

# 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	-	HI	-	LD												
<p>CFL Mounting/Connector Options</p> <p>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</p> <p>Linear Fluorescent Mounting/Connector Options</p> <p>2LS = 2 Level Switching                      SD = Step Dimming</p>																					
<p>CFL Can Description</p> <p>HI = 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</p> <p>Linear Fluorescent Can Description</p> <p>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</p>																					
<p>Lamp Watts (Primary lamp)</p>																					
<p>Wiring Configuration</p> <p>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</p>																					
<p>Maximum Number of Lamps</p>																					
<p>Family Name</p> <table border="0"> <tr> <td>CF = Compact Fluorescent</td> <td>CN = Centium</td> </tr> <tr> <td>DA = ROVR</td> <td>DL = ROVR</td> </tr> <tr> <td>EB = AmbiStar</td> <td>ELB = AmbiStar</td> </tr> <tr> <td>EZ = Mark 10® Powerline</td> <td>MB = AmbiStar</td> </tr> <tr> <td>OP = Optanium</td> <td>UV = PureVolt</td> </tr> <tr> <td>ZT = Mark 7® 0-10V</td> <td></td> </tr> </table>										CF = Compact Fluorescent	CN = Centium	DA = ROVR	DL = ROVR	EB = AmbiStar	ELB = AmbiStar	EZ = Mark 10® Powerline	MB = AmbiStar	OP = Optanium	UV = PureVolt	ZT = Mark 7® 0-10V	
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<p>Input Voltage</p> <p>G = 347V                      H = IntelliVolt 347V to 480V 50/60 Hz                      I = IntelliVolt 120V to 277V 50/60 Hz                      R = 120V                      V = 277V</p>																					

### Corporate Offices

(800) 322-2086

### Customer Support/Technical Service

(800) 372-3331

(+) | 847 390-5000 (International)

**Visit our web site at**  
**[www.philips.com/advance](http://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.

# ELECTRONIC FLUORESCENT BALLASTS

## Remote, Tandem or Through Wiring Distances

### Remote Mounting of Electronic Ballasts

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

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

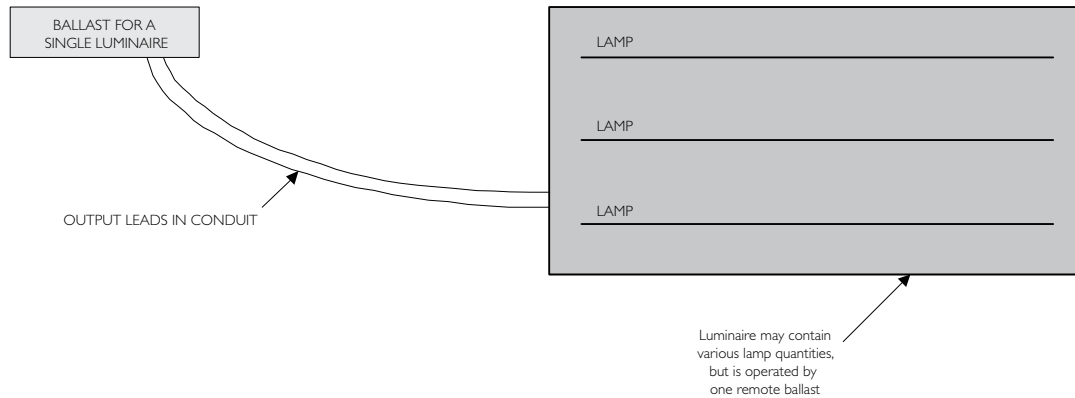
Second, if the lamp is capable of ignition, the increased capacitance will cause a loss in the current to the lamp. The added capacitance creates what is known as a "shunt" around the lamp; in other words the current will leak from the red wire (or blue) to the yellow, completely bypassing the lamp.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

The Mark 7 0-10V, Mark 10 *Powerline*, 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)

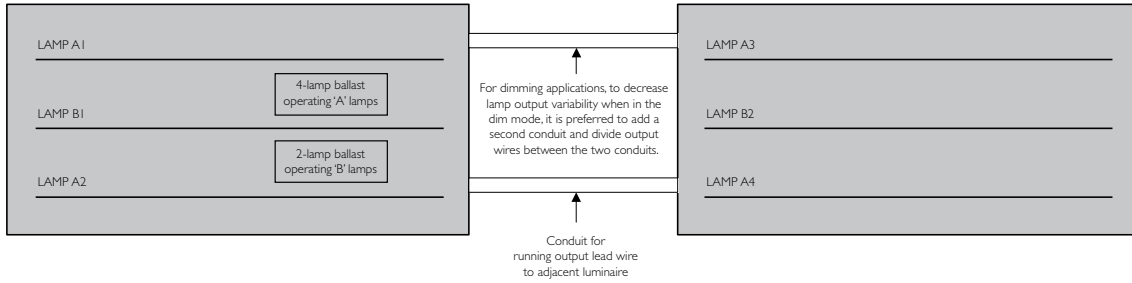
### Remote Wiring



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

# ELECTRONIC FLUORESCENT BALLASTS

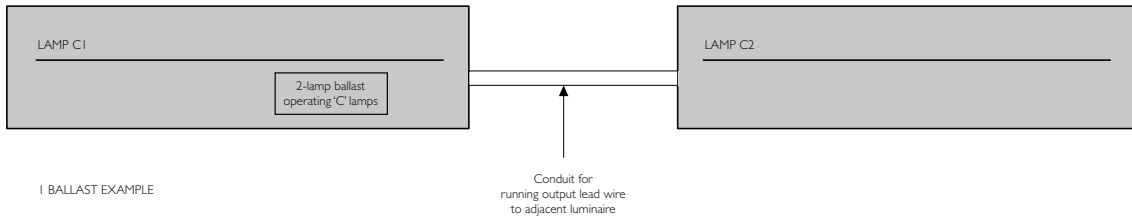
## Tandem Wiring



2 BALLAST EXAMPLE

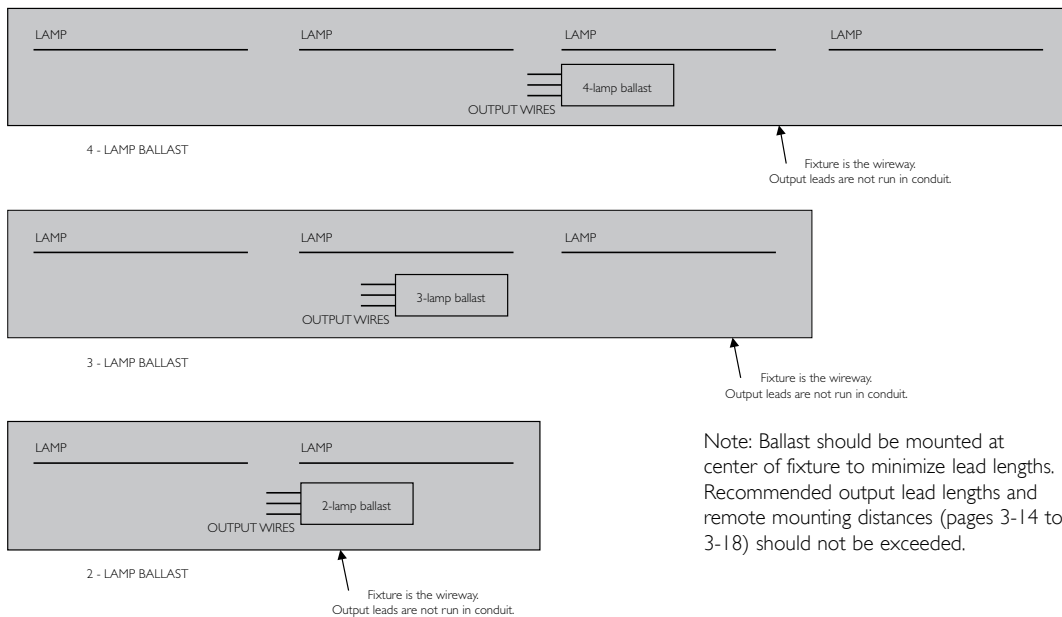
BALLAST 'A' OPERATES OUTBOARD LAMPS  
BALLAST 'B' OPERATES INBOARD LAMPS

(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



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

# ELECTRONIC FLUORESCENT BALLASTS

## 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
  - For non emergency application, the remote mounting distance should not exceed the specified limit.
  - 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
  - For non emergency application, the output lead length should not be extended any further than what was provided with the dimming ballast.
  - 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	
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	Yes	5'	4'	4'				3
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-MI-BS-QS	1-Lamp	15'	No	No						4
	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

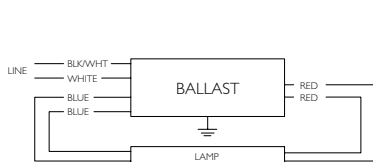
## For 17W T8 Lamps

HIGH POWER FACTOR SOUND RATED A

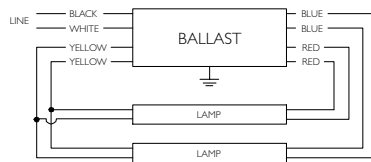


No. of Lamps	Input Volts	Lamp Starting Method	Ballast Family	Catalog Number	Input Power ANSI (Watts)	Ballast Factor	Max. THD %	Line Current (Amps)	Min. Starting Temp. (°F/°C)	Dim.	Wiring Dia.					
<b>F17T8, FBO16T8 (17W)</b>																
3	120	IS	AmbiStar <sup>‡</sup>	REB-4P32-SC	44	0.81	135	0.87	0/-18	B	*66					
			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									
	120-277	IS	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									
			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									
			IOPA-4P32-HL-SC													
			PS	Optanium	IOP-3PSP32-LW-SC	39	0.72	10	0.33-0.15	0/-18	B	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									
	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									
			GOPA-4P32-SC	50		1.00	0.15									
			GOP-3PSP32-SC	46		0.88	0.14									
			GOP-4PSP32-LW-SC	46		0.74	0.14									
347-480	PS	Optanium	GOP-4PSP32-SC	46	0.93	0.14	0/-18	G	178							
			HOP-4PSP32-HL-G	69	1.32	0.21-0.15										

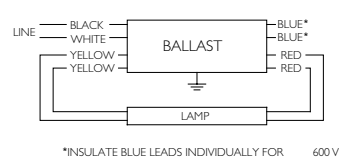
<sup>‡</sup> The above AmbiStar ballasts are normal power factor and labeled 'For Residential Use Only'



Diag. 20



Diag. 21



Diag. 77

\*INSULATE BLUE LEADS INDIVIDUALLY FOR 600 V

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