

Special Lucalox™

High Pressure Sodium Lamps

Lucalox™ Internal Ignitor Elliptical Clear 70W and
Elliptical Diffuse 50W and 70W

Lucalox™ TD Double Ended 1000W

Lucalox™ E-Z Lux™ Elliptical Diffuse 110W

Description

Lucalox™ Internal Ignitor lamps

- For use in luminaires without internal ignitor equipment
- Simplifies luminaire design
- Up to 17,500 hour life



Road and Tunnel



Hospitality



Street and Pedestrian



Commercial areas



Car Park

TD Double Ended Lucalox™ lamps

- Lucalox™ efficiency in an ultra compact size
- Small size fits ultra compact fixtures
- Excellent optical control
- Concentrated beam of light exactly where needed
- High efficiency
- 20,000 hour life
- Instant restrike



Industrial



Street and Pedestrian



Commercial areas



Sport

Lucalox™ E-Z Lux lamps

- Mercury retrofit lamp with no starter required
- Alternative for 125W Mercury lamp
- 24,000 hour life



Road and Tunnel



Street and Pedestrian



Commercial areas



Car Park



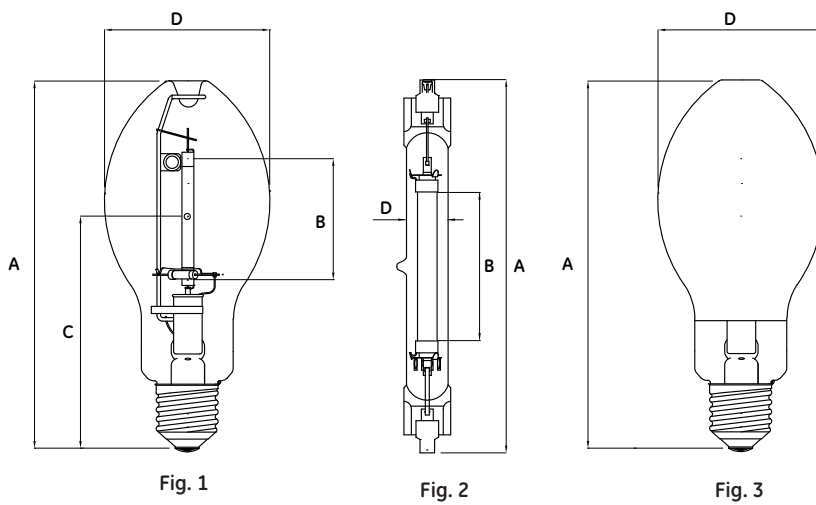
Specification summary

Nominal Wattage [W]	Rated Wattage [W]	Weighted Energy Consumption [kWh/1000 hrs]	Volts [V]	Cap	Product Description	Product Code	Nominal Lumen [lm]	Rated Lumen [lm]	Rated Lamp Efficacy [lm/W]	Energy Efficiency Class [EEC]	CCT [K]**	Colour Rendering Index [Ra]**	Rated Average Life [hr]	Mercury Content [mg]	Ambient Temperature [°C]
Lucalox™ Internal Ignitor - Elliptical Clear															
70	71	79.39	90	E27	LU 70/90/MO/I/E27	46209	6100	6400	91	A+	2000	25	17,500	10.0	25
Lucalox™ Internal Ignitor - Elliptical Diffuse															
50	51	56.22	85	E27	LU50/85/MO/D/I/E27	88556	3300	3700	72	A	2000	25	12,000*	10.0	25
70	71	78.17	90	E27	LU 70/90/MO/D/I/E27	46186	5750	6000	86	A	2000	25	17,500	10.0	25
Lucalox™ TD Double Ended															
1000	994	1070.56	250	RX7s-24	LU1000/TD	30246	137000	137103	138	A++	2000	25	20,000	21.1	25
Lucalox™ E-Z Lux™ - Elliptical Diffuse - Mercury retrofit															
110	113	124.52	110	E27	LUH110/D/27-SHx	39512	8000	8435	75	A	2000	25	24,000	19.8	25

*Non EU product

**CCT and CRI data are informative only due to the HPS performance. No regular measurements are taken on these parameters.

Dimensions



Physical data

Wattage	A Length (mm)	D Diameter (mm)	C LCL (mm)	B Arc Gap (mm)	Cap	Bulb Glass	Mass (g)	Operating Position	Minimum Starting Temperature
Lucalox™ - Internal Ignitor Elliptical Clear - Fig. 1									
70	156	72	97	34.8	E27	Soft	70	Universal	-40°C
Lucalox™ - Internal Ignitor Elliptical Diffuse - Fig. 3									
50	156	72	-	-	E27	Soft	70	Universal	-40°C
70	156	72	-	-	E27	Soft	70	Universal	-40°C
Lucalox™ - TD - Double Ended - Fig. 2									
1000	334	22.4	-	202	Rx7s	Quartz	90	Hor. ±20°	-40°C
Lucalox™ E-Z Lux™ - Elliptical Diffuse - Fig. 3									
110	175	72	-	-	E27	Soft	59	Universal	-40°C

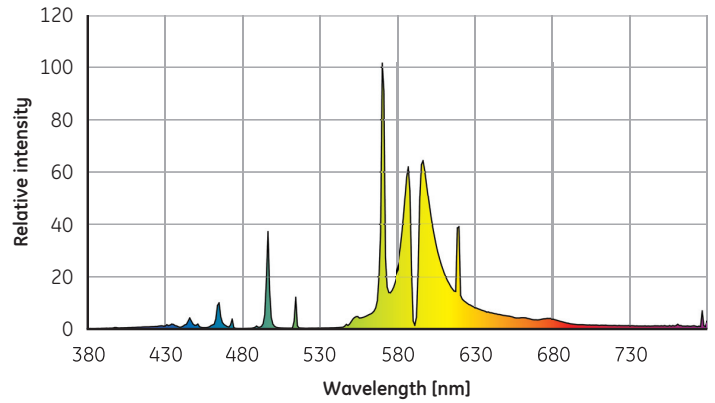
Photometric data

Wattage	100 Hour Lumens	CCT [K]	Chromaticity Coordinates		CRI [Ra]	Prop. DIN5035 Class.
			x	y		
Lucalox™ – Internal Ignitor Elliptical Clear						
70	6,000	2,000	0.53	0.43	25	4
Lucalox™ – Internal Ignitor Elliptical Diffuse						
50	3,300	2,000	0.53	0.43	25	4
70	5,800	2,000	0.53	0.43	25	4
Lucalox™ – TD – Tubular Clear Double Ended						
1000	137,000	2,000	0.53	0.43	25	4
Lucalox™ E-Z Lux™ - Elliptical Diffuse						
110	8,000	2,000	0.54	0.40	25	4

Photometric data is quoted for the lamp in a horizontal orientation operating from a nominal ballast at rated supply volts.

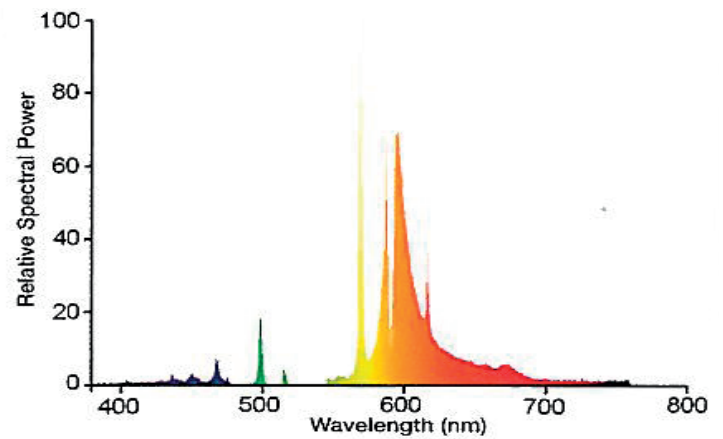
Spectral power distribution

Double Ended and Internal Ignitor lamps



Spectral power distribution

E-Z Lux™



Electrical data

Data is based on a nominal lamp operating from a nominal choke (reactor) ballast with power factor correction. Supply power is based on a typical commercially available ballast.

Lamp data

Wattage	Volts ± 15 (V)	Current [A]	Power [W]	Current Crest Factor
Lucalox™ – Internal Ignitor				
50	85	0.76	50	1.45
70	90	0.98	70	1.45
Lucalox™ – TD Double Ended				
1000	250	4.70	1000	1.45
Lucalox™ E-Z Lux™				
110	115	1.22	110	1.42

Lamp survival and lumen maintenance

Average lamp life & lumen maintenance is based on laboratory tests of a large number of representative lamps under controlled conditions, including operation at 10 hours per start on ballasts having specified electrical characteristics.

The following conditions can reduce average lamp life and lumen maintenance:

- frequent on/off switching
- high line voltage
- vibration
- high ambient temperature within the fixture
- ballast and ignitor characteristics

Average rated life

The survival of individual lamps or particular groups of lamps depends on these system conditions, and actual data may fall within the lines, or dependent upon the lamp operating conditions even below the lower limit below (see Lamp survival graph).

For cost-of-light calculations involving these lamps, the following estimated operating times are suggested for 50% survival:

Lucalox™ Internal Ignitor – 50W – 12,000 hours -

70W – 17,500 hours

Lucalox™ TD Double Ended – 1000W – 20,000 hours

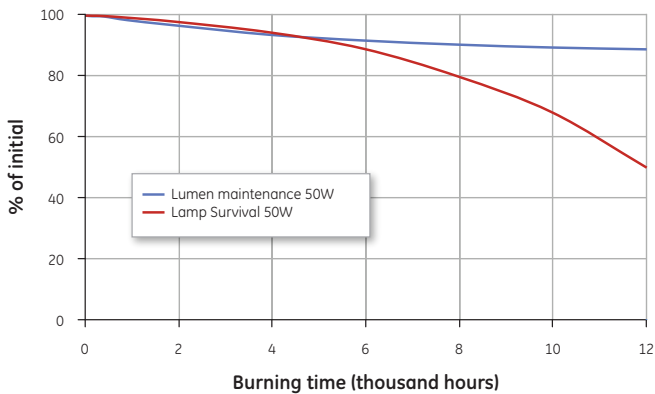
Lucalox™ E-Z Lux™ – 110W – 24,000 hours

Lumen maintenance

Under the same controlled conditions, Initial Reference lumens refer to the lamp lumen output after 100-hours burning. Due to variations in systems and service conditions (in particular the burning cycle), actual lamp performance can vary from the reference lumen ratings. The lumen maintenance (light output during life) of individual lamps or particular groups of lamps may fall within the lines, or dependent upon the lamp operating conditions even below the lower limit line (see Lumen maintenance graph).

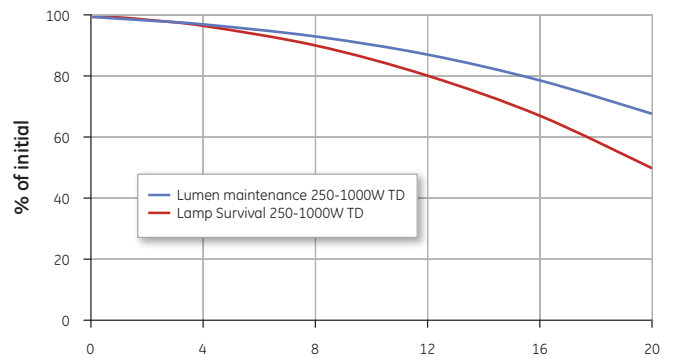
Lumen maintenance and survival rate

Internal ignitor 50W



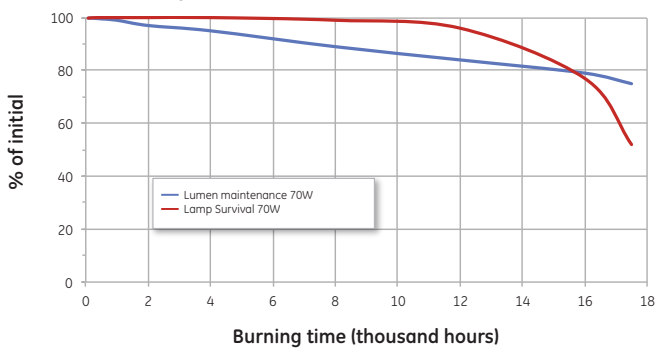
Lumen maintenance and survival rate

TD Double Ended



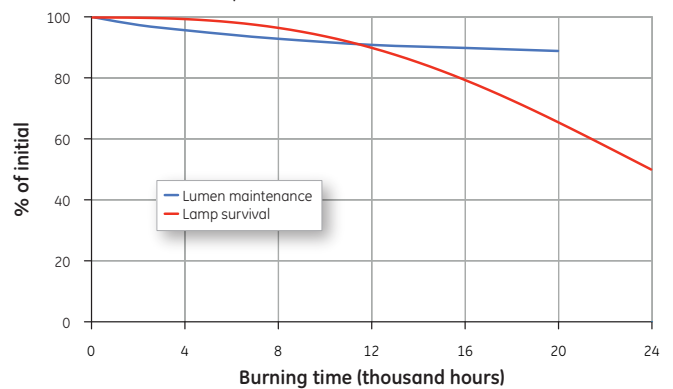
Lumen maintenance and survival rate

Internal ignitor 70W



Lumen maintenance and survival rate

E-Z Lux™ lamps



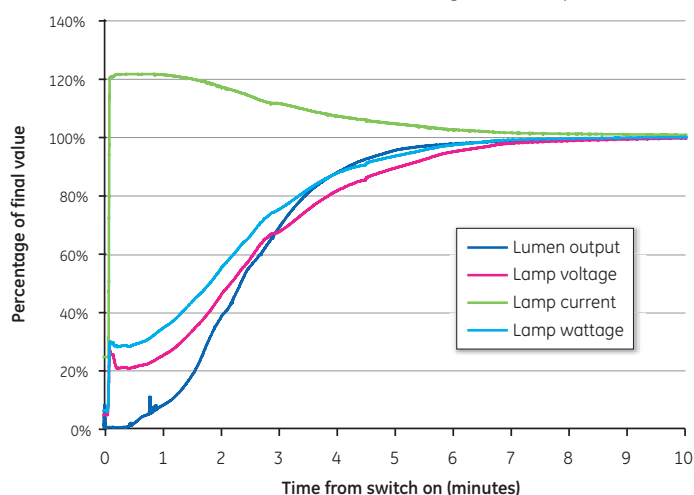
Run-up characteristics

The graph shows typical run-up characteristics for a 250W Lucalox™ lamp. Time for the light output to reach 90% of the final value is determined by supply voltage and ballast design. Typical values are:

Wattage	50	70	110	1000
Run-up (mins)	4	<5	3	6

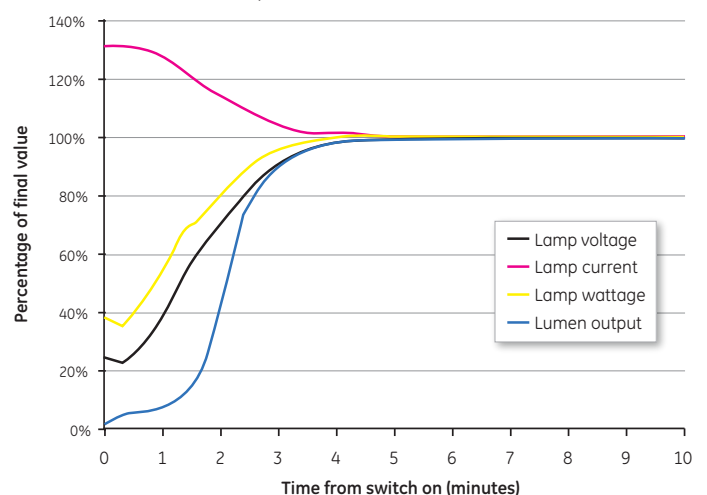
Typical run-up characteristics

TD double ended and internal ignitor lamps



Typical run-up characteristics

E-Z Lux™ lamps



Hot re-strike time

Lucalox™ TD Double Ended

All ratings re-strike within 1 minute following a short interruption in the supply. Actual re-strike time is determined by ignitor type, pulse voltage and cooling rate of the lamp. TD lamps can re-strike immediately using suitable high starting pulse.

Lucalox™ Internal Ignitor

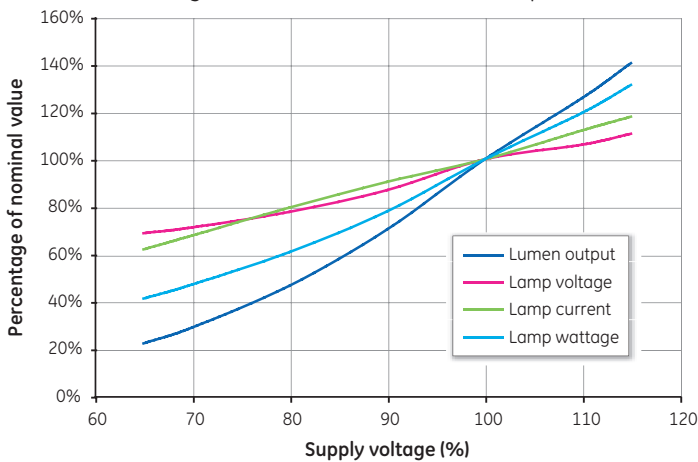
All ratings must re-strike between 1 and 7 minutes following a short interruption of power supply.

Supply voltage

Lamps are suitable for supplies in the range 220V to 250V 50/60Hz for appropriately rated series choke (reactor) ballasts. Supplies outside this range require a transformer (conventional, high reactance or CWA) to ensure correct lamp operation. Lamps start and operate at 10% below the rated supply voltage when the correct control gear is used. However, in order to maximise lamp survival, lumen maintenance and colour uniformity the supply voltage and ballast design voltage should be within $\pm 3\%$. Supply variations of $\pm 5\%$ are permissible for short periods only. This may be achieved by measuring mean supply voltage at the installation and selecting ballasts with appropriate settings.

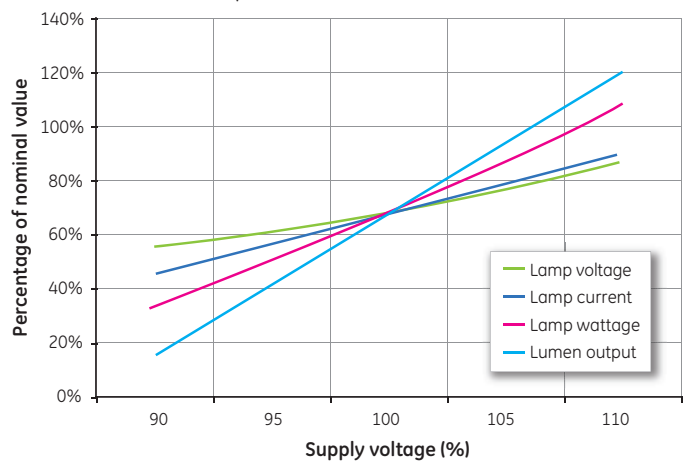
Effect of supply voltage variations on performance

Internal ignitor and TD double ended lamps



Effect of supply voltage variations on performance

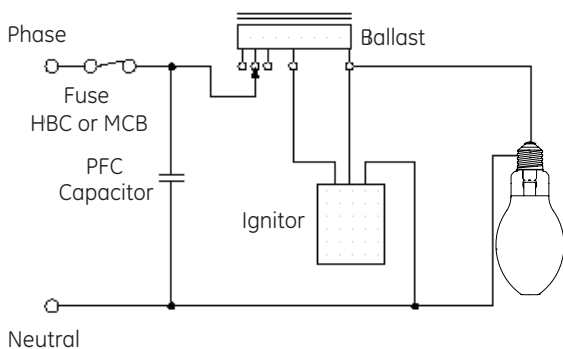
E-Z Lux™ lamps



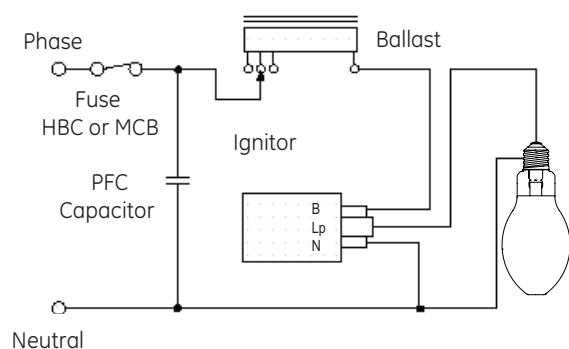
Control gear

It is essential to use a ballast appropriate to the supply voltage at the luminaire. Typical wiring diagrams for control circuits incorporating "Superimposed" or "Impulser" ignitor and choke (reactor) ballast are shown. Refer to actual choke and ignitor manufacturers data for terminal identification and wiring information. A typical wiring diagram for Lucalox™ Internal Ignitor HPS lamps and choke (reactor) ballasts is shown separately.

Typical impulser ignitor circuit



Typical superimposed ignitor circuit



Warning

Do not use a Lucalox™ Internal Ignitor HPS lamp in an installation that has an external ignitor unit as this may cause the lamp to become inoperable.

Compliance with IEC standards

All Elliptical lamps comply with IEC 60662.

Guidance for luminaire manufacturers

Lamp operating temperature limits

Wattage	50-110	1000 (TD)
Max. Bulb Temperature	310°C	750°C
Max. Cap Temperature	210°C	350°C

Luminaire voltage rise

To maximise lamp life it is essential that luminaires are designed so that when lamps are enclosed lamp voltage rise does not exceed the following values:

Wattage	50	70	1000
Lucalox™ – Internal Ignitor			
Voltage Rise (V)	5	5	-
Lucalox™ – TD – Double Ended			
Voltage Rise (V)	-	-	20

Control gear

To achieve correct lamp starting, performance and life it is important that lamp and control gear are compatible and suitably rated for the supply voltage at the luminaire.

Ballasts

Lamps are fully compatible with ballasts manufactured for high pressure sodium lamps to IEC 60662. Ballasts should comply with specifications IEC 60922 and IEC 60923.

Ballast thermal protection

Use of ballasts incorporating thermal cut-out is not a specific requirement but is a good optional safety measure for the installation.

Ballast voltage adjustment

Series choke (reactor) ballasts incorporating additional tapings at $\pm 10V$ of the rated supply voltage are recommended. Alternatively a single additional tapping 10V above the rated supply voltage will ensure lamps are not overloaded due to excessive supply voltage.

Ignitors

Ignitors should comply with specifications IEC60926 and IEC60927 and have starting pulse characteristics as follows:

Wattage	Min. Pulse Voltage (kV) ⁽¹⁾	Max. Pulse Voltage (kV) ⁽²⁾	Min. Pulse Width (μ s) ⁽³⁾	Min. Pulse Repetition Rate ⁽⁴⁾	Min. HF Peak Current (A)
Lucalox™ – TD – Double Ended					
1000	3.5	-	0.2	1 / cycle	0.2

1. When Loaded with 100 pF min. 2. When Loaded with 20 pF max. 3. At 90 % peak voltage 4. Pulse Phase Angle: 60-90°el and/or 240-270° el.

Timed ignitors

Use of a “timed” or “cut-out” ignitor is not a specific requirement, but it is a good optional safety feature for installation. The timed period must be adequate to allow lamps to cool and restart when the supply is interrupted briefly (see “Hot re-strike time”).

Cable between ignitor and lamp

Cables connected between the lamp and a superimposed ignitor “Lp” terminal, or the ballast when using an impulser ignitor, must be rated at a minimum 50/60Hz voltage of 1000V. Mineral insulated cable is not suitable for connecting the lamp to the control gear. To achieve good starting superimposed ignitors must be adjacent to the luminaire. Cable capacitance of wiring between the ignitor “Lp” terminal and the lamp should not exceed 100pF (<1 metre length) when measured to adjacent earthed metal and/or other cables, unless otherwise stated by the ignitor manufacturer. When using impulser type ignitors longer cable lengths between ballast and lamp are normally permissible. Limits for particular ignitors are available on request from GE Lighting or directly from the ignitor manufacturer.

PFC capacitors for choke (reactor) circuits

Power factor correction is advisable in order to minimise supply current and electricity costs. For 220-250V supplies 250V \pm 10% rated capacitors are recommended as follows:

Wattage	50	70	110
PFC Capacitor (μ F)	8	8	10