43 for additional information.

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

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

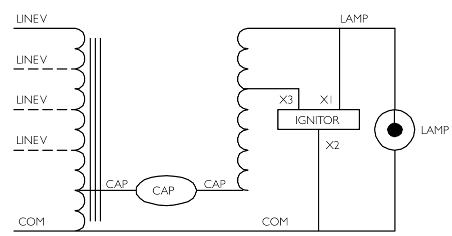
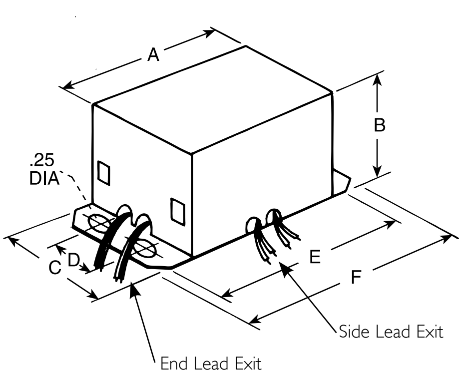


Fig. M

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	6.5	5.0	5.9	2.0	7.0	7.75



60 Hz Postline Ballasts

Metal Halide

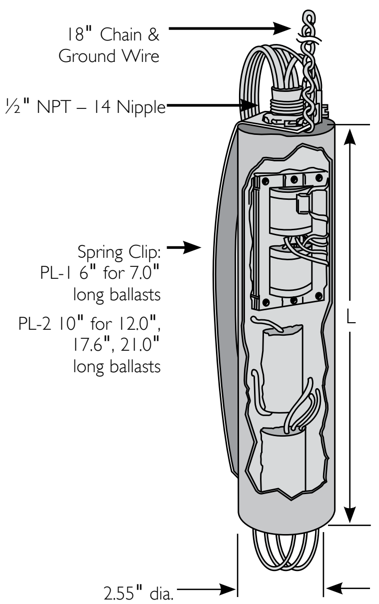
Input Volts	Catalog Number† (P=Thermally Protected)	Circuit Type	Input Watts	Max• Input Current	Nom. Open Circuit Voltage	Fuse (amps)	Length (in)	Weight (lbs)	Spring Clip & Support Chain Kit	Max Dist To Lamp (ft)	Certifications		
											UL	CSA	RoHS COMPLIANT
50W Lamp, ANSI Code M110													
120	74P5104-011P	HX-PFC	69	1.1	260	3	12.0	6.0	PL-2 (Optional)	20	✓	✓	✓

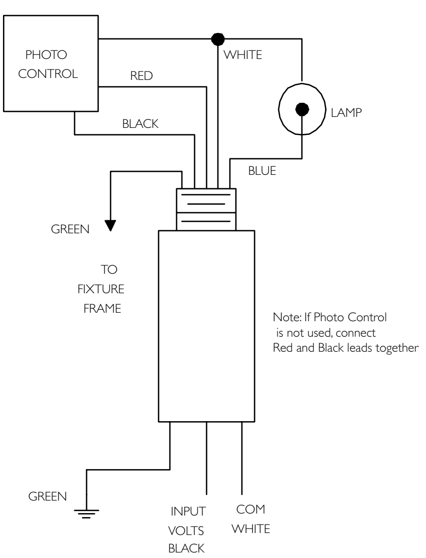
† Ordering information:
Order catalog number indicated. If spring clip and support chain kit is desired, order separately.

• 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

MAGNETIC HID BALLASTS

60 Hz Postline Ballasts

High Pressure Sodium

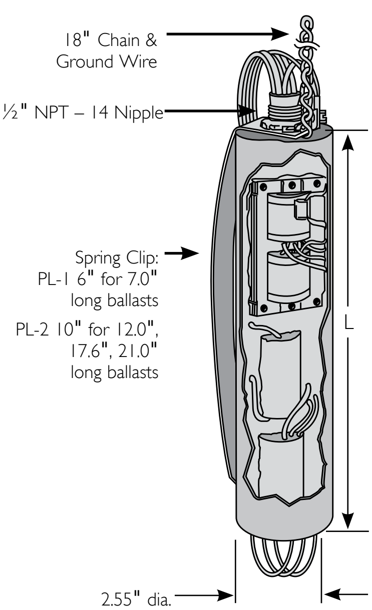
Input Volts	Catalog Number† (P=Thermally Protected)	Circuit Type	Input Watts	Max Input Current	Nom. Open Circuit Voltage	Fuse (amps)	Length (in)	Weight (lbs)	Spring Clip & Support Chain Kit	Max Dist To Lamp (ft)	Certifications UL	Certifications CSA	Certifications RoHS Compliant
35W Lamp, ANSI Code S76													
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	✓	✓	✓
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	✓	✓	✓

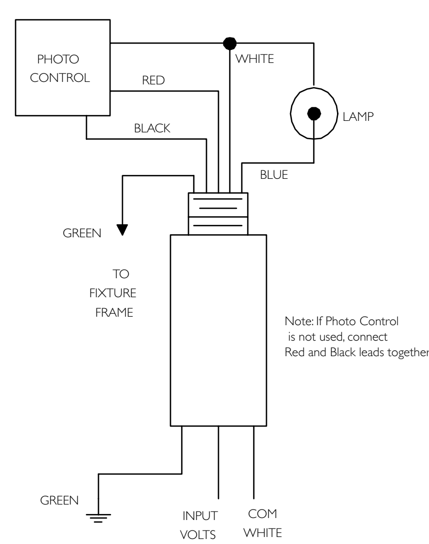
† Ordering information:
Order catalog number indicated. Ballasts rated 100W and above include pre-assembled spring clip and support chain kit. For ballasts rated less than 100W, if spring clip and support chain kit is desired, order separately.

* 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 allow for 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	CSA	RoHS COMPLIANT
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	78E8443-001			1.0		3	IE-1			✓		✓

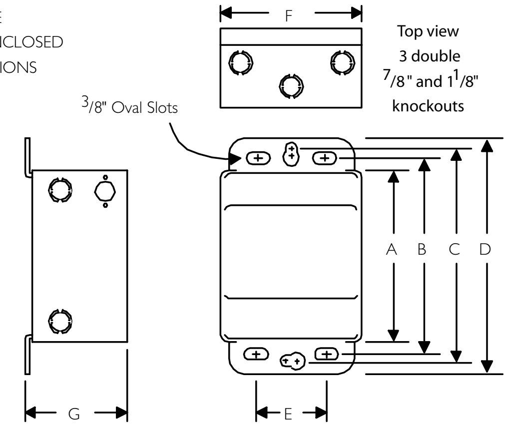
Note: Ballasts must be mounted at least 12" apart. All indoor enclosed high pressure sodium and pulse-start metal halide lamp ballasts are furnished with an Philips Advance long range ignitor built into the ballast enclosure. Maximum lamp-to-ballast distance is 50 ft. (Except 1000 watt ballasts which are 75 ft). For ballasts not requiring ignitors, see page 7-39 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.
- ** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.
- *** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.
- **** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.
- ***** The 860 Watt Lamp, ANSI Code C194, is an energy saving, screw in replacement lamp for the 1000W M47 or M141 PS lamps that may reduce input watts up to 15% on existing ballasts.

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



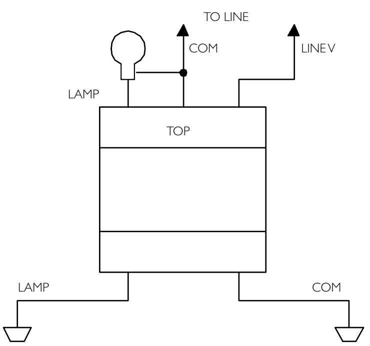


Fig IE-1

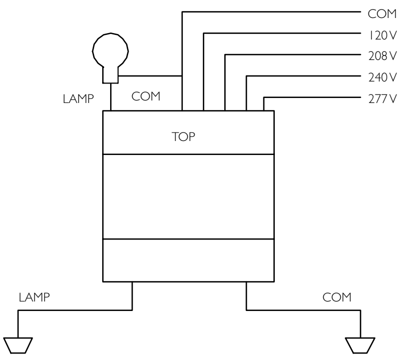


Fig IE-2

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	Certification RoHS COMPLIANT
400W Lamp, ANSI Code M59 or 330W Lamp, ANSI Code C185****												
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	✓	✓	✓
400W Lamp, ANSI Code M135 or 330W Lamp, ANSI Code C185** (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	✓	✓	✓
1000W Lamp, ANSI Code M47, or 860W Lamp, ANSI Code C194 (Philips AllStart)*****												
120/208/ 240/277	78E6592-WC1◇	CWA (55°C)	1080	9.0/5.2/ 4.5/3.9	430	20/15/ 10/10	IE-2	PC-724	42	✓	✓	✓
120/208/ 240/277	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	CWA (55°C)	1080	2.3	430	6	IE-1	PC-724	42	✓		✓

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 7-39 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.

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

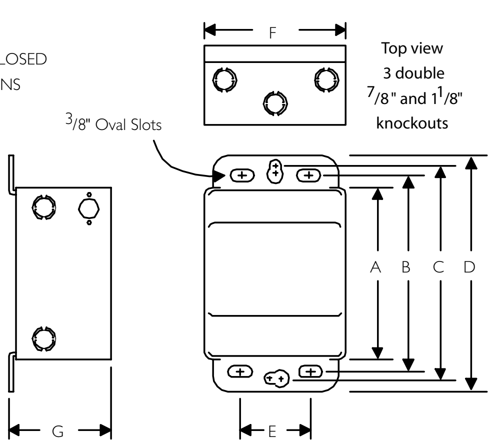
**** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.

***** The 860 Watt Lamp, ANSI Code C194, is an energy saving, screw in replacement lamp for the 1000W M47 or M141 PS lamps that may reduce input watts up to 15% on existing ballasts.

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



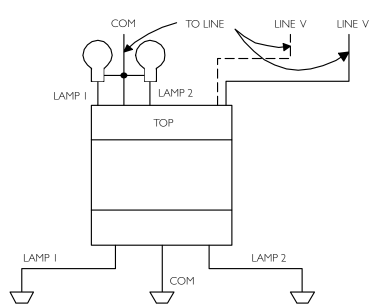


Fig IE-3

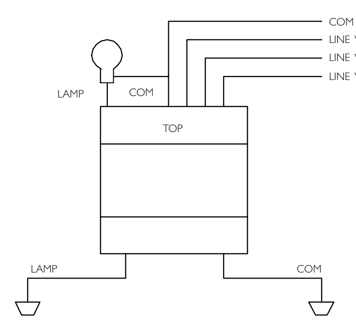


Fig IE-4

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	Certification RoHS COMPLIANT
175/150W Lamp, ANSI Code M57/M107 or 145W Lamp, ANSI Code C192**												
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 or 205W Lamp, ANSI Code C184***												
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 or 330W Lamp, ANSI Code C185****												
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	79W6041-001		462	1.0		4	OW-1			✓		✓
Two 400W Lamps, ANSI Code M59 or two 330W Lamp, ANSI Code C185****												
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			✓	✓	✓

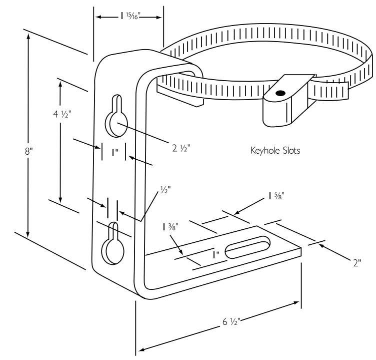
All weatherproof high pressure sodium lamp ballasts are furnished with an Philips Advance long range ignitor built into the ballast enclosure. Maximum lamp-to-ballast distance is 50 ft. (except 1000W ballasts which are 75 ft.)

- • 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.

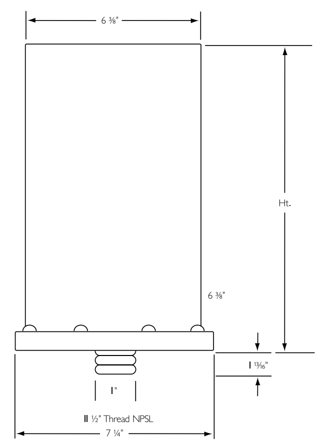
** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

**** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.



SH-1 Mounting Bracket Kit (includes bracket & band clamp, order separately)



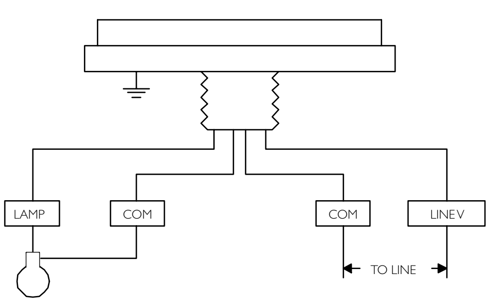


Fig OW-1

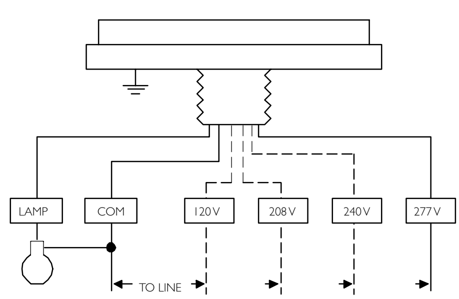


Fig OW-2

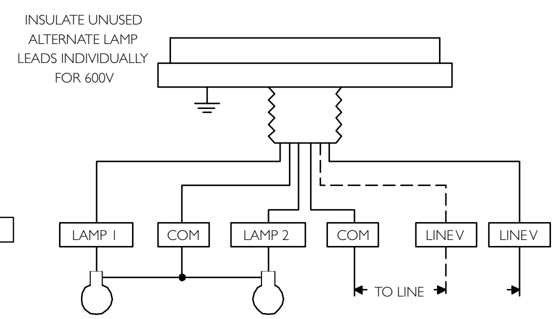


Fig OW-3

MAGNETIC HID BALLASTS

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	CSA	RoHS COMPLIANT
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.

** The 145 Watt Lamp, ANSI Code C192, is an energy saving, screw in replacement lamp for the M57 or M152 lamps, that may reduce input watts up to 15% on existing 175W ballasts.

*** The 205 Watt Lamp, ANSI Code C184 is an energy saving, screw in replacement lamp for the M58 or M138 and M153 PS lamps that may reduce input watts up to 18% on existing ballasts.

**** The 330 Watt Lamp, ANSI Code C185 is an energy saving, screw in replacement lamp for the M59 or M135 and M155 PS lamps that may reduce input watts up to 18% on existing ballasts.

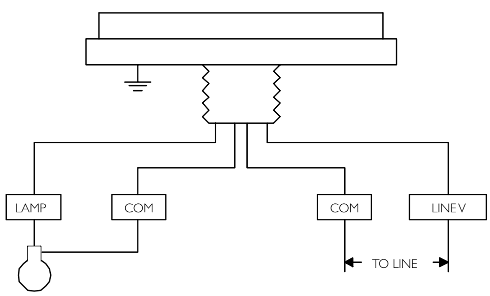


Fig OW-1

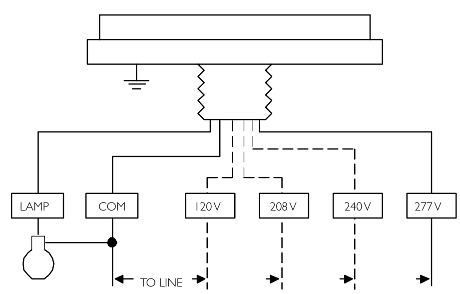
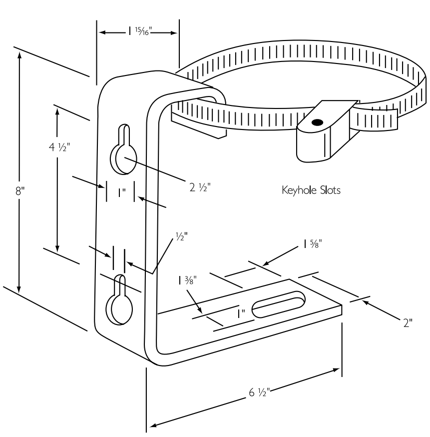
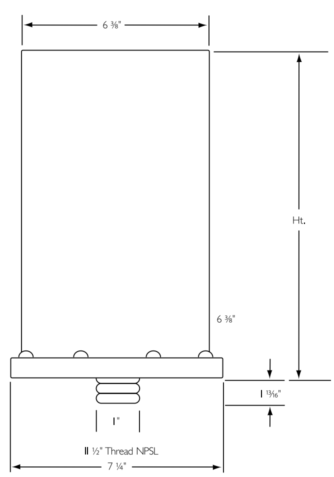


Fig OW-2



SH-1 Mounting Bracket Kit (includes bracket & band clamp, order separately)



INTERNATIONAL ELECTROMAGNETIC HID BALLASTS

We offer 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. The assembled Philips Advance 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 7-37 and 7-38

For ignitors, see pages 7-40 to 7-43

Special Voltages

For voltage and frequencies not shown in the charts of the following pages, please contact your Philips Lighting 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)

RoHS COMPLIANT

Restrictions on Hazardous Substances (RoHS) is a European directive (2002/95/EC) designed to limit the content of 6 substances [lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE)] in electrical and electronic products.

MAGNETIC HID BALLASTS

50 HZ Core & Coil Ballasts

Mercury

Ballasts for operating Mercury lamps are for use outside the USA ONLY are for use outside the USA ONLY

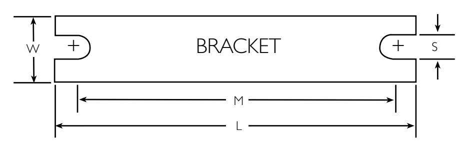
Input Volts	Catalog† Number	Circuit Type	Watts Input	Max• Input Current	Nom Open Circuit Voltage	Fuse Rating (Amps)	Wiring Dia	Dimensions			Non-PCB Capacitor (Page 7-37 & 7-39)				Total Weight (lbs)	U.L. Bench Top Rise Code 1029 (Pg 7-3)
								Fig	A	B	Mfd	Min Volt	Cap Catalog Number	Dry or Oil		
175W Lamp, ANSI Code H39																
120/ 220/240	See 175W Metal Halide CWA 71A55N0-500 (page 7-59)															
250W Lamp, ANSI Code H37																
120/ 220/240	See 250W Metal Halide CWA 71A57N0-500D (page 7-59)															
400W Lamp, ANSI Code H33																
120/ 220/240	See 400W Metal Halide CWA 71A60N1-500 (page 7-59)															
1000W Lamp, ANSI Code H36																
120/ 220/240	See 1000W Metal Halide CWA 71A65N2-500 (page 7-59)															

† 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



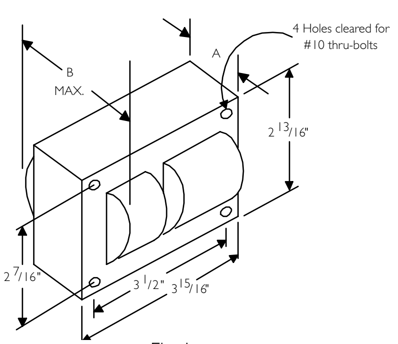


Fig. 1
(3" x 4" Core)

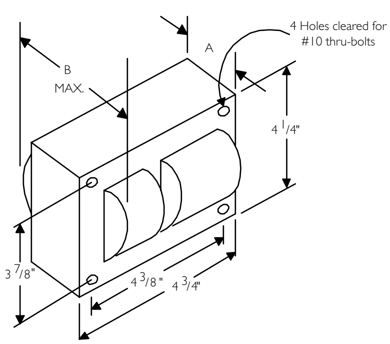


Fig. 2
(4¼" x 4¾" Core)

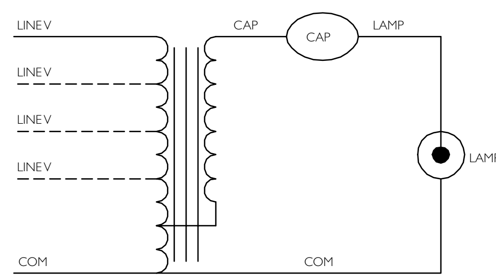


Fig. A

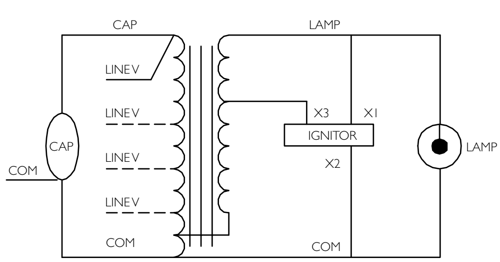


Fig. K

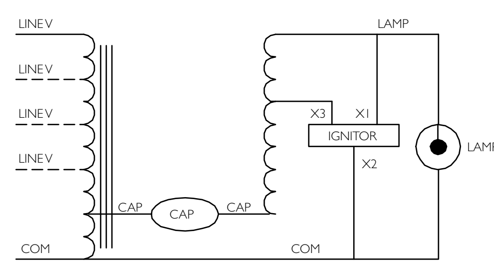


Fig. M

50 HZ Core & Coil Ballasts

Metal Halide

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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	7C300P34	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

MAGNETIC HID BALLASTS

50 HZ Core & Coil Ballasts

High Pressure Sodium

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 7-37 & 7-39)				Total Weight (lbs)	Ignitor †† (Page 7-39 to 7-43)		U.L. Bench Top Rise Code 1029 (Pg 7-3)	
								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)

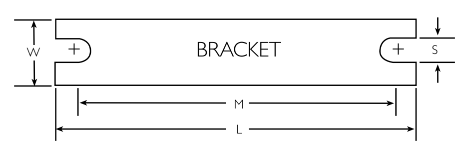
†† Each ballast requiring an ignitor is furnished as standard with the Short Range ignitor model shown for use within fixtures. If a Long Range ignitor is required for remote mounting, specify on order. See pages 7-39 to 7-43 for additional information.

• 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



Dimension and Wiring Diagrams

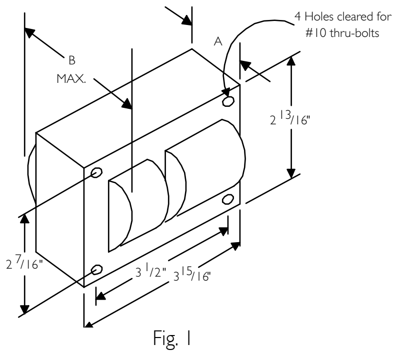


Fig. 1
(3" x 4" Core)

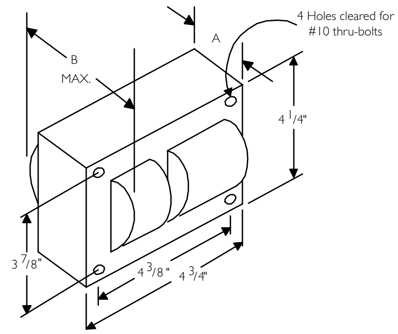


Fig. 2
(4¼" x 4¾" Core)

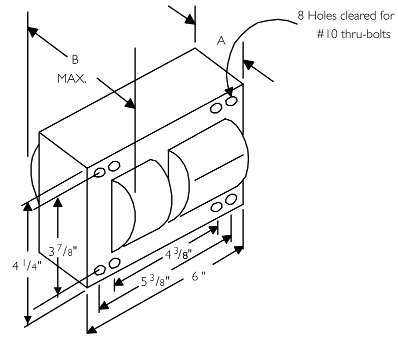


Fig. 8 and 8a
(4 ¼" x 6" core)

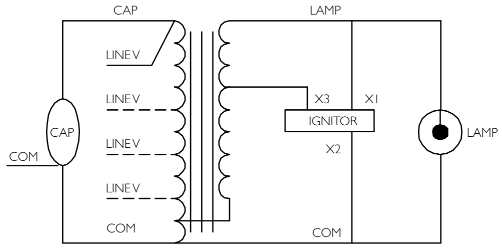


Fig. K

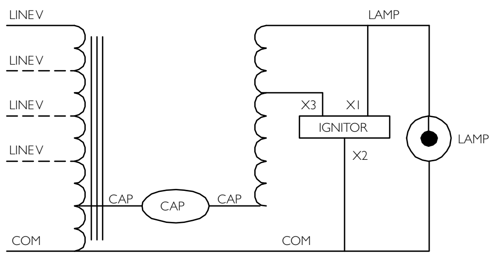


Fig. M

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/lightingcontrolsna

LuxSense Daylight Regulation Sensor

Provides daylight regulation via a single miniature sensor

LuxSense is a daylight sensor that can control up to 20 fixtures equipped with Philips Advance Mark 7 0-10V fluorescent ballasts or compatible e-Vision HID ballasts, as well as Xitanium drivers. 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 additional energy by reducing excess light output that occurs from design factors of lumen depreciation. Lamps are dimmed slightly when new, but then raised over time to compensate for depreciation of lamp output that occurs in normal lamp aging.

Up to a potential 32% evergy savings without sacrificing visual comfort*

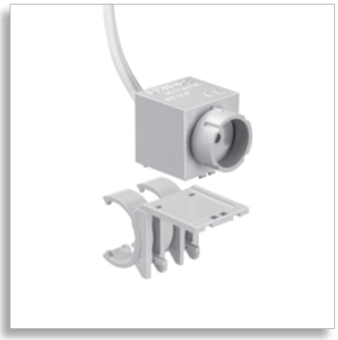
State-of-the-art daylight sensor

No specific lighting control training needed

Simple to use lighting control system; just adjust the rotating diaphragm to set the desired light level

Flexibility in design

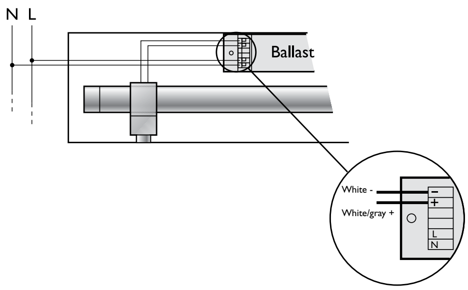
Can be incorporated directly into a fixture or alternatively clipped to a T8 or T5 lamp**



* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: field study," National Research Council Canada, v4 no1, July 2007 pg. 15 -16.

** External installation low voltage wiring where allowed by local codes.

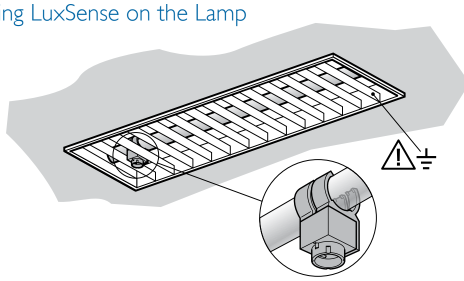
Installation of LuxSense into existing fixtures



Connecting diagram of the sensor to the ballast

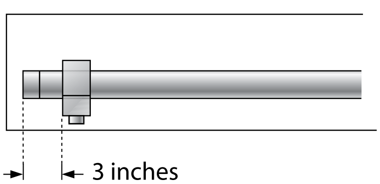
The maximum fixture temperature should always remain below 158° F (70° C). The sensitivity opening angle should never be obscured by the optics or any other part of the fixture. Metal optics should be properly grounded.

Mounting LuxSense on the Lamp



LuxSense mounted with a lamp clip (For use with T5 lamps only).

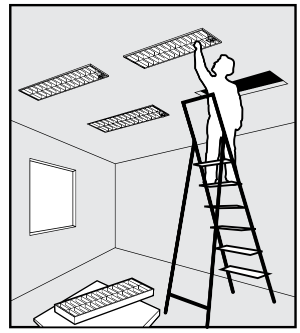
Not for use with T5/HO lamps.



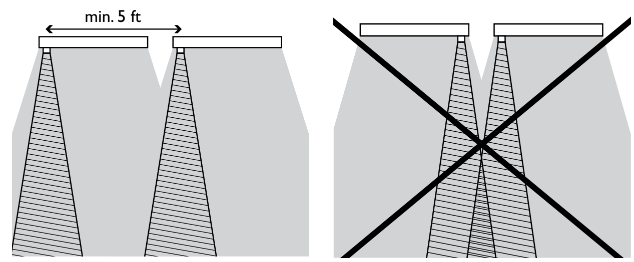
Position LuxSense 3 inches away from the end cap on the (electrical) "cold" side of the lamp. This is the side of the lamp that is connected to the terminals of the ballast that allows for the longest wiring to the lamp.

Installation of fixtures that include LuxSense

Install fixtures



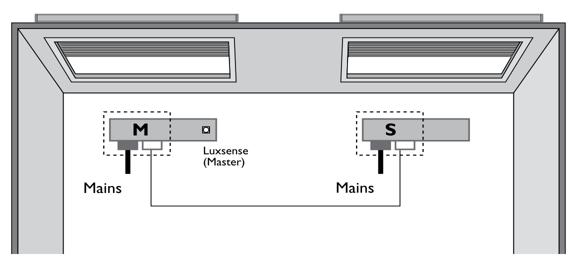
Interconnecting LuxSense Master fixtures (M) to Satellite fixtures (S)



Interconnecting LuxSense Master fixture (M) to Satellite fixture (S).

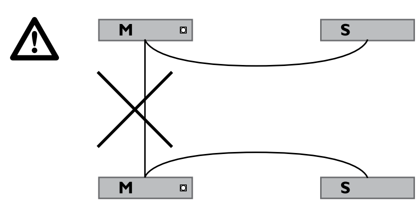
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7® *0-10V* or EssentiaLine *0-10V* ballasts.

Satellite fixture should have similar daylight conditions to the master.



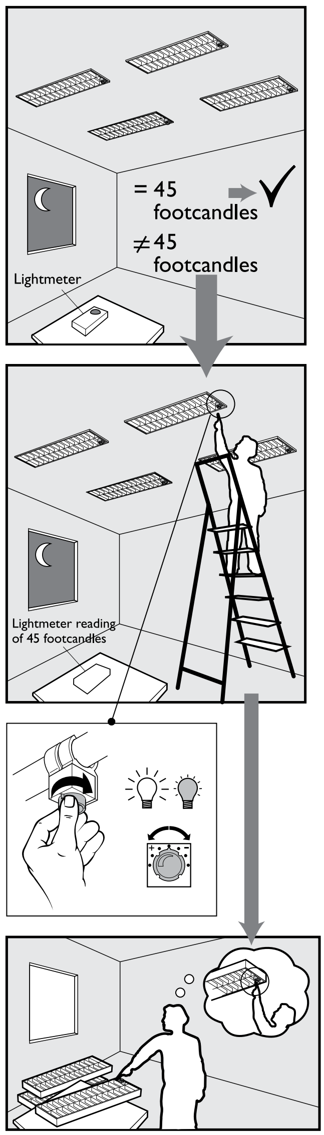
Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!



LuxSense Daylight Regulation Sensor

LRL1220TL5



Measure the light level under each LuxSense sensor with no or negligible daylight contribution.

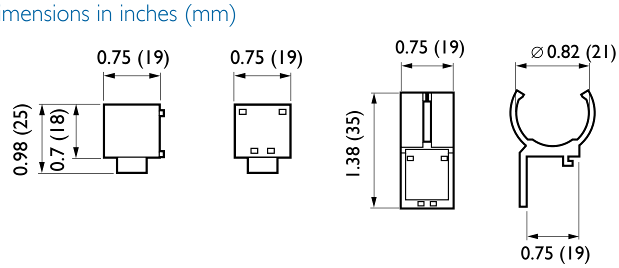
If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).

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 inches (mm)



Technical data

Operation conditions

Ambient temperature	41°F to 131°F (5° C to 55° C)
Rel. humidity	15% to 90%, no condensation
Max. temperature of clip to lamp contact surface	158° F (70° C)

Storage conditions

Ambient temperature	-17° F to 158° F (-25° C to 70° C)
Rel. humidity	5% to 95% at 77° F (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. .7 oz (20g), .98x.82x.75 in (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

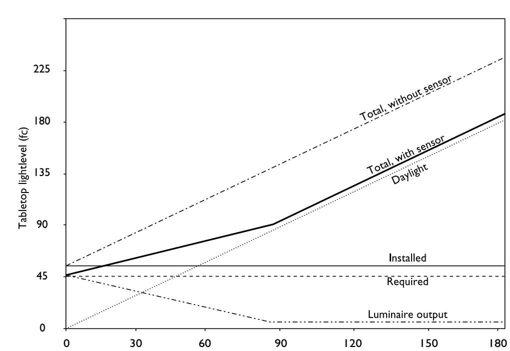
Optical characteristics

It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft / .8 m in height) will result in 2.3 fc seen by the controller at ceiling height (8 ft / 2.4 m) 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 Daylight Regulation Sensor

Provides daylight regulation via a single miniature sensor

MicroLuxSense is a simple and easy to design-in daylight compensation option for luminaires equipped with a Philips 0-10V dimming ballast/driver for a variety of technologies including LED. 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 providing the end-user energy savings at ease.

MicroLuxSense arrives from the factory ready to be installed. It comes in a standard preset configuration so no complex commissioning is required. Its versatile design allows this device to be installed adjacent to the luminaire with the ceiling mounting plate option or in the luminaire either mounted between the louvers or recessed in the housing. MicroLuxSense contains a simple to use dial for adjusting light levels in the field. It also shares the same footprint as the ActiLume family of sensors making one luminaire design capable of housing a variety of control options from Philips.

MicroLuxSense is ideal for private offices, meeting and conference rooms, classrooms, break areas and smaller open office area, anywhere with ample amounts of ambient light are present with the potential for providing energy savings without sacrificing visual comfort*.

Up to a potential 32% evergy savings without sacrificing visual comfort*
Advanced daylight harvesting sensor

Enables compliance with energy codes, and may qualify for additional LEED points
Sustainable solution

Automated regulation of artificial lighting allows for task illumination to be maintained
Maximize visual comfort

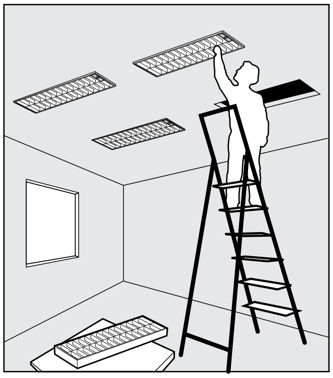
One sensor can be used for continuous rows or multiple sensors with single luminaires
Regulate up to 20 luminaires

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: field study," National Research Council Canada, v4 no1, July 2007 pg. 15 -16

MicroLuxSense Daylight Regulation Sensor

LRL1222

Installation

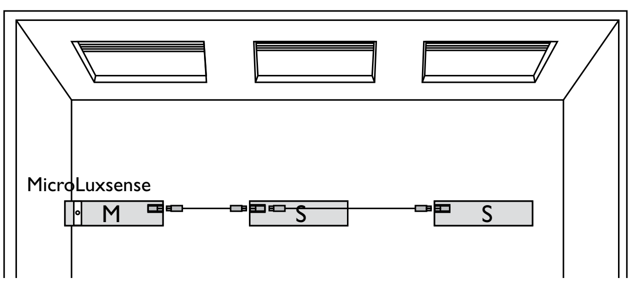


Mount the luminaire with MicroLuxSense daylight Regulation option.

Interconnecting MicroLuxSense Master fixture (M) to Satellite fixture (S).

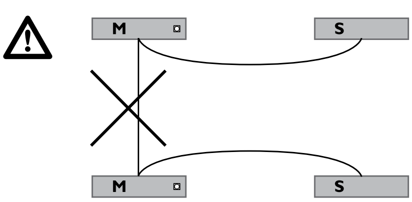
Up to 19 satellite fixtures can be looped through to 1 Master fixture, if all of them are equipped with Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts.

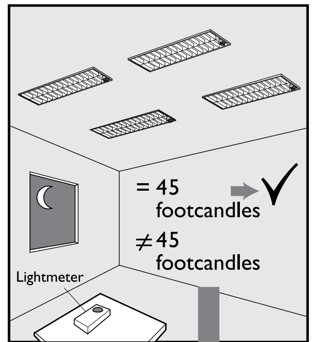
Satellite fixture should have similar daylight conditions to the master.



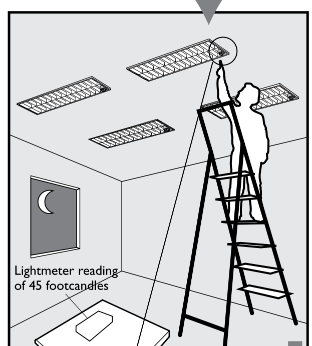
Connect 0-10V "+ to +" and "– to –". (See diagram above)

Never loop through 2 Master fixtures!

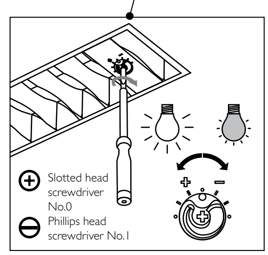




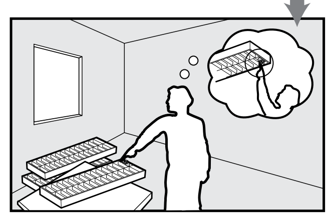
Measure the light level under each MicroLuxSense sensor with no or negligible daylight contribution.



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.

MicroLuxSense Daylight Regulation Sensor
LRL1222

General Specifications

Technical data

Operation conditions

Ambient temperature	41°F to 131°F (5°C to 55°C)
Rel. humidity	5% to 90%, no condensation
Max. allowed temperature Anywhere on the sensor housing	131°F (55°C)

Storage conditions

Ambient temperature	-13°F to 158°F (-25°C to 70°C)
Rel. humidity	5% to 95% at 77°F (25°C)

Connection	20 AWG, flying leads, length 27 inches (.68 meters)
Color coding of cable	purple +, 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. 1.13oz, 1.85x.75x.75 inches (32g, 47x19x19 mm)

Control signal input

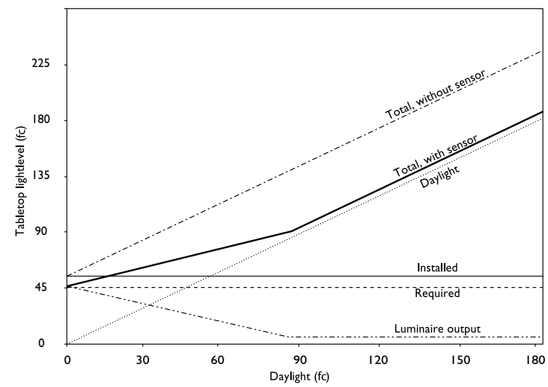
operating voltage	+2.5 - +10Vdc
operating current sink	100µA-2.4mA (sufficient for 20 Philips Advance Mark 7 *0-10V* or EssentiaLine *0-10V* ballasts)
control voltage variation	< 0.7V over current and temp. range
max. input voltage	15 Vdc (maximum rating)
max. current sink	50 mA (maximum rating)

Optical characteristics

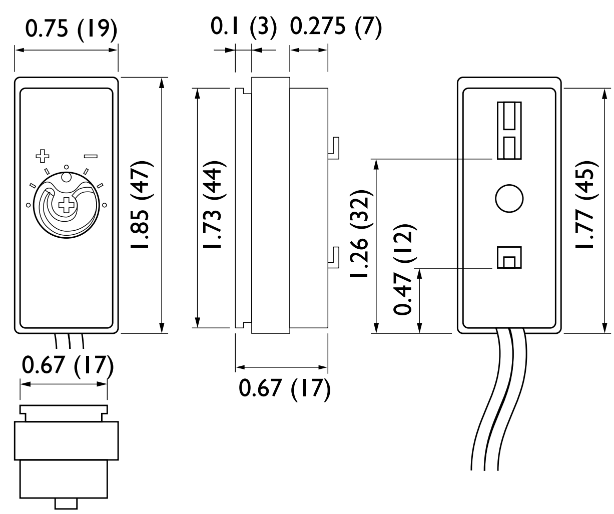
- It is assumed that the reflection in a room is such that a light level of 45 fc on a table (2.6 ft. in height / .79m) will result in 2.3 fc seen by the controller at ceiling height (8 ft. / 2.4m) under a viewing angle of 45°
- The opening angle can be adapted by the diaphram control, realizing an attenuation 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 inches (mm)



ActiLume DALI Lighting Control System

An easy to use and install lighting control system

ActiLume DALI 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 DALI consists of a ready to use sensor and control unit to be built directly into a luminaire. Research shows that daylight and occupancy sensing functionality may provide a potential energy savings of up to 65% without sacrificing desired light levels.*

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.

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. 15-16

ActiLume DALI Lighting Control System
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	32°F to 131°F (0°C to 55°C) Sensor and controller
Relative humidity	20% to 85%, no condensation

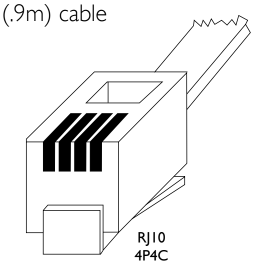
Storage Conditions

Ambient temperature	-13°F to 185°F (-25°C to 85°C)
Relative humidity	10% to 95%

Sensor / Controller Specifications

Sensor LRI 1653

Connection — RJ-10 4-Pole
Fixed to LRI1653 3 ft. (.9m) cable



Housing (casing)

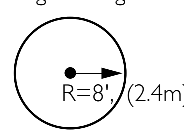
Material — Polycarbonate UL94 V-0

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

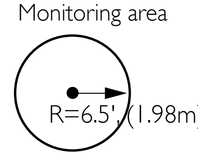
Safety, basic insulation — > 1500 V

When placed at a height of 9 ft. the following values are valid:

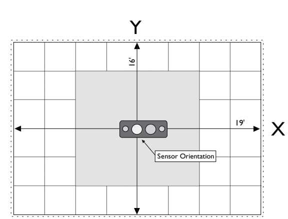
Infrared receiver — Signal Range



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., (3.35m)
X-angle PIR: 100°
Y-angle PIR: 82°

Detection area at 9 ft. (2.74m) height:
- 13x13 ft. (3.96x3.96 m) (sensitive for small movements)
- 20x16 ft. (6.1x4.9 m) (sensitive for larg movements)

ActiLume DALI Lighting Control System
Controller LLC 1654
Sensor LRI 1653

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 DALI 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.

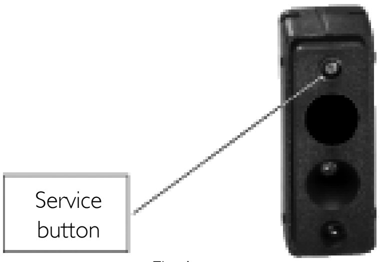


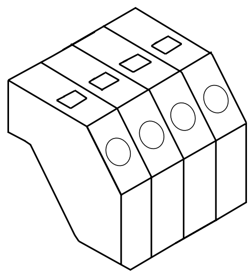
Fig. A

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 1.78in (4.5mm). The snap-in pins are designed for a metal thickness of maximum .03in (.8mm). The maximum distance between the fixation holes is 3" (78mm).

Connector type

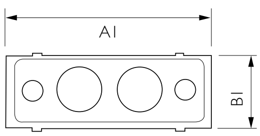
Connection wiring is greatly simplified through use of POKE-IN connectors.



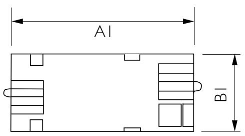
Wire cross-section

22 AWG - 18 AWG solid or stranded with tinned ends
Strip length 3/8"

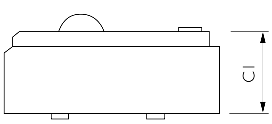
Dimensions in inches



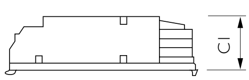
Sensor LRI1653



Controller LLC1654



Sensor LRI1653

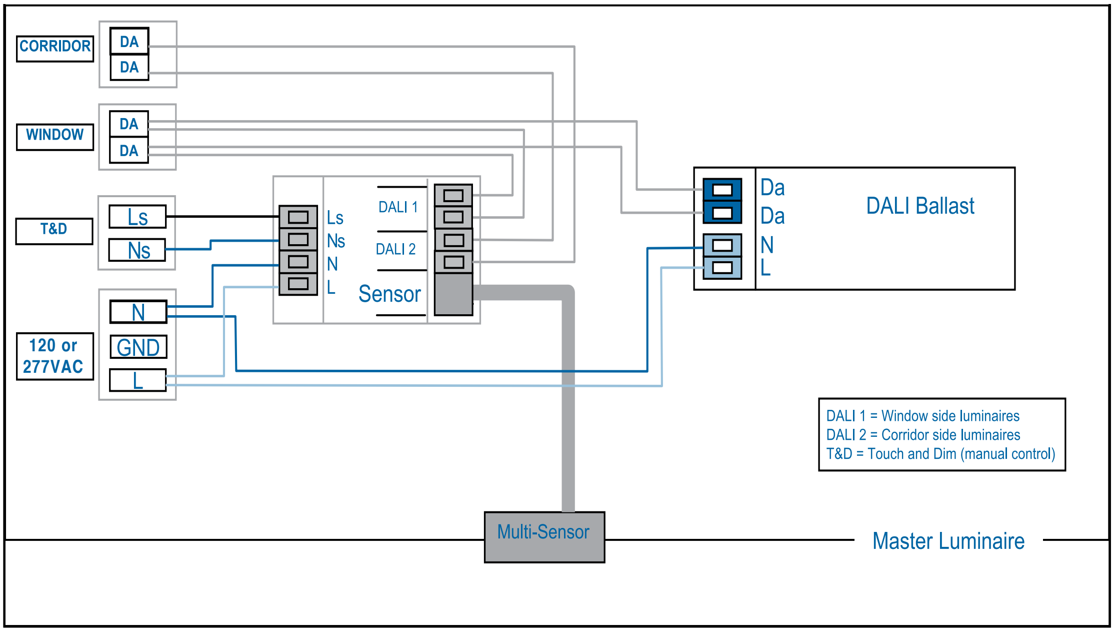


Controller LLC1654

	A1	B1	C1
Sensor LRI 1653	1 3/4 (44)	5/8 (16)	5/8 (16)
Controller LLC 1654	3 1/8 (79)	1 3/16 (35)	7/8 (22)

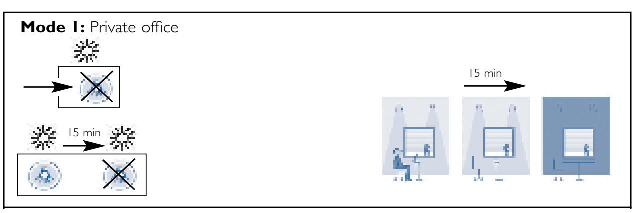
Dimensions in inches (mm)

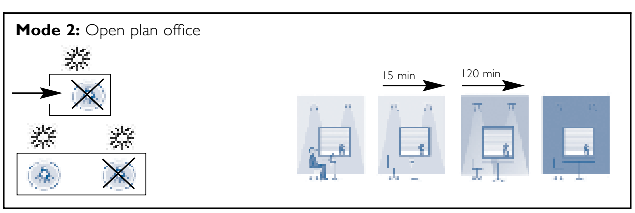
ActiLume DALI wiring



ActiLume DALI Modes

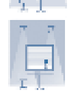
Besides the private office and open plan office modes, in the future it will be possible to recall additional (yet to be determined) application modes. This will make the ActiLume system very flexible for all different kinds of applications. An advanced remote control will be added in the future to allow users to select and store other specific modes to meet the space needs.



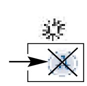


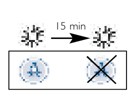

Presence - Area is occupied.


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.

ActiLume Wireless 1-10V System

Easy and flexible energy savings

The ActiLume Wireless 1-10V System is a new easy to install and easy to use luminaire based control solution. It is suitable for offices, schools, etc. and offers energy savings without sacrificing visual comfort. The system can automatically switch the artificial lights in a space on and off based on occupancy and can also dim the artificial lights when enough daylight (natural light) enters the space.

Although the ActiLume Wireless 1-10V system is intended to be used as an easy to install system, some commissioning will be needed. Commissioning is done by means of a small screwdriver for adjusting the light level and/or the timing. This will set the artificial light according to the designer's requested light level, switch the controller off or dim the light after a certain period of time. By means of the remote control a network (room) can be created and scenes can be created or a specific light level can be set.

The ActiLume Wireless 1-10V system consists of a sensor (which can also be used as a standalone device in conjunction with a dimmable ballast/driver or other 1-10V devices) and a control unit (Wireless SwitchBox) designed to be built into a luminaire. The sensor contains two functions – a light sensor for daylight dependent light level regulation and a movement detector for occupancy control. The lighting can also be controlled manually by a wired switch with a momentary contact (Touch and Dim). The system is operated with Philips 0-10V dimmable electronic ballasts/drivers. Moreover, the light output of the luminaire is already pre-defined according to the setting of the diaphragm on the sensor.

The luminaires are connected and mounted in the ceiling. Via rotating the diaphragm the required light level can be adjusted. This setting is then easily copied to the other luminaires in order to have a similar setting. The system is now ready for use. With the commissioning procedure as described in this document, several devices can be linked together so they will act as one system.

LLC1681 ActiLume Wireless 1-10V SwitchBox

LRI1655 ActiLume 1-10V Sensor

CONTROLS

As the system's name already implies, it can also be controlled via a secured radio connection which makes use of the ZigBee protocol (2.4GHz, 2007/ZigBee PRO), via a special remote controller. With this controller special features can be unlocked such as "occupancy sharing", connecting various ZigBee devices (up to 16 devices) from this family together into one network (room) which can be split-up, into a maximum of 16 zones.

Note that encrypted commands are used for communication between the different Philips devices.

UID8410 Wireless Scene Remote

LRM1743

LRM1760 OccuSwitch Wireless Multi Sensor

LRM1766, LRM 1771, LRM1776

ActiLume *1-10V* Lighting Control System

Lighting control made simple

The ActiLume *1-10V* System is a simple to install and easy to use lighting control system designed to operate in personal or open office settings. This system contains both a light sensor for daylight harvesting, and movement detector for occupancy sensing. Research shows that daylight and occupancy sensing functionality provides a potential energy savings of up to 65% without sacrificing light levels.* ActiLume *1-10V* can automatically switch the lights on and off with its occupancy sensing feature. The daylight harvesting feature will dim the luminaires when enough daylight enters the room offering automatic energy savings without the need for complex commissioning.

The ActiLume *1-10V* System consists of a sensor and a control unit designed to be built directly in to a luminaire. The sensor provides both daylight harvesting and occupancy detection. The system can be used with any Philips Advance 0-10V dimming or fixed output ballast/driver. The ActiLume *1-10V* sensor shares a common footprint with other sensors in the ActiLume family making one luminaire design capable of housing a variety of control options from Philips.

Installers and end-users do not have to worry about complicated programming anymore. Commissioning is effortless – simply use a small screwdriver to adjust the light level and/or occupancy detection time delay. The ActiLume *1-10V* System is a truly Plug-and-Play lighting control system that provides excellent visual comfort and automatic energy savings with simple installation.

* Galasiu, A.D. "Energy saving lighting control systems for open-plan offices: a field study," National Research Council Canada, v4 no1, July 2007 pg. 15-16

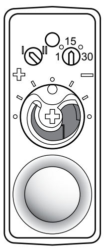
Save on installation and maintenance costs. No professional training required for commissioning and light level adjustments.

Installation ease with one step commissioning

Maximize visual comfort

Automated regulation of artificial lighting allows for task illumination to be maintained.

Sensor Overview

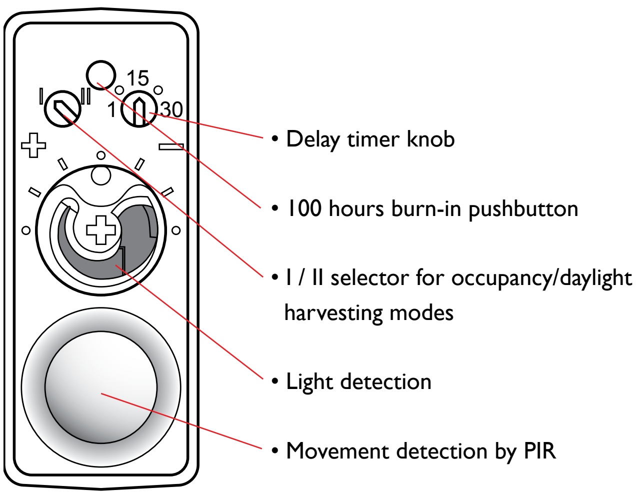


Daylight sensing

When space light levels surpass task levels the light will automatically dim. Adjust the light level to meet your specific light needs simply by rotating the diaphragm. The minimum dimming level corresponds to a 2.5V control signal to the dimming ballast/driver.

Occupancy detection

When no presence is detected. The luminaire will be dimmed down to a light output level corresponding to a 2.5V control signal to the ballast/driver.



The sensor will automatically lengthen the delay time when the sensor detects presence directly after the moment it has given the signal "no presence" (will double the delay time once). Reduce the frustration of false "no presence" triggers with the smart timer function.

- Smart timer function: Adjust the dial to set the delay time between 1 and 30 minutes.
- Mode selector: On the adjustment dial chose between:
  - Setting I = Presence detection only (default factory setting)
  - Setting II = Presence detection and daylight sensing.

Burn-in Button:

- The burn-in mode is set to switch on/off the functionality of daylight and presence detection for 100 hours to ensure a proper burn-in of the fluorescent lamp that may be required by the lamp manufacturer. After 100 hours of burning in the system will automatically switch to the normal operating mode. The activation/deactivation of the burn-in mode is confirmed by blinking of the lamps
- When the burn in button is pressed for greater than 1 second but less than 3 seconds, the system is in a burn-in mode. The confirmation comes with one blink.
- When pressed more than 3 seconds, the burn-in will be deactivated. The confirmation comes with two blinks.

Mounting Guidelines

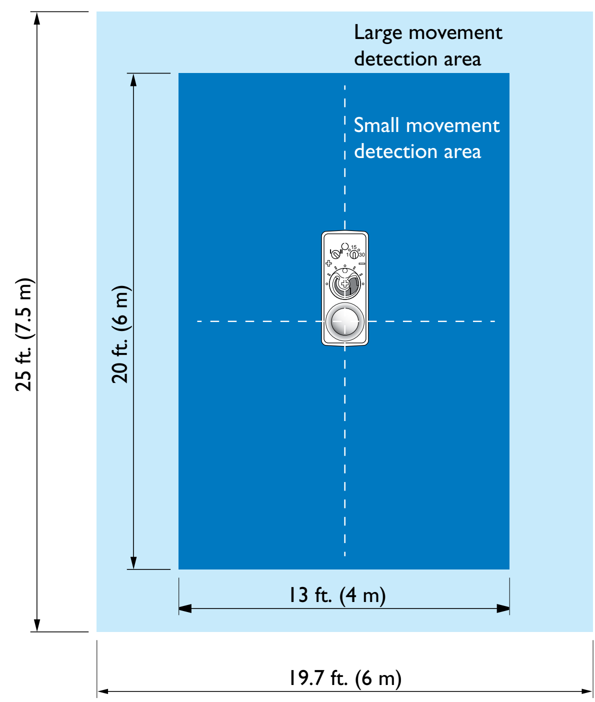
Detection of sensor designed for mounting heights no greater than 12 ft. (3.5 m).

Multiple Luminaires on one sensor

- While it's recommended to use one sensor per luminaire, ActiLume *1-10V* can connect up to 20 ballasts or drivers with one sensor.

Detection area of the movement detector

If the sensor is mounted at a ceiling height of 8 ft. (2.5 m) the detection area of the PIR is as follows:



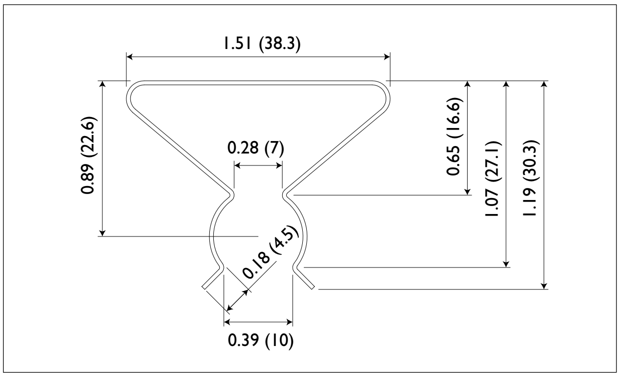
ActiLume *1-10V* Lighting Control System
Controller LLC 1655
Sensor LRI 1655

Sensor Accessories

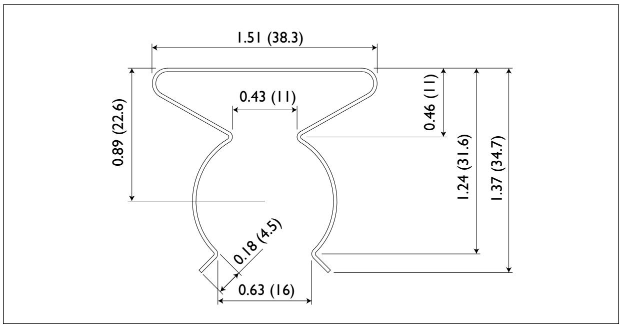
For easy mounting of a sensor to a lamp use our metal clip for all luminaire-based sensors in the ActiLume family. There is a separate clip for TL-D (T8) and one for TL5 (T5).

The Ring can be used to increase the size of the sensor when the sensor is placed between the lamella of the luminaire.

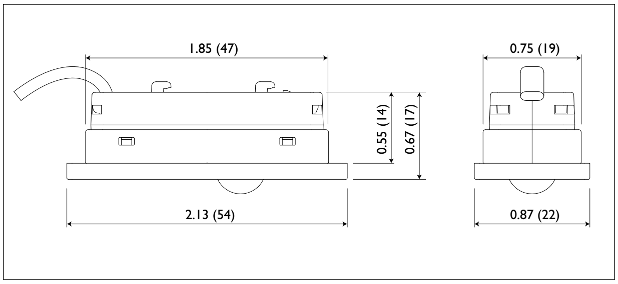
Dimensions of TL5 (T5) Clip LCA8002 inches (mm)



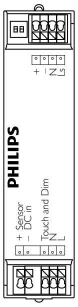
Dimensions of TLD (T8) Clip LCA8003 inches (mm)



Dimensions of ring LCA8001 inches (mm)



SwitchBox Overview



The Sensor will give a signal over the 1-10V connection when the SwitchBox can switch off the ballast.

When the ballast is switched off, the Sensor will be powered by the SwitchBox to ensure that daylight and presence detection continue to function.

On the SwitchBox there is a Mode Selection dip switch to set the point at which the ballast will be switched off due to excessive light.

- Mode 1 is at 150% of footcandle set point for use with 0-10V ballast/driver (default factory setting)
- Mode 2 is at 250% of footcandle set point for use with 0-10V or fixed output ballasts/drivers

While in standby mode, the SwitchBox continues to provide power to the ActiLume *1-10V* Sensor but at a reduced consumption level of less than 350mW.

The SwitchBox is suitable for 120 - 277V input voltage at 50/60Hz. The SwitchBox is a simple relay that detects zero-crossing and switches on during the next pass. The switch box can switch multiple ballasts up to 400W of connected load:

Connectors: Color connectors for ease of wiring installation.

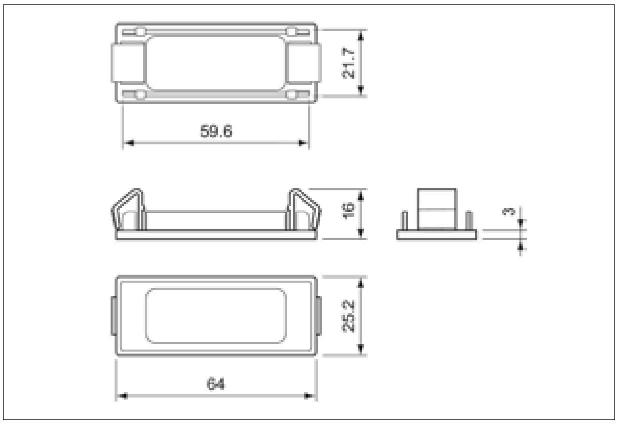
Personal Control

When override of the automatic dimming function is required, install a momentary contact ("Touch and Dim") switch in conjunction with the SwitchBox. This application allows the end user to set a temporary light level. Upon space vacancy as per the delay timer, the system will go back to automatic mode.

Fixed output ballast/driver installation

When the SwitchBox does not receive a signal via the 0-10V ballast input point, the switchbox will conclude that a fixed output ballast/driver is connected and will only switch off if the footcandle level exceeds 250% of the footcandle setpoint.

Dimensions of ring LCA8005 inches (mm)



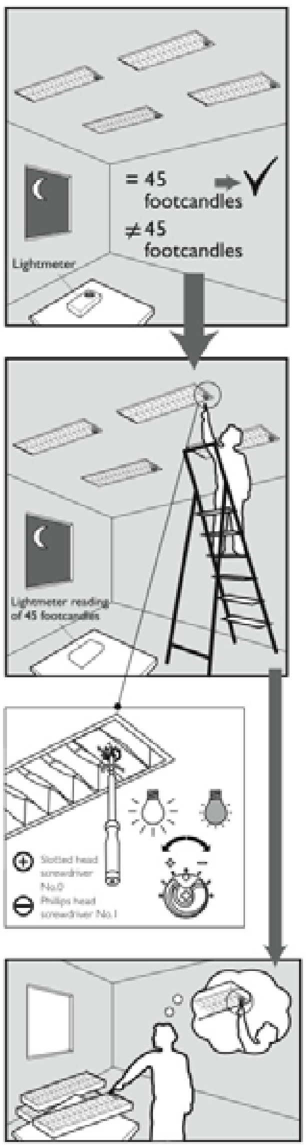
CONTROLS

ActiLume *1-10V* Lighting Control System
Controller LLC 1655
Sensor LRI 1655

Installation

- When the sensor is clipped on the lamp or attached to optics, (distance between sensor and lamp is less than 0.31 in. (8 cm)) the sensor should be located at the cold side of the lamp (wired by the long lead wires of the ballast).
- If the sensor is placed in the housing of the luminaire or clipped onto the lamp, a distance of at least 0.31 in. (8 cm) should be maintained between sensor and the electrically "warm" lamp-end (the lamp-end where the short wires are connected to).

Commissioning



Measure the light level under each ActiLume 1-10V sensor with no or negligible daylight contribution.

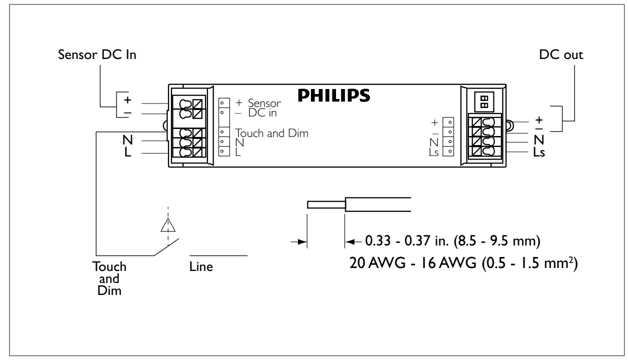
If needed, turn the diaphragm until the required light level is reached (with no or negligible daylight contribution).

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.

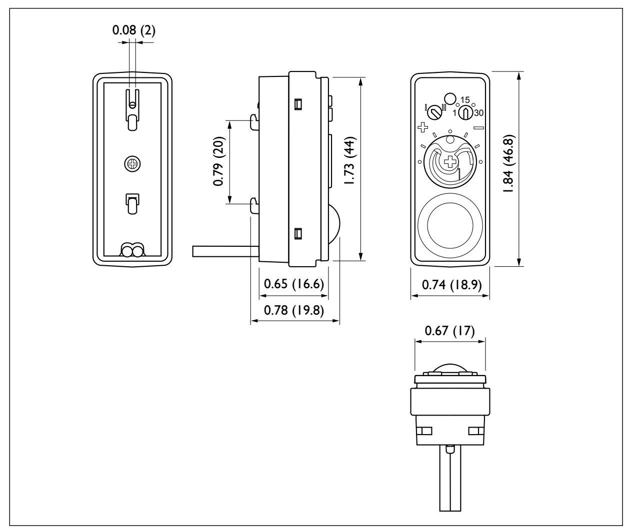
You can easily copy the new set point to other rooms when similar daylight and reflector conditions exist.

Warning: The required light level should be within 70% of the average installed light level without daylight contribution (e.g. 55 footcandles installed, adjustment down to 39 foot candles is possible). Please note that ActiLume *1-10V* is not designed for maintaining a constant light level.

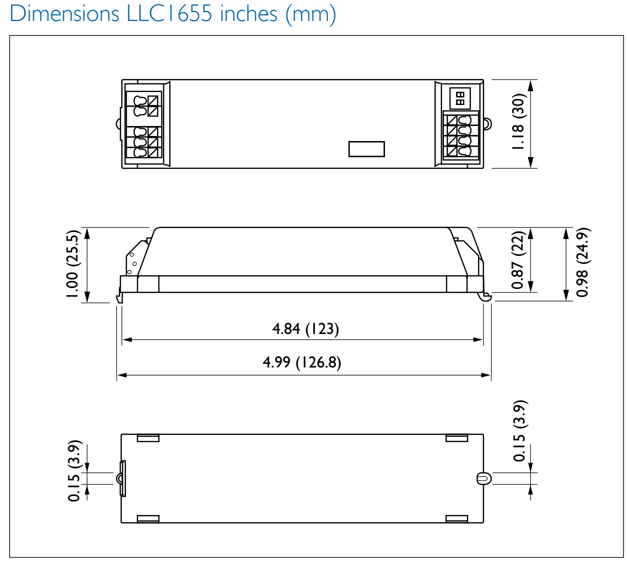
Wiring Diagrams



Dimensions LRI1655 inches (mm)



Dimensions LLC1655 inches (mm)



ActiLume *1-10V* Sensor LRI1655 Specifications

Operation conditions	
Ambient temperature	41°F to 131°F (5°C to 55°C)
Rel. humidity	5% to 90%, no condensation
Max. allowed temperature	131°F (55°C) Anywhere on the sensor housing
Storage conditions	
Ambient temperature	-13°F to 158°F (-25°C to 55°C)
Rel. humidity	5% to 95% at 77°F (25°C)
Connection	18 AWG (1mm^2, flying leads (PVC free), 25.4" (100 cm)
Color coding of cable	purple + ,gray –. When connected wrongly to the ballast dim input, the ballast input is short circuited, resulting 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. 0.88 oz. (25 g) 1.85" x 0.75" x 0.75" (47 x 19 x 19 mm)
EMC According to	Ed.7.1
Control signal input	
- operating voltage	+2.5 - +10Vdc
- operating current	sink 100µA-3mA (sufficient for 20 0-10V ballasts/drivers)
- control voltage variation	< 0.7V over current and temp. range
- default setting	5Vdc at 3.75 fc/140µA (factory calibration tool)
- step response	within 2 sec. on 5V after power-up in case of insufficient ambient light
- 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 50 fc on a table (30 inches / .76m in height) will result in 2.5 fc seen by the controller at ceiling height 8 ft. (2.4m) under a viewing angle of 45°. The opening angle can be adapted by the diaphragm control, realizing an attenuation factor between 1/3 and 3.

ActiLume *1-10V* SwitchBox LLC1655 Specifications

Operation conditions	
Ambient temperature	32°F to 131°F (o°C to 55°C)
Rel. humidity	5% to 90%, no condensation
Max. allowed temperature	149°F (65°C) at Tc testpoint

Storage conditions	
Ambient temperature	-25°F to 158°F (-25°C to 70°C)
Rel. humidity	5% to 95% at 77°F (25°C)

Connections	Wago 250 connectors
Color coding of connectors	Inputs
purple =	1-10V +
gray =	1-10V –
red =	Touch and Dim
white =	mains Neutral
black =	mains Line

Outputs
violet = 1-10V +
gray = 1-10V –
white = mains Neutral
black = mains Line

Housing material	Polyphenylene Oxide (PPHOX), Noryl PX9406 by Sabic, UL94 V-0
Color housing	White (WH8581)
Weight/dimensions	Approx. 1.8 oz. (51 g) 0.87" x 1.22" x 4.84" (22 x 31 x 123 mm)

Control signal input	
- 0-10V input current	Sourcing 120 µA
- max. input voltage	Protected against accidental mains voltage connection

Control signal output	
- 0-10V output voltage	+2.5 - +10Vdc
- 0-10V output current	sinking 20 mA (maximum rating)
Max. switching capacity	400VA
Input voltage range	
- Nominal range	120 ... 277V
- Performance range(-8% / +6%)	110 ... 294V
- Safety range (-10% / +10%)	108 ... 305V
Input mains frequency range	
- Nominal range	50 ... 60Hz
- Performance range(-8% / +6%)	46 ... 64Hz
- Operational range (-10% / +10%)	45 ... 66Hz
Approvals/marking	CE, UL KEMA KEUR

Ordering Data

Catalog Number	Description
LRI1655	ActiLume *1-10V* Sensor
LLC1655	ActiLume *1-10V* SwitchBox
LCA8001	Ring for cover set of 100 Pieces
LCA8002	Clip T5 set 50 Pieces
LCA8003	Clip T8 set 50 Pieces
LCA8005	Locking trim ring set 50 Pieces

ActiLume Classic Lighting Controls

Simple energy saving solutions for industrial applications

The ActiLume Classic Lighting Controls are the simple way for industrial facilities to realize the energy saving benefits of occupancy sensors while at the same time helping to minimize maintenance and setup costs. ActiLume Classic sensors easily attach to existing fixtures to turn individual fixtures on or off depending on whether a space is occupied. Consisting of 16 different models for a variety of industrial high bay applications, ActiLume Classic contains a number of value added features including technology that can help to preserve lamp life, take advantage of daylight holdback, make set-up easier, and provide the flexible solutions that industrial facilities need in today's high energy cost economy.

In addition to helping facilities cut energy usage, Philips ActiLume Classic products are designed to be flexible and help facilities minimize their setup and maintenance costs. Depending on the specific products, the ActiLume Classic line may integrate interchangeable lenses, rotating sensors, masking kits, self contained relays (that eliminate the need for power packs), and other features that ensure flexibility.

Compatibility

Compatible with Philips Advance Optanium programmed start and Centium electronic fluorescent ballasts.

Features and Benefits

- Reduces energy costs by turning lights off when the space is not in use, or leaving them off if there is enough daylight
- Passive Infrared (PIR) technology maximizes energy savings by helping to minimize false triggers from minor background environmental conditions or vibrations
- Easily attaches to existing luminaries or electrical junction box
- Push button adjustments means no professional training required for commissioning and light level adjustment
- Optional mounting bracket allows sensor to be mounted up to 4.3 inches (11cm) lower to avoid obstructions

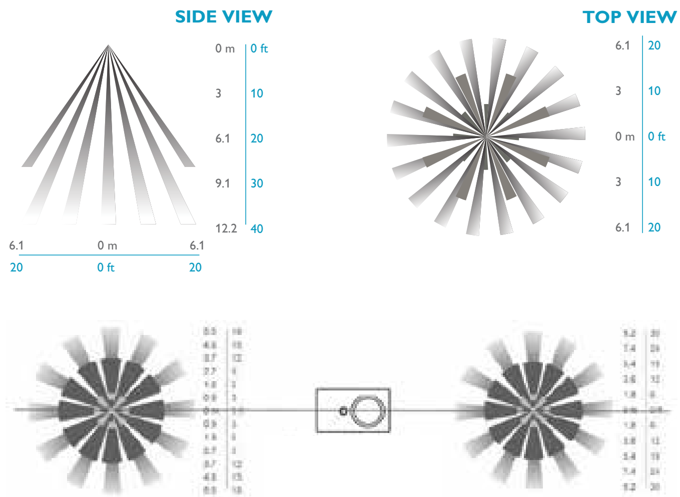
Applications

- Industrial
- Warehouse
- Parking garage
- Other high bay application areas

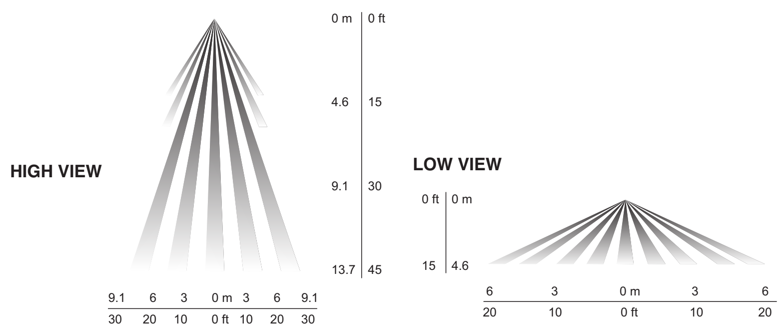
Wall Switch Luminaire Sensors

Type	Description
LRS2235	Fixture mounted ocupancy sensor 3 lenses
LRS2237	Fixture mounted ocupancy sensor 3 lenses, 480Vac
LRM2310	Internal Fixture Mount, High-Bay, 360° PIR, 120/277VAC
LRM2315	Internal Fixture Mount, High-Bay, 360° PIR, 347VAC
LRM2320	Internal Fixture Mount, Low-Bay, 360° PIR, 120/277VAC
LRM2325	Internal Fixture Mount, Low-Bay, 360° PIR, 347VAC
LRM2330	Fixture Mount, High-Bay, 360° PIR, Self Contained, 120-277VAC
LRM2335	Fixture Mount, High-Bay, 360° PIR, Self Contained, 347VAC
LRM2340	Fixture Mount, High-Bay, 360° PIR, Self Contained, Photo Cell, Low Temp, 120-277VAC
LRM2345	Fixture Mount, High-Bay, 360° PIR, Self Contained, Photo Cell, Low Temp, 347VAC
LRM2348	Fixture Mount, High-Bay, 360° PIR, Self Contained, 2 pole 480VAC
LRM2350	Fixture Mount, High-Bay, Aisle Focus PIR, Self Contained, 120-277VAC
LRM2355	Fixture Mount, High-Bay, Aisle Focus PIR, Self Contained, 347VAC
LRM2360	Fixture Mount, High-Bay, Aisle Focus PIR, Self Contained, Photo Cell, Low Temp, 120-277VAC
LRM2365	Fixture Mount, High-Bay, Aisle Focus PIR, Self Contained, Photo Cell, Low Temp, 347 VAC
LRM2368	Fixture Mount, High-Bay, Aisle Focus PIR, Self Contained, 2 pole 480VAC
LRM2369	Sensor mounting bracket

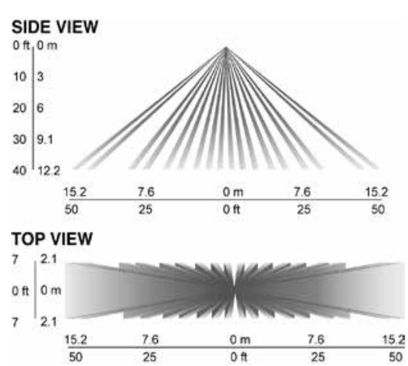
LRM2310, 15, 20, 25 Detection Pattern



LRM2230, 35, 40, 45, 48 Detection Pattern



LRM2350, 55, 60, 65, 68 Detection Pattern



Dynadimmer *0-10V* Lighting Control System

A simple, easy to install outdoor controller for electronic lighting systems

The Dynadimmer is a stand-alone dimming control with a 0-10V 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.

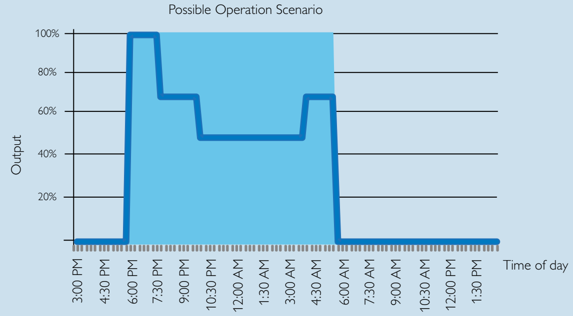
The five time periods and five dim levels provide an optimal schedule whether the application is an industrial area, parking lot, residential area or road. The Dynadimmer can help to meet certain road/area-lighting requirements and standards, which entail the introduction of illumination levels that 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

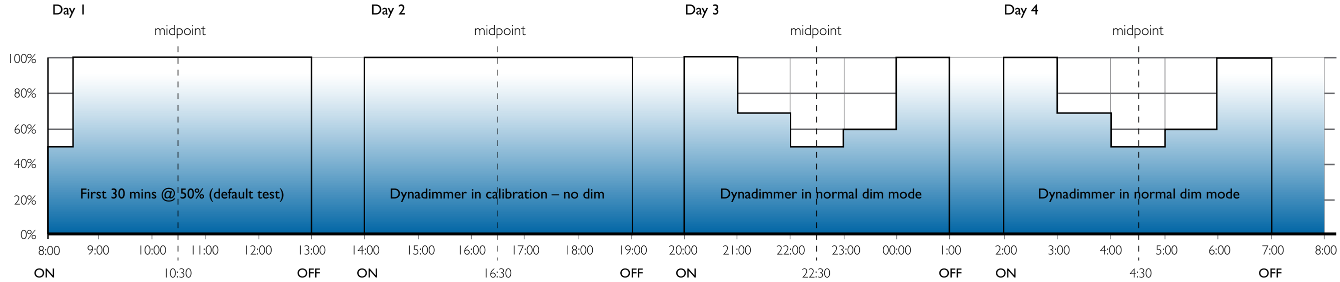
Energy savings may be maximized with the Dynadimmer. The fact that any level can be configured at any time makes very low levels late at night possible, high levels at peak times (though not necessarily 100%) and medium levels during the transitional periods. For example, a dimming schedule like the one shown in the picture projects an overall yearly energy saving of 35%.



Dynadimmer Standard Programming Schedule

Ordering information

Ordering Code	Description	Compatible Ballasts
LLC7230	Dynadimmer 0–10V	0–10V eHID ballasts and LED drivers
LCC7210	USB PC Cable	
KIT7210	Programming Kit	



CONTROLS

Technical data

Storage conditions

Temperature	min -40°F (-40°C) / max 176°F (80°C)
Relative humidity	min 5% / max 95% RH

Operating conditions

Ambient temperature	min -22°F (-30°C) / max 140°F (60°C)
Case temperature	80° C
Relative humidity	min 10% / max 90% RH (no condensation)

Mains connection

Operational voltage	120-277V ± 10%
Frequency	50/60 Hz ± 5%
Maximum load	Not applicable

Mains / 1-10v connections

Connector type	WAGO 250 Cage Clamp
Drivers per Dynadimmer 1-10v	2 max.
Wire range	18 gauge
Wire strip length	8 in (203 mm)
Power consumption	0.5W at 220VAC/60Hz

Programming connector

Connector type	Micro MATE-N-LOK connector
Factory setting	After power-up, the control voltage will rise slowly to +5VDC

Dim interface

Control voltage	1-10V
Max. current	0.3mA sinking
Dim curve	Defined by selected driver
Protection	Protected against accidental connection with mains voltage
Output impedance	2700 ohm

Housing

Protection class	Tested to IP66
Dimensions (H x W x L)	1 x 2.125 x 3.15 inches (25 x 54 x 80 mm)
Weight	0.085 Kg
Material	PC-GE LEXAN 223R-111
Color	Black
Glow wire test	≥ 850° C at 1 mm material thickness
Flammability	UL94-V2 at 0.75 mm material thickness UL94-V0 at 6 mm material thickness
Fixation	M8 x 16 bold (class 8.8) or 2 x M4 screw with cylinder head

The LLC7230 is designed to be built into a luminaire, a box, an enclosure, or the like and is not intended to be mounted outside a luminaire, etc. without special precautions.
The LLC7230 housing provides insulation for class 2.

Safety

1-10V interface	The interface is double (0-10V) isolated from the mains supply (4kV routine test for transformer)
Programming interface	The interface is double (0-10V) isolated from the mains supply (4kV routine test for transformer)

Warning
Mains has to be disconnected before connecting the programmer. Failure to do so could result in personal injury, and/or damage to the Dynadimmer

Starsense Lighting Control System

A cost-effective telemanagement outdoor lighting control system

Starsense is a telemanagement system, with remote control of outdoor light points on highways, roads, streets and in residential areas. It is designed to save energy by enabling individual light points to be switched on or off at any given time or set to any dimming level. Makes outdoor lighting installations intelligent and dynamic.

Features and benefits

Starsense controls and monitors any lamp type from electromagnetic ballasts to electronic drivers making it a flexible choice.

Starsense can accurately detect failures in the light points which can lower maintenance costs.

Starsense's user-friendly software tool is easily accessible from the internet and shows relevant information such as failures, energy consumption, lifetime, etc. With real-time monitoring using web mapping services from the Internet, this system is able to provide immediate information and feedback.

Please contact your local Philips sales representative to learn more about the Philips Starsense solutions.

CONTROLS

Technical data

Operating conditions	
Ambient temperature (t_a)	-22°F to 140°F (-30°C to 60°C)
Relative humidity	10 to 90%
Max. housing temperature	176°F (80°C)
Lifetime	90% operational products after 80,000 hours of operation
Non-operating conditions	
Temperature	-22°F to 176°F (-30°C to 80°C)
Relative humidity	5 to 90%
Mains connection	
Mains voltage (LFC7320)	120VAC ±10%
Mains voltage (LFC7310)	240/480VAC ±10%
Mains frequency	50/60 Hz ± 5%
Max. load wattage	750VA @ 120V 1000VA @ 277V, 347V, 480V
Recommended external fuse	15A Maximum
Power consumption	
Operating wattage	50W
Accuracy integrated power	±5% consumption metering
Radio frequency	
Protocol	IEEE802.15.4
Frequency band	906-924MHz
Range	300m (OLC to OLC) 50m (OLC to SC)
Data rate	250 kbit/s
Antenna	Internal 1/4 wave monopole
Transmitter output power	89dBµV/m
Receiver sensitivity	46dBµV/m
Transceiver security	AES128 encryption

* **NOTE:** Multiple OLC's should be in range of the Segment Controller.

Certifications/misc	
Conducted emission	FCC 47 Part 15
Radiated emission	FCC 47 Part 15
ANSI	136.10
Flammability	UL 94V-0
Protection class	IP54
Housing material	Polycarbonate (PC)
Damp heat	IEC 60068-2-30
Salt mist	IEC 60068-2-11
Mixed gas corrosion	IEC 60068-2-60
Vibration	IEC 60068-2-6
Rain tightness test	UL773
Temperature sensor	37°F (3°C) (-22°F to 140°F / -30°C to 60°C range)
Agency marking	UL, CSA, NOM

Notes

Corporate Offices
(800) 322-2086

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

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REFERENCE MATERIALS

All products contained within this catalog carry a limited warranty from the date of manufacture.

For ballast warranty information, go to our web site for up-to-date warranty information:
www.philips.com/advancewarranty

For warranty information on controls and ballasts, please contact your local sales representative and agent.

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.

AllStart Technology - Philips proprietary, high efficacy, ceramic metal halide (CDM) lamp technology that allows this class of lamps to operate on either standard probe-start, or pulse-start magnetic ballasts. Consult Philips SAG-100 for lamp details.

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 detect 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 among other 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 occur for a number of reasons, including but not limited 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 input power. 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 Luminous Efficiency (BLE) - Measure used to compare ballast efficiency based upon lamp power and input power. BLE = Total Lamp Arc Power / Input Watts

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 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 and a capacitor is required as part of the lamp (secondary) circuit.

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 - Fluorescent lamp ballast energy efficiency regulations in Canada SOR 2006-271

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 also referred to as a 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.

REFERENCE MATERIALS

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 Intertek Testing laboratory, which is an independent testing facility, that 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, "Title 47 CFR 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) - A volunteer professional membership agency dedicated to 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.

Insulation Detector - See definition "Self Heating Thermal Protector"

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) - Electrical installation code developed by the National Fire Protection Association to reduce the risk of fire, which use is commonly mandated by state or local law in the U.S..

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 a 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 in or about 1979.

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.

RoHS - Short for Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment, was adopted in February 2003 by the European_Union.

RFI (Radio Frequency Interference) - Form of electromagnetic interference.

Series (LED) - Electrical condition where LEDS operate under the same current being provided by a driver.

Self Heating Thermal Protector - An add-on device required by various electrical codes for recessed downlight luminaires. This device is designed to shut power to the luminaire when the exterior luminaire surface reaches a defined temperature limit to prevent fire.

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 could 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 Total 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 products that may be listed with UL and may bear the UL 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

Fluorescent/HID Ballast Ballast Specification for Lighting

Electronic Fluorescent

- Centium Micro Can
- Centium T5
- Centium T8, T12 and FT5
- Optanium
- SmartMate
- AmbiStar
- PowrKut
- PureVOLT
- Optanium Step-Dim
- Mark 7 0-10V
- Mark 10 Powerline
- ROVR
- PowerSpec HDF

Magnetic HID (Including Metal Halide, High Pressure Sodium, and Low Pressure Sodium)

Electronic HID (Metal Halide)

- e-Vision
- Xtreme

Corporate Offices
(800) 322-2086

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

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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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 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 color-coded integral leads or connectors 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 or 347V through 480V with sustained variations of +/- 10% (voltage and frequency) with no damage to the ballast.

2.4 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.

2.5 Ballast shall have a Power Factor greater than 0.98 for primary lamp.

2.6 Ballast shall have a minimum ballast factor of 1.0 for primary lamps.

2.7 Ballast shall provide for a Lamp Current Crest Factor of 1.7 or less in accordance with lamp manufacturer recommendations.

2.8 Ballast input current shall have Total Harmonic Distortion (THD) of less than 10% when operated at normal line voltage with full load primary lamps.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18°C (0°F) or -29°C (-20°F) or 0°C (32°F) for primary lamp.

2.11 Ballast shall provide Lamp EOL Protection.

2.12 Ballast shall tolerate sustained open circuit and short circuit output conditions without damage.

Section III - Regulatory

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 9002 Quality System Standards.

4.2 Ballast shall carry a ______ year 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.

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 start).

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 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 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 -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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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

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 ballasts allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 Ballast shall operate from 50/60 Hz input source of ______ (120 through 277V or 347V or 347 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 between 42 kHz and 52kHz to avoid interference with infrared devices, eliminate visible flicker and avoid Article Surveillance Systems, such as anti-theft devices.

2.5 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: 0.77 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.

2.7 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 for all 4-foot lamps and smaller.

2.10 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.

2.11 Ballast shall tolerate sustained open circuit and short circuit output conditions.

2.12 Ballast shall have lamp striation-reduction circuitry.

2.13 Programmed Start ballast shall provide lamp EOL protection circuitry.

Section III - Regulatory

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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

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 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.

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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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 Dimming ballast shall be controlled by a compatible Ambistar two-wire dimmer. When input voltage to dimmer is 120V, control voltage to the ballast (from the dimmer) shall be 120V at full light output and 56V at minimum light output.

4.4 Ballast shall be Philips Advance part # __________ or approved equal.

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 or 277V 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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment

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 ______ year 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

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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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.

1.2 Ballast shall be provided with integral leads color-coded per ANSI C82.11.

Section II - Performance Requirements

2.1 The ballast shall be Programmed Start.

2.2 The 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 at 100% power and greater than 0.90 at 50% power for primary lamp.

2.6 Ballast shall have a ballast factor of 0.87 for primary T8 lamps or a ballast factor of 0.95 or 1.15 for primary T5HE lamps at full light output.

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 and 100% power.

2.9 Ballast shall have a Class A sound rating.

2.10 Ballast shall have a minimum starting temperature of -18C (°F) for standard T8 or T5HE lamps or 0C (32F) for energy-saving T5HE lamps or 16C (60F) for energy-saving T8 lamps. 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 Circuit for T5 lamps.

2.13 Ballast shall control light output in two steps: 100% power and 50% power. Control shall be any device that switches the line voltage input. Both line voltage inputs must be on the same phase.

2.14 Ballast shall ignite the lamps at any light output setting without first going to another output setting..

Section III - Regulatory

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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

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 IZT-4PSP32-G ballast shall provide Independent Lamp Operation (ILO) allowing remaining lamp(s) to maintain full light output when one or more lamps fail.

2.3 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.

2.4 Ballast shall contain auto restart circuitry in order to restart lamps without resetting power.

2.5 Ballast shall operate from 50/60 Hz input source of 120V or 277V or 347V 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).

2.6 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.

2.7 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.

2.8 Ballast shall have a minimum ballast factor of 1.00 (120V and 277V 1-3 lamp models) or 0.88 (120V and 277V 4 lamp models and 347V 2-3 lamp models) or 1.18 (277V 4 lamp HL models) at maximum light output and 0.03 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) of less than 10% when operated at nominal line voltage and 100% power.

2.11 Ballast shall have a Class A sound rating.

2.12 Ballast shall have a minimum starting temperature of 10° C (50° F) for primary lamp.

2.13 Ballast shall provide Lamp EOL Protection Circuit for all T5, T5/ HO and CFL lamps.

2.14 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.

2.15 Ballast shall ignite the lamps at any light output setting without first going to another output setting.

2.16 Ballast shall tolerate sustained open circuit and short circuit output conditions.

Section III - Regulatory

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 9001Quality System Standards.

4.2 Ballast shall carry a ______ year 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

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 or 277V 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 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% 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 10° C (50° F) 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% - 5% 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

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 9001Quality System Standards.

4.2 Ballast shall carry a ______ year 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. When input voltage to dimmer is 120V, control voltage at the ballast (from the dimmer) shall be 120V at full light output and 56V at minimum light output. When input voltage to dimmer is 277V, control voltage at the ballast (from the dimmer) shall be 277V at full light output and 129V at minimum light output.

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 50/60Hz input source of 120V or 277V with sustained variations of +/-10% (voltage and frequency) with no damage to the bal last. IntelliVolt models shall operate from 50/60Hz input source of 120V through 277V with sustained variations of +/-10% (voltage and frequency) with no damage to the ballast.

2.5 Ballast shall be high frequency electronic type and operate lamps at a frequency 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 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 throughout the dimming range in accordance with lamp manufacturer recommendations.

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 10°C (50° F) 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 without damage.

Section III - Regulatory

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 9002 Quality System Standards.

4.2 Ballast shall carry a ______ year 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 DALI controller.

4.5 Ballast shall be Philips Advance part # ___________ or approved equal.

Ballast Specification for Controllable Light Output Electronic Fluorescent

PowerSpec HDF family

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 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 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 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 (1-3 lamp models) or 0.88 at maximum light output and 0.03 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% 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 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

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 applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 18, for Non-Consumer equipment.

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 ______ year 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 HDF direct drive dimmers or an applicable HDF amplifier or interface.

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

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 twenty-five 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 applicable 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.

1.2 The electronic ballast shall be furnished with a metallic enclosure for maximum thermal dissipation.

Section II - Performance

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. Power to ballast shall be disconnected to reset end-of-life detection 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

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.

3.3 Ballast shall comply with ANSI C62.41 Category A for transient protection.

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 when operated at marked case temperature (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

4.5 The electronic ballast shall comply with RoHS.

Section V - Additional Specifications for MasterColor Elite Medium Wattage (IZTMH210315RLF)

5.1 Ballast must automatically reduce lamp power to lower its operating temperature when its internal operating temperature increases beyond its maximum limit.

5.2 Ballast must be approved by Philips to operate MasterColor CDM Elite Medium Wattage Lamps.

5.3 Ballast must include a 0-10V dimming interface and control the duimming function such that the CDM Elite MW lamp is allowed to warm up for 10 minutes at full power before the lmap is allowed to dim, regardless of the level of the 0-10V dimming signal.

5.4 Ballast shall dim the lamp from 100% to 50% power in 30 seconds and shall be able to restore power to 100% in 3 seconds maximum.

Electronic HID (Metal Halide)

Ballast Specification for Electronic Metal Halide

Xtreme Electronic Ballast

Applicable to all Ballast Catalog Numbers beginning with ICW, IDCW, RCW

Section I - Physical Characteristics

1.1 The electronic ballast shall be made of a polymeric housing and double insulated with a double isolated functional ground to protect metal parts of the luminaire from becoming live in any normal operating or fault mode.

1.2 The electronic ballast shall incorporate integral wiring connectors with push button wire entrapment.

Section II - Performance

2.1 The electronic ballast shall have a minimum starting temperature of -30oC (-22oF) and maximum case temperature of 90oC (194oF)

2.2 The electronic ballast shall have integral common mode surge protection of 10kV/5kA (combination wave) and differential mode surge protection of 2kV (IEEE 62.41.2)

2.3 The electronic ballast shall be suitable for use up to 50oC ambient conditions.(+55°C for Flat Xtreme, Q case, CosmoPolis models)

2.4 The electronic ballast shall operate from a nominal line voltage range of either 208-277V or 120V as applicable, 50/60Hz, +/-10%.

2.5 The electronic ballast shall have a Total harmonic Distortion (THD) of 15% or less.

2.6 The electronic ballast shall have an input power factor of 90% or greater.

2.7 The electronic ballast shall have a lamp end-of-life detection and shutdown circuit. Power to ballast shall be disconnected to reset the shutdown circuit.

2.8 The electronic ballast shall be sound rated A.

2.9 The electronic ballast steady state output frequency to the lamps shall be less than 200Hz to prevent acoustic resonance in the lamps resulting in premature failure.

2.10 The electronic ballast shall be thermally protected to shut down the ballast and lamp if temperatures reach unacceptable levels.

2.11 The electronic ballast must have a rated average life of 80,000 hours or operation.

Section III - Regulatory

3.1 The electronic ballast shall be UL Recognized and CSA Recognized.

3.2 The electronic ballast shall be approved by Philips to operate Philips CosmoPolis or CDM Elite MW lamps, as applicable.

3.3 The electronic ballast shall be RoHS compliant.

Section IV - Other

4.1 The electronic ballast shall be provided with a 5-year limited warranty from date of manufacture against defects in material or workmanship when operated within its maximum rated case temperature. (refer to our website for updated warranty information, www.philips.com/advance)

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

4.3 The electronic ballast shall not contain any Polychlorinated Biphenyls (PCBs).

4.4 The electronic ballast shall be produced in a factory certified to ISO 9001 Quality System Standards.

Section V - Additional Specifications for Programmable CosmoPolis Xtreme Ballasts (IDCW…)

5.1 The electronic ballast shall have DALI functionality that complies with HID Standard Commands IEC 62386-203.

5.2 Ballast shall be capable of line voltage dimming to 50% light output.

5.3 Ballast shall have override to restore light output to 100% regardless of dimming mode.

5.4 Ballast shall be capable of maintaining constant light output of the lamp over lamp life.

5.5 Ballast shall be capable to be programmed for up to 5 light levels over daily on-off cycle without any external dimming commands.

Catalog Number to Page Number *Lead Lengths and Shipping Data (Fluorescent Ballasts)*

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	Orange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
ASB-0412-12-BL-TP	5-18	18	18	33	33	51								1	12	✓
ASB-0620-24-BL-TP	5-18	24	24	75	46	75	46			46				1	12	✓
ASB-1224-24-BL-TP	5-18	24	24	74	32	70	52			78				1	14	✓
ASB-1240-46-BL-TP	5-18	24	24	50	80	70	50			50		50	50	1	21	✓
ASB-2040-24-BL-TP	5-18	24	24	80	80	72	54			72				1	21	✓
ASB-2432-34-BL-TP	5-18	24	24	72	72	72	72			72				1	18	✓
ASB-2448-46-BL-TP	5-18	24	24	50	50	70	50			50		50	50	1	21	✓
GCN-2S28-L	3-30, 3-31	23	23	27	27	48								10	10	
GOP-2PSP32-LW-SC	3-38, 3-39, 3-42, 3-43, 3-46,	25	25	33	33	48								20	24	
GOP-2PSP32-SC	3-47, 3-49, 3-50, 3-52, 3-53	25	25	33	33	48								20	24	
GOP-3PSP32-SC	3-38,39,42,43,46,47,49,3-50,52,53	25	25	33	33	48	33							20	24	
GOP-4PSP32-LW-SC	3-40, 3-44, 3-48, 3-51	25	25	33	33	48	33			33				20	24	
GOP-4PSP32-SC	3-40, 41, 44, 45, 48, 51, 54, 55	25	25	33	33	48	33			33				20	24	
GOPA-1P32-LW-SC	3-40, 41, 44, 45, 48, 3-51, 54, 55		25	31	37			25						20	28	
GOPA-1P32-SC	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						20	28	
GOPA-2P32-LW-SC	3-38, 3-42, 3-46, 3-49, 3-52	25	25	31	37									20	28	
GOPA-2P32-SC	3-38,39,42,43,46,47,49,50,52,53	25	25	31	37									20	28	
GOPA-3P32-LW-SC	3-38,39,42,43,46,47,49,50,52,53	25	25	31	37									20	28	
GOPA-3P32-SC	3-39,40,43,44,47,48,50,51,53,54	25	25	31	37									20	28	
GOPA-4P32-LW-SC	3-40, 41, 44, 45, 48, 51, 54, 55, 56	25	25	31	37	39								20	28	
GOPA-4P32-SC	3-40, 41, 44, 45, 48, 51, 54, 55, 56	25	25	31	37	39								20	28	
GZT-2S32-SC***	4-15	22	22	26	26	46								20	21	
GZT-3S32-SC***	4-15	22	22	26	46	26	46							20	21	
H-1B13-TP-W	5-16		15	15				15						36	36	✓
H-1B9-TP-W	5-16		15	15				15						36	29	
H-1Q26-TP-W	5-16		15	15				15						20	46	✓
H-2B13-TP-BLS	5-16	7	7	7										20	36	
H-2Q26-TP-BLS	5-16	7	7	7										10	40	
HCN-2S54-90C-WL	3-27, 3-28, 3-29, 3-32, 3-33, 3-34			28	28	48		31					31	12	12	✓
HCN-4S54-90C-2LS-G	3-27, 3-28, 3-29, 3-32, 3-33, 3-34			54	51	60	42	32		60		42	32	6	18	✓
HDF128T5	4-26	No Leads - Poke in Connectors												12	12	
HDF132T8	4-28		22	46	26			22						20	20	
HDF140T5	4-25		12	24	24			12						20	20	
HDF154T5	4-25, 4-27	No Leads - Poke in Connectors												12	12	
HDF224T5	4-27	No Leads - Poke in Connectors												12	12	
HDF226T4	4-24	No Leads - Poke in Connectors												20	16	
HDF228T5	4-26	No Leads - Poke in Connectors												12	12	
HDF232T8	4-28	22	22	26	26	46								20	20	
HDF239T5	4-27	No Leads - Poke in Connectors												12	12	
HDF240T5	4-25	12	12	24	24	24								20	20	
HDF242T5	4-27	No Leads - Poke in Connectors												20	16	
HDF254T5	4-25, 4-27	No Leads - Poke in Connectors												12	12	
HDF332T8	4-28	22	22	26	46	26	46							20	21	
HDF432T8	4-28	No Leads - Poke in Connectors												12	12	
HM-1P20-TP	5-13		8	10	10			8						10	32	✓
HM-2SP20-TP	5-13	10	10	13	13	16								10	34	✓
HOP-2PSP32-HL-L	3-38,39,42,43,46,47,49,50,52,53	32	32	29	29	49								10	12	
HOP-2PSP54-L	3-27, 3-28, 3-29, 3-33, 3-34			28	28	48		31					31	12	12	
HOP-4PSP32-HL-G	3-27,40,41,44,45,48,51,54,55	32	32	33	33	48	33			33				6	7.2	
HOP-4PSP54-2LS-G	3-28, 3-29, 3-33, 3-34			28	30		25	31	56	25			31	6	18	
ICF-1D38-H1-LD	3-25, 3-32	No Leads - Poke in Connectors												20	8	
ICF-2S13-H1-LD	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												20	8	
ICF-2S13-H1-LD-K	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												20	8	✓
ICF-2S13-M1-BS	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												16	6.4	
ICF-2S13-M1-BS-QS	3-21, 3-22	No Leads - Poke in Connectors												16	6.4	
ICF-2S18-H1-LD	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												20	8	
ICF-2S18-H1-LD-K	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												20	8	✓
ICF-2S18-M1-BS	3-21, 3-22, 3-24, 3-25	No Leads - Poke in Connectors												16	6.4	
ICF-2S18-M1-BS-QS	3-21, 3-23	No Leads - Poke in Connectors												16	6.4	
ICF-2S26-H1-LD	3-22, 3-23, 3-24, 3-25, 3-27	No Leads - Poke in Connectors												20	8	
ICF-2S26-H1-LD-K	3-22, 3-23, 3-24, 3-25, 3-27	No Leads - Poke in Connectors												20	8	✓
ICF-2S26-M1-BS	3-22, 3-23, 3-24, 3-25, 3-27	No Leads - Poke in Connectors												16	6.4	
ICF-2S26-M1-BS-QS	3-22, 3-23, 3-24	No Leads - Poke in Connectors												16	6.4	

* Electromagnetic ballasts packed in individual cartons (IC) have shorter leads, typically 12 inches. Electronic ballasts in individual cartons (IC) have same lead lengths as listed in table.
** Also includes 36" violet & grey control leads.
*** Also includes 32" violet & grey control leads

Catalog Number to Page Number *Lead Lengths and Shipping Data (Fluorescent Ballasts)*

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.
ICF-2S42-90C-M2-BS	3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-32	No Leads - Poke in Connectors												16	13	
ICF-2S42-90C-M2-LD	3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-32	No Leads - Poke in Connectors												20	16	
ICF-2S42-M2-BS	3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-32	No Leads - Poke in Connectors												16	13	
ICF-2S42-M2-LD	3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-32	No Leads - Poke in Connectors												20	16	
ICF-2S42-M2-LD-K	3-22, 3-23, 3-24, 3-25, 3-27, 3-28, 3-32	No Leads - Poke in Connectors												20	16	✓
ICF-2S70-M4-LD	3-24	No Leads - Poke in Connectors												20	26	
ICN-132-MC	3-38, 3-42, 3-52		25	31	37			25						20	15	✓
ICN-1P32-N	3-38, 3-42, 3-52		25	31	37			25						30	24	✓
ICN-1S80-T	3-29, 3-34, 3-64	No Leads - Poke in Connectors												18	18	
ICN-1TTP40-SC	3-28		25	30	30			25						20	28	✓
ICN-2M32-MC	3-39, 3-43, 3-53	25	25	31	37									20	15	✓
ICN-2P32-N	3-38, 3-39, 3-42, 3-43, 3-52, 3-53, 3-56	25	25	31	37									30	24	✓
ICN-2P60-SC	3-61	25	25	46	79									20	28	✓
ICN-2S110-SC	3-62	25	25	46	46	79								20	34	✓
ICN-2S24-N	3-27, 3-28, 3-32, 3-33	25	25	27	27	42								30	24	✓
ICN-2S24-T	3-27, 3-28, 3-32, 3-33	No Leads - Poke in Connectors												18	18	✓
ICN-2S28-N	3-30, 3-31	23	23	27	27	42								30	30	✓
ICN-2S28-T	3-30, 3-31	No Leads - Poke in Connectors												18	18	✓
ICN-2S39-N	3-27, 3-28, 3-32, 3-33	25	25	27	27	42								30	24	✓
ICN-2S39-T	3-27, 3-28, 3-32, 3-33	No Leads - Poke in Connectors												18	18	✓
ICN-2S40-N	3-60	25	25	31	31	46								30	30	✓
ICN-2S54-90C-N	3-27, 28, 29, 32, 33, 34, 64	24	24	27	27	47								30	24	✓
ICN-2S54-90C-T	3-27, 28, 29, 32, 33, 34, 64	No Leads - Poke in Connectors												18	18	
ICN-2S54-N	3-27, 28, 29, 32, 33, 34, 64	25	25	27	27	42								30	24	✓
ICN-2S54-T	3-27, 28, 29, 32, 33, 34, 64	No Leads - Poke in Connectors												18	18	✓
ICN-2S86	3-59	22	22	46	46	70								6	25	✓
ICN-2TTP40-SC	3-28	25	25	30	30									20	28	✓
ICN-3P32-N	3-39, 3-40, 3-43, 3-44, 3-53, 3-54	25	25	31	37									30	30	✓
ICN-3S14-T	3-30	No Leads - Poke in Connectors												18	18	
ICN-3TTP40-SC	3-28	25	25	30	30									20	28	✓
ICN-4P32-N	3-40, 3-41, 3-44, 3-45, 3-54, 3-55, 3-57	25	25	31	31	39								30	30	✓
ICN-4S54-90C-2LS-G	4-22	32	32	54	51	60	42			60		42		6	18	✓
IDA-128-D	4-20	No Leads - Poke in Connectors												12	12	
IDA-132-SC	4-22		22	46	26			22						20	15	
IDA-154	4-19, 4-21	No Leads - Poke in Connectors												12	12	
IDA-2S28-D	4-20	No Leads - Poke in Connectors												12	12	
IDA-2S32-SC	4-22	22	22	26	26	46								20	21	
IDA-2S54	4-19, 4-21	No Leads - Poke in Connectors												12	12	
IDA-3S32-G	4-22	22	22	28	54	28	54							6	18	
IDA-4S32	4-22	No Leads - Poke in Connectors												12	12	
IDL-2S26-M5-BS	4-18	No Leads - Poke in Connectors												16	14	
IDL-2S26-M5-LD	4-18	No Leads - Poke in Connectors												20	16	
IDL-2T42-M5-BS	4-18	No Leads - Poke in Connectors												16	14	
IDL-2T42-M5-LD	4-18	No Leads - Poke in Connectors												20	16	
IEZ-124-D	4-6, 4-8	No Leads - Poke in Connectors												12	12	
IEZ-128-D	4-7	No Leads - Poke in Connectors												12	12	
IEZ-2S24-D	4-6, 4-8	No Leads - Poke in Connectors												12	12	
IEZ-2S28-D	4-7	No Leads - Poke in Connectors												12	12	
IOP-1P32-HL-SC	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						20	28	
IOP-1P32-LW-N	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						30	24	✓
IOP-1P32-N	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						30	24	✓
IOP-1PSP32-LW-N	3-38, 3-42, 3-46, 3-49, 3-52		25	26	36			25						30	24	
IOP-1PSP32-N	3-38, 3-42, 3-46, 3-49, 3-52		25	26	36			25						30	24	
IOP-2P32-HL-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOP-2P32-LW-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOP-2P32-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOP-2P59-SC	3-58	22	22	46	70									20	20	✓
IOP-2PSP32-HL-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53	25	25	33	33	48								30	24	
IOP-2PSP32-LW-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53	25	25	33	33	48								30	24	✓
IOP-2PSP32-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53	25	25	33	33	48								30	24	✓
IOP-2PSP54-SC	3-27, 28, 29, 33, 34, 30, 31	26	26	28	27	46								20	40	
IOP-2S28-115-SC	3-30, 3-31	22	22	26	26	36								20	20	
IOP-2S28-115-SC-SD	4-2	(2) 22	22	26	26	36								20	20	
IOP-2S28-95-SC	3-30, 3-31	22	22	26	26	36								20	20	
IOP-2S28-95-SC-SD	4-2	(2) 22	22	26	26	36								20	20	
IOP-2S32-SC-SD	4-3	(2) 25	25	27	27	48								20	20	
IOP-3P32-HL-N	3-39, 40, 43, 44, 47, 48, 50, 51, 56	25	25	31	37									20	32	

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** Also includes 36" violet & grey control leads.

Catalog Number to Page Number *Lead Lengths and Shipping Data (Fluorescent Ballasts)*

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	Orange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
IOP-3P32-LW-N	3-39,40,43,44,47,48,50,51,56	25	25	31	37									20	28	✓
IOP-3P32-N	3-39,40,43,44,47,48,50,51,56	25	25	31	37									20	28	✓
IOP-3PSP32-HL-SC	3-39,40,43,44,47,48,50,51,54,56	25	25	33	33	48	33							20	24	
IOP-3PSP32-LW-SC	3-39,40,43,44,47,48,50,51,54,56	25	25	33	33	48	33							20	24	✓
IOP-3PSP32-SC	3-39,40,43,44,47,48,50,51,54,56	25	25	33	33	48	33							20	24	✓
IOP-4P32-HL-SC	3-40, 41, 34, 45, 48, 51, 54, 55	25	25	31	31	39								20	28	
IOP-4P32-LW-N	3-40, 41, 34, 45, 48, 51, 54, 55, 56	25	25	31	31	39								20	28	✓
IOP-4P32-N	3-40, 41, 34, 45, 48, 51, 54, 55, 56	25	25	31	31	39								20	28	✓
IOP-4PSP32-HL-G	3-40, 41, 44, 45, 48, 51, 54, 55	25	25	33	33	48	33			33				6	18	
IOP-4PSP32-LW-SC	3-40, 41, 34, 45, 48, 51, 54, 55, 56	25	25	33	33	48	33			33				20	20	✓
IOP-4PSP32-SC	3-40, 41, 34, 45, 48, 51, 54, 55, 56	25	25	33	33	48	33			33				20	20	✓
IOP-4PSP54-2LS-G	3-27, 3-28, 3-29, 3-33, 3-34	26	26	28	30		25		56	25				6	18	
IOPA-1P32-HL-N	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						30	24	
IOPA-1P32-LW-N	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						30	24	✓
IOPA-1P32-N	3-38, 3-42, 3-46, 3-49, 3-52		25	31	37			25						30	24	✓
IOPA-2P32-HL-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOPA-2P32-LW-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOPA-2P32-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56	25	25	31	37									30	24	✓
IOPA-3P32-HL-N	3-39,40,43,44,47,48,50,51,56	25	25	31	37									30	24	✓
IOPA-3P32-LW-N	3-39,40,43,44,47,48,50,51,56	25	25	31	37									30	24	✓
IOPA-3P32-N	3-39,40,43,44,47,48,50,51,56	25	25	31	37									30	24	✓
IOPA-4P32-HL-SC	3-40,41,44,45,48,51,54,55,56	25	25	31	31	39								20	28	✓
IOPA-4P32-LW-N	3-40,41,44,45,48,51,54,55,56	25	25	31	31	39								30	24	✓
IOPA-4P32-N	3-40,41,44,45,48,51,54,55,56	25	25	31	31	39								30	24	✓
IUV-2S18-H1-LD	3-63	No Leads - Poke in Connectors												20	8	
IUV-2S36-M2-LD	3-63	No Leads - Poke in Connectors												20	16	
IUV-2S60-M4-LD	3-63	No Leads - Poke in Connectors												20	26	
IZT-124-D	4-14	No Leads - Poke in Connectors												12	12	
IZT-128-D	4-13	No Leads - Poke in Connectors												12	12	
IZT-132-SC **	4-15		22	46	26			22						20	15	✓
IZT-154-D	4-12, 4-14	No Leads - Poke in Connectors												12	12	
IZT-180-D	4-12, 4-14	No Leads - Poke in Connectors												12	12	
IZT-2S26-M5-BS	4-11	No Leads - Poke in Connectors												16	14	
IZT-2S26-M5-LD	4-11	No Leads - Poke in Connectors												20	16	
IZT-2S24-D	4-14	No Leads - Poke in Connectors												12	12	
IZT-2S28-D	4-13	No Leads - Poke in Connectors												12	12	
IZT-2S32-SC **	4-15	22	22	26	26	46								20	21	✓
IZT-2S54-D	4-12, 4-14	No Leads - Poke in Connectors												12	12	
IZT-2T42-M5-BS	4-11	No Leads - Poke in Connectors												16	14	
IZT-2T42-M5-LD	4-11	No Leads - Poke in Connectors												20	16	
IZT-2TTS40-SC **	4-12	12	12	24	24	24								20	21	
IZT-3S32-SC **	4-15	22	22	26	46	26	46							20	21	✓
IZT-4PSP32-G **	4-15	32	32	58	58	13	61				61			6	18	
IZT-4S32	4-15	No Leads - Poke in Connectors												12	12	
L-140F-TP	5-11, 5-12		43	27				14						20	42	✓
LC-13-TP	5-15	17		14										50	35	✓
LC-14-20-C	5-11, 5-12	14, 17												50	30	✓
LC-14-20-C-TP	5-12	17		14										50	35	✓
LC-25-TP	5-15	18		22										50	35	✓
LC-4-9-C	5-11	(2) 10												50	30	✓
LC-4-9-C-TP	5-15	10		10										50	30	
LO-13-22	5-11, 5-12	(2) 15												72	43	
LO-13-22-TP	5-15	15		15										72	43	
LOS-1Q28	5-15	(2) 15												72	58	
LPL-5-9	5-11	(2) 9												135	41	
LPL-5-9-TP	5-15	9		9										120	36	✓
LX-140-F-TP	5-11, 5-12		26	26			26	10			26			20	40	✓
R-1P32-TP	5-3		18	36	23			18						10	37	✓
R-2P32-TP	5-3	20	20	24	24	36								10	37	✓
R-2S110-TP	5-6	22	22	46	46	70								6	71	✓
R-4S40-A-TP-AC	5-3	No Leads - Poke in Connectors												1	7	✓
RC-2S102-TP	5-8	18	18	43	43	19								4	46	✓
RC-2S110-FO	5-7	6.5	6.5	6.5	6.5	6.5								1	17	✓
RC-2S200-TP	5-8	22	22	44	44	68								4	60	✓
RC-2S85-FO	5-7	6.5	6.5	6.5	6.5	6.5								1	18	✓
RC-2S85-TP	5-4, 5-5, 5-6	18	18	33	33	51								6	60	✓
RC-4S60-TP	5-4, 5-6	24	24	46	46	46	46			46				6	66	✓
RCF-2S13-M1-BS-QS	3-21, 3-22, 3-23	No Leads - Poke in Connectors												16	6.4	
RCF-2S18-M1-BS-QS	3-21, 3-23	No Leads - Poke in Connectors												16	6.4	
REB-2P32-SC	3-38, 3-39, 3-42, 3-43, 3-52, 3-53	25	25	31	37									20	15	

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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	Orange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
RCF-2S26-H1-LD-QS	3-22, 3-23, 3-24	No Leads - Poke in Connectors												20	8	
RCF-2S26-M1-BS-QS	3-22, 3-23, 3-24	No Leads - Poke in Connectors												16	6.4	
REB-4P32-SC	3-40, 3-41, 3-44, 3-45, 3-54, 3-55	25	25	31	31	39								20	20	
RELB-2S40-N	3-60	22	22	26	26	36								30	30	✓
REZ-132-SC	4-9		22	46	26			22						20	20	✓
REZ-154	4-6, 4-8	No Leads - Poke in Connectors												12	12	
REZ-1Q18-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
REZ-1Q18-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
REZ-1T42-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
REZ-1T42-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
REZ-1T42-M2-LD-K	4-5	No Leads - Poke in Connectors												20	16	✓
REZ-1TTS40-SC	4-6		12	24	24			12						20	20	
REZ-2Q18-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
REZ-2Q18-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
REZ-2Q26-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
REZ-2Q26-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
REZ-2Q26-M2-LD-K	4-5	No Leads - Poke in Connectors												20	16	✓
REZ-2S32-SC	4-9	22	22	26	26	46								20	20	✓
REZ-2S54	4-6, 4-8	No Leads - Poke in Connectors												12	12	
REZ-2T42-M3-BS	4-5	No Leads - Poke in Connectors												16	18	
REZ-2T42-M3-LD	4-5	No Leads - Poke in Connectors												20	22	
REZ-2TTS40-SC	4-6	12	12	24	24	24								20	20	
REZ-3S32-SC	4-9	22	22	26	46	26	46							20	20	✓
RIF-1	5-2	6	(2) 6		6									24	22	
RK-2S32-TP	5-3, 5-5	22	22	26	26	36								10	38	✓
RL-140-TP	5-3, 5-14		36	36	25			10						20	42	✓
RL-2SP20-TP	5-13	15	15	15	15	18								20	50	✓
RLCS-140-TP-W	5-14		11	11	11			10						10	21	✓
RLQ-120-TP	5-13		18	18	12			10						20	42	✓
RLQS-122-TP-W	5-14		13/11	11	11			13						10	22	✓
RM-2S35-TP	5-3	22	22	26	26	36								10	35	✓
RM-2SP30-TP	5-3	18	18	17	17	26								10	37	✓
RS-110-TP	5-4, 5-5, 5-6		22	70	46			22						6	59	✓
RS-22-32-TP-W	5-14	15	15	10	10	10								10	26	✓
RS-2S200-TP	5-8	22	22	44	44	68								4	60	✓
RS-32-40-TP-W	5-14	10	10	10	10	10								10	26	✓
RSM-175-S-TP	5-9, 5-10		70	46				19						10	62	✓
SM-140-S-TP	5-9		34	22				10						6	40	✓
SM-2E40-S-TP	5-9	41	41	23	23									10	58	✓
V-2P32-TP	5-3	20	20	24	24	36								10	37	✓
V-2S110-TP	5-6	22	22	46	46	70								6	71	✓
VC-2S102-TP	5-8	18	18	43	43	19								4	47	✓
VC-2S85-TP	5-4, 5-5, 5-6	22	22	47	47	70								6	60	✓
VEZ-132-SC	4-9		22	46	26			22						20	20	✓
VEZ-154	4-6, 4-8	No Leads - Poke in Connectors												12	12	
VEZ-1Q18-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
VEZ-1Q18-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
VEZ-1T42-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
VEZ-1T42-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
VEZ-1T42-M2-LD-K	4-5	No Leads - Poke in Connectors												20	16	✓
VEZ-1TTS40-SC	4-6		12	24	24			12						20	20	
VEZ-2Q18-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
VEZ-2Q18-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
VEZ-2Q26-M2-BS	4-5	No Leads - Poke in Connectors												16	14	
VEZ-2Q26-M2-LD	4-5	No Leads - Poke in Connectors												20	16	
VEZ-2Q26-M2-LD-K	4-5	No Leads - Poke in Connectors												20	16	✓
VEZ-2S32-SC	4-9	22	22	26	26	46								20	20	✓
VEZ-2S54	4-6, 4-8	No Leads - Poke in Connectors												12	12	
VEZ-2T42-M3-BS	4-5	No Leads - Poke in Connectors												16	18	
VEZ-2T42-M3-LD	4-5	No Leads - Poke in Connectors												20	22	
VEZ-2TTS40-SC	4-6, 4-9	12	12	24	24	24								20	20	
VEZ-3S32-SC	4-9	22	22	26	46	26	46							20	20	✓
VH-1B13-TP-W	5-16		15	15				15						24	34	✓
VH-1B9-TP-W	5-16		15	15				15						24	26	
VH-1Q26-TP-W	5-16		15	15				15						24	36	✓
VH-2B13-TP-BLS	5-16	7	7	7										27	40	
VLO-13-TP	5-15	15		15										72	72	✓

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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	Orange	Orange/ Black	Units Std. Ctn.	Weight Std. Ctn. (lbs.)	Avail IC* Ctn.
VH-2Q26-TP-BLS	5-16	7		7	7									10	36	
VK-2S32-TP	5-53	22	22	26	26	36								10	38	✓
VLO-2S13-TP	5-15	7		7										20	26	✓
VS-110-TP	5-4, 5-5, 5-6		22	40	46			22						6	59	✓
VS-2S200-TP	5-8	22	22	44	44	68								4	60	✓
VSB-0620-24-BL-TP	5-17, 5-18	24	24	75	46	75	46			46				1	12	✓
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* Electromagnetic ballasts packed in individual cartons (IC) have shorter leads, typically 12 inches. Electronic ballasts in individual cartons (IC) have same lead lengths as listed in table.
** Also includes 36" violet & grey control leads.

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VEL-4P32-RH-TP	ICN-4P32-N	3-40, 41, 44, 45, 54, 55, 57
VEL-4P32-SC	ICN-4P32-N	3-40, 41, 44, 45, 54, 55, 57
VEL-4P32-TP	ICN-4P32-N	3-40, 41, 44, 45, 54, 55, 57
VIC-132	-	
VIC-132-TP	-	
VIC-140-TP	ICN-2S40-N	3-60
VIC-2S32	IOP-2PSP32-SC	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56
VIC-2S32-TP	IOP-2PSP32-SC	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56
VIC-2S40-TP	ICN-2S40-N	3-60
VIC-3S32	-	
VIC-3S32-TP	-	
VIC-3S40-TP	-	
VOP-2P32-LW-SC	IOP-2P32-LW-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56
VOP-2P32-SC	IOP-2P32-N	3-38, 39, 42, 43, 46, 47, 49, 50, 52, 53, 56
VOP-3P32-LW-SC	IOP-3P32-LW-N	3-39, 40, 43, 44, 47, 49, 50, 52, 53, 56
VOP-3P32-SC	IOP-3P32-N	3-39, 40, 43, 44, 47, 49, 50, 52, 53, 56
VOP-4P32-LW-SC	IOP-4P32-LW-N	3-40, 41, 44, 45, 48, 51, 54, 55, 56
VOP-4P32-SC	IOP-4P32-N	3-40, 41, 44, 45, 48, 51, 54, 55, 56

Discontinued Catalog Number to Replacement Number

Controllable Fluorescent

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ILV-2S32-SC	-	
ILV-4S32-G	-	
IZT-1T42-M2-BS	IZT-2S26-M5-BS	4-11
IZT-1T42-M2-LD	IZT-2S26-M5-LD	4-11
IZT-2Q26-M2-BS	IZT-2S26-M5-BS	4-11
IZT-2Q26-M2-LD	IZT-2S26-M5-LD	4-11
IZT-2T42-M3-BS	IZT-2T42-M5-BS	4-11
IZT-2T42-M3-LD	IZT-2T42-M5-LD	4-11
RDC-132-TP	IZT-132-SC	4-15
RDC-140-TP	-	
RDC-2BS40-TP	IZT-2TT40-SC	4-12
RDC-2S32-TP	IZT-2S32-SC	4-15
RDC-2S40-TP	-	
RDC-3S32-TP	IZT-3S32-SC	4-15
RDC-3S40-TP	-	
REB-2S26-M1-BS-DIM	-	
REB-2S26-M1-LS-DIM	-	
REZ-132	REZ-132-SC	4-9
REZ-1T32	REZ-1T42-M2-LD-K	4-5
REZ-1T42	REZ-1T42-M2-LD-K	4-5
REZ-1TTS40	REZ-1TTS40-SC	4-6
REZ-2Q26	REZ-2Q26-M2-LD-K	4-5
REZ-2S32	REZ-2S32-SC	4-9
REZ-2TTS40	REZ-2TTS40-SC	4-6
REZ-3S32	REZ-3S32-SC	4-9
REZ-C1200-A	-	
REZ-C500-I	-	
RTR-2S32-SC	-	
RZT-132	IZT-132-SC	4-5
RZT-154	IZT-154-D	4-12, 13, 14
RZT-1TTS40	-	
RZT-1TTS40-SC	-	
RZT-2S32	IZT-2S32-SC	4-15
RZT-2S54	IZT-2S54-D	4-12, 14
RZT-2TTS40	IZT-2TTS40-SC	4-12
RZT-3S32	IZT-3S32-SC	4-15
VDC-132-TP	IZT-132-SC	4-15
VDC-140-TP	-	
VDC-2BS40-TP	IZT-2TT40-SC	4-12
VDC-2S32-TP	IZT-2S32-SC	4-15
VDC-2S40-TP	-	
VDC-3S32-TP	IZT-3S32-SC	4-15
VDC-3S40-TP	-	
VEZ-132	VEZ-132-SC	4-9
VEZ-1T32	VEZ-1T42-M2-LD-K	4-5
VEZ-1T42	VEZ-1T42-M2-LD-K	4-5
VEZ-1TTS40	VEZ-1TTS40-SC	4-6
VEZ-2Q26	VEZ-2Q26-M2-LD-K	4-5
VEZ-2S32	VEZ-2S32-SC	4-9
VEZ-2TTS40	VEZ-2TTS40-SC	4-6
VEZ-3S32	VEZ-3S32-SC	4-15
VEZ-C1200-A	-	
VEZ-C500-I	-	
VTR-2S32-SC	-	
VZT-132	IZT-132-SC	4-15
VZT-154	IZT-154-D	4-12, 14
VZT-180	IZT-180-D	4-12, 14
VZT-1TTS40	-	
VZT-2S32	IZT-2S32-SC	4-15
VZT-2S54	IZT-2S54-D	4-12, 14
VZT-2TTS40-SC	IZT-2TTS40-SC	4-12
VZT-3S32	IZT-3S32-SC	4-15
VZT-4PSP32-G	IZT-4PSP32-G	4-15
VZT-4S32-4	IZT-4S32	4-15
VZT-4S32-8	IZT-4S32	4-15
VZT-4S32-G	IZT-4S32	4-15

Low Frequency Fluorescent

Discontinued Catalog Number	Current Catalog Number	Page No.
GK-132-TP	-	
GK-2S110-TP	-	
GK-2S32-TP	-	
RK-132-TP	-	
RK-134-TP	-	
RK-2S110-TP	-	
RK-2S34-TP	-	
RK-2S40-TP	-	
RK-3S34-TP	-	
VK-132-TP	-	
VK-134-TP	-	
VK-2S34-TP	-	
VK-2S40-TP	-	
VK-3S34-TP	-	
YK-2S32-TP	-	

Discontinued Catalog Number to Replacement Number *HID*

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A0201	71A0280	7-35	....
71A0401-791	....	....	....
71A0410	71A0490	7-35	71A0490
71A0430	71A0490	7-35	71A0490
71A0440			....
71A0450	71A0490	7-35	71A0490
71A04D0	71A0490	7-35	....
71A04F0			
71A0540	71A05F0	7-35	....
71A0550	71A0590	7-36	71A0590
71A0560	71A0590	7-36	71A0590
71A05D0	71A0590/05F0	7-36	....
71A0740	71A07F0	7-36	....
71A0750	71A0790	7-36	71A0790
71A0760	71A0790	7-36	71A0790
71A07D0	71A0790/07F0	7-36	....
71A1500	....	....	....
71A1510	....	....	....
71A1530	....	....	....
71A1540	....	....	....
71A1580	....	....	....
71A15R0	....	....	....
71A1800	....	....	....
71A1801	....	....	....
71A1810	....	....	....
71A1820	....	....	....
71A1830	....	....	....
71A2000	....	....	....
71A2020	....	....	....
71A2030	....	....	....
71A2080	....	....	....
71A20R0	....	....	....
71A2300	....	....	....
71A2301	....	....	....
71A2303	....	....	....
71A2310	....	....	....
71A2320	....	....	....
71A2330	....	....	....
71A2340	....	....	....
71A2500	....	....	....
71A2501	....	....	....
71A2502	....	....	....
71A2510	....	....	....
71A2512	....	....	....
71A2520	....	....	....
71A2522	....	....	....
71A2530	....	....	....
71A2531	....	....	....
71A2532	....	....	....
71A2540	....	....	....
71A2541	....	....	....
71A2542	....	....	....
71A2551	....	....	....
71A2561	....	....	....
71A2571	....	....	....
71A2591	....	....	....
71A25D1 (120/240/347V)	....	....	....
71A25J1	....	....	....
71A25M1	....	....	....
71A25N1	....	....	....
71A25R1	....	....	....
71A2800	....	....	....
71A2801	....	....	....
71A2802	....	....	....
71A2803	....	....	....
71A2810	....	....	....
71A2820	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A2840	....	....	....
71A29G0	....	....	....
71A3000	....	....	....
71A3001	....	....	....
71A3002	....	....	....
71A3010	....	....	....
71A3011	....	....	....
71A3012	....	....	....
71A3020	....	....	....
71A3021	....	....	....
71A3022	....	....	....
71A3030	....	....	....
71A3031	....	....	....
71A3032	....	....	....
71A3040	....	....	....
71A3041	....	....	....
71A3042	....	....	....
71A3050	....	....	....
71A3052	....	....	....
71A3060	....	....	....
71A3062	....	....	....
71A3072	....	....	....
71A3092	....	....	....
71A30J2	....	....	....
71A3140	....	....	....
71A3150	....	....	....
71A3301	....	....	....
71A3306	....	....	....
71A3307	....	....	....
71A3320	....	....	....
71A3325	....	....	....
71A3330	....	....	....
71A3335	....	....	....
71A3340	....	....	....
71A3500	....	....	....
71A3501	....	....	....
71A3502	....	....	....
71A3510	....	....	....
71A3520	....	....	....
71A3521	....	....	....
71A3522	....	....	....
71A3530	....	....	....
71A3531	....	....	....
71A3532	....	....	....
71A3540	....	....	....
71A3541	....	....	....
71A3542	....	....	....
71A3552	....	....	....
71A3562	....	....	....
71A3592	....	....	....
71A35J2	....	....	....
71A35R2	....	....	....
71A3640	....	....	....
71A3650	....	....	....
71A3800	....	....	....
71A3810	....	....	....
71A3820	....	....	....
71A3825	....	....	....
71A3825-791	....	....	....
71A3830	....	....	....
71A3840	....	....	....
71A4000	....	....	....
71A4001	....	....	....
71A4020	....	....	....
71A4021	....	....	....
71A4030	....	....	....
71A4031	....	....	....
71A4040	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A4041	....	....	....
71A4051	....	....	....
71A4061	....	....	....
71A4091	....	....	....
71A40D1	....	....	....
71A40J1	....	....	....
71A40R1	....	....	....
71A4142	....	....	....
71A4152	....	....	....
71A4310	....	....	....
71A4320	....	....	....
71A4401	....	....	....
71A4411	....	....	....
71A4421	....	....	....
71A4431	....	....	....
71A4441	....	....	....
71A4451	....	....	....
71A5000	....	....	....
71A5005	71A5005-P	7-11	....
71A5030*	....	....	....
71A5037	71A5037-P	7-11	....
71A5037-B	71A5037-BP	7-11	....
71A5050	....	....	....
71A5060	....	....	....
71A5090	....	....	....
71A5090	....	....	....
71A50R0	....	....	....
71A50Y1	....	....	....
71A50Y5	....	....	....
71A5102	....	....	....
71A5105	71A5105-P	7-11	....
71A5122	....	....	....
71A5137	71A5137-P	7-11	....
71A5137-B	71A5137-BP	7-11	....
71A5142	....	....	....
71A5181	71A5191	7-5, 11	....
71A5202	....	....	....
71A5205	71A5205-P	7-12	....
71A5227 (Reactor)	....	....	71A5292 (3x4 Core)
71A5228	....	....	....
71A5229 (Reactor)	....	....	71A5292 (3x4 Core)
71A5237	71A5237-P	7-12	....
71A5237-B	71A5237-BP	7-12	....
71A5281	71A52A1	7-12	....
71A5282	71A5292	7-12	....
71A5283	....	....	....
71A5288	....	....	....
71A5289 (Reactor + Transformer)	....	....	71A5292 (3x4 Core)
71A52C0	....	....	....
71A52S7	....	....	....
71A5300	71A5390	7-13 40	....
71A5303	71A5383	7-13 40	....
71A5337	71A5337-P	7-13	....
71A5337-B	71A5337-BP	7-13	....
71A5338	....	....	....
71A5380	71A5390	7-13 40	....
71A5386	....	....	....

* 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
71A5387 (Reactor + Transformer)	....	....	71A5390 (3x4 Core)
71A5388	....	....	....
71A53M0	....	....	....
71A53Y3	....	....	....
71A5402	....	....	....
71A5427 (Reactor)	....	....	71A5390 (3x4 Core)
71A5428 (Reactor)	....	....	71A5390 (3x4 Core)
71A5429 (Reactor)	....	....	71A5392 (3x4 Core)
71A5437	71A5437-P	7-14	....
71A5437-B	71A5437-BP	7-14	....
71A5480	71A5490	7-14	....
71A5482	71A5492	7-14	....
71A5486	....	....	....
71A5488 (Reactor + Autotransformer)	....	....	71A5490 (3x4 Core)
71A5489 (Reactor + Autotransformer)	....	....	71A5492 (3x4 Core)
71A54C0	....	....	....
71A54J9	....	....	....
71A54M2	....	....	....
71A54Y2	....	....	....
71A5500	71A5570/90	7-5, 15	....
71A5504	....	....	....
71A5510	71A5570/90	7-5, 15	71A5570/90
71A5520	71A5570/90	7-5, 15	71A5570/90
71A5530	71A5570/90	7-5, 15	....
71A5534	....	....	....
71A5544	....	....	....
71A5540T	....	....	....
71A5550	71A5570/90	7-5, 15	71A5570/90
71A5560	71A5570/90	7-5, 15	71A5570/90
71A5580	71A5570/90	7-5, 15	....
71A5592	71A5593	7-5, 15	71A5593
71A55A2	71A55A3	7-15	....
71A55B0	71A55A0	7-15	....
71A55D0 (120/240/347V)	71A55A0 (120/240/347V)	7-15	71A5570/90
71A55G0	71A55H0	7-15	....
71A55J0	71A55H0	7-15	....
71A55M0	....	....	....
71A55R0	71A55N0	7-8	....
71A5693	71A5692	7-5, 18	....
71A56A3	71A56A2	7-16	....
71A56J9	....	....	....
71A56N3	....	....	....
71A5700	71A5770/90	....	....
71A5701	71A5771/91	....	....
71A5710	71A5770/90	7-5	71A5770/90
71A5711	71A5771/91	7-5, 17	71A5771/91
71A5720	71A5770/90	7-5	71A5770/90
71A5721	71A5771/91	7-5, 17	71A5771/91
71A5730	71A5770/90	7-5	....
71A5731	71A5771/91	7-5, 17	....
71A5734	....	....	....
71A5737	....	....	....
71A5740	71A5750	7-17	
71A5744	....	....	....
71A5750	....	....	71A5770/90
71A5756	....	....	....
71A5760	....	....	71A5770/90
71A5766	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A5780	71A5770/90	7-5	....
71A5792	71A5792-EE	7-5 18	....
71A5793	71A5792	7-5, 18	71A5792
71A57A3	71A57A2	7-18	....
71A57D0 (120/240/347V)	71A57A0 (120/240/347V)	7-17	71A5770/90
71A57E6	....	....	....
71A57J0	71A55H0	7-15	....
71A57V0	....	....	....
71A5837	....	....	....
71A5841	....	....	....
71A5842	71A5842-TEE	7-5, 19	....
71A5843-T	71A5842-T	7-5, 19	
71A5871	....	....	....
71A5880	....	....	....
71A5893	71A5892	7-5, 19	71A5892
71A58A3	71A58A2	7-8, 19	....
71A58H2	....	....	....
71A5937			....
71A5942-T	71A5943-T	....	....
71A5992	71A5993	7-5, 20	71A5993
71A59A2	71A59A3	7-20	....
71A59N2	....	....	....
71A59N3	....	....	....
71A6000	71A6001	....	71A6071/91
71A6001	71A6071/91	7-5, 20	....
71A6004	....	....	....
71A6010	71A6071/91	7-5, 20	71A6071/91
71A6011	71A6071/91	7-5, 20	71A6071/91
71A6020	71A6021	....	71A6071/91
71A6021	71A6071/91	7-5, 20	71A6071/91
71A6030	71A6031	....	71A6071/91
71A6031	71A6071/91	7-5, 20	....
71A6034	....	....	....
71A6037	....	....	....
71A6040	71A6041	7-5, 20	71A6071/91
71A6042	71A6042-TEE	7-21	....
71A6043-T	71A6042-T	7-21	....
71A6044	....	....	....
71A6056	....	....	....
71A6061	71A6071/91	7-5, 20	71A6071/91
71A6066	....	....	....
71A6071	71A6071/91	7-5, 20	....
71A6081	71A6071/91	7-5, 20	....
71A6084 (120/277V)	....	....	....
71A6093	71A6092	7-5, 21	71A6092
71A60A3	71A60A2	7-5, 21	....
71A60B1	71A60A1 (120/277/347V)	7-20	....
71A60D1 (120/240/347V)	71A60A1 (120/240/347V)	7-20	71A6071/91
71A60F6	....	....	....
71A60J1	71A60H1	7-20	....
71A60J9	....	....	....
71A60M2	....	....	....
71A60S4	....	....	....
71A60V1	....	....	....
71A60Y1	....	....	....
71A61E6	....	....	....
71A6240	....	....	....
71A62E0	....	....	....
71A6300 (Series)	....	....	....
71A6310 (Series)	....	....	....
71A6320 (Series)	....	....	....
71A6330 (Series)	....	....	....
71A6340 (Series)	....	....	....
71A6342	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A6352 (120/240V)	....	....	....
71A6382	....	....	....
71A63A3	....	....	....
71A63J2	....	....	....
71A6492	71A6490	7-22	....
71A6498	....	....	....
71A64E2	....	....	....
71A64F8	....	....	....
71A6500	....	....	71A6572/92
71A6501	....	....	71A6572/92
71A6502	71A6572/92	7-5, 23	....
71A6510	71A6572/92	7-5, 23	71A6572/92
71A6511	71A6572/92	7-5, 23	71A6572/92
71A6512	71A6572/92	7-5, 23	71A6572/92
71A6520	71A6572/92	7-5, 23	71A6572/92
71A6521	71A6572/92	7-5, 23	71A6572/92
71A6522	71A6572/92	7-5, 23	71A6572/92
71A6530	71A6532	....	71A6572/92
71A6531	71A6532	....	71A6572/92
71A6532	71A6572/92	7-5, 23	....
71A6540	71A6552	7-23	....
71A6551	71A6572/92	7-5, 23	71A6572/92
71A6561	71A6572/92	7-5, 23	71A6572/92
71A6571	71A6572	7-5, 23	71A6572/92
71A6586	....	....	....
71A65B2	71A65A2 (120/277/347V)	7-23	....
71A65D2 (120/240/347V)	71A65A2	7-23	....
71A65E3 (120/240/347V)	71A6593 (120/240/347V)	7-5, 24	71A6593
71A65F3 (277/347/480V)	71A65F3-T (277/347/480V)	7-24	....
71A65J2-M	....	....	....
71A65M6	....	....	....
71A65N3	....	....	....
71A65Y6	....	....	....
71A6700	71A6702	....	71A6772/92
71A6701	71A6772/92	7-5, 25	71A6772/92
71A6710	71A6772/92	7-5, 25	71A6772/92
71A6711	71A6772/92	7-5, 25	71A6772/92
71A6712	71A6772/92	7-5, 25	71A6772/92
71A6720	71A6772/92	7-5, 25	71A6772/92
71A6721	71A6772/92	7-5, 25	71A6772/92
71A6722	71A6772/92	7-5, 25	71A6772/92
71A6730	71A6772/92	7-5, 25	71A6772/92
71A6731	71A6772/92	7-5, 25	71A6772/92
71A6740	71A6742	7-25	....
71A6753	71A6742	7-25	....
71A6771	71A6772	7-5, 25	71A6772/92
71A6791	71A6792	7-25	71A6772/92
71A67D2 (120/240/347V)	71A67A2 (120/240/347V)	7-25	71A6772/92
71A67J2	....	....	....
71A6890	....	....	....
71A68J0	....	....	....
71A69E5	....	....	....
71A69H0	....	....	....
71A7781	....	....	....
71A7805	....	....	....
71A7809	....	....	....
71A7891	71A7801	7-26, 42	....
71A78R1	....	....	....
71A7900	....	....	....

* 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
71A7901	71A7991	7-27	....
71A7910*	....	....	....
71A7920	....	....	....
71A7931	71A7991	7-27	....
71A7948	....	....	....
71A7950	....	....	....
71A7956	71A79E6 (120/208/240V)	7-27	....
71A7960 (240/480V)	....	....	....
71A79D1 (120/240/347V)	71A79A1 (120/240/347V)	7-27	71A7971/91
71A79S1	....	....	....
71A79T8	....	....	....
71A8000	....	....	....
71A8001	71A8091	7-6,28	....
71A8005	....	....	....
71A8021	71A8091	7-6,28	....
71A8030	....	....	....
71A8050	....	....	....
71A8056	71A80E6 (120/277/347)	7-28	....
71A8060 (240/480V)	....	....	....
71A8080	....	....	....
71A80B6	....	....	....
71A80D1 (120/240/347V)	71A80A1 (120/240/347V)	7-28	71A8071/91
71A80J9	....	....	....
71A80L1	71A8071/91	7-6,28	....
71A80S1	....	....	....
71A80W1	....	....	....
71A8102	71A8192	7-29	....
71A8106*	....	....	71A8176/96
71A8111	....	....	71A8176/96
71A8116*	....	....	71A8176/96
71A8127	....	....	....
71A8130	....	....	....
71A8131	71A8176/96	7-6,30	71A8176/96
71A8136	71A8176/96	7-6 30	71A8176/96
71A8141	....	....	....
71A8150	....	....	....
71A8151	....	....	71A8176/96
71A8156	71A81E6 (120/208/240V)	7-30	....
71A8160	....	....	....
71A8180	....	....	....
71A81B6	....	....	....
71A81D2 (120/240/347V)	71A81A2 (120/240/347V)	7-31	71A8172/92
71A81L2	....	....	....
71A81R6	....	....	....
71A81S2	....	....	....
71A81W2	....	....	....
71A8201	71A8291	7-32	....
71A8211	71A8271/91	7-7,32	71A8271/91
71A8221	71A8271/91	7-7,32	71A8271/91
71A8230	....	....	....
71A8231	71A8291	7-32	
71A8250 (120/240V)	....	....	....
71A8256	71A82E6 (120/208/240V)	7-32	....
71A8260 (240/480V)	....	....	....
71A8280	....	....	....
71A8281	71A8271/91	7-7,32	....
71A8290	....	....	....

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A8294 (120/208/240/277V)	....	....	....
71A82B1	71A82A1 (120/277/347V)	7-32	....
71A82B6	....	....	....
71A82D1 (120/240/347V)	71A82A1 (120/240/347V)	7-32	71A8271/91
71A82L1	71A8271/91	7-7,32	....
71A82V1	....	....	....
71A82W1	....	....	....
71A8311	....	....	71A8371/91
71A8321	....	....	71A8371/91
71A8331	....	....	71A8371/91
71A8341	71A8351	7-33	....
71A8343	....	....	
71A8350	....	....	....
71A8360	....	....	....
71A8391	71A8351	7-33	....
71A8392	....	....	....
71A8401	71A8403	....	71A8473/93
71A8402	71A8403	.....	71A8473/93
71A8403	71A8473/93	7-7,33	....
71A8411	71A8473/93	7-7,33	71A8473/93
71A8412	71A8473/93	7-7,33	71A8473/93
71A8413	71A8473/93	7-7,33	71A8473/93
71A8420	....	....	....
71A8421	71A8473/93	7-7,33	71A8473/93
71A8422	71A8473/93	7-7,33	71A8473/93
71A8423	71A8473/93	7-7,33	71A8473/93
71A8430	....	....	....
71A8431	71A8473/93	7-7,33	71A8473/93
71A8432	71A8473/93	7-7,33	71A8473/93
71A8433	71A8473/93	7-7,33	....
71A8440	....	....	....
71A8441	71A8443	7-33	....
71A8442	71A8443	7-33	....
71A8450	....	....	....
71A8456	71A84E6 (120/208/240V)	7-33	....
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)	7-33	71A8473/93
71A84H3	....	....	....
71A84J7	....	....	....
71A84L3	71A8473/93	7-7,33	....
71A84V3	....	....	....
71A84W2	....	....	....
71A8540	71A85F5	7-34	....
71A8590 (120/208/240/277V)	71A85E5 (120/208/240V)	7-34	71A85F5 (277/347/480)
71A85A3	....	....	....
71A85B0	....	....	....
71A85E6	....	....	....
71A85F6	....	....	....
71A8703	71A8773/93	7-7,34	....
71A8733	71A8773/93	7-7,33	....
71A8741	71A8743	7-34	....
71A8755	71A8753	7-34	....
71A8771	71A8773/93	7-7 33	71A8773/93

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.	Alternate Quadri-volt 120/208/ 240/277V
71A8791	71A8773/93	7-7,33	71A8773/93
71A87D3 (120/240/347V)	71A87A3 (120/240/347V)	7-34	71A8773/93
71A87J3	....	....	....
71A87V9	....	....	....
71A8900	....	....	71A8970/90
71A8930	....	....	71A8970/90
71A8931	....	....	71A8991
71A8941	....	....	....
71A8950	71A8940/90	7-7,31	....
71A8954	....	....	....
71A8964	....	....	....
71A8976	71A8970/90	7-7,31	....
71A8984 (120/277V)	....	....	71A8970/90 (CWA)
71A9068	....	....	....
71A9073	....	....	....
71A9074	....	....	....
71A9082	....	....	....
71A9114	....	....	....
71A9115	....	....	....
71A9124	....	....	....
71A9127	....	....	....
71A9135	....	....	....
71A9136	....	....	....
71A9137	....	....	....
71A9138	....	....	....
71A9139	....	....	....
71A9189	71A0590	7-36	....
71A9192	71A0490	7-35	....
71A9209	71A5570/90	7-5,15	71A5570/90
71A9212	....	....	....
71A9240	....	....	....
71A9242	....	....	71A5570/90
71A9243	71A5540	7-5,15	....
71A9263	....	....	....
71A9278	....	....	....
71A9279	....	....	....
71A9301	71A07F0	7-36	....
71A9302	....	....	71A6071/91
71A9303	....	....	71A6071/91
71A9305	....	....	71A6572/92
71A9306	....	....	....
71A9312	....	....	....
71A9313	....	....	....
71A9314	....	....	....
71A9315	....	....	....
71A9316	....	....	....
71A9317	71A0790	7-36	....
71A9318	71A0790	7-36	....
71A9319	....	....	....
71A9325	....		
71A9326	71A07F0	7-36	....
71A9327	71A04F0	7-35	....
71A9328	71A05F0	7-36	....
71A9331	....	....	....
71A9332	....	....	....
71A9334	....	....	....
71A9335	....	....	....
71A9341	71A0590	7-36	....
71A9352	....	....	....
71A9355	71A0790	7-36	....

* 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.

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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
71A9356	71A0590	7-36	....
71A9357	71A0490	7-35	....
71A9359	71A0490	7-35	....
71A9366	....	....	....
71A9377*	....	....	....
71A9378*	....	....	....
71A9416	....	....	....
71A9417	....	....	....
71A9418	....	....	....
71A9424	71A65A2	7-23	....
71A9432 (240/480V)	....	....	....
71A9437 (240/480V)	....	....	....
71A9445	71A0490	7-35	....
71A9446	....	....	....
71A9449	....	....	....
71A9451	71A82H1	7-32	....
71A9452	....	....	....
71A9462	....	....	....
71A9465	....	....	....
71A9467	....	....	....
71A9468	....	....	....
71A9469	....	....	....
71A9470	....	....	....
71A9471	....	....	....
71A9473	....	....	....
71A9474	....	....	....
71A9475	....	....	....
71A9476	....	....	....
71A9477	....	....	....
71A9487	....	....	....
71A9491	....	.....	....
71A9492	70A87R3	....	....
71A9494	....	....	....
71A9502(240/480V)	71A8241 (480V)	7-32	71A8271/91 (240V)
71A9519	....	....	....
71A9520	....	....	....
71A9521	....	....	....
71A9522	71A7941	7-27	....
71A9523	71A8041	7-28	....
71A9524	....	....	....
71A9525	....	....	....
71A9526	71A07F0	7-36	....
71A9530	....	....	....
71A9532	....	....	....
71A9533	....	....	....
71A9534	....	....	....
71A9545	71A8107	7-29, 38, 42	....
71A9546	71A8007	7-28,42	....
71A9547	71A7907	7-27,42	....
71A9590	....	....	71A8176/96
71A9597	....	....	....
71A9646	....	....	....
71A9665	....	....	....
71A9696	....	....	....
71A9720	71A60H1	7-20	....
71A9722	71A55H0	7-15	....
71A9733	....	....	....
71A9734	....	....	....
71A9735	....	....	....
71A9737	....	....	....
71A9740	....	....	....
71A9740-2T	....	....	....
71A9742	71A9743	7-44	....
71A9744	....	....	....
71A9745-2T	....	....	....
71A9748*	....	....	....
71A9761	71A65J2	7-23	....
71A9770	....		
71A9775	....	....	....
71A9784	71A57H0	7-19	....
71A9787	....	....	....
71A9789	....	....	....
71A9791	....	....	....
71A980 (120/277V)	....	....	....
71A9808*	....	....	....
71A9814	....	....	....
71A9833	....	....	....
71A9846	....	....	....
71A9847	....	....	....
71A9863	....	....	....
71A9877	71A9900	7-44	....
71A9884	....	....	....
71A9885	71A9862	7-44	....
71A9893	....	....	....
71A9907	71A8192	7-29	....
71A9911	71A80J1	7-28	....
71A9923	....	....	....
71A9928	....	....	....
71A9932	....	....	....
71A9934	....	....	....
71A9945	71A8990	7-31	....
71A9947	71A8271	7-7, 32	....
71A9948	....	....	....
71A9951	....	....	....
71A9955	71A8196	7-32	....
71A9971	....	....	....
71A9969	....	....	....
72C2584	....	....	....
72C3084	....	....	....
72C5005	72C5081	7-45	....
72C52C1	....	....	....
72C54C1	....	....	....
72C55C1	....	....	....
72C57C2	....	....	....
72C5983-NP	....	....	....
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	7-48	....
73B54A3	....	....	....
73B5580	73B5590	7-48	73B5590
73B5593	73B5591-EE	7-48	....
73B55A0	....	....	....
73B5692	....	....	....
73B5740	....	....	....
73B5780	73B5790	....	73B5790
73B57A0	....	....	....
73B57A2	....	....	....
73B58A2	....	....	....
73B5993	....	....	....
73B6041	73B6041-T	.....	....
73B6042	73B6052-EE	7-49	....
73B6081	73B6091	7-49	73B6091
73B60A2	....	....	....
73B6542	....	....	....
73B6592	73B6590	7-49	....
73B65N2	....	....	....
73B7705	....	....	....
73B7901	....	....	....
73B8005	....	....	....
73B8102	....	....	....
73B8188	....	....	....
73B8281	73B8291	7-50	....
73B82A1	....	....	....
73B8483	73B8493	7-50	....
74P1801	....	....	....
74P1831-011	....	....	....
74P2001	....	....	....
74P2321-011	....	....	....
74P2503	....	....	....
74P2513	....	....	....
74P2523	....	....	....
74P2533	....	....	....
74P2802	....	....	....
74P2832	....	....	....
74P3003	....	....	....
74P3013	....	....	....
74P3023	....	....	....
74P3033	....	....	....
74P3303	....	....	....
74P3313	....	....	....
74P3323	....	....	....
74P3333	....	....	....
74P3503	....	....	....
74P3533	....	....	....
74P5103	74P5104	7-51	....
74P7702	74P7703	7-52	....
74P7802	74P7803	7-52	....
74P7902	74P7903	77-52	....
74P7913	....	....	....
74P7923	....	....	....
74P7933	....	....	....
74P8002	74P8003	7-52	....
74P8103	74P8104	7-52	....
77K5570	77L5570	7-9	....
77K5892	....	....	....
77K5993	....	....	....
77K6051	77L6051	7-9	....
77K6071	77L6051	7-9	....
77K8071	77L8071	7-9	....
77K8172	77L8172	7-9	....
77K8473	77L8453	7-9	....
77L5292	....	....	....
77L7971	....	....	....
77L8071	....	....	....
78E3542-001	....	....	....
78E4041	....	....	....
78E4300 (Series)	....	....	....
78E4310 (Series)	....	....	....

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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
78E4320 (ILO)	....	....	....
78E4330 (Series)	....	....	....
78E4340 (Series)	....	....	....
78E5040-001	....	....	....
78E5090-001	....	....	....
78E5330	....	....	....
78E5590	....	....	....
78E5591	....	....	....
78E5752	78E5752-EE	7-54	....
78E5852	....	....	....
78E5993	....	....	....
78E6041	....	....	....
78E6092	78E6052-EE	7-54	....
78E6300 (Series)	....	....	....
78E6310 (Series)	....	....	....
78E6320 (Series)	....	....	....
78E6330 (Series)	....	....	....
78E6340 (Series)	....	....	....
78E6351*	....	....	....
78E64E2	....	....	....
78E64F2	....	....	....
78E65A2	....	....	....
78E65F3	....	....	....
78E6593	....	....	....
78E8291	....	....	....
78E8391	....	....	....
78E8492	78E8493	7-53	....
78E8703	....	....	....
78E8743	....	....	....
78E8793	....	....	....
79W3092	....	....	....
79W3140	....	....	....
79W3150	....	....	....
79W3640	....	....	....
79W3650	....	....	....
79W4041	....	....	....
79W4300 (Series)	79W6351(ILO)	7-55	....
79W4320 (Series)	79W6351(ILO)	7-55	....
79W4330 (Series)	....	....	....
79W4340 (Series)	79W6341(ILO)	7-55	....
79W5090	....	....	....
79W6300 (Series)	79W6351(ILO)	7-55	....
79W6310 (Series)	....	....	....
79W6320 (Series)	79W6351(ILO)	7-55	....
79W6330 (Series)	....	....	....
79W6340 (Series)	79W6341(ILO)	7-55	....
79W6381*	....	....	....
79W6541	79W6542	7-55	....
79W6591	79W6592	7-55	....
79W65Z6	....	....	....
79W6742	....	....	....
79W6792	....	....	....
79W8192	....	....	....
79W8241	....	....	....
79W8291	....	....	....
79W8463 (240/480V)	79W8443 (480V)	7-56	79W8493 (240V)
79W8492	79W8493	7-56	....
79W9256	79W6351	7-55	....
79W9499*	....	....	....
79W9500 (240/480V)	....	....	....
79W9501*	....	....	....
79W9502 (240/480V)	....	....	....
79W9503 (240/480V)	79W8443 (480V)	7-56	79W8493 (240V)

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	....

Electronic HID

Obsolete Catalog Numbers	Suggested Replacement Catalog Number	Page No.
IDMH210TLS	No Replacement	
IMH50ABLS (39W operation)	IMH39GBLS	6-4
IMH50ABLS (50W operation)	IMH50GBLS	6-5
IMH50ALF (39W operation)	IMH39GLF	6-4
IMH50ALF (50W operation)	IMH50GLF	6-5
IMH100ALF (100W operation)	IMH100BLF	6-5
IMH100ALF (70W operation)	IMH70DLF	6-5
IMH100ABLS (100W operation)	IMH100DBLS	6-5
IMH175CBLS (150W operation)	IMH150HBLS	6-5
IMH175CBLS (175W operation)	No Replacement	
IMH175CLF (150W operation)	IMH150HLF	6-5
IMH175CLF (175W operation)	No Replacement	
IMH39JLF	IMH39ELF	6-4
IMH70JLF	IMH70ELF	6-5
IMH200CLF	No Replacement	....
IWSN100CBLS	No Replacement	....
IZTEMH4003PS	No Replacement	
IZTEMH4003PSF	No Replacement	....
IZTEMH4003PSXJ	No Replacement	
IZTMH150CLF	No Replacement	
IZTSN150CLF	No Replacement	....
RCW90TLS	ICW90QLS + 71A9741-600 transformer	
RMH20ELF	RMH20KLF	6-4

* 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

	Ballast Type			
Lamp Type	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
CF13DD			5-15, 5-16	
CF13DD/E	3-21	4-11, 4-18, 4-24		
CF13DS			5-15, 5-16	
CF13DS/E				
CF13DT/E	3-22	4-11, 4-18, 4-24		
CF18DD				
CF18DD/E	3-21	4-5, 4-11, 4-18, 4-24		
CF18DF				
CF18DT				
CF18DT/E	3-22	4-5, 4-11, 4-18, 4-24		
CF24DF				
CF26DD			5-15, 5-16	
CF26DD/E	3-22	4-5, 4-11, 4-18, 4-24		
CF26DT			5-16	
CF26DT/E	3-23	4-5, 4-11, 4-18, 4-24		
CF32DT/E	3-24	4-5, 4-11, 4-18, 4-24		
CF36DF				
CF42DT/E	3-24	4-5, 4-11, 4-18, 4-24		
CF57DT/E	3-24	4-5, 4-11, 4-18, 4-24		
CF5DS			5-15, 5-16	
CF5DS/E				
CF70DT/E	3-24	4-5, 4-11, 4-18, 4-24		
CF7DS			5-15, 5-16	
CF7DS/E				
CF9DD			5-15, 5-16	
CF9DS			5-15, 5-16	
CF9DS/E				
CFM18W/2G10				
CFM24W/2G10				
CFM36W/2G10				
CFQ10W/G24q				
CFQ13W/G24d				
CFQ13W/G24q	3-21	4-11, 4-18, 4-24		
CFQ13W/GX23			5-15, 5-16	
CFQ18W/G24d				
CFQ18W/G24q	3-21	4-5, 4-11, 4-18, 4-24		
CFQ20W/GX32d				
CFQ26W/G24d			5-15, 5-16	
CFQ26W/G24q	3-22	4-5, 4-11, 4-18, 4-24		
CFQ27W/GX32d			5-15	
CFQ9W/G23			5-15, 5-16	
CFS10W/GR10q	3-25			
CFS16W/GR10q	3-25			
CFS21W/GR10q	3-25			
CFS28W/GR10q	3-25			
CFS38W/GR10q	3-25			
CFS55W/GRY10q				
CFT13W/2GX7				
CFT13W/GX23			5-15, 5-16	
CFT5W/2G7				
CFT5W/G23			5-15, 5-16	
CFT7W/2G7				
CFT7W/G23			5-15, 5-16	
CFT9W/2G7				
CFT9W/G23			5-15, 5-16	
CFTR13W/GX24q	3-22	4-11, 4-18, 4-24		
CFTR18W/GX24d				
CFTR18W/GX24q	3-23	4-5, 4-11, 4-18, 4-24		
CFTR26W/GX24d			5-16	
CFTR26W/GX24q	3-23	4-5, 4-11, 4-18, 4-24		
CFTR32W/GX24q	3-24	4-5, 4-11, 4-18, 4-24		
CFTR42W/GX24q	3-24	4-5, 4-11, 4-18, 4-24		
CFTR57W/GX24q	3-24	4-5, 4-11, 4-18, 4-24		
CFTR70W/GX24q	3-24	4-5, 4-11, 4-18, 4-24		
F10 2D/4P	3-25			
F13BX			5-15, 5-16	
F13DBX/4P	3-21	4-11, 4-18, 4-24		
F13DBX23T4			5-15, 5-16	
F13DBXT4				

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
F13T5				
F13T8			5-11, 5-13	
F13TBX/4P	3-22	4-11, 4-18, 4-24		
F14T12			5-12, 5-13	
F14T5	3-30	4-2, 4-13, 4-20, 4-26		
F14T8			5-11	
F15T12			5-12, 5-13	
F15T8			5-11, 5-13	
F15T8/PLUS				
F15T8/XL				
F16 2D/4P	3-25			
F17T8	3-38 to 3-41	4-3, 4-9, 4-15, 4-22, 4-29		
F18BX			5-15	
F18BX/RS				
F18DBX/4P	3-21	4-5, 4-11, 4-18, 4-24		
F18DBXT4				
F18T12/HO				5-17
F18T8			5-11	
F18TBX/4P	3-23	4-5, 4-11, 4-18, 4-24		
F19T8			5-11	
F20T12			5-12, 5-13	
F21 2D/4P	3-25			
F21T5	3-30	4-2, 4-13, 4-20, 4-26		
F24T12			5-9	
F24T12/HO			5-4	5-7, 5-17
F24T5/HO	3-33	4-8, 4-27		
F25T12 (28-33")			5-12	
F25T12 (36")			5-3	
F25T8	3-42 to 3-45	4-3, 4-9, 4-15, 4-22, 4-29		
F26DBX/4P	3-22	4-5, 4-11, 4-18, 4-24		
F26DBXT4			5-15, 5-16	
F26TBX/4P	3-23	4-5, 4-11, 4-18, 4-24		
F27BX/RS	3-27	4-6		
F28 2D/4P	3-25			
F28T5	3-30, 3-31	4-2, 4-13, 4-20, 4-26		
F30T12	3-60		5-3, 5-12	
F30T12/HO			5-4	5-17
F30T8			5-11	
F32T8	3-52 to 3-55	4-3, 4-9, 4-16, 4-22, 4-29	5-3	
F32T8/ES (25W)	3-46 to 3-48	4-3		
F32T8/ES (28W)	3-49 to 3-51	4-3		
F32T8/ES (30W)				
F32T8/U6	3-52 to 3-55	4-3, 4-9, 4-16, 4-22, 4-29	5-3	
F32TBX/4P	3-24	4-5, 4-11, 4-18, 4-24		
F34T12	3-60		5-3	
F34T12/U	3-60		5-3	
F35T5	3-31	4-2		
F36T12			5-9	
F36T12/HO			5-4	5-7, 5-17
F38 2D/4P	3-25			
F39BX/RS	3-27	4-6, 4-12, 4-25		
F39T5/HO	3-33	4-8, 4-27		
F40BX	3-28	4-6, 4-12, 4-25		
F40T10				
F40T12	3-60		5-3, 5-12	
F40T12/IS				
F40T12/U	3-60		5-3	
F40T17/IS				
F40T8	3-56, 3-57			
F42T12			5-9	
F42T12/HO			5-4	5-7, 5-17
F42T6				
F42TBX/4P	3-24	4-5, 4-11, 4-18, 4-24		
F48PG17/VHO			5-8	
F48T10/VHO			5-8	
F48T12			5-9	
F48T12/ES			5-9	
F48T12/HO	3-62		5-4	5-7, 5-17
F48T12/VHO			5-8	
F48T5/VHO				

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
F48T8/HO	3-59			
F48T8/VHO				
F4T5			5-11	
F50BX/RS	3-28			
F54T5/HO	3-33, 3-34	4-8, 4-14, 4-21, 4-27		
F54T5/HO/ES	3-33, 3-34	4-8, 4-14, 4-21, 4-27		
F55 2D/4P				
F55BX	3-29	4-6, 4-12, 4-19, 4-25		
F57QBX/4P	3-24	4-5, 4-11, 4-18, 4-24		
F58T8	3-64			
F5BX			5-15, 5-16	
F60T10/VHO			5-8	
F60T12			5-9	
F60T12/HO	3-62		5-5	5-7, 5-17
F60T12/VHO			5-8	
F60T8/HO	3-59			
F64T12			5-9	
F64T12/HO			5-5	5-7, 5-17
F64T6				
F6T5			5-11	
F70QBX/4P	3-24	4-5, 4-11, 4-18, 4-24		
F70T8	3-64			
F72PG17/VHO			5-8	
F72T10/VHO			5-8	
F72T12	3-61		5-9	
F72T12/HO	3-62		5-6	5-7, 5-17
F72T12/VHO			5-8	
F72T8 (200mA)				
F72T8 (265mA)	3-58			
F72T8/HO	3-59			
F7BX			5-15, 5-16	
F80T5/HO	3-34	4-12		
F84T12				
F84T12/HO			5-6	5-17
F8T5			5-11	
F96PG17/HO/ES			5-8	
F96PG17/VHO			5-8	
F96T10/VHO			5-8	
F96T12	3-61		5-10	
F96T12/ES	3-61		5-10	
F96T12/HO	3-62		5-6	5-7, 5-17
F96T12/HO/ES	3-62		5-6	
F96T12/VHO			5-8	
F96T12/VHO/ES			5-8	
F96T8 (200mA)				
F96T8 (265mA)	3-58			
F96T8/ES	3-58			
F96T8/HO	3-59			
F9BX			5-15, 5-16	
F9DBX23T4			5-15, 5-16	
FB016T8	3-38 to 3-41	4-3, 4-9, 4-15, 4-22, 4-29		
FB024T8	3-42 to 3-45	4-3, 4-9, 4-15, 4-22, 4-29		
FB031T8	3-52 to 3-55	4-3, 4-9, 4-16, 4-22, 4-29	5-3	
FC12T5	3-32			
FC12T5/HO	3-32	4-8, 4-14, 4-21, 4-27		
FC12T9			5-14	
FC16T9			5-14	
FC6T9			5-14	
FC8T9			5-14	
FC9T5	3-32			
FO13T8/XP				
FT18DL			5-15	
FT18DL/RS				
FT18W/2G11			5-15	
FT18W/2G11/RS				
FT24DL	3-27	4-6		
FT24W/2G11	3-27	4-6		
FT36DL	3-27	4-6, 4-12, 4-25		
FT36W/2G11	3-27	4-6, 4-12, 4-25		
FT40DL/RS	3-28	4-6, 4-12, 4-25		
FT40W/2G11/RS	3-28	4-6, 4-12, 4-25		

REFERENCE MATERIALS

Fluorescent Lamp to Ballast

Lamp Type	Ballast Type			
	Electronic		Electromagnetic	
	High Frequency Page Number	Dimming Page Number	Standard Page Number	Sign & Weatherproof Page Number
FT50W/2G11/RS	3-28			
FT55DL	3-29	4-6, 4-12, 4-19, 4-25		
FT55W/2G11	3-29	4-6, 4-12, 4-19, 4-25		
FT80DL	3-29	4-12		
FT80W/2G11	3-29	4-12		
G15T8				
G30T8				
G64T5				
PL-C13W				
PL-C13W/4P	3-21	4-11, 4-18, 4-24		
PL-C13W/USA			5-15, 5-16	
PL-C15MM/22W				
PL-C15MM/28W			5-15	
PL-C18W				
PL-C18W/4P	3-21	4-5, 4-11, 4-18, 4-24		
PL-C26W			5-15, 5-16	
PL-C26W/4P	3-22	4-5, 4-11, 4-18, 4-24		
PL-H120W/4P				
PL-H60W/4P				
PL-H85W/4P				
PL-L18W			5-15	
PL-L18W/TUV	3-63			
PL-L24W	3-27	4-6		
PL-L35WHO/TUV	3-63			
PL-L36W	3-27	4-6, 4-12, 4-25		
PL-L36W/TUV	3-63			
PL-L40W	3-28	4-6, 4-12, 4-25		
PL-L50W	3-28			
PL-L55W	3-29	4-6, 4-12, 4-19, 4-25		
PL-L60WHO/TUV	3-63			
PL-L80W	3-29	4-12		
PL-L95WHO/TUV	3-63			
PL-Q 28W/4P	3-25			
PL-Q 38W/4P	3-25			
PL-S13W			5-15, 5-16	
PL-S5W			5-15, 5-16	
PL-S7W			5-15, 5-16	
PL-S9W			5-15, 5-16	
PL-T18W	3-23	4-5, 4-11, 4-18, 4-24		
PL-T26W	3-23	4-5, 4-11, 4-18, 4-24		
PL-T32W	3-24	4-5, 4-11, 4-18, 4-24		
PL-T42W	3-24	4-5, 4-11, 4-18, 4-24		
PL-T57W	3-24	4-5, 4-11, 4-18, 4-24		
TUV36T5/HO	3-63			
TUV64T5/HO	3-63			

HID Lamp to Ballast

Metal Halide

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					
20	M or C156	6-4	....	....	....	....	....	....	....	....
22	C175	6-4	....	....	....	....	....	....	....	....
35/39	C179	6-4	....	....	....	....	....	....	....	....
35/39	M or C130	6-4	7-13	....	....	....	....	....	....	....
45	C196	6-7								
50	M110	6-5	7-13	....	....	....	7-45	7-51	....	....
50 CDM Elite	C193	6-5	....	....	....	....	....	....	....	....
60	C187	6-7	....	....	....	....	....	....	....	....
70	M or C 98	6-5	7-14	....	7-59	7-48	7-45	....	....	....
70	M85	....	7-14	....	....	....	7-45	....	....	....
70	M143	6-5	7-14	....	7-59	....	7-45	....	....	....
70	M or C139	6-5	7-14	....	....	....	7-45	....	....	....
90	C188	6-7	....	....	....	....	....	....	....	....
100	M90	6-5	7-15	....	7-59	7-48	7-45	....	....	....
100	M140, C191	6-5	7-15	....	....	7-48	7-45	....	....	....
100	CDM Elite C191	6-5								
140	C189	6-7	....	....	....	....	....	....	....	....
145	C192	....	7-15	....	....	....	....	....	....	....
150	M or C102	6-5	7-14	....	....	7-48	7-45	....	....	....
150	M107	....	7-15	....	7-59	....	7-45	....	7-54	7-55
150	M81	....	7-14	....	....	....	7-45	....	....	....
150	M or C142	6-5	7-14	....	....	7-48	7-45	....	....	....
175	M57	....	7-15	....	....	7-48	7-46	....	7-54	7-55
175 (Pulse-Start)	M137	....	7-15	....	....	7-48	7-46	....	7-54	....
175 (Pulse-Start)	M152	....	7-15	....	....	7-48	7-46	....	7-54	....
200 (Pulse-Start)	M136	...	7-15	....	....	....	....	....	....	....
205	C184	....	7-17, 7-18	....	....	....	....	....	....	....
210	C183	6-8	....	....	....	....	....	....	....	....
250	M58	....	7-17	....	....	7-48	7-46	....	7-54	7-55
250	M80	....	....	....	....	....	....	....	....	....
250 (Pulse-Start)	M138	....	7-18	....	....	7-48	7-46	....	7-54	....
250 (Pulse-Start)	M153	....	7-18	....	....	7-48	7-46	....	7-54	....
250	M168	....	7-32	....	....	....	....	....	....	....
315	C182	6-8	....	....	....	....	....	....	....	....
320 (Pulse-Start)	M132	....	7-19	....	....	7-48	7-46	....	7-54	....
320 (Pulse-Start)	M154	....	7-19	....	7-59	7-48	7-46	....	....	....
330	C185	....	7-20, 7-21	....	....	....	....	....	....	....
350 (Pulse-Start)	M131	....	7-20	....	....	7-48	7-46	....	7-54	....
400	M169	....	7-33	....	....	....	....	....	....	....
400	M59	....	7-20	....	7-59	7-49	7-46	....	7-54	7-55
400 (Pulse-Start)	M135	....	7-21	....	....	7-49	7-46	....	7-54	....
400 (Pulse-Start)	M155	....	7-21	....	....	7-49	7-46	....	7-54	....
450 (Pulse-Start)	M144	....	7-21	....	....	....	....	....	....	....
750 (Pulse-Start)	M149	....	7-22	....	....	....	....	....	....	....
830	C194	....	9-24, 9-25	....	....	....	....	....	....	....
1000 (Pulse-Start)	M141	....	7-23	....	....	7-49	....	....	7-54	....
1000	M47	....	7-23	....	....	7-49	....	....	7-54	7-55
1500	M48	....	7-24	....	7-59	....	....	....	....	....

High Pressure Sodium

35	S76	....	7-26	....	....	....	....	7-52	....	....
50	S68	....	7-26	....	....	....	7-47	7-52	....	....
70	S62	....	7-27	....	7-60	....	7-47	7-52	....	....
100	S54	....	7-28	....	7-60	....	7-47	7-52	....	....
150 (55V)	S55	....	7-29, 7-30	....	7-60	....	7-47	7-52	....	7-62
150 (100V)	S56	....	7-30	....	....	....	....	....	....	....
200	S66	....	7-31	....	....	....	....	....	....	....
250	S50	....	7-32	....	7-60	7-60	....	....	....	....
310	S67	....	7-33	....	....	....	....	....	....	....
400	S51	....	7-33	....	7-60	7-60	....	....	7-53	7-56
430	S145	....	....	....	....	....	....	....	....	....
600	S106	....	7-34	....	....	....	....	....	....	....
750	S111	....	7-34	....	....	....	....	....	....	....
1000	S52	....	7-34	....	7-60	....	....	....	7-53	7-56

Low Pressure Sodium

18	L69	....	7-35	....	....	....	....	....	....	....
35	L70	....	7-35	....	....	....	....	....	....	....
55	L71	....	7-35	....	....	....	....	....	....	....
90	L72	....	7-36	....	....	....	....	....	....	....
135	L73	....	7-36	....	....	....	....	....	....	....
180	L74	....	7-36	....	....	....	....	....	....	....

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	-	5-15, 5-16
	7W	CFT7W/G23	PL-S7W	F7BX	CF7DS	-	5-15, 5-16
	9W	CFT9W/G23	PL-S9W	F9BX	CF9DS	-	5-15, 5-16
	13W	CFT13W/GX23	PL-S13W	F13BX	CF13DS	-	5-15, 5-16
Quad Tube	9W	CFQ9W/G23	-	F9DBX23T4	CF9DD	-	5-15, 5-16
	13W	CFQ13W/GX23	PL-C13W/USA	F13DBX23T4	CF13DD	FDS13/2	5-15, 5-16
	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	5-15, 5-16
	28W	CFQ27W/GX32d	PL-C15MM/28W	-	-	FDL28	5-15
Triple Tube	18W	CFTR18W/GX24d	-	-	CF18DT	-	-
	26W	CFTR26W/GX24d	-	-	CF26DT	-	5-16
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	-	-
	9W	CFT9W/2G7	-	-	CF9DS/E	-	-
	13W	CFT13W/2GX7	-	-	CF13DS/E	-	-
Quad Tube	10W	CFQ10W/G24q	-	-	-	FDS10/4	-
	13W	CFQ13W/G24q	PL-C13W/4P	F13DBX/4P	CF13DD/E	FDS13/4	3-21
	18W	CFQ18W/G24q	PL-C18W/4P	F18DBX/4P	CF18DD/E	FDS18/4	3-21
	26W	CFQ26W/G24q	PL-C26W/4P	F26DBX/4P	CF26DD/E	-	3-22
Triple Tube	13W	CFTR13W/GX24q	-	F13TBX/4P	CF13DT/E	-	3-22
	18W	CFTR18W/GX24q	PL-T18W	F18TBX/4P	CF18DT/E	FHT18	3-23
	26W	CFTR26W/GX24q	PL-T26W	F26TBX/4P	CF26DT/E	FHT26	3-23
	32W	CFTR32W/GX24q	PL-T32W	F32TBX/4P	CF32DT/E	FHT32	3-24
	42W	CFTR42W/GX24q	PL-T42W	F42TBX/4P	CF42DT/E	-	3-24
	57W	CFTR57W/GX24q	PL-T57W	F57QBX/4P	CF57DT/E	-	3-24
	60W		PL-H60W/4P	-	-	-	-
	70W	CFTR70W/GX24q	-	F70QBX/4P	CF70DT/E	-	3-24
	85W		PL-H85W/4P	-	-	-	-
	120W		PL-H120W/4P	-	-	-	-
2D	10W	CFS10W/GR10q	-	F10 2D/4P	-	-	3-25
	16W	CFS16W/GR10q	-	F16 2D/4P	-	-	3-25
	21W	CFS21W/GR10q	-	F21 2D/4P	-	-	3-25
	28W	CFS28W/GR10q	PL-Q 28W/4P	F28 2D/4P	-	-	3-25
	38W	CFS38W/GR10q	PL-Q 38W/4P	F38 2D/4P	-	-	3-25
	55W	CFS55W/GRY10q	-	F55 2D/4P	-	-	-
Long Twin Tube	18W	FT18W/2G11	PL-L18W	F18BX	FT18DL	-	5-15
	18W	FT18W/2G11/RS	-	F18BX/RS	FT18DL/RS	-	-
	24-27W	FT24W/2G11	PL-L24W	F27BX/RS	FT24DL	-	3-27
	36-39W	FT36W/2G11	PL-L36W	F39BX/RS	FT36DL	-	3-27
	40W	FT40W/2G11/RS	PL-L40W	F40BX	FT40DL/RS	-	3-28
	50W	FT50W/2G11/RS	PL-L50W	F50BX/RS	-	-	3-28
	55W	FT55W/2G11	PL-L55W	F55BX	FT55DL	-	3-29
	80W	FT80W/2G11	PL-L80W	-	FT80DL	-	3-29

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