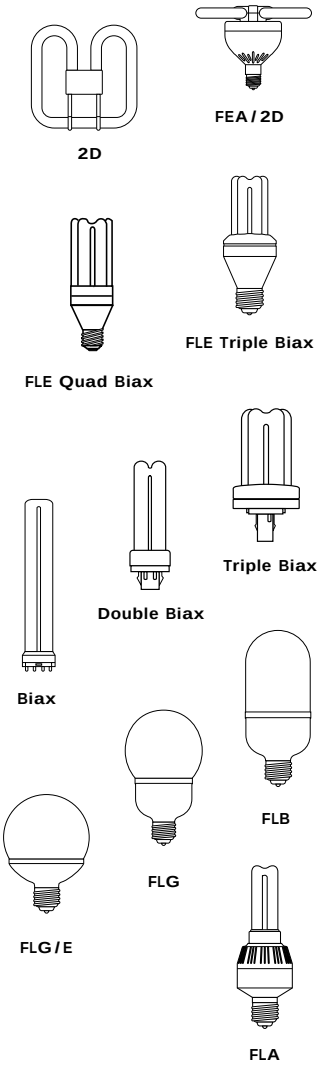
Lamp Shapes



PLUG-IN LAMPS

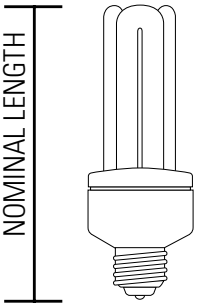
SELF BALLASTED LAMPS

PLUG-IN LAMPS WITH SEPARABLE ELECTROMAGNETIC ADAPTERS

ACCESSORIES

MISCELLANEOUS

BULB IDENTIFICATION

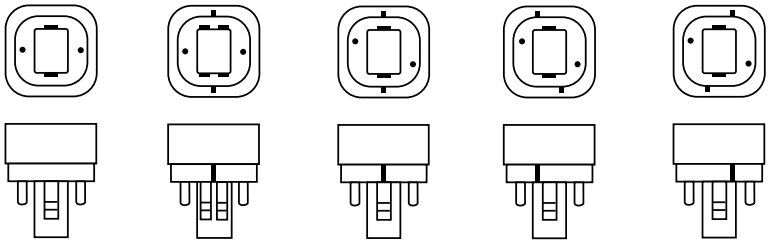


NOMINAL LENGTH:
Overall length including base or pins.

Note: Lamp drawings are not drawn to scale.
Be sure to check size and dimension information when identifying each lamp.

To convert inches to millimeters, multiply the dimension (in inches) by 25.4 (i.e. 1.5″ x 25.4 = 38.1 mm).

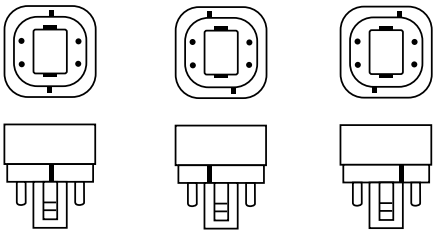
BASE IDENTIFICATION



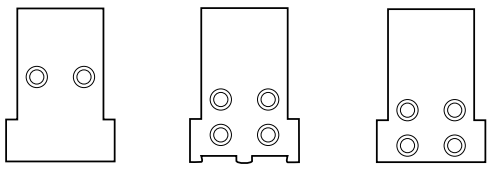
G23-2 (DBX2P) | *GX23-2 (DBX2P)* | *G24d-1 (DBX2P)* | *G24d-2 (DBX2P)* | *G24d-3 (DBX2P)*

2G11-4 (HLBX)

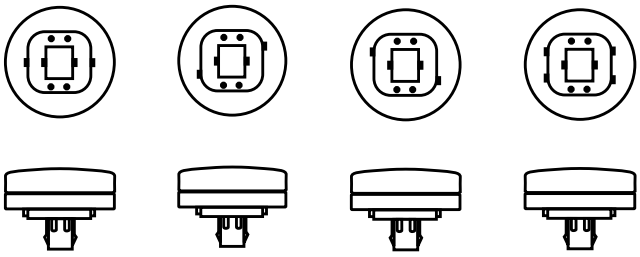
E26 Med Screw



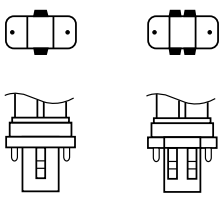
G24q-1 (DBX4P) | *G24q-2 (DBX4P)* | *G24q-3 (DBX4P)*



GR8-2 (2D2P) | *GR10q-3 (2D4P)* | *GR10q-4 (2D4P)*



GX24q-1 (TBX4P) | *GX24q-2 (TBX4P)* | *GX24q-3 (TBX4P)* | *GX24q-4 (TBX4P)*



G23 (LWBX) | *GX23 (LWBX)*

INTRODUCTION

Compact Fluorescent Lamps offer many advantages:

- Dramatic energy cost savings... up to 75% vs. incandescent lamps of comparable light output
- Extra long life… up to 13 times longer than standard incandescent lamps
- High light output comparable, and in some cases exceeding, incandescent lamps replaced
- Excellent color rendering… rare earth tri-phosphor provides color so true and natural you won't believe it's fluorescent. Deluxe SPX colors are available. Most types offer a choice of color options, from warm to cool, to let you select the tone and atmosphere you need.
- A choice of wattages, shapes and sizes to meet your lighting needs. Designed to fit everything from table lamps to wall sconces and ceiling fixtures.
- Several lamps use amalgam technology which provides stable lumen performance when operated in any position, indoors or out

PRODUCT INFORMATION

PLUG-IN COMPACT FLUORESCENT LAMPS

- Create attractive, cost-efficient lighting designs in recessed downlights, task lights, accent lighting, or general lighting or wherever long life, compact size and energy savings are important
- High efficiency, compact size and long life
- An economical alternative to incandescent and even conventional fluorescent lighting

2D® Plug-In Lamps (pg 5-5)

- Highest light output compact fluorescent lamp
- Uniform light distribution
- High light output – up to 200W incandescent equivalent
- Unique shape suitable for broad range of applications

Low-Wattage Biax® Plug-In Lamps (pg 5-5)

- Compact size offers fixture and design flexibility
- GX23 and G23 bases are preheat lamps with internal starters
- Available in warm and cool color temperatures

High Lumen Biax® Plug-In Lamps (pg 5-5 and 5-6)

- Available in a range of sizes and wattages for innovative compact luminaires
- High efficiency and outstanding performance in fixtures make them ideal for 2X2, 1X1 and indirect fixtures
- Available in warm to cool color temperatures; excellent color rendering

Double Biax® Plug-In Lamps (pg 5-6 and 5-7)

- More compact than low wattage Biax® with higher lumen output – suitable for a broad range of applications
- 2-pin: preheat lamps with starters; not suitable for use with dimming ballasts
- 4-pin: dimmable and compatible with electronic ballasts
- Available in warm to cool color temperatures

Triple and Quad Biax® Plug-In Lamps (pg 5-7 and 5-8)

- Shortest, most compact Biax® lamp. 17-31% shorter than Double Biax® lamps.
- 2-pin: preheat lamps with starters; not suitable for use with dimming ballasts
- 4-pin: dimmable and compatible with electronic ballasts
- Available in warm to cool color temperatures

ONE PIECE SELF BALLASTED LAMPS FOR INCANDESCENT SOCKETS (pg 5-8 and 5-9)

- Highly efficient – up to 75% energy cost savings vs. incandescent lamps
- Short and lightweight to meet application needs
- One piece unit screws directly into incandescent sockets and is simply discarded at end of a long life
- Wide variety of wattages and sizes to meet application needs. High and low power factor versions available.
- Genura™ reflector lamps provide more light than 75W incandescent lamps and provide the longest life of any compact fluorescent lamp

PLUG-IN LAMP WITH ADAPTER SYSTEMS (pg 5-9 and 5-10)

- Most economical system
- Lamp and adapter are separate. Replacable lamps plug into adapters that screw into standard incandescent sockets.
- Lamps last 10,000 hours; adapters last 40,000 hours (4 lamp lives)
- 2D® system is our highest light output compact fluorescent lamp: 39W system gives nearly the light of a 150W, 22W system gives more light than a 75W incandescent lamp

HEADINGS IN THIS CATALOG SECTION

The following terms and descriptions can help you when checking Compact Fluorescent lamp specifications and when ordering products. Within each product line, lamps are divided into families, within these families, lamps are then listed by wattage.

Total Harmonic Distortion (THD):
A measure (in percent) of power quality. Indicates the distortion of the alternating current wave form. Low values (<20%) are preferred.

Power Factor (PF):
A measure of power quality. The ratio of total watts to total volt-amperes. A value of 1.0 is ideal.

Minimum Starting Temperature:
The minimum ambient temperature at which the lamp will start reliably.

Color Rendering Index (CRI or R_a):
An indication of the ability of the lamp to render object colors in a normal, natural way. The higher the number (0-100), the better the color appearance.

Color Temperature - Kelvins (K):
A measure of the visual "warmth" or "coolness" of the light from the lamp. The higher the value, the whiter or "cooler" the light appears.

Rated Average Life - Hours:
Life (as defined by FTC Lamp Label Rules) is rated average life in hours.

Light Output - Mean Lumens:
Lamp light output (lumens) at 40% of rated lamp life.

Light Output - Initial Lumens:
Light output (as defined by FTC Lamp Label Rules) is rated average lumens.

Nominal Length:
Lamp length including base and/or pins.

Energy Used - Nominal Watts:
Energy Used (as defined by FTC lamp label rules). To estimate energy consumption (kWh), multiply watts x hours of use and divide by 1000.

Base:
The type of base.

Product Code:
It is important to use this five-digit code when ordering to ensure that you receive the exact product you require.

Lamp Description:
The lamp's identification code.

Case Quantity:
Number of product units packed in a case.

Additional Information:
Typical application and/or other important information including footnotes ( ).*

Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
ELECTRONIC SELF BALLASTED LAMPS															
15	Med	**12544**	**FLE15TBX/L/SPX27**	6	RE 827 Phosphor,Soft White, Triple Biax®, Slimshell Ballast (1, 9, 11, 12, 15)*	5.2	900	765	10000	2700	82	-10F	(-23)	<.6	170%

FL E 15 TBX / L / SPX27

- FL — *Identifies as Fluorescent lamp.*
- E — *Electronically ballasted.*
- 15 — *Identifies the lamp's wattage.*
- TBX — *Identifies the lamp shape.*
- L — *Identifies the lamp's ballast shape.*
- SPX27 — *Identifies the lamp's finish or color.*

WHEN YOU DON'T KNOW THE LAMP DESCRIPTION

1. Identify bulb shape next to lamp information.
2. Measure bulb diameter using ruler in **Document #4700** to determine width in eighths of an inch.
3. Identify base type using table on page **5-2**.
4. Find your lamp in the table containing the bulb shape, size and base.

Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
2D® PLUG-IN LAMPS															
2-PIN															
16	GR8-2	**21302** ➵ ⁄	**F162D/827**	50	RE 827 Phosphor (1, 2, 4)*	5.5	1050	880	8000	2700	82	25F	(-4)		
		22175 ➵ ⁄	**F162D/835**	50	RE 835 Phosphor (1, 2, 4)*	5.5	1050	880	8000	3500	82	25F	(-4)		
28	GR8-2	**21304** ➵ ⁄	**F282D/827**	20	RE 827 Phosphor (1, 2, 4)*	8.1	2050	1720	10000	2700	82	25F	(-4)		
		22179 ➵ ⁄	**F282D/835**	20	RE 835 Phosphor (1, 2, 4)*	8.1	2050	1720	10000	3500	82	25F	(-4)		
4-PIN															
10	GR10q-4	**21301** ➵ ⁄	**F102D/827/4P**	60	RE 827 Phosphor (1, 2, 4, 8)*	3.6	650	545	10000	2700	82	25F	(-4)		
		22173 ➵ ⁄	**F102D/835/4P**	60	RE 835 Phosphor (1, 2, 4, 8)*	3.6	650	545	10000	3500	82	25F	(-4)		
16	GR10q-4	**22169** ➵ ⁄	**F162D/827/4P**	50	RE 827 Phosphor (1, 2, 4, 8)*	5.5	1050	880	8000	2700	82	25F	(-4)		
		22177 ➵ ⁄	**F162D/835/4P**	50	RE 835 Phosphor (1, 2, 4, 8)*	5.5	1050	880	8000	3500	82	25F	(-4)		
21	GR10q-4	**21303** ➵ ⁄	**F212D/827/4P**	50	RE 827 Phosphor (1, 2, 4, 8)*	5.5	1350	1135	10000	2700	82	25F	(-4)		
		22178 ➵ ⁄	**F212D/835/4P**	50	RE 835 Phosphor (1, 2, 4, 8)*	5.5	1350	1135	10000	3500	82	25F	(-4)		
28	GR10q-4	**22172** ➵ ⁄	**F282D/827/4P**	20	RE 827 Phosphor (1, 2, 4, 8)*	8.1	2050	1720	10000	2700	82	25F	(-4)		
		22180 ➵ ⁄	**F282D/835/4P**	20	RE 835 Phosphor (1, 2, 4, 8)*	8.1	2050	1720	10000	3500	82	25F	(-4)		
38	GR10q-4	**21305** ➵ ⁄	**F382D/827/4P**	20	RE 827 Phosphor (1, 2, 4, 8)*	8.1	2850	2395	10000	2700	82	25F	(-4)		
		25427 ➵ ⁄	**F382D/827/4P/CD**	5	RE 827 Phosphor, Carded (1, 2, 4, 8)*	8.1	2850	2395	10000	2700	82	14F	(-10)		
		22181 ➵ ⁄	**F382D/835/4P**	20	RE 835 Phosphor (1, 2, 4, 8)*	8.1	2850	2395	10000	3500	82	14F	(-10)		
55	GRY10q-3	**35971** ➵ ⁄	**F552D/827/A/4P/BULK**	48	RE 827 Phosphor, Bulk Pack (1, 2, 4, 8)*	8.1	3900	3300	10000	2700	82	14F	(-10)		
		36358 ➵ ⁄	**F552D/830/A/T/4P/B**	20	RE 830 Phosphor, Torchiere Replacement Lamp (1, 2, 4, 8)*	8.1	4000	3400	10000	3000	82	14F	(-10)		
		35972 ➵ ⁄	**F552D/835/A/4P/BULK**	48	RE 835 Phosphor, Bulk Pack (1, 2, 4, 8)*	8.1	3900	3300	10000	3500	82	14F	(-10)		
LOW WATT BIAX® PLUG-IN LAMPS - T4															
5	G23	**37654** ➵ ⁄	**F5BX/SPX27/827 10PK**	100	RE 827 Phosphor (1, 2)*	4.2	250	210	10000	2700	82	0F	(-18)		
		13575 ➵ ⁄	**F5BX/SPX27/CD**	6	RE 827 Phosphor, Carded (1, 2)*	4.2	250	210	10000	2700	82	0F	(-18)		
		37661 ➵ ⁄	**F5BX/SPX41/840 10PK**	100	RE 835 Phosphor (1, 2)*	4.2	250	210	10000	4100	82	0F	(-18)		
7	G23	**37846** ➵ ⁄	**F7BX/SPX27/827 10PK**	100	RE 827 Phosphor (1, 2)*	5.3	400	330	10000	2700	82	0F	(-18)		
		13576 ➵ ⁄	**F7BX/SPX27/CD**	6	RE 827 Phosphor, Carded (1, 2)*	5.3	400	330	10000	2700	82	0F	(-18)		
		37659 ➵ ⁄	**F7BX/SPX35/835 10PK**	100	RE 835 Phosphor (1, 2)*	5.3	400	330	10000	3500	82	0F	(-18)		
		37660 ➵ ⁄	**F7BX/SPX41/840 10PK**	100	RE 841 Phosphor (1, 2)*	5.3	400	330	10000	4100	82	0F	(-18)		
9	G23	**37651** ➵ ⁄	**F9BX/SPX27/827 10PK**	100	RE 827 Phosphor (1, 2)*	6.6	600	500	10000	2700	82	25F	(-4)		
		13577 ➵ ⁄	**F9BX/SPX27/CD**	6	RE 827 Phosphor, Carded (1, 2)*	6.6	600	500	10000	2700	82	25F	(-4)		
		37652 ➵ ⁄	**F9BX/SPX35/835 10PK**	100	RE 835 Phosphor (1, 2)*	6.6	600	500	10000	3500	82	25F	(-4)		
		37653 ➵ ⁄	**F9BX/SPX41/840 10PK**	100	RE 841 Phosphor (1, 2)*	6.6	600	500	10000	4100	82	25F	(-4)		
13	GX23	**14650** ➵ ⁄	**F13BX/SPX27/827 10PK**	100	RE 827 Phosphor (1, 2)*	7.3	825	710	10000	2700	82	32F	(0)		
		14583 ➵ ⁄	**F13BX/SPX27/CD**	6	RE 827 Phosphor, Carded (1, 2)*	7.3	825	710	10000	2700	82	32F	(0)		
		17612 ➵ ⁄	**F13BX/SPX30/830 10PK**	100	RE 830 Phosphor (1, 2)*	7.3	825	710	10000	3000	82	32F	(0)		
		17048 ➵ ⁄	**F13BX/SPX35/835 10PK**	100	RE 835 Phosphor (1, 2)*	7.3	825	710	10000	3500	82	32F	(0)		
		20434 ➵ ⁄	**F13BX/SPX41/840 10PK**	100	RE 841 Phosphor (1, 2)*	7.3	825	710	10000	4100	82	32F	(0)		
		11671 ➵ ⁄	**F13BX/SPX50**	100	RE 850 Phosphor (1, 2)*	7.3	784	675	10000	5000	80	32F	(0)		
HIGH LUMEN BIAX® PLUG-IN LAMPS - T5															
PREHEAT															
18	2G11	**16649** ➵ ⁄	**F18BX/SPX30 10PK**	40	RE 830 Phosphor (1, 2, 5, 8)*	9.0	1200	1080	10000	3000	82	25F	(-4)		
		16053 ➵ ⁄	**F18BX/SPX35 10PK**	40	RE 835 Phosphor (1, 2, 5, 8)*	9.0	1200	1080	10000	3500	82	25F	(-4)		
		16940 ➵ ⁄	**F18BX/SPX41 10PK**	40	RE 841 Phosphor (1, 2, 5, 8)*	9.0	1200	1080	10000	4100	82	25F	(-4)		

To save energy costs, find the bulbs with the light output you need, then choose the one with the lowest watts.
( ) * All footnote references found at the end of this section. ➵ Reduced Wattage ⁄ High Color Rendering. To convert inches to millimeters, multiply by 25.4.

Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
HIGH LUMEN BIAX® PLUG-IN LAMPS - T5 (Continued)															
RAPID START/INSTANT START/PREHEAT															
18	2G11	**17174** ➘ ⁄	**F18BX/SPX30/RS 10PK**	40	RE 830 Phosphor (1, 2, 5, 8)*	10.5	1250	1130	20000	3000	82	50F	(10)		
		17175 ➘ ⁄	**F18BX/SPX35/RS 10PK**	40	RE 835 Phosphor (1, 2, 5, 8)*	10.5	1250	1130	20000	3500	82	50F	(10)		
		17176 ➘ ⁄	**F18BX/SPX41/RS 10PK**	40	RE 841 Phosphor (1, 2, 5, 8)*	10.5	1250	1130	20000	4100	82	50F	(10)		
		12521 ➘ ⁄	**F18BX/SPX65/RS**	40	RE 865 Phosphor (1, 2, 5, 8)*	10.5	1250	1130	20000	6500	82	50F	(10)		
27	2G11	**16944** ➘ ⁄	**F27/24BX/SPX30 10PK**	40	RE 830 Phosphor (1, 2, 5, 8)*	12.8	1800	1620	12000	3000	82	50F	(10)		
		16948 ➘ ⁄	**F27/24BX/SPX35 10PK**	40	RE 835 Phosphor (1, 2, 5, 8)*	12.8	1800	1620	12000	3500	82	50F	(10)		
		16951 ➘ ⁄	**F27/24BX/SPX41 10PK**	40	RE 841 Phosphor (1, 2, 5, 8)*	12.8	1800	1620	12000	4100	82	50F	(10)		
39	2G11	**16538** ➘ ⁄	**F39/36BX/SPX30 10PK**	40	RE 830 Phosphor (1, 2, 5, 8)*	16.5	2850	2510	12000	3000	82	50F	(10)		
		15867 ➘ ⁄	**F39/36BX/SPX35 10PK**	40	RE 835 Phosphor (1, 2, 5, 8)*	16.5	2850	2510	12000	3500	82	50F	(10)		
		16952 ➘ ⁄	**F39/36BX/SPX41 10PK**	40	RE 841 Phosphor (1, 2, 5, 8)*	16.5	2850	2510	12000	4100	82	50F	(10)		
40	2G11	**16953** ➘ ⁄	**F40/30BX/SPX30 10PK**	40	RE 830 Phosphor (1, 2, 8, 17)*	22.5	3150	2840	20000	3000	82	50F	(10)		
		20444 ➘ ⁄	**F40/30BX/SPX30 36PK**	36	RE 830 Phosphor, Bulk Pack (1, 2, 8, 17)*	22.5	3150	2840	20000	3000	82	50F	(10)		
		16648 ➘ ⁄	**F40/30BX/SPX35 10PK**	40	RE 835 Phosphor (1, 2, 8, 17)*	22.5	3150	2840	20000	3500	82	50F	(10)		
		20446 ➘ ⁄	**F40/30BX/SPX35 36PK**	36	RE 835 Phosphor, Bulk Pack (1, 2, 8, 17)*	22.5	3150	2840	20000	3500	82	50F	(10)		
		16954 ➘ ⁄	**F40/30BX/SPX41 10PK**	40	RE 841 Phosphor (1, 2, 8, 17)*	22.5	3150	2840	20000	4100	82	50F	(10)		
		20447 ➘ ⁄	**F40/30BX/SPX41 36PK**	36	RE 841 Phosphor, Bulk Pack (1, 2, 8, 17)*	22.5	3150	2840	20000	4100	82	50F	(10)		
		10490 ➘ ⁄	**F40/30BX/SPX50/RS 36PK**	36	RE 850 Phosphor, Bulk Pack (1, 2, 8, 17)*	22.5	2900	2700	20000	5000	80	50F	(10)		
50	2G11	**20898** ➘ ⁄	**F50BX/SPX30/RS 10PK**	40	RE 830 Phosphor (1, 2, 5, 8)*	22.5	4000	3400	14000	3000	82	50F	(10)		
		20899 ➘ ⁄	**F50BX/SPX35/RS 10PK**	40	RE 835 Phosphor (1, 2, 5, 8)*	22.5	4000	3400	14000	3500	82	50F	(10)		
		20900 ➘ ⁄	**F50BX/SPX41/RS 10PK**	40	RE 841 Phosphor (1, 2, 5, 8)*	22.5	4000	3400	14000	4100	82	50F	(10)		
DOUBLE BIAX® PLUG-IN LAMPS - T4															
2-PIN BASE															
9	G23-2	**12409** ➘ ⁄	**F9DBX23T4/SPX27/827**	50	RE 827 Phosphor (1, 2)*	4.3	550	470	10000	2700	82	25F	(-4)		
13	GX23-2	**18844** ➘ ⁄	**F13DBX23T4/SPX27 10PK**	50	RE 827 Phosphor (1, 2)*	4.7	810	685	10000	2700	82	32F	(0)		
		13578 ➘ ⁄	**F13DBX/SPX27/CD**	6	RE 827 Phosphor, Carded (1, 2)*	4.7	810	685	10000	2700	82	32F	(0)		
		10574 ➘ ⁄	**F13DBX23T4/SPX30 10PK**	50	RE 830 Phosphor (1, 2)*	4.7	810	685	10000	3000	82	32F	(0)		
		18556 ➘ ⁄	**F13DBX23T4/SPX35 10PK**	50	RE 835 Phosphor (1, 2)*	4.7	810	685	10000	3500	82	32F	(0)		
		20531 ➘ ⁄	**F13DBX23T4/SPX41 10PK**	50	RE 841 Phosphor (1, 2)*	4.7	810	685	10000	4100	82	32F	(0)		
13	G24d-1	**18557** ➘ ⁄	**F13DBXT4/SPX27 10PK**	50	RE 827 Phosphor (1, 2)*	5.3	900	765	10000	2700	82	5F	(-15)		
		12956 ➘ ⁄	**F13DBXT4/SPX30 10PK**	50	RE 830 Phosphor (1, 2)*	5.3	900	765	10000	3000	82	32F	(0)		
		18559 ➘ ⁄	**F13DBXT4/SPX35 10PK**	50	RE 835 Phosphor (1, 2)*	5.3	900	765	10000	3500	82	5F	(-15)		
		20532 ➘ ⁄	**F13DBXT4/SPX41 10PK**	50	RE 841 Phosphor (1, 2)*	5.3	900	765	10000	4100	82	5F	(-15)		
18	G24d-2	**12860** ➘ ⁄	**F18DBXT4/SPX27 10PK**	50	RE 827 Phosphor (1, 2, 6)*	6.1	1150	980	10000	2700	82	5F	(-15)		
		12861 ➘ ⁄	**F18DBXT4/SPX30 10PK**	50	RE 830 Phosphor (1, 2, 6)*	6.1	1150	980	10000	3000	82	5F	(-15)		
		12863 ➘ ⁄	**F18DBXT4/SPX35 10PK**	50	RE 835 Phosphor (1, 2, 6)*	6.1	1150	980	10000	3500	82	5F	(-15)		
		12864 ➘ ⁄	**F18DBXT4/SPX41 10PK**	50	RE 841 Phosphor (1, 2, 6)*	6.1	1150	980	10000	4100	82	5F	(-15)		
26	G24d-3	**35250** ➘ ⁄	**F26DBXT4/SPX27**	50	RE 827 Phosphor (1, 2)*	6.7	1710	1460	10000	2700	82	15F	(-9)		
		35237 ➘ ⁄	**F26DBXT4/SPX30**	50	RE 830 Phosphor (1, 2)*	6.7	1710	1460	10000	3000	82	15F	(-9)		
		35251 ➘ ⁄	**F26DBXT4/SPX35**	50	RE 835 Phosphor (1, 2)*	6.7	1710	1460	10000	3500	82	15F	(-9)		
		35252 ➘ ⁄	**F26DBXT4/SPX41**	50	RE 841 Phosphor (1, 2)*	6.7	1710	1460	10000	4100	82	15F	(-9)		

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Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
DOUBLE BIAX® PLUG-IN LAMPS (Continued)															
4-PIN BASE															
13	G24q-1	**30035** ↠ ⁄	**F13DBX/SPX27/4P 10PK**	50	RE 827 Phosphor (1, 2, 8)*	5.0	900	765	10000	2700	82	32F	(0)		
		10580 ↠ ⁄	**F13DBX/SPX30/4P 10PK**	50	RE 830 Phosphor (1, 2, 8)*	5.0	900	765	10000	3000	82	32F	(0)		
		30037 ↠ ⁄	**F13DBX/SPX35/4P 10PK**	50	RE 835 Phosphor (1, 2, 8)*	5.0	900	765	10000	3500	82	32F	(0)		
		30038 ↠ ⁄	**F13DBX/SPX41/4P 10PK**	50	RE 841 Phosphor (1, 2, 8)*	5.0	900	765	10000	4100	82	32F	(0)		
18	G24q-2	**12865** ↠ ⁄	**F18DBX/SPX27/4P 10PK**	50	RE 827 Phosphor (1, 2, 6, 8)*	5.8	1150	980	10000	2700	82	32F	(0)		
		12866 ↠ ⁄	**F18DBX/SPX30/4P 10PK**	50	RE 830 Phosphor (1, 2, 6, 8)*	5.8	1150	980	10000	3000	82	32F	(0)		
		12869 ↠ ⁄	**F18DBX/SPX35/4P 10PK**	50	RE 835 Phosphor (1, 2, 6, 8)*	5.8	1150	980	10000	3500	82	32F	(0)		
		12870 ↠ ⁄	**F18DBX/SPX41/4P 10PK**	50	RE 841 Phosphor (1, 2, 6, 8)*	5.8	1150	980	10000	4100	82	32F	(0)		
26	G24q-3	**35247** ↠ ⁄	**F26DBXT4/SPX27/4P**	50	RE 827 Phosphor (1, 2, 8)*	6.4	1710	1460	10000	2700	82	32F	(0)		
		35235 ↠ ⁄	**F26DBXT4/SPX30/4P**	50	RE 830 Phosphor (1, 2, 8)*	6.4	1710	1460	10000	3000	82	32F	(0)		
		35248 ↠ ⁄	**F26DBXT4/SPX35/4P**	50	RE 835 Phosphor (1, 2, 8)*	6.4	1710	1460	10000	3500	82	32F	(0)		
		35236 ↠ ⁄	**F26DBXT4/SPX41/4P**	50	RE 841 Phosphor (1, 2, 8)*	6.4	1710	1460	10000	4100	82	32F	(0)		
TRIPLE BIAX® PLUG-IN LAMPS - T4															
4-PIN BASE															
	13 GX24q-1	**34391** ↠ ⁄	**F13TBX/SPX27/A/4P**	10	RE 827 Phosphor, Amalgam (1, 2, 8, 15)*	4.2	900	765	10000	2700	82	32F	(0)		
		34395 ↠ ⁄	**F13TBX/SPX30/A/4P**	10	RE 830 Phosphor, Amalgam (1, 2, 8, 15)*	4.2	900	765	10000	3000	82	32F	(0)		
		34400 ↠ ⁄	**F13TBX/SPX35/A/4P**	10	RE 835 Phosphor, Amalgam (1, 2, 8, 15)*	4.2	900	765	10000	3500	82	32F	(0)		
		34387 ↠ ⁄	**F13TBX/SPX41/A/4P**	10	RE 841 Phosphor, Amalgam (1, 2, 8, 15)*	4.2	900	765	10000	4100	82	32F	(0)		
	18 GX24q-2	**34392** ↠ ⁄	**F18TBX/SPX27/A/4P**	10	RE 827 Phosphor, Amalgam (1, 2, 8, 15)*	4.8	1200	1020	10000	2700	82	32F	(0)		
		34396 ↠ ⁄	**F18TBX/SPX30/A/4P**	10	RE 830 Phosphor, Amalgam (1, 2, 8, 15)*	4.8	1200	1020	10000	3000	82	32F	(0)		
		34405 ↠ ⁄	**F18TBX/SPX35/A/4P**	10	RE 835 Phosphor, Amalgam (1, 2, 8, 15)*	4.8	1200	1020	10000	3500	82	32F	(0)		
		34385 ↠ ⁄	**F18TBX/SPX41/A/4P**	10	RE 841 Phosphor, Amalgam (1, 2, 8, 15)*	4.8	1200	1020	10000	4100	82	32F	(0)		
	26 GX24q-3	**34393** ↠ ⁄	**F26TBX/SPX27/A/4P**	10	RE 827 Phosphor, Amalgam (1, 2, 8, 15)*	5.2	1800	1530	10000	2700	82	32F	(0)		
		34397 ↠ ⁄	**F26TBX/SPX30/A/4P**	10	RE 830 Phosphor, Amalgam (1, 2, 8, 15)*	5.2	1800	1530	10000	3000	82	32F	(0)		
		34406 ↠ ⁄	**F26TBX/SPX35/A/4P**	10	RE 835 Phosphor, Amalgam (1, 2, 8, 15)*	5.2	1800	1530	10000	3500	82	32F	(0)		
		34381 ↠ ⁄	**F26TBX/SPX41/A/4P**	10	RE 841 Phosphor, Amalgam (1, 2, 8, 15)*	5.2	1800	1530	10000	4100	82	32F	(0)		
	32 GX24q-3	**34394** ↠ ⁄	**F32TBX/SPX27/A/4P**	10	RE 827 Phosphor, Amalgam (1, 2, 8, 15)*	5.8	2200	1870	10000	2700	82	32F	(0)		
		34399 ↠ ⁄	**F32TBX/SPX30/A/4P**	10	RE 830 Phosphor, Amalgam (1, 2, 8, 15)*	5.8	2200	1870	10000	3000	82	32F	(0)		
		34388 ↠ ⁄	**F32TBX/SPX35/A/4P**	10	RE 835 Phosphor, Amalgam (1, 2, 8, 15)*	5.8	2200	1870	10000	3500	82	32F	(0)		
		34380 ↠ ⁄	**F32TBX/SPX41/A/4P**	10	RE 841 Phosphor, Amalgam (1, 2, 8, 15)*	5.8	2200	1870	10000	4100	82	32F	(0)		

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Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
TRIPLE BIAX® PLUG-IN LAMPS - T4 (Continued)															
INVERTED BASE															
13	GX24q-1	**25799** ➵ ⁄	**F13TBX/I/827/A/4P**	10	RE 827 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.4	900	765	10000	2700	82	32F	(0)		
		25800 ➵ ⁄	**F13TBX/I/830/A/4P**	10	RE 830 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.4	900	765	10000	3000	82	32F	(0)		
		25801 ➵ ⁄	**F13TBX/I/835/A/4P**	10	RE 835 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.4	900	765	10000	3500	82	32F	(0)		
18	GX24q-2	**25802** ➵ ⁄	**F18TBX/I/827/A/4P**	10	RE 827 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.9	1200	1020	10000	2700	82	32F	(0)		
		25803 ➵ ⁄	**F18TBX/I/830/A/4P**	10	RE 830 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.9	1200	1020	10000	3000	82	32F	(0)		
		25804 ➵ ⁄	**F18TBX/I/835/A/4P**	10	RE 835 Phosphor, Inverted Post, Amalgam (1, 2, 8, 15)*	3.9	1200	1020	10000	3500	82	32F	(0)		
QUAD BIAX® PLUG-IN LAMPS-T4															
4-PIN BASE															
42	GX24q-4	**44795** ➵ ⁄	**F42QBX/SPX30/A/4P**	6	RE 830 Phosphor, Amalgam (1, 2, 8, 15)*	6.0	3200	2720	10000	3000	82	32F	(0)		
		34834 ➵ ⁄	**F42QBX/SPX35/A/4P**	6	RE 835 Phosphor, Amalgam (1, 2, 8, 15)*	6.0	3200	2720	10000	3500	82	32F	(0)		
		44796 ➵ ⁄	**F42QBX/SPX41/A/4P**	6	RE 841 Phosphor, Amalgam (1, 2, 8, 15)*	6.0	3200	2720	10000	4100	82	32F	(0)		
GENURA™															
23	Med	**12273** ➵ ⁄	**EL23/R25/WW**	6	Genura, Warm White (18)*	4.9	1100	880	15000	3000	82	32F	(0)	<.55	130%
		25418 ➵ ⁄	**EL23/R25/SW**	6	Genura, Soft White (18)*	4.9	1100	880	15000	2700	82	32F	(0)	<.55	130%
ELECTRONIC SELF BALLASTED LAMPS															
15	Med	**12544** ➵ ⁄	**FLE15TBX/L/SPX27**	6	RE 827 Phosphor,Soft White, Triple Biax®, Slimshell Ballast (1, 9, 11, 12, 15)*	5.2	900	765	10000	2700	82	-10F	(-23)	<.6	170%
		27188 ➵ ⁄	**FLE15TBX/L/SW/CD**	3	RE 827 Phosphor , Soft White, Triple Biax®, Slimshell Ballast, Carded (1, 9, 11, 12, 15)*	5.2	900	765	10000	2700	82	-10F	(-23)	<.6	170%
		12981 ➵ ⁄	**FLE15TBX/HPF/SPX27/SW**	6	RE 827 Phosphor, Soft White Ultra, Triple Biax®, High Power Factor, Shortshell Ballast (1, 9, 11, 12, 15)*	6.0	825	700	10000	2700	82	-10F	(-23)	> .9	<32%
		13105 ➵ ⁄	**FLE15TBX/L/R30**	6	RE 827 Phosphor,Soft White, R30 Reflector Slimshell Ballast (1, 9, 11, 12, 13, 15)*	5.5	515	440	10000	2700	82	-10F	(-23)	<.6	170%
		12501 ➵ ⁄	**FLE15TBX/L/G29**	6	RE 827 Phosphor, Soft White, G30 Globe Slimshell Ballast (1, 9, 11, 12, 15)*	5.8	695	600	10000	2700	82	-10F	(-23)	<.6	170%
		80506 ➵ ⁄	**FLG15/E-120**	6	RE 827 Phosphor, Soft White Ultra, Globe Shaped (1, 9, 10, 11, 12)*	5.1	765	575	10000	2800	82	0F	(-18)	0.5	<150%

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Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
ELECTRONIC SELF BALLASTED LAMPS (Continued)															
20	Med	**12545** ⚡ ⁄	**FLE20TBX/L/SPX27**	6	RE 827 Phosphor, Soft White, Triple Biax®, Slimshell Ballast (1, 9, 11, 12, 15)*	5.8	1200	1020	10000	2700	82	-10F	(-23)	<.6	170%
		27189 ⚡ ⁄	**FLE20TBX/L/SW/CD**	3	RE 827 Phosphor, Soft White, Triple Biax®, Slimshell Ballast, Carded (1, 9, 11, 12, 15)*	5.8	1200	1020	10000	2700	82	-10F	(-23)	<.6	170%
		12987 ⚡ ⁄	**FLE20TBX/HPF/SPX27/SW**	6	RE 827 Phosphor, Soft White Ultra, Triple Biax®, High Power Factor, Shortshell Ballast (1, 9, 11, 12, 15)*	5.8	1200	1020	10000	2700	82	-10F	(-23)	> .9	<32%
		40332 ⚡ ⁄	**FLE20TBX/L/R40**	6	RE 827 Phosphor, R40 Reflector W/Lens, Slimshell Ballast (1, 9, 11, 12, 15)*	6.2	785	670	10000	2700	82	-10F	(-23)	<.6	170%
		13174 ⚡ ⁄	**FLE20TBX/HPF/RFL/SW**	6	RE 827 Phosphor, Soft White Ultra, Triple Biax®, High Power Factor, R40 Reflector, Shortshell Ballast, No Lens (1, 9, 11, 12, 15)*	6.2	885	750	10000	2700	82	-10F	(-23)	0.95	<20%
24	Med	**12546** ⚡ ⁄	**FLE24TBX/SPX27**	6	RE 827 Phosphor - Soft White, Triple Biax®, Standard Shell Ballast (1, 9, 11, 15, 18)*	6.7	1520	1290	10000	2700	82	-10F	(-23)	<.6	170%
25	Med	**12990** ⚡ ⁄	**FLE25TBX/HPF/SPX27/SW**	6	RE 827 Phosphor, Soft White Ultra, Triple Biax®, High Power Factor, Standard Shell Ballast (1, 9, 11, 15, 18)*	6.9	1520	1290	10000	2700	82	-10F	(-23)	> .9	<32%
28	Med	**13129** ⚡ ⁄	**FLE28QBX/SPX27**	6	RE 827 Phosphor, Soft White, Performance Biax®, Standard Shell Ballast (1, 9, 11, 15, 18)*	6.3	1750	1485	10000	2700	82	-10F	(-23)	<.6	170%
		27191 ⚡ ⁄	**FLE28QBX/SW/CD**	3	RE 827 Phosphor, Soft White, Performance Biax®, Carded, Standard Shell Ballast (1, 9, 11, 15, 18)*	6.3	1750	1485	10000	2700	82	-10F	(-23)	<.6	170%
ELECTROMAGNETIC SELF BALLASTED LAMPS															
17	Med	**80503** ⚡ ⁄	**FLB17**	6	RE 827 Phosphor, Bullet Shape (1, 9, 10, 11, 12)*	6.7	700	595	9000	2800	82	32F	(0)	0.5	<32%
		80504 ⚡ ⁄	**FLG17**	6	RE 827 Phosphor, Globe Shape (1, 9, 10, 11, 12)*	6.4	700	595	9000	2800	82	32F	(0)	0.5	<32%
BIAX® PLUG-IN LAMPS WITH SEPARABLE ELECTROMAGNETIC ADAPTERS															
9	Med	**80508** ⚡ ⁄	**FLA5/SPX27**	6	RE 827 Phosphor, Biax® (1, 9, 11, 14)*	6.5	250	210	10000	2700	82	32F	(0)	0.5	<20%
		80510 ⚡ ⁄	**FLA7/SPX27**	6	RE 827 Phosphor, Biax® (1, 9, 11, 14)*	7.7	375	320	10000	2700	82	32F	(0)	0.5	<20%
		80511 ⚡ ⁄	**FLA9/SPX27**	6	RE 827 Phosphor, Biax® (1, 9, 11, 14)*	8.8	500	425	10000	2700	82	32F	(0)	0.5	<20%
11	Med	**20659** ⚡ ⁄	**FLA9BX/SPX27**	5	RE 827 Phosphor, Biax® (1, 9, 11, 14)*	7.9	570		10000	2700	82	25F	(-4)	0.5	10-15%
13	Med	**80507** ⚡ ⁄	**FLA13/SPX27**	6	RE 827 Phosphor (1, 9, 11, 14)*	7.2	750	635	10000	2700	82	32F	(0)	0.9	<32%
21	Med	**11307** ⚡ ⁄	**FCA21/CD**	4	RE 830 Phosphor, Circlite, Carded, FC8T9/KB Replacement Lamp (1, 9, 11, 14)*	3.4	1200	1020	10000	3000	82	50F	(10)	0.5	<20%
		14681	**FCA21/BLB**	4	Blacklight, UVA Source, Peak Emission 365nm	3.4			10000						

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Watts	Base	Product Code	Lamp Description	Case Qty.	Additional Information	Nominal Length in.	Lumens Initial	Lumens Mean	Rated Avg. Life Hours	Color Temp K.	CRI	Min. Start Temp F	Min. Start Temp (°C)	Power Factor	THD
2D® PLUG-IN LAMPS WITH SEPARABLE ELECTRONIC ADAPTERS															
22	Med	**25805** ➵ ⁄	**FEA212D/827-BULK**	20	RE 827 Phosphor, 2D®, Bulk Pack (1, 4, 9, 11, 14)*	4.0	1300	1105	10000	2700	82	32F	(0)	0.5	170%
		25806 ➵ ⁄	**FEA212D/835-BULK**	20	RE 835 Phosphor, 2D®, Bulk Pack (1, 4, 9, 11, 14)*	4.0	1300	1105	10000	3500	82	32F	(0)	0.5	170%
		26631 ➵ ⁄	**FEA212D/SW/EC/CD**	4	RE 827 Phosphor, Carded, Uses F212D/827 Replacement Lamp (1, 4, 9, 14, 18)*	4.0	1300	1105	10000	2700	82	32F	(0)	0.5	170%
39	Med	**25807** ➵ ⁄	**FEA382D/827-BULK**	20	RE 827 Phosphor, 2D®, Bulk Pack (1, 4, 9, 14, 18)*	4.3	2780	2365	10000	2700	82	32F	(0)	0.5	170%
		25808 ➵ ⁄	**FEA382D/835-BULK**	20	RE 835 Phosphor, 2D®, Bulk Pack (1, 4, 9, 14, 18)*	4.3	2780	2365	10000	3500	82	32F	(0)	0.5	170%
		18739 ➵ ⁄	**FEA382D/SW/CD**	4	RE 827 Phosphor, Carded, Uses F382D/827 Replacement Lamp (1, 4, 9, 14, 18)*	4.0	2780	2365	10000	2700	82	32F	(0)	0.5	170%
15	Med	**25809** ➵ ⁄	**FEA382D/3W/827/B**	20	RE 827 Phosphor, 3-Way, Bulk Pack (1, 4, 9, 14, 18)*	4.3	750	640	10000	2700	82	32F	(0)	0.5	170%
		25812 ➵ ⁄	**FEA382D/3W/835/B**	20	RE 835 Phosphor, 3-Way, Bulk Pack (1, 4, 9, 14, 18)*	4.3	750	640	10000	3500	82	32F	(0)	0.5	170%
		27253 ➵ ⁄	**FEA382D/3WAY/CD**	4	RE 827 Phosphor, 3-Way, Carded Uses F382D/827 Replacement Lamp (1, 4, 9, 14, 18)*	4.3	750	640	10000	2700	82	32F	(0)	0.5	170%
39	Med	**11526** ➵ ⁄	**FEA392D/HPF/SW/CD**	6	RE 827 Phosphor - Soft White Ultra, High Power Factor, Uses F382D/827 Replacement Lamp (1, 4, 9, 11, 14)*	4.3	2780	2360	10000	2700	82	0F	(-18)	>.9	<20%
TRIPLE BIAX® PLUG-IN LAMPS WITH SEPARABLE ELECTRONIC ADAPTERS															
15	Med	**25790** ➵ ⁄	**FEA13TBX/I/827/B**	10	RE 827 Phosphor, Inverted Post, Replacement Lamp F13TBX/I/827/4P (1, 12, 14, 15)*	5.9	775	660	10000	2700	82	32F	(0)	0.5	170%
		27623 ➵ ⁄	**FEA13TBX/I/827 6PK**	6	RE 827 Phosphor, Inverted Post, Replacement Lamp F13TBX/I/827/4P (1, 12, 14, 15)*	5.9	775	660	10000	2700	82	32F	(0)	0.5	170%
		25791 ➵ ⁄	**FEA13TBX/I/830/B**	10	RE 830 Phosphor, Inverted Post, Replacement Lamp F13TBX/I/830/4P (1, 12, 14, 15)*	5.9	775	660	10000	3000	82	32F	(0)	0.5	170%
		25792 ➵ ⁄	**FEA13TBX/I/835/B**	10	RE 835 Phosphor, Inverted Post, Replacement Lamp F13TBX/I/835/4P (1, 12, 14, 15)*	5.9	775	660	10000	3500	82	32F	(0)	0.5	170%
20	Med	**25793** ➵ ⁄	**FEA18TBX/I/827/B**	10	RE 827 Phosphor, Inverted Post, Replacement Lamp F18TBX/I/827/4P (1, 12, 14, 15)*	6.5	1100	935	10000	2700	82	32F	(0)	0.5	170%
		27624 ➵ ⁄	**FEA18TBX/I/827 6PK**	6	RE 827 Phosphor, Inverted Post, Replacement Lamp F18TBX/I/827/4P (1, 12, 14, 15)*	6.5	1100	935	10000	2700	82	32F	(0)	0.5	170%
		25797 ➵ ⁄	**FEA18TBX/I/830/B**	10	RE 830 Phosphor, Inverted Post, Replacement Lamp F18TBX/I/830/4P (1, 12, 14, 15)*	6.5	1100	935	10000	3000	82	32F	(0)	0.5	170%
		25798 ➵ ⁄	**FEA18TBX/I/835/B**	10	RE 835 Phosphor, Inverted Post, Replacement Lamp F18TBX/I/835/4P (1, 12, 14, 15)*	6.5	1100	935	10000	3500	82	32F	(0)	0.5	170%

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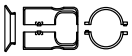
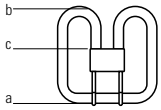
BIAX® SCREW-IN ADAPTERS															
9	Med	**16217**	**FLA7/9 BULK**	50	Bulk Pack, Contains 50 Screw-In Adapters to Operate F7BX or F9BX Biax Lamps	2.9			4000						
CFL REFLECTOR LENSES															
		25448	**LENS-CFL/R30/PINK**	100	Lens, Pink, R30, Fits 13105 FLE15TBX/L/R30										
		25449	**LENS-CFL/R30/RED**	100	Lens, Red, R30, Fits 13105 FLE15TBX/L/R30										
		25451	**LENS-CFL/R40/PINK**	100	Lens, Pink, R40, Fits 40332 FLE20TBX/L/R40										
LOCKING DEVICE															
		**26632**	**LOCKDEVICE-UNIVERSAL**	100	Locking Device, All FEA products plus Slimshell.										
		**25455**	**LOCKDEVICE-SHRT**	100	Locking Device, All Short Shell Products										
		**25454**	**LOCKDEVICE-STND**	100	Locking Device, All Standard Shell Products										
BRIGHT STIK® LIGHTING UNIT															
33		**12257**	**FBS25/WX/PP**	6	Bright Stik, White Lamp-In-Holder Unit with Standard 2-Prong Plug, Integral Lamp(1)*	25	725		7500	3450	59				
		47912	**FBS25/BLB/PP**	6	Bright Stik, Blacklight Blue Lamp-In-Holder Unit with Standard 2-Prong Plug, Integral Lamp (1)*	25			7500						
		12263	**FBS25/GS/PP**	6	Bright Stik, Gro & Sho Lamp-In-Holder Unit with Standard 2-Prong Plug, Integral Lamp (1)*	25	470		7500	3050	90				

FOOTNOTES

 # Footnote

1 Fluorescent lamp lumens decline during life.
2 Based on 60Hz reference circuit.
4 10-watt, 16-watt and 28-watt 2D® lamps may be operated in any position. 21-watt, 38-watt, 39-watt, and 55-watt 2D® lamps must be used with the leg marked (a) in the diagram below the bend (b), in order to avoid overheating the end of the cap marked (c).
5 Life ratings for the F18BX Preheat lamps are based on operating the lamp at 3 hrs. per start on a preheat type circuit. Operation on rapid start and instant start ballasts is not recommended. Life ratings for all lamps are based on operating the lamp at 3 hrs. per start on a rapid start type ballast. Life rating on a preheat or instant start ballast is 25% lower than other Rapid Start High Lumen Biax®.
6 Cold cathode resistance is approximately 6.0 Ohms.
7 Typically not used in under cabinet applications.
8 4-Pin lamp minimum starting temperature is a function of the ballast. Most ballasts are rated with a minimum starting temperature of 50° F (10° C). Ballasts are also available that provide reliable starting to 0° F (-18° C) and -20° F (-29° C).
9 One piece sell ballasted lamps for incandescent sockets and plug-in lamps with screw-in adapters do not work with clip-on shades.
10 Lumens on one piece self ballasted lamp systems are measured base up. When operated base down, lumens may decrease > 5%.
11 Best performance if operated base up and at 77° F (25° C) ambient temperature.
12 Use only on 120V 60Hz circuits. Do not use on dimming circuits or timers. Use indoors and do not use in wet locations. Not for use in totally enclosed recessed fixtures.
13 Fits most R30 applications.
14 Adapters rated at 40,000 hours life.
15 Amalgam product experience stable brightness over a wider temperature range and in various operating positions.
17 Life ratings based on rapid start operation. On instant start ballast, life rating is 25% lower.
18 Use only on 120v 60Hz circuits. Do not use on dimming circuits or timers.



To save energy costs, find the bulbs with the light output you need, then choose the one with the lowest watts.
( ) * All footnote references found at the end of this section. Reduced Wattage High Color Rendering. To convert inches to millimeters, multiply by 25.4.