GE
Lighting

Biax® T/E

Triple Biax®
Compact Fluorescent Lamps
Non-Integrated
13W, 18W, 26W, 32W and 42W

Product description

Ultra compact energy saving CFL lamps with triple-tube design give an ideal light source for small fixtures and downlights.

The Biax® T/E lamps are electrically interchangeable with Biax® D/E lamps. They are available in 13, 18, 26, 32 and 42W. Light output ranges between 900 and 3200 lumens. Biax® T/E lamps are designed for high-frequency electronic ballasts.

Features

- Similar light output in any operating position
- Up to 80% energy savings
- Lasts up to 20,000 hours (electronic ballast)
- High color rendering index – CRI = 82
- Full range of color temperatures – 2700K, 3000K, 3500K, 4000K and 5000K (only 32W and 42W)
- May be used with dimmable electronic ballasts
- Built in EOL protection

Application areas

- Outdoor luminaires
- Enclosed luminaires
- Downlights
- Residential applications
- Offices
- Hotels/motels/restaurants
- Corridor lighting, wall sconces
- Industrial and retail

imagination at work

GE Biax® T/E

Range Summary

Non-Amalgam 4-Pin Triple Biax®

Rated Wattage	Base	Description	Product Code	Initial Lumens	Mean Lumens	CCT (K)	Life (3 hrs/start)
13	GX24q-1	F13TBX/827/4P/ECO	97623	900	755	2700	17,000
18	GX24q-1	F18TBX/827/4P/ECO	97628	1200	1010	2700	17,000
26	GX24q-1	F26TBX/827/4P/ECO	97618	1800	1530	2700	17,000

Amalgam 4-Pin Triple Biax®

Rated Wattage	Base	Description	Product Code	Initial Lumens	Mean Lumens	CCT (K)	Life (3 hrs/start)
13	GX24q-1	F13TBX/827/A/ECO	97619	900	755	2700	17,000
13	GX24q-1	F13TBX/830/A/ECO	97620	900	755	3000	17,000
13	GX24q-1	F13TBX/835/A/ECO	97621	900	755	3500	17,000
13	GX24q-1	F13TBX/840/A/ECO	97622	900	755	4000	17,000
18	GX24q-2	F18TBX/827/A/ECO	97628	1200	1010	2700	17,000
18	GX24q-2	F18TBX/830/A/ECO	97625	1200	1010	3000	17,000
18	GX24q-2	F18TBX/835/A/ECO	97626	1200	1010	3500	17,000
18	GX24q-2	F18TBX/840/A/ECO	97627	1200	1010	4000	17,000
26	GX24q-3	F26TBX/827/A/ECO	97614	1800	1530	2700	17,000
26	GX24q-3	F26TBX/830/A/ECO	97615	1800	1530	3000	17,000
26	GX24q-3	F26TBX/835/A/ECO	97616	1800	1530	3500	17,000
26	GX24q-3	F26TBX/840/A/ECO	97617	1800	1530	4000	17,000
32	GX24q-3	F32TBX/827/A/ECO	97629	2400	2040	2700	17,000
32	GX24q-3	F32TBX/830/A/ECO	97630	2400	2040	3000	17,000
32	GX24q-3	F32TBX/835/A/ECO	97631	2400	2040	3500	17,000
32	GX24q-3	F32TBX/840/A/ECO	97632	2400	2040	4000	17,000
42	GX24q-4	F42TBX/827/A/ECO	97633	3200	2720	2700	17,000
42	GX24q-4	F42TBX/830/A/ECO	97634	3200	2720	3000	17,000
42	GX24q-4	F42TBX/835/A/ECO	97635	3200	2720	3500	17,000
42	GX24q-4	F42TBX/840/A/ECO	97636	3200	2720	4000	17,000

All the lamps in the table above have:

- CRI = 82
- Mercury (mg): 3
- Life on Electronic Ballast at 3 hours per start: 17,000
- Life on Electronic Ballast at 12 hours per start: 20,000
- Pack Quantity: 10

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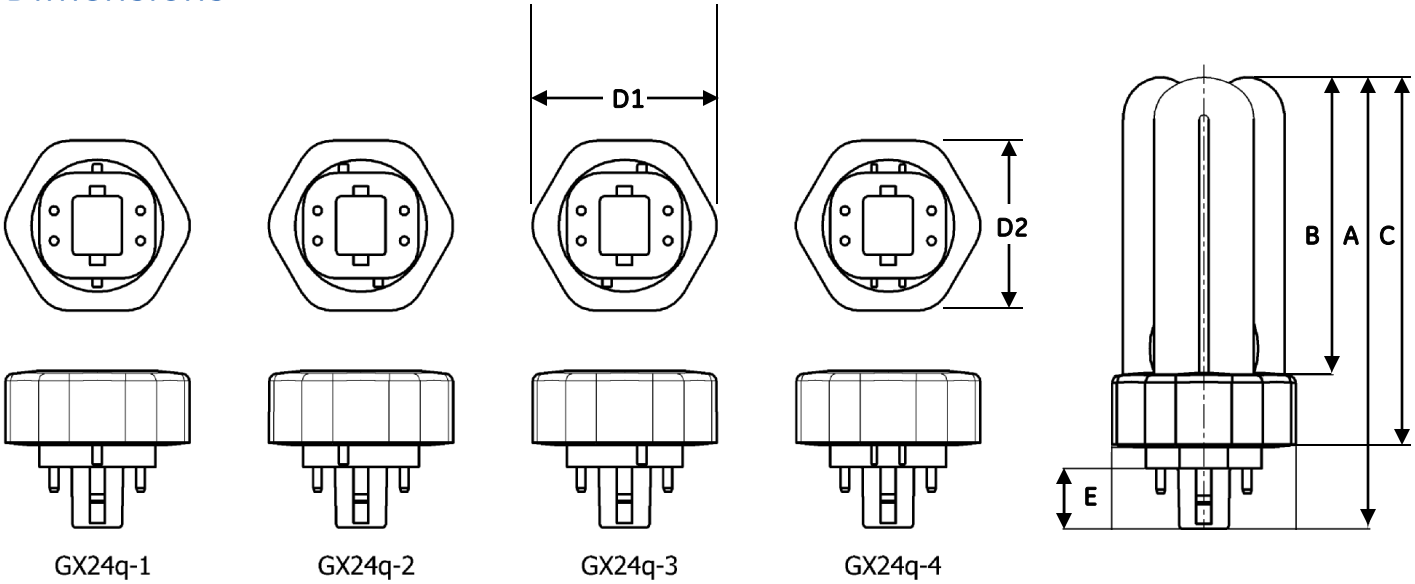
Dimensions



Nominal Lamp Dimension – Inches (mm)

	A	B	C	D1	D2	E
F13TBX/A/4P	4.18 (106.2)	2.54 (64.5)	3.27 (83.0)	1.93 (49)	1.77 (45)	0.63 (16)
F18TBX/A/4P	4.75 120.7)	3.11 (79.0)	3.84 (97.5)	1.93 (49)	1.77 (45)	0.63 (16)
F26TBX/A/4P	5.24 (133.2)	3.60 (91.5)	4.33 (110.0)	1.93 (49)	1.77 (45)	0.63 (16)
F32TBX/A/4P	5.56 (141.2)	3.92 (99.5)	4.65 (118.0)	1.93 (49)	1.77 (45)	0.63 (16)
F42TBX/A/4P	6.43 (163.2)	4.78 (121.5)	5.51 (140.0)	1.93 (49)	1.77 (45)	0.63 (16)

GE Biax® T/E

Lamp Life

Rated life for Biax® T/E is 17,000 hours at 3 hours/start and is 20,000 hours at 12 hours/start. (Graph A).

Cathodes of a fluorescent lamp lose their electron-emissivity during life due to the evaporation of emission mixture. When the deterioration reaches a certain level, the cathode breaks. Typical lifetime characteristics are based on GE Lighting's measurements according to the relevant IEC standards.

The rated lamp life is the median life, which is when 50% of the lamps from a large sample batch would have failed. Real lifetime figures may depend on actual application. For instance, improper cathode preheat, too high operating current, or too low operating current without additional cathode heating reduces the expected life

Lumen Maintenance

Lumen Maintenance curve presented for Biax® T/E lamps are based on laboratory conditions, in the base up position. In actual use, lumen output is a function of burning hours and lamp operating watts throughout life. (Graph B).

Lumen maintenance graph shows how the luminous output decreases throughout life. The main causes of the lumen depreciation are the deterioration of phosphor coating and the lamp blackening due to the deposition of evaporated emission mixture on the glass tube. Lumen maintenance curve presented here for Biax® T/E lamps are based on photometry under laboratory conditions.

Test conditions:

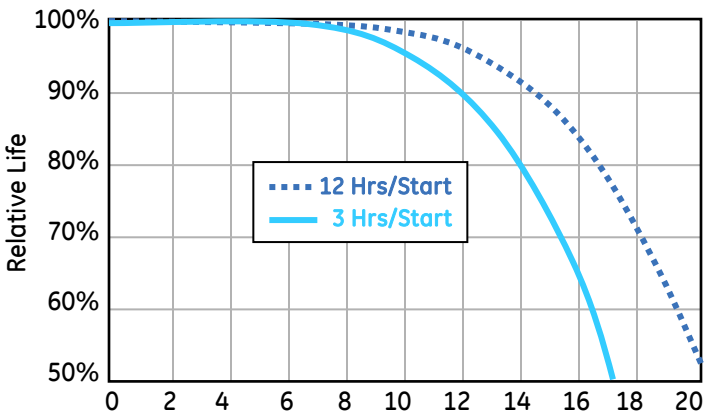
- Photometric sphere
- Base up operation
- Switching cycle: 165 min on – 15min off and 11 hours on – 1 hour off
- Standard gear or high frequency operation
- 25ºC ambient temperature

Life vs. Frequency of Switching

For impact on life of alternative switching cycles refer to Graph C.

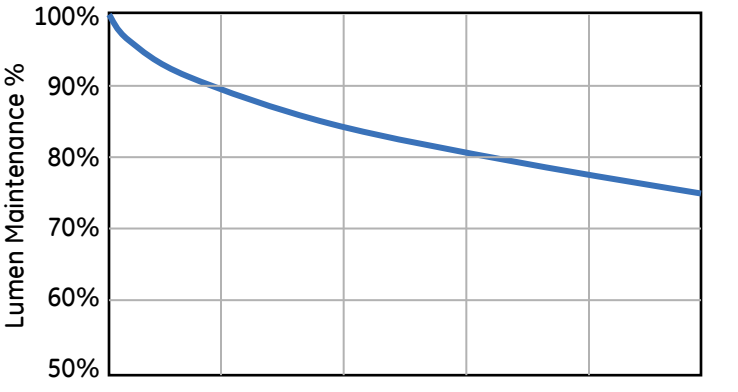
For applications where a fast switching cycle is required it is possible to minimize the effect of switching on lamp life with the use of a suitable program start ballast. Instant start ballasts are not recommended for frequent switching applications.

Relative Life vs. Operating Time



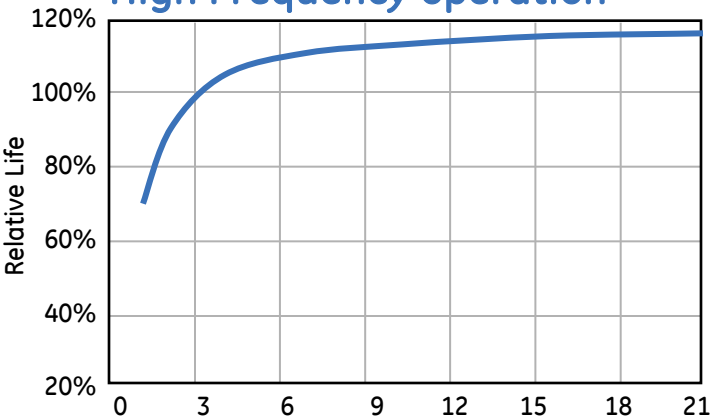
(Graph A)

Lumen Maintenance



(Graph B)

Relative Life vs. Hours per Start High Frequency operation



(Graph C)

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Luminous Intensity Distribution

The luminous intensity distribution describes the intensity of light that is emitted in a particular direction.

Graph C and D show the Luminous Intensity Distribution curve of Biax® T/E lamps. Tests were taken with lamps operating base-up.

Graph C shows the intensity distribution in the horizontal plane while Graph D shows the light intensity distribution plot in the vertical plane

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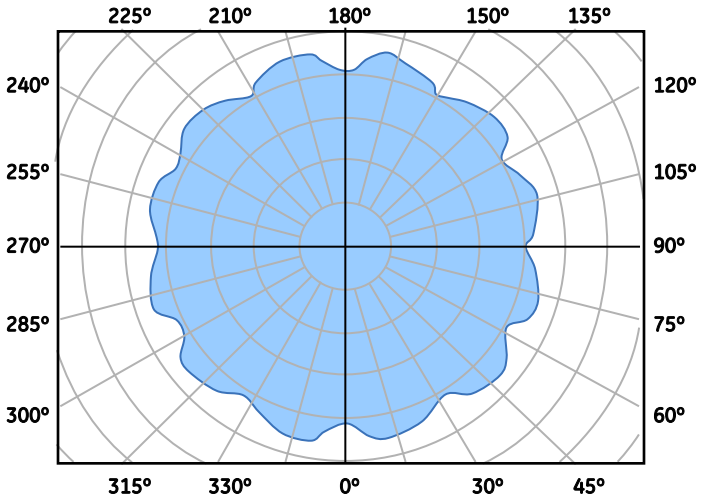
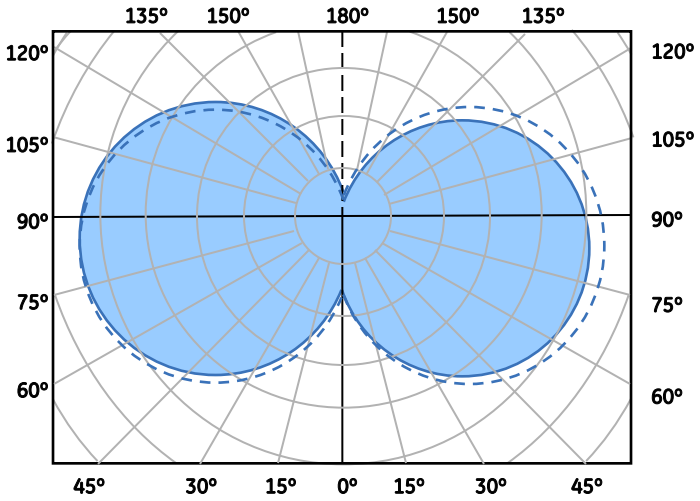
Disclaimer: Graphs show typical lamp behavior. Individual lamps and groups can show different values.

Luminous Intensity Distribution
- Horizontal Plane



Operating Position: Base-up
(Graph C)

Luminous Intensity Distribution
- Vertical Plane



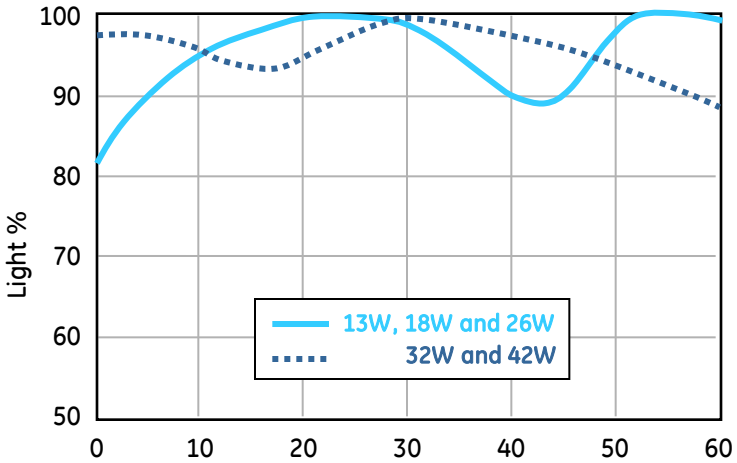
Operating Position: Base-up
(Graph D)

Relative Luminous Flux vs. Ambient Air Temperature – No Airflow

The lamp luminous output depends on the mercury vapor pressure in the discharge tube. The mercury vapor pressure is a function of the thermal conditions around the glass tubes and the amalgam. The operating position, air flow, and radiated heat sources have an effect on these conditions. Graph E shows the relative luminous output as function of the ambient temperature in the base-up position. Tests were performed in draft-free air under thermally controlled conditions.

IES Files are available on
www.gelighting.com.

Light Output vs. Ambient Temperature – Base-up Operation



Ambient Temperature in °C (Graph E)

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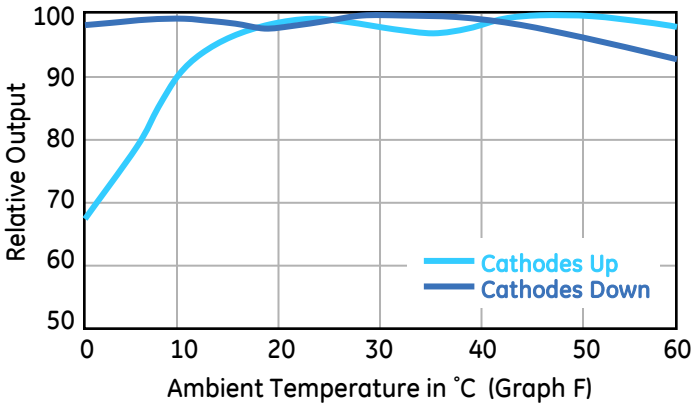
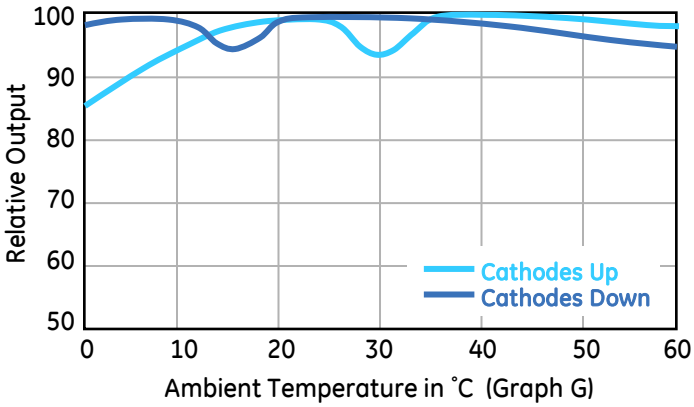
Relative light output vs. ambient temperature TBX 26W horizontal operation with Airflow



Relative light output vs. ambient temperature TBX 42W horizontal operation with Airflow



Standards

Biax® T/E lamps comply with the relevant clauses of applicable safety and performance specifications such as IEC 61199 Single-capped fluorescent lamps – Safety specifications and IEC 60901 Single-capped fluorescent lamps : Performance specifications.

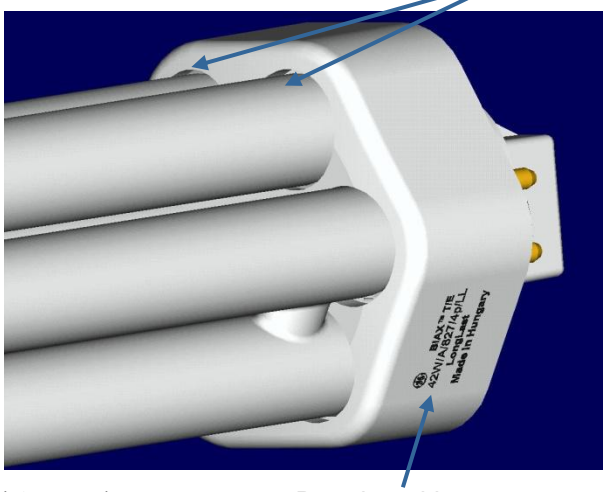
Relative Luminous Flux vs. Ambient Temperature – Airflow across the lamps

In horizontal operation, the light output vs. temperature performance of Biax® T/E 26, 32 and 42W lamps differs depending on the position of the tubes with the cathodes relative to the other tubes. **Graphs F** and **G** show the performance of the 26 and 42W lamps with the cathode legs up (above the other legs) and down (below the other legs). **Figure H** shows the location of the tubes with the cathode legs relative to the monogram on the lamp.

Environmental aspect

The mercury content of the Biax® T/E lamps is maintained under 3mg per lamp, supporting GE Lighting's commitment to the environment.

Cathode Position



(Figure H)

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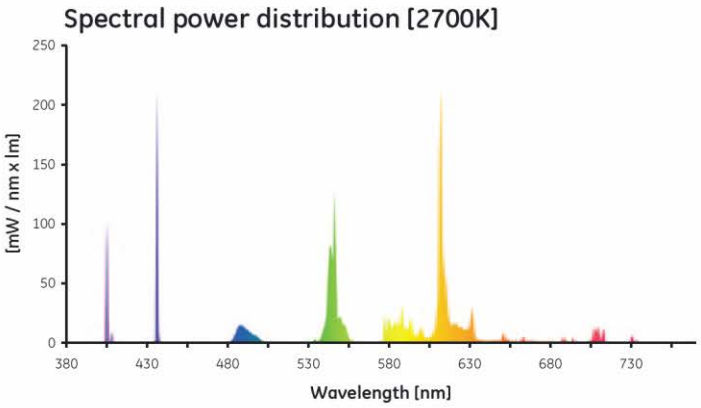
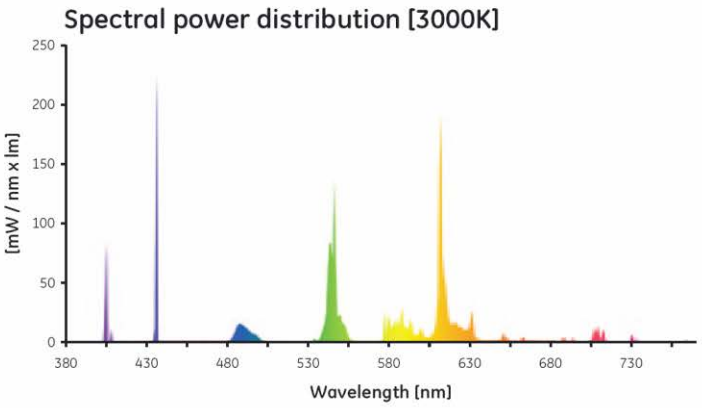
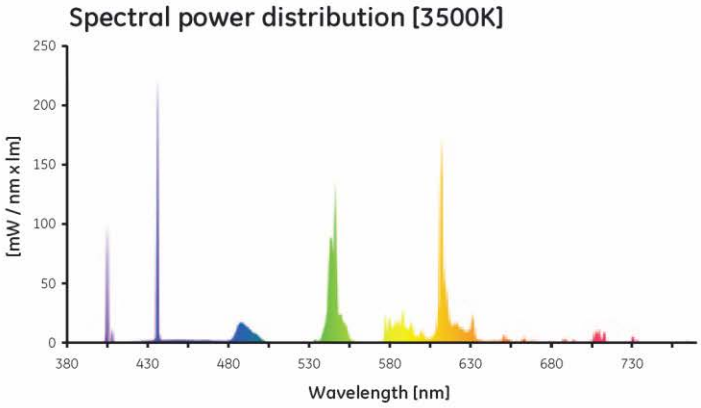
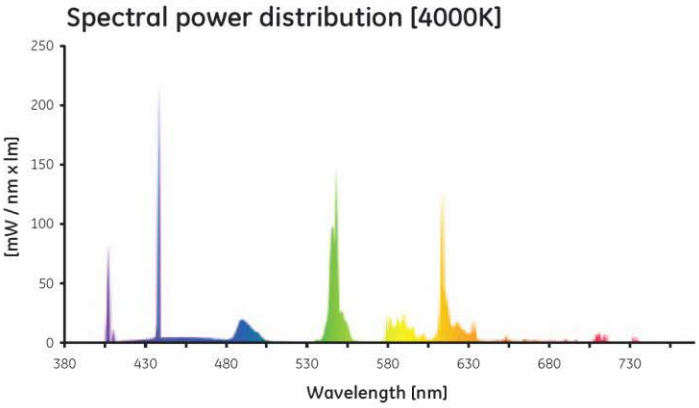
Spectral Distribution



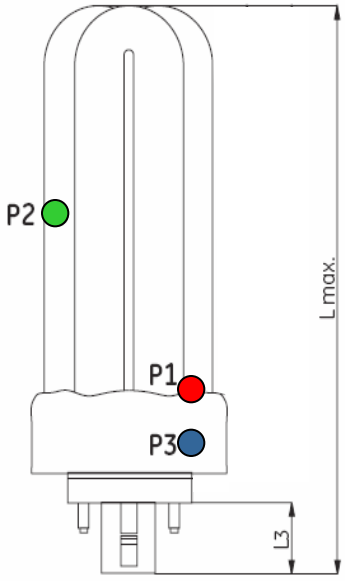






Operating Temperature limits for Biax® T/E

Lamp surface temperatures in any application shall not exceed maximum temperature values that are given on the right. The exact location where the relevant temperature is measured, depends on the lamp orientation, e.g. VBU, horizontal, etc. **P2** and **P3** temperatures are measured on the hottest surfaces of the indicated lamp portion. (This is normally on the uppermost surface of the lamp in horizontal operation.) **P1** is always measured on the surface of the plastic housing between the cathode



Lamp Portion	Description	Maximum Temperature
P1	Plastic housing between cathodes	180 °C
P2	Mid part of the bulb	180 °C
P3	Plastic housing along the circumference	140 °C

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- Values conform to IEC 60901 data sheets at time of publication. Consult IEC 60901 and ANSI/IEC C78.901 for additional parameters not provided here.
- Lamp operating current crest factor (CCF) shall not exceed 1.70.

Cathode Preheat requirements

Nominal Power	Base	Standard Data Sheet 60901-IEC	Emin = Qmin + Pmin*ts			Emax = Qmax + Pmax*ts		
			Qmin (J)	Pmin (W)	Rsub, min (ohm)	Qmin (J)	Pmin (W)	Rsub, min (ohm)
13	GX24q-1	-3413	1	0.7	30	2	1.4	40
18	GX24q-2	-3418	0.9	0.7	18	1.8	1.4	24
26	GX24q-3	-3426	1	0.8	9	2	1.6	12
32	GX24q-3	-7432	1	0.8	9	2	1.6	12
42	GX24q-4	-7442	1	0.8	9	2	1.6	12

Preheat time shall be longer than 0.4 s and shorter than 3s. Ballast preheat energy shall be measured with substitution resistance of table below.

Dimming requirements

Nominal Power	Base	Standard Data Sheet 60901-IEC	Idmin (A)	Idmax (A)	X (A^2)	Y (A^2)
13	GX24q-1	-3413	0.015	0.115	0.035	0.26
18	GX24q-2	-3418	0.020	0.16	0.07	0.35
26	GX24q-3	-3426	0.030	0.25	0.175	0.57
32	GX24q-3	-7432	0.030	0.25	0.175	0.57
42	GX24q-4	-7442	0.030	0.25	0.175	0.57

In the dimming range of the lamp operating current Idmin — Idmax. Minimum SoS = $I^2_{LH} + I^2_{LL} = X - Y*I_d$. Target SoS = $I^2_{LH} + I^2_{LL} = X - 0.3*Y*I_d$.
Idmax for dimming operation = Idmin for normal operation. Values conform to IEC proposal.

Starting requirements

Nominal Power	Base	Standard Data Sheet 60901-IEC	Minimum OCV at +10C (Vrms)	Maximum OCV (non-ignition) (Vrms)	Rsub (ohm)
13	GX24q-1	-3413	400	190	30...90
18	GX24q-2	-3418	550	250	18...54
26	GX24q-3	-3426	550	265	9...27
32	GX24q-3	-7432	560	265	9...27
42	GX24q-4	-7442	600	265	9...27

Ballast open circuit voltage (OCV) shall be measured with substitution resistance of above table.

For additional product and application information, please consult GE's Website: www.gelighting.com