



Mark III®

ELECTROMAGNETIC FLUORESCENT BALLASTS

Contents

General Ballast Information _____ 3-2 to 3-4

Rapid Start Ballasts for Linear Fluorescent Lamps

T8 Straight & U-Shaped _____ 3-5

T12 Straight & U-Shaped _____ 3-6

High Output Ballasts for Linear Fluorescent Lamps

T12 High Output (HO) _____ 3-7 to 3-11

Very High Output Ballasts for Linear Fluorescent Lamps

T10 & T12 Very High Output (VHO) _____ 3-12 to 3-13

Slimline Ballasts for Linear Fluorescent Lamps

T12 Slimline _____ 3-14 to 3-15

Preheat Ballasts for Linear Fluorescent Lamps

T5, T8 & T12 Preheat _____ 3-16 to 3-17

Trigger Start Ballasts for Linear Fluorescent Lamps

T8 & T12 Preheat _____ 3-18

Ballasts for Circline Lamps _____ 3-19

Ballasts for Compact Fluorescent Lamps

2-Pin Compact Lamps _____ 3-20 to 3-21

Dimming Ballasts for Rapid Start Lamps _____ 3-22

Radio Interference Filter _____ 3-22

Weatherproof Ballasts _____ 3-23

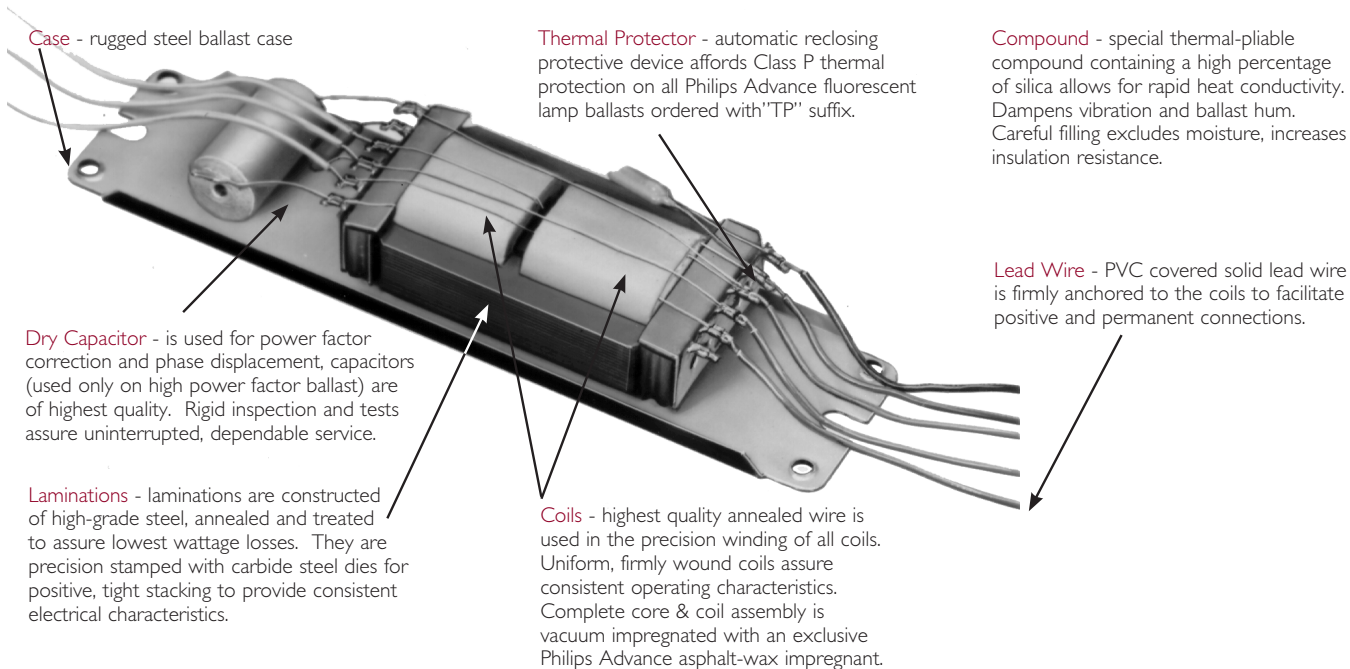
Sign Ballasts _____ 3-24 to 3-25

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 operate at increased temperatures. This will result in reduced ballast life. Low voltage can cause premature lamp failures as well as unreliable lamp starting.

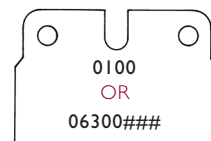
All ballasts are designed for single frequency operation. Therefore, best results will be obtained when that ballast is used on the frequency shown on the ballast label. Frequency limitations are as follows:

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

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

Ballast Date Codes

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



See catalog table of contents for important change Certifications



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



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

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



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

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



Indicates ballast complies with U.S. Energy Standards.



Indicates ballast complies with Canadian Energy Standards.



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

ELECTROMAGNETIC FLUORESCENT BALLASTS

Class P Ballasts

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

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

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

Safety

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

Starting

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

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

Cold Weather Operation

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

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

These are the two considerations for low temperature application:

1. Starting of the lamps

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

2. Operating the Lamps

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

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

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

ELECTROMAGNETIC FLUORESCENT BALLASTS

Ballast Sound

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

Temperature and Ventilation

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

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

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

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

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

Ballast Type

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

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

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

The Federal Ballast Law prohibits the manufacture of the following ballasts starting on July 1, 2010

R-140-TP	V-140-TP
R-2S34-TP	V-2S34-TP
R-2S40-TP	V-2S40-TP
R-2E60-S-TP	V-2E60-S-TP
R-2E75-S-TP	V-2E-75-S-TP

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



T8 & T12

ELECTROMAGNETIC FLUORESCENT BALLASTS

Straight & U-Shaped

HIGH POWER FACTOR SOUND RATED A

Rapid Start Lamps

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

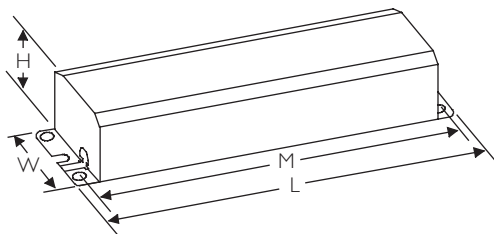
❖ Normal Power Factor

❖ Requires Circuit-Interrupting Lamp Holders

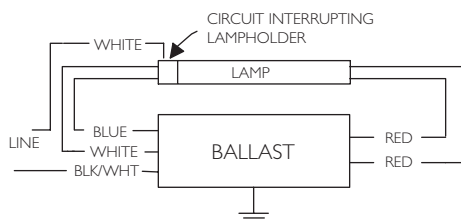
+ Mounting dimensions refer to slots only

DIMENSIONS

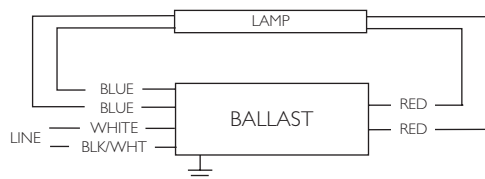
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
T-2	9½	2¾	1½	8 ²⁹ / ₃₂
R-4	6½	1 ¹⁵ / ₁₆	1¾	6+



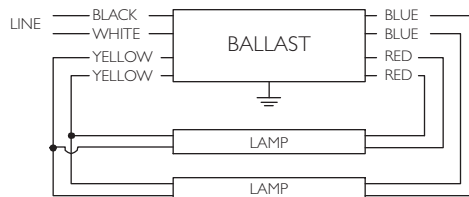
Case T



Diag. 16



Diag. 20



Diag. 21

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



Straight & U-Shaped

HIGH POWER FACTOR SOUND RATED A

Rapid Start Lamps

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

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

* Normal Power Factor

★ For Residential Use Only

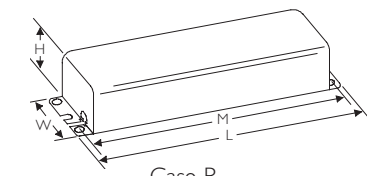
- ❖ Requires Circuit-Interrupting Lamp Holders

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

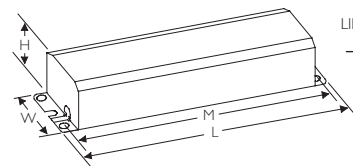
+ Mounting dimensions refer to slots only

DIMENSIONS

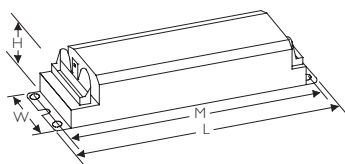
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
D-2	17	2 ³ / ₈	1½	16 ⁵ / ₁₆
T-2	9½	2 ³ / ₈	1½	8 ²⁹ / ₃₂
R-4	6½	1 ¹⁵ / ₁₆	1 ³ / ₈	6+



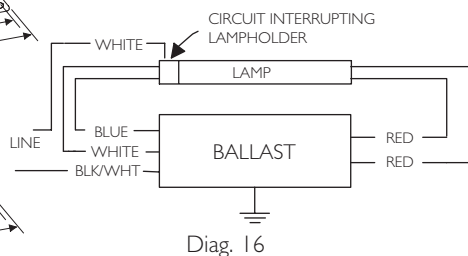
Case R



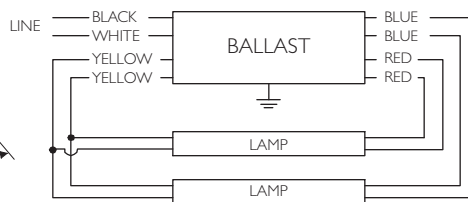
Case T



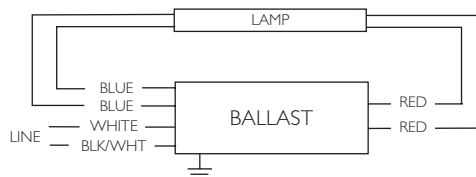
Case D2



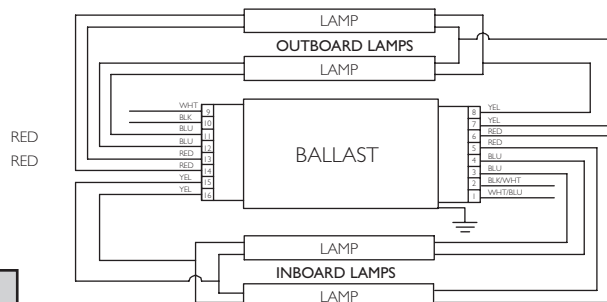
Diag. 16



Diag. 21



Diag. 20



Diag. 25

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



High Output

HIGH POWER FACTOR SOUND RATED C

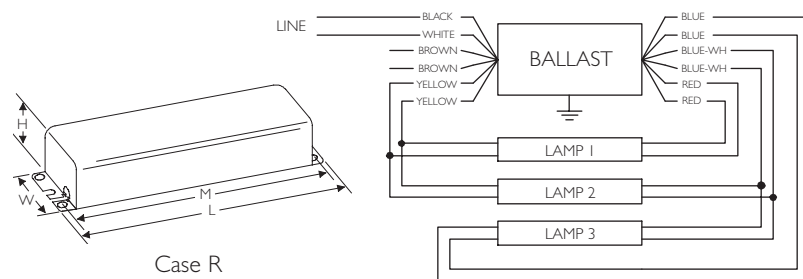
Rapid Start Lamps

Lamp Data		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														
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		
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		
3	50	-20	120	RC-4S60-TP ■	✓	✓			1.60	166	0.93	<30	0.86	R-9	8
4	50	-20	120	RC-4S60-TP ■	✓	✓			1.90	212	0.98	<20	0.93	R-9	13

- Sound Rated B
- Sound Rated D

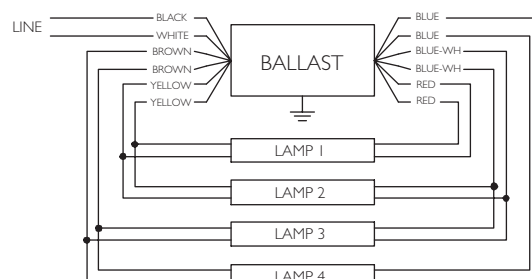
DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11 3/4	3 3/16	2 5/8	11 9/64

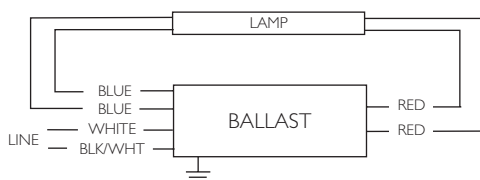


Diag. 8

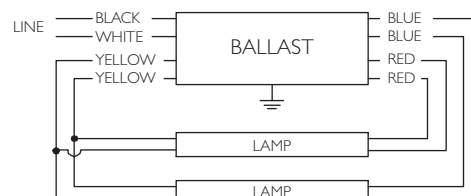
Note: Insulate unused leads individually as shown on a ballast label



Diag. 13



Diag. 20



Diag. 21

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



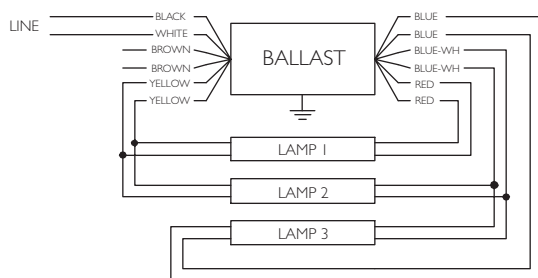
High Output

HIGH POWER FACTOR SOUND RATED C

Rapid Start Lamps

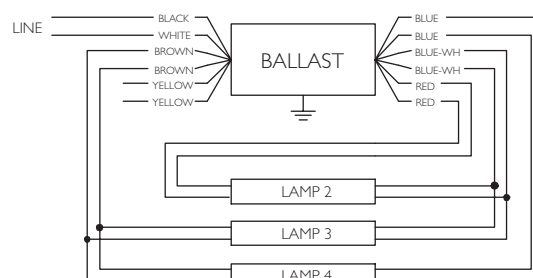
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
F42T12/HO (800mA)															
1	55	-20	120	RS-110-TP ●	✓	✓			0.69	80	0.96	<40	0.97	R-9	20
			277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

- Sound Rated B
■ Sound Rated D



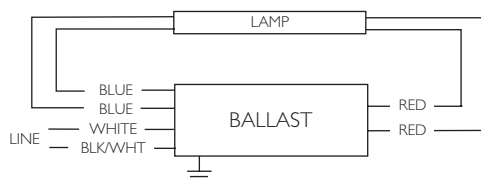
Diag. 8

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

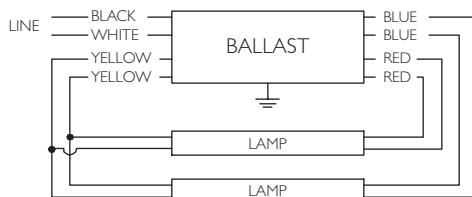


Diag. 9

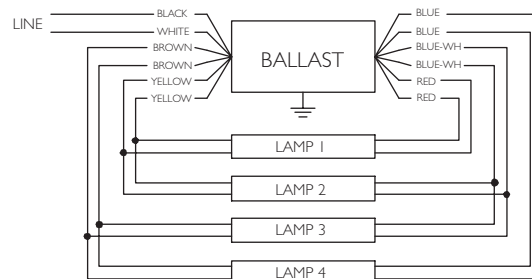
Note: Insulate unused leads individually as shown on a ballast label



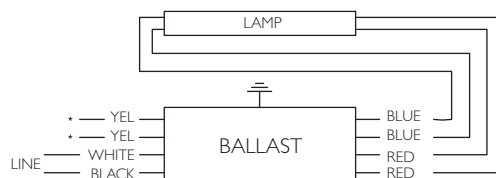
Diag. 20



Diag. 21



Diag. 13



Diag. 39

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

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



High Output

HIGH POWER FACTOR SOUND RATED C

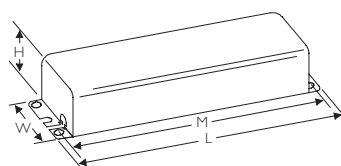
Rapid Start Lamps

Lamp Data		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														
F60T12/HO (800mA)															
1	75	-20	120	RS-110-TP ●	✓	✓			0.83	97	0.93	<35	0.97	R-9	20
				RC-2S85-TP	✓	✓			0.94	90	0.77	<40	0.80		39
			277	VS-110-TP ●	✓	✓			0.38	98	0.96	<35	0.93		20
				VC-2S85-TP	✓	✓			0.48	87	0.80	<40	0.66		39
2	75	-20	120	RC-2S85-TP	✓	✓			1.50	178	0.90	<15	0.99	R-9	21
			277	VC-2S85-TP	✓	✓			0.65	170	0.86	<20	0.94		21
3	75	-20	120	RC-4S85-TP ■	✓	✓			1.90	223	0.83	<20	0.98	R-11	9
4	75	-20	120	RC-4S85-TP ■	✓	✓			2.35	278	0.80	<15	0.99	R-11	13
F64T12/HO (800mA)															
1	80	-20	120	RS-110-TP ●	✓	✓			0.88	104	0.96	<35	0.98	R-9	20
				RC-2S85-TP	✓	✓			0.94	90	0.77	<40	0.80		39
			277	VS-110-TP ●	✓	✓			0.42	106	0.96	<35	0.91		20
				VC-2S85-TP	✓	✓			0.47	95	0.78	<40	0.73		39
2	80	-20	120	RC-2S85-TP	✓	✓			1.50	178	0.90	<15	0.99	R-9	21
			277	VC-2S85-TP	✓	✓			0.65	170	0.86	<20	0.94		21
3	80	-20	120	RC-4S85-TP ■	✓	✓			2.09	246	0.84	<15	0.98	R-11	9
4	80	-20	120	RC-4S85-TP ■	✓	✓			2.64	312	0.78	<10	0.98	R-11	13

● Sound Rated B
■ Sound Rated D

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11 3/4	3 3/16	2 5/8	11 9/64
R-11	14 5/16	3 3/16	2 5/8	13 3/4



Case R

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



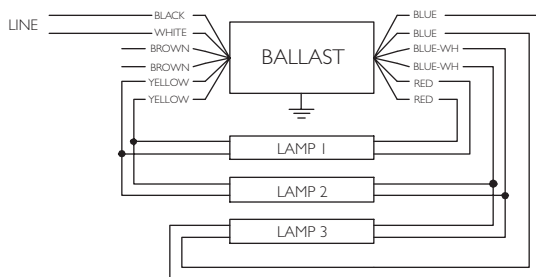
High Output

HIGH POWER FACTOR SOUND RATED C

Rapid Start Lamps

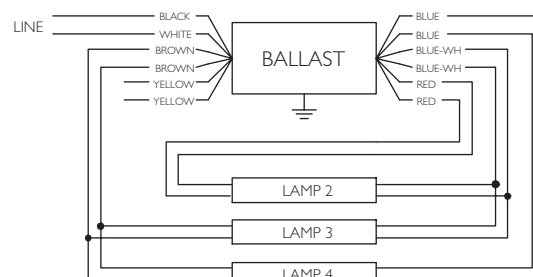
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
F72T12/HO (800mA)															
1	85	-20	120	RC-2S85-TP	✓	✓			0.98	100	0.82	<35	0.85	R-9	39
				RS-110-TP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

- Sound Rated B
■ Sound Rated D



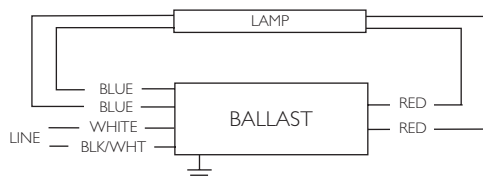
Diag. 8

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

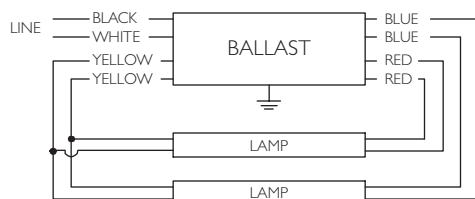


Diag. 9

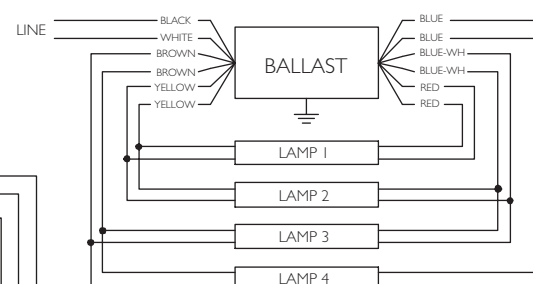
Note: Insulate unused leads individually as shown on a ballast label



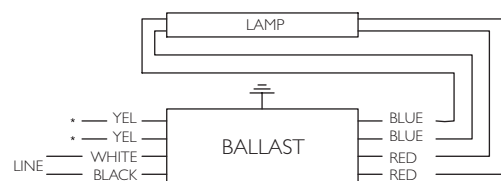
Diag. 20



Diag. 21



Diag. 13



Diag. 39

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

Refer to pages 3-11 for dimensions

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



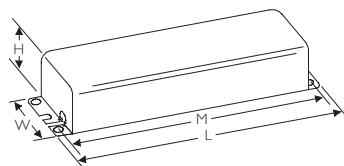
High Output

HIGH POWER FACTOR SOUND RATED C

Rapid Start Lamps

Lamp Data		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														
F96T12/HO Energy Saver (840mA)															
1	95	60	120	RS-110-TP ●	✓	✓			1.00	121	0.94	<35	0.99	R-9	20
			277	VS-110-TP ●	✓	✓			0.47	125	0.95	<35	0.96		
2	95	60	120	R-2S110-TP Mark III	✓	✓	✓	✓	1.70	203	0.91	<20	0.99	R-9	21
			277	V-2S110-TP Mark III	✓	✓	✓	✓	0.79	210	0.93	<25	0.96		
F96T12/HO (800mA)															
1	110	-20	120	RC-2S85-TP	✓	✓			1.07	121	0.84	<25	0.94	R-9	39
				RS-110-TP ●	✓	✓			1.20	140	0.98	<35	0.97		20
			277	VC-2S85-TP	✓	✓			0.48	114	0.83	<30	0.85		39
				VS-110-TP ●	✓	✓			0.54	145	1.00	<30	0.97		20
2	110	-20	120	R-2S110-TP Mark III	✓	✓	✓	✓	2.00	237	0.95	<15	0.99	R-9	21
			277	V-2S110-TP Mark III	✓	✓	✓	✓	0.90	245	0.98	<20	0.98		
3	110	-20	120	RC-4S85-TP ■	✓	✓			2.50	292	0.75	<15	0.97	R-11	9

● Sound Rated B
■ Sound Rated D



Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-9	11 3/4	3 3/16	2 5/8	11 7/64
R-11	14 5/16	3 3/16	2 5/8	13 3/4

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



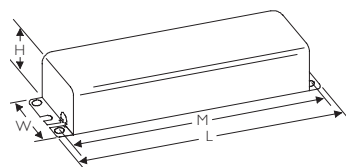
Very High Output

HIGH POWER FACTOR SOUND RATED D

VHO & Powergroove Rapid Start Lamps

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
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-II	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-II	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-II	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-II	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-II	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-II	21
				RS-2S200-TP	✓	✓			2.90	314	0.85	<15	0.90		
			277	VS-2S200-TP	✓	✓			1.40	376	0.99	<15	0.97		

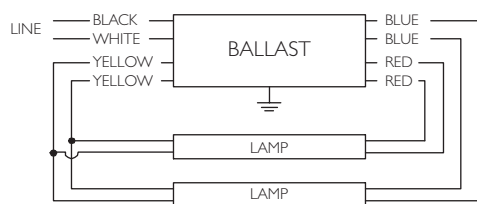
Electromagnetic Fluorescent Ballasts



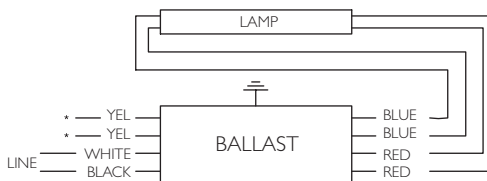
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-II	14 ⁵ / ₁₆	3 ³ / ₁₆	2 ⁵ / ₈	1 3 ³ / ₄



Diag. 21



Diag. 39

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

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

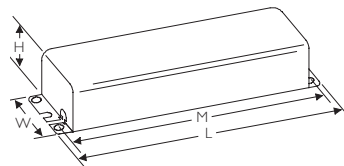


Very High Output

HIGH POWER FACTOR SOUND RATED D

VHO & Powergroove Rapid Start Lamps

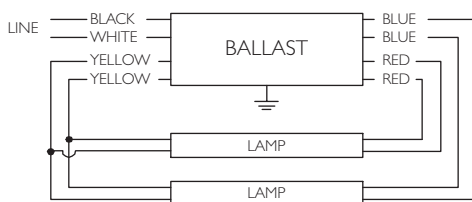
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
F96T12/VHO Energy Saver (1580mA), F96PG17/VHO Energy Saver (1580mA)															
1	185	60	120	RC-2S102-TP	✓	✓			2.00	198	0.87	<35	0.83	R-II	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-II	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-II	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-II	21
				RS-2S200-TP	✓	✓			3.31	358	0.85	<10	0.90		
			277	VS-2S200-TP	✓	✓			1.65	442	0.90	<15	0.97		



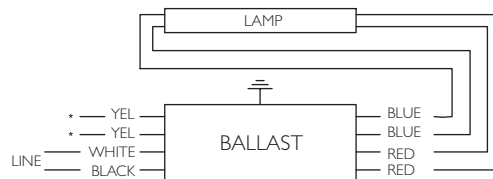
Case R

DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-II	14 ⁵ / ₁₆	3 ³ / ₁₆	2 ⁵ / ₈	1 3 ³ / ₄



Diag. 21



Diag. 39

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



Slimline

HIGH POWER FACTOR SOUND RATED C

Instant Start Lamps

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

● Sound Rated B

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

Refer to pages 3-15 for wiring diagrams and dimensions

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



Slimline

HIGH POWER FACTOR SOUND RATED C

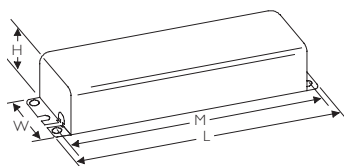
Instant Start Lamps

Lamp Data		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														
F96T12 Energy Saver (440mA)															
1	60	60	120	RSM-I75-S-TP	✓	✓			0.68	74	0.88	<35	0.91	R-6	10
			277	VSM-I75-S-TP	✓	✓			0.30	76	0.88	<35	0.91		
2	60	60	120	R-2E60-S-TP E-Pak ^R	✓	✓	✓	✓	1.03	112	0.88	<35	0.91	R-8	12
				R-2E75-S-TP Mark III ^R	✓	✓	✓	✓	1.10	126	0.88	<35	0.95		
			277	V-2E60-S-TP E-Pak ^R	✓	✓	✓	✓	0.44	112	0.88	<35	0.92		36
				V-2E75-S-TP Mark III ^R	✓	✓	✓	✓	0.47	126	0.88	<25	0.97		
F96T12 (425mA)															
1	75	0	120	RSM-I75-S-TP	✓	✓			0.82	92	0.94	<25	0.93	R-6	10
			277	VSM-I75-S-TP	✓	✓			0.35	94	0.94	<25	0.97		
2	75	50	120	R-2E60-S-TP E-Pak ^R	✓	✓	✓	✓	1.24	144	0.86	<30	0.98	R-8	12
				R-2E75-S-TP Mark III ^R	✓	✓	✓	✓	1.35	158	0.94	<30	0.98		
			277	V-2E60-S-TP E-Pak ^R	✓	✓	✓	✓	0.54	144	0.86	<30	0.96		36
				V-2E75-S-TP Mark III ^R	✓	✓	✓	✓	0.60	158	0.94	<25	0.95		

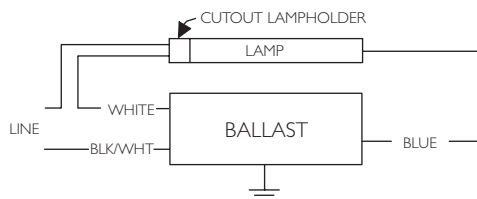
R For Replacement Use Only - not available after July 1, 2010

DIMENSIONS

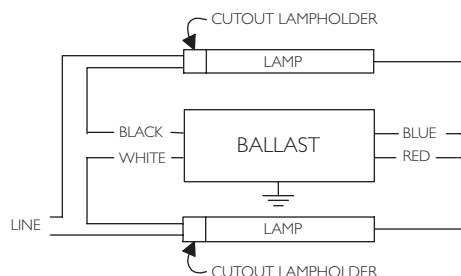
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-6	9½	3 ⁷ / ₆₄	1 ²⁵ / ₃₂	8 ²⁹ / ₃₂
R-8	11¾	3 ⁷ / ₆₄	1 ²⁵ / ₃₂	11 ⁹ / ₆₄



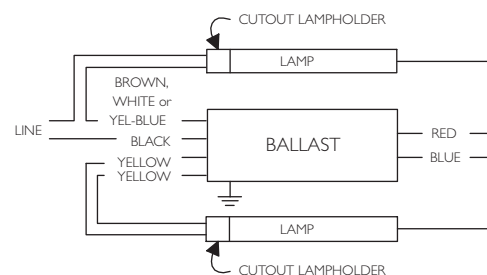
Case R



Diag. 10



Diag. 12



Diag. 36

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



Preheat Lamps

CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

Preheat Ballasts (Starter Required) ☆

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts				UL	SF	E	IE							
F4T5															
I	4	50	120	LPL-5-9 ✕	✓	✓			0.19	9	1.01	<10	0.39	X-1	1/16
				LC-4-9-C ★✕	✓	✓			0.20	9	1.07	<10	0.38	C-2	1/16
F6T5															
I	6	50	120	LPL-5-9 ✕	✓	✓			0.17	9	1.02	<10	0.44	X-1	1/16
				LC-4-9-C ★✕	✓	✓			0.19	10	1.07	<10	0.44	C-2	1/16
F8T5															
I	8	50	120	LPL-5-9 ✕	✓	✓			0.14	9	1.00	<10	0.54	X-1	1/16
				LC-4-9-C ★✕	✓	✓			0.17	11	1.08	<10	0.54	C-2	1/16
F13T8															
I	13	50	120	LO-13-22 ✕	✓	✓			0.34	17	0.91	<10	0.42	X-3	1/16
F14T8															
I	14	50	120	LO-13-22 ✕	✓	✓			0.32	18	0.90	<20	0.47	X-3	1/16
				LC-14-20-C ★✕	✓	✓			0.37	20	0.97	<10	0.45	C-2	1/16
F15T8															
I	15	50	120	LO-13-22 ✕	✓	✓			0.29	18	0.96	<10	0.52	X-3	1/16
				LC-14-20-C ★✕	✓	✓			0.34	20	1.08	<10	0.49	C-2	1/16
F18T8															
I	18	50	120	LO-13-22 ✕	✓	✓			0.29	17	0.80	<15	0.49	X-3	1/16
				LC-14-20-C ★✕	✓	✓			0.33	20	0.92	<10	0.51	C-2	1/16
F19T8															
I	19	50	120	LO-13-22 ✕	✓	✓			0.28	17	0.90	<15	0.51	X-3	1/16
				LC-14-20-C ★✕	✓	✓			0.33	20	0.92	<15	0.51	C-2	1/16
F30T8															
I	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 ¹ / ₁₆	1 ³ / ₈	1 ¹⁹ / ₃₂	1 ¹³ / ₁₆	2 ³ / ₄
X-1	2 ³ / ₈	1 ¹ / ₈	1 ³ / ₈	1 ³ / ₈	2
X-3	3 ¹ / ₁₆	1 ¹ / ₄	1 ⁷ / ₁₆	1 ¹³ / ₁₆	2 ³ / ₄
R-4	6 ¹ / ₂	—	1 ¹⁵ / ₁₆	1 ³ / ₈	6+

Refer to pages 3-17 for wiring and dimension diagrams

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



T12

ELECTROMAGNETIC FLUORESCENT BALLASTS

Preheat Lamps

CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

Preheat Ballasts (Starter Required) ☆

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
F14T12															
I	14	50	120	LO-13-22 ✕	✓	✓			0.34	18	0.92	<10	0.44	X-3	1/16
				LC-14-20-C ✕★	✓	✓			0.39	21	1.01	<10	0.45	C-2	1/16
F15T12															
I	15	50	120	LO-13-22 ✕	✓	✓			0.32	18	0.97	<10	0.47	X-3	1/16
				LC-14-20-C ✕★	✓	✓			0.38	21	1.10	<15	0.46	C-2	1/16
F20T12															
I	20	50	120	LO-13-22 ✕	✓	✓			0.28	18	0.77	<10	0.54	X-3	1/16
				LC-14-20-C ✕★	✓	✓			0.33	21	0.93	<10	0.53	C-2	1/16
F25T12															
I	25	50	120	LC-25-TP ★	✓	✓			0.36	24	0.90	<10	0.56	C-2	1/16
F30T12															
I	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															
I	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

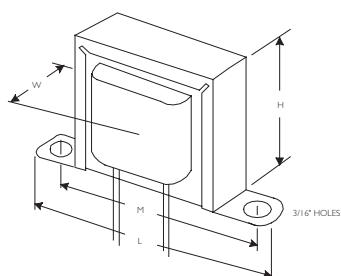
✖ Available with Class P Thermal Protection—
Add Suffix -TP to Catalog Number.

★ Core & Coil with Cover, painted white

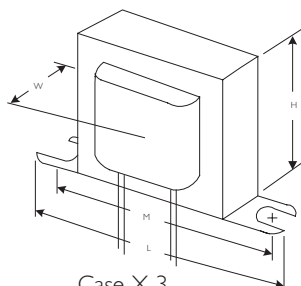
☆ Ballast Includes Built-in Starter.

† Class A Insulation

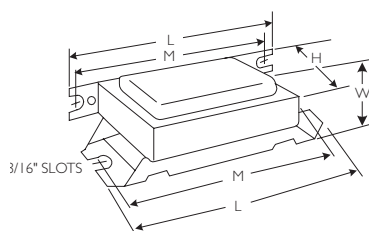
+ Mounting dimensions refer to slots only



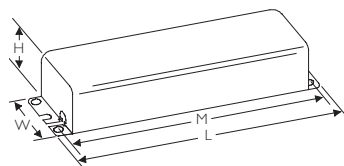
Case X-1



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



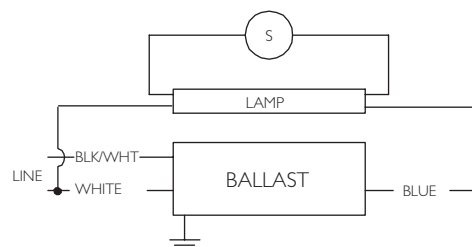
Case C



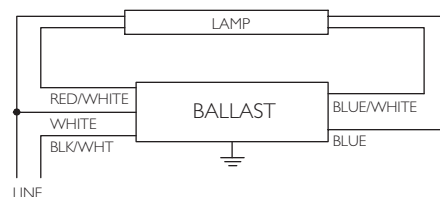
Case R

Refer to pages 3-16 for dimensions

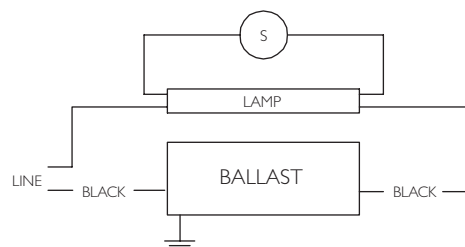
Refer to pages 9-24 to 9-28 for lead lengths and shipping data



Diag. 2



Diag. 4



Diag. 116

Electromagnetic
Fluorescent Ballasts



Preheat Lamps

HIGH POWER FACTOR SOUND RATED A

Trigger 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														
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

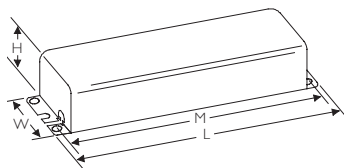
❖ Requires Circuit-Interrupting Lamp Holders

* Normal Power Factor

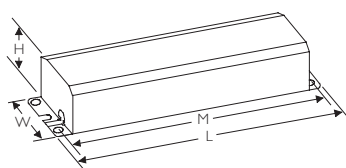
+ Mounting dimensions refer to slots only

DIMENSIONS

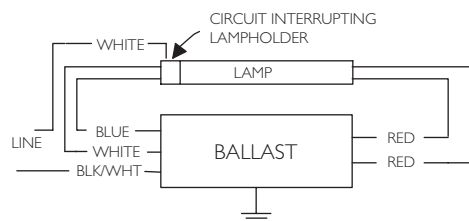
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	1 15/16	1 3/8	6+
T-1	6½	2 3/8	1 ½	6+
T-2	9½	2 3/8	6½	8 29/32



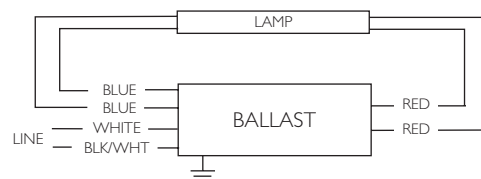
Case R



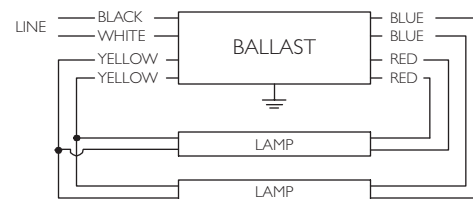
Case T



Diag. 16



Diag. 20



Diag. 21

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



T9

ELECTROMAGNETIC FLUORESCENT BALLASTS

Circline Lamps

NORMAL POWER FACTOR SOUND RATED A

Rapid Start Ballasts

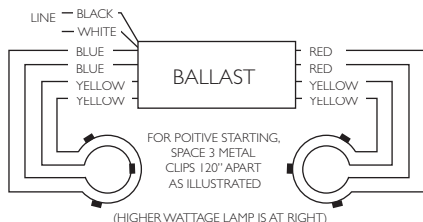
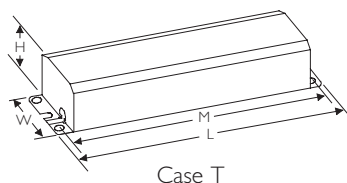
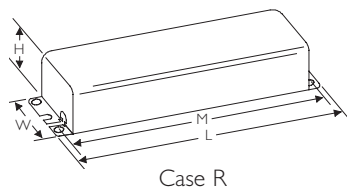
Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
FC6T9 (20W Circline)															
I	20	50	120	RLQS-122-TP-W	✓	✓			0.56	24	0.76	<10	0.36	R-4	32
FC8T9 (22W Circline)															
I	22	50	120	RLQS-122-TP-W	✓	✓			0.53	25	0.75	<10	0.39	R-4	32
FC12T9 (32W Circline)															
I	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)															
I	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
(I)FC8T9 & (I)FC12T9 ((I)22W & (I)32W Circline)															
2	22 & 32	50	120	RS-22-32-TP-W	✓	✓			0.40	46	0.70	<15	0.96	T-I	105
(I)FC12T9 & (I)FC16T9 ((I)32W & (I)40W Circline)															
2	32 & 40	50	120	RS-32-40-TP-W	✓	✓			0.76	56	0.60	<20	0.61	T-I	105

+ Mounting dimensions refer to slots only

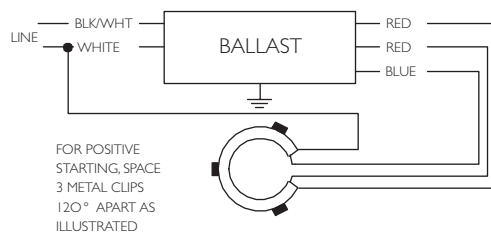
Note: All Ballasts supplied with Circline sockets in white can except RL-140-TP

DIMENSIONS

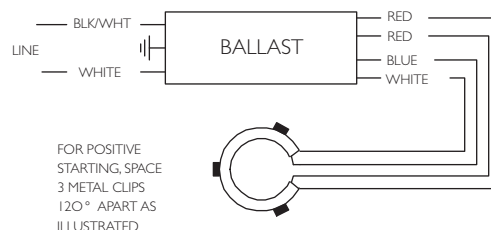
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-4	6½	1½ ¹ / ₁₆	1¾	6+
T-1	6½	2¾	1½	6+



Diag. 105



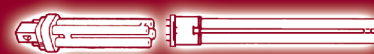
Diag. 31



Diag. 32

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

Electromagnetic
Fluorescent Ballasts



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

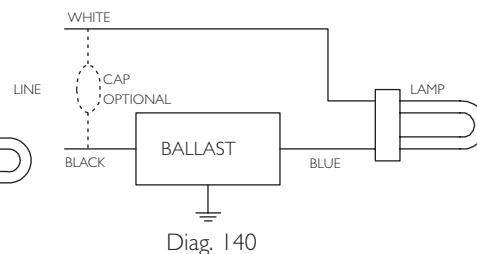
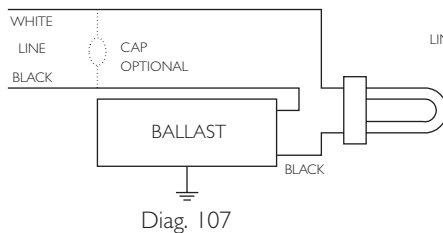
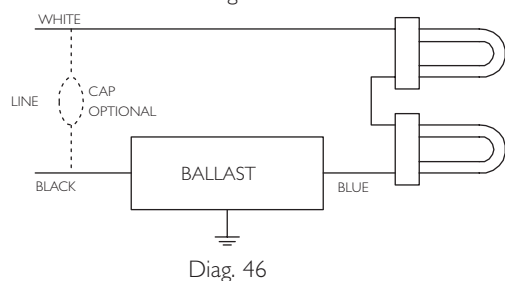
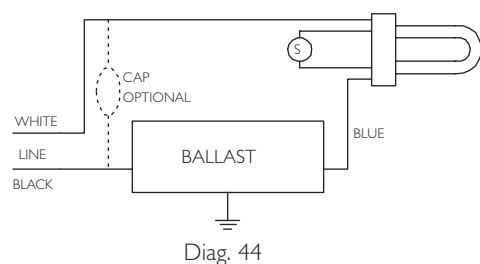
CLASS B INSULATION NORMAL POWER FACTOR SOUND RATED A

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	SF	E	ETL	Operating	Starting	Open Circuit					
CFT5W/G23 - 5W Twin Tube Lamp (PL-S5W, F5BX, CF5DS)																
I	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)																
I	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)																
I	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)																
I	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																
I	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)																
I	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)																
I	28	-20	120	LOS-1Q28 f	✓	✓			0.61	0.74	—	32	0.97	<15	X-6	107

★ Core & Coil with Cover, painted white

f For Outdoor Use Only



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

Designation	Length (L) (inches)	Width (W) (inches)		Height (H) (inches)	Mounting (M) (inches)
		Standard	With TP		
C-2	3 ¹ / ₁₆	1 ³ / ₈	1 ¹⁹ / ₃₂	1 ¹³ / ₁₆	2 ³ / ₄
X-1	2 ³ / ₈	1 ¹ / ₈	1 ³ / ₈	1 ³ / ₈	2
X-3	3 ¹ / ₁₆	1 ¹ / ₄	1 ⁷ / ₁₆	1 ¹³ / ₁₆	2 ³ / ₄
X-5	3 ¹ / ₄	1 ¹ / ₂	1 ³ / ₄	2	2 ³ / ₁₆
X-6	3 ¹ / ₁₆	1 ¹ / ₂	—	1 ¹³ / ₁₆	2 ³ / ₄
X-8	4	1 ⁹ / ₁₆	1 ¹³ / ₁₆	2 ¹ / ₄	3 ¹ / ₂

Refer to page 3-17 for dimension diagrams.

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



T4

ELECTROMAGNETIC FLUORESCENT BALLASTS

2-Pin Compact Lamps

HIGH POWER FACTOR SOUND RATED A

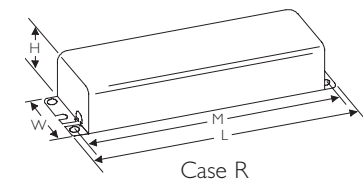
Preheat Ballasts

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	SFA	E	ETL	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 H-2B13-TP-W	✓	✓			0.30	0.44	—	35	1.02	<30	T-1	51
		0	277	VH-2B13-TP-BLS VH-2B13-TP-W	✓	✓			0.10	0.35	0.21	27	0.92	<30	R-2	50
CFQ26W/G24d - 26W Quad Tube Lamp (PL-C26W, F26DBXT4, CF26DD)																
CFTR26W/GX24d - 26W Triple Tube Lamp (CF26DT)																
1	26	50	120	H-1Q26-TP-W	✓	✓			0.24	0.33	0.41	28	0.83	<20	T-1	47
			277	VH-1Q26-TP-W	✓	✓			0.11	0.38	0.24	32	0.90	<20	R-2	47
2	26	50	120	H-2Q26-TP-BLS H-2Q26-TP-W	✓	✓			0.42	0.34	—	50	0.82	<15	R-5	50
			277	VH-2Q26-TP-BLS VH-2Q26-TP-W	✓	✓			0.21	0.32	—	58	0.87	<25	R-5	51

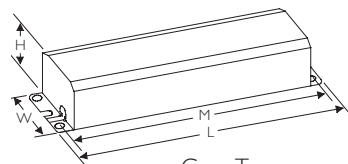
+ Mounting dimensions refer to slots only

DIMENSIONS

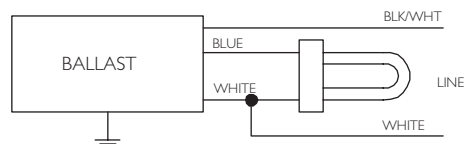
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-1	4¼	2	1 ⁷ / ₁₆	3 ⁹ / ₁₆
R-2	4¾	2 ⁷ / ₃₂	1 ⁵ / ₆	4 ³ / ₈ +
R-5	9½	2 ³ / ₈	1 ¹¹ / ₁₆	8 ²⁹ / ₃₂
T-1	6½	2 ³ / ₈	1½	6+



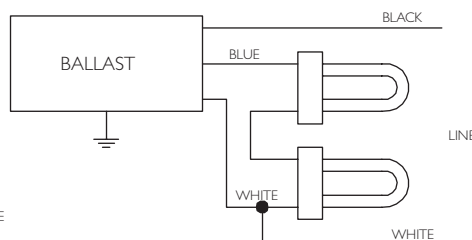
Case R



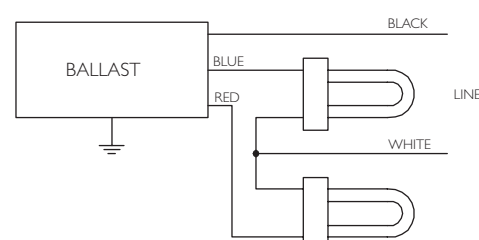
Case T



Diag. 47



Diag. 50



Diag. 51

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

Electromagnetic
Fluorescent Ballasts



Straight & U-Shaped Lamps

HIGH POWER FACTOR SOUND RATED A

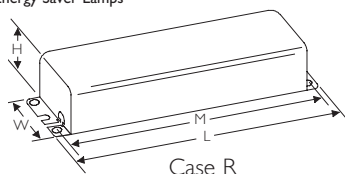
Dimming Ballasts

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

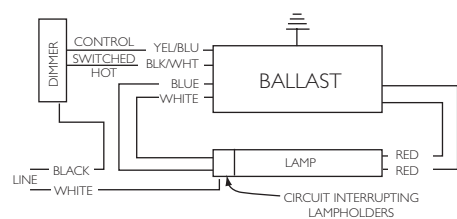
Data listed is for full light output
Line Current Controlled by Control Setting
Dimming Range-100%-5%
All Require Circuit Interrupting Lampholders
Note: Will NOT Operate 34W Energy Saver Lamps

DIMENSIONS

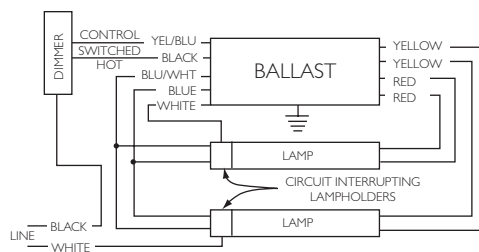
Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
R-5	9½	2⅜	1⅞	8 ²⁹ / ₃₂
R-12	15¾	2⅜	1½	14 ⁷ / ₁₆



Case R



Diag. 17



Diag. 84

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

Radio Interference Filter

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

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

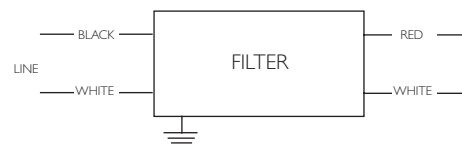
To correct the first cause, it is recommended the radio and aerial circuit be separated at least 10 feet from the fluorescent lamp and the radio provided with a positive ground.

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

SOUND RATED A

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

For bottom leads with studs, add suffix -BLS



Diag. 118

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



High Output Lamps

HIGH POWER FACTOR SOUND RATED C

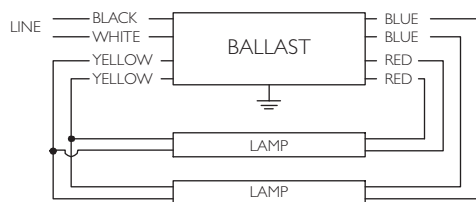
Weatherproof Ballasts

Lamp Data		Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Line Current (Amps)	Input Power ANSI (Watts)	Ballast Factor	THD %	Power Factor	Dim.	Wiring Dia.
Number	Watts														
F24T12/HO (800mA)															
2	35	-20	120	RC-2S85-FO	✓				1.01	95	0.78	<45	0.80	FO	2I
F36T12/HO (800mA)															
2	50	-20	120	RC-2S85-FO	✓				1.00	107	0.82	<35	0.90	FO	2I
F42T12/HO (800mA)															
2	55	-20	120	RC-2S85-FO	✓				1.10	126	0.82	<35	0.95	FO	2I
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	2I
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	2I
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	2I
				RC-2S110-FO	✓				1.80	203	0.99	<20	0.94		
F96T12/HO (800mA)															
1	110	-20	120	RC-2S85-FO	✓				1.07	121	0.84	<25	0.94	FO	39
2	110	-20	120	RC-2S110-FO	✓				2.10	248	0.98	<15	0.98	FO	2I

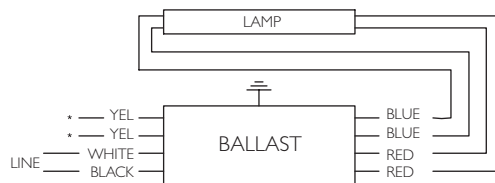
DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
FO	21 ¹ / ₁₆	3 ³ / ₄	3	20 ⁵ / ₁₆

Note: Can must be mounted vertically



Diag. 21



Diag. 39



Rectangular Can
(FO)

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



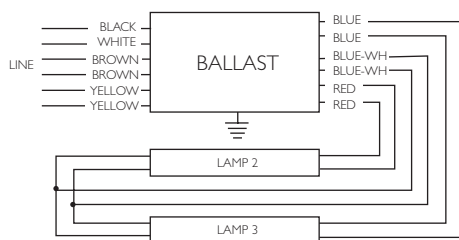
High Output Lamps

CLASS P BALLAST IN WHITE CAN

Sign Ballasts

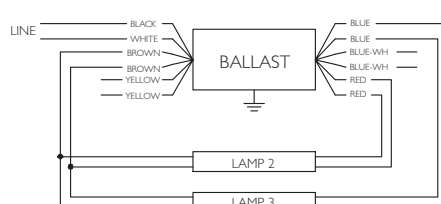
Lamp Data			Min. Starting Temp. (F)	Input Volts	Catalog Number	Certifications				Max. Line Current (Amps)	Max. Input Power (Watts)	Open Circuit Volts	Dim.	Wiring Dia.
No. of Lamps	Lamp Footage													
	Min	Max												
T12/HO (800mA)														
1,2	4	12	-20°F	120	ASB-0412-12-BL-TP	✓	✓			1.48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

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



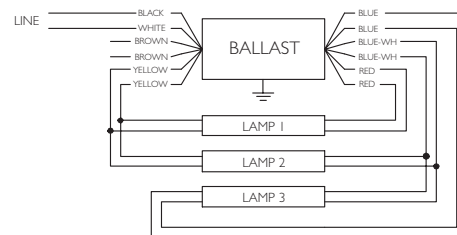
Diag. 5

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



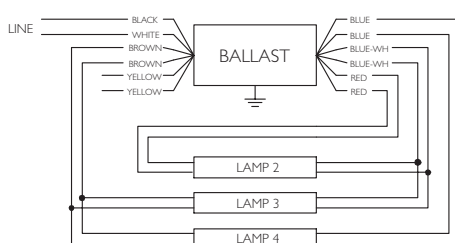
Diag. 7

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



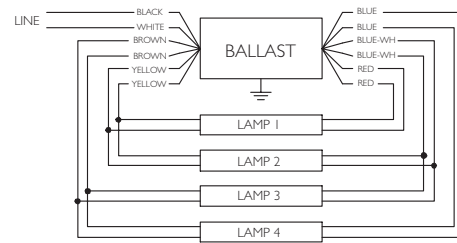
Diag. 8

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

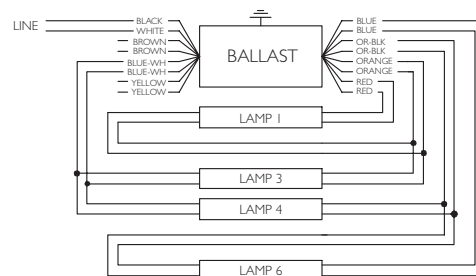


Diag. 9

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



Diag. 13



Diag. 14

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

Wiring diagrams continued on page 3-25

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



High Output Lamps

CLASS P BALLAST IN WHITE CAN

Sign Ballasts

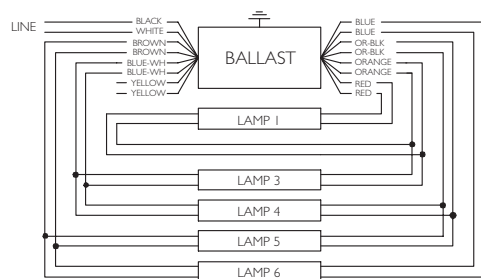
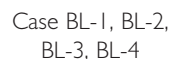
		Total Lamp Feet																													
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50					
Number of Lamps per Ballast	1,2		ASB-0412-12-BL-TP VSB-0412-12-BL-TP																												
	2,3,4			ASB-0620-24-BL-TP VSB-0620-24-BL-TP																											
	2,3,4						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 Philips Lighting Electronics Catalog Number. Note that the first ballast you come to, reading down the chart, will be the most economical for your application.
- 2) The number of lamps per ballast is shown in the left column.

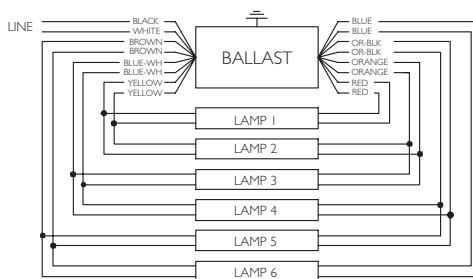
DIMENSIONS

Designation	Length (L) (inches)	Width (W) (inches)	Height (H) (inches)	Mounting (M) (inches)
BL-1	11 $\frac{3}{4}$	3 $\frac{3}{16}$	2 $\frac{5}{8}$	11 $\frac{3}{64}$
BL-2	14 $\frac{3}{16}$	3 $\frac{3}{16}$	2 $\frac{5}{8}$	13 $\frac{3}{4}$
BL-3	19 $\frac{3}{16}$	3 $\frac{3}{16}$	2 $\frac{1}{16}$	18 $\frac{5}{8}$
BL-4	16 $\frac{11}{16}$	3 $\frac{3}{16}$	2 $\frac{5}{8}$	16 $\frac{3}{64}$

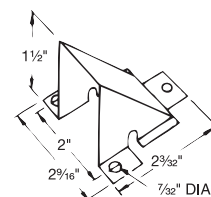


Diag. 15

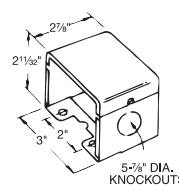
Note: Insulate unused leads individually as shown on a ballast label



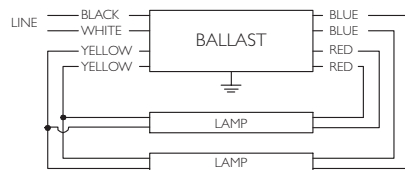
Diag. 19



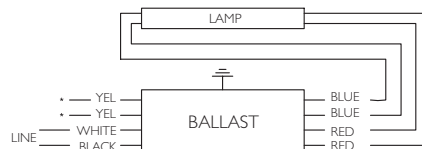
PC-161W



PC-857W



Diag. 21



Diag. 39

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