

Lucalox XO Superlife

High Pressure Sodium Lamps
Tubular Clear
70W, 100W, 150W, 250W and 400W
Elliptical Diffuse
50 and 70W



DATASHEET

Product information

Lucalox XO Superlife lamps comprise a sodium discharge system operating at a high pressure within a ceramic arc tube which is mounted in an outer glass bulb. These lamps offer outstanding luminous efficacy, lumen maintenance thus reducing energy and maintenance costs. All lamps have two arc tubes. The second arc tube will instantly light after a momentary power interruption. Arc tubes are Monolithic construction for 50-400W lamps. Easy replacement of standard HPS lamps, fits standard HPS sockets – no new wiring, ballast or fixture are required.

Features

• Dual arc tube

Tungsramp Lucalox XO Superlife lamps feature a dual arc tube design that provides extra long life. The second arc tube also assures that critical lighting applications will instantly relight, even after momentary power outages.

• Longest life for reduced maintenance

The twin arc tubes provide up to 60,000 hours life, up to 70% longer than XO HPS lamps. This longer rated life reduces relamping costs by significantly increasing the maintenance interval.

• **Continuous light after power interruption.** The second tube provides light instantly after momentary power interruption increasing to full light output in less than three minutes.

• **Highly efficient** – up to 135 lumens per watt.

Lucalox XO Superlife lamps have the following advantages above the standard one:

- Superb performance and longer life
- Rugged monolithic arc tube, with Tungsramp Reliable Starting Technology for higher reliability
- High Xenon-Fill gas delivers:
 - Higher luminous efficacy,
 - Extra light, up to 17% more lumens than standard without increase in energy consumption
- More resistant to mains voltage fluctuations
- Zirconium gettering system for improved lumen maintenance

Applications areas



Road and Tunnel



Car park



Street and Pedestrian



Industrial

Specification summary

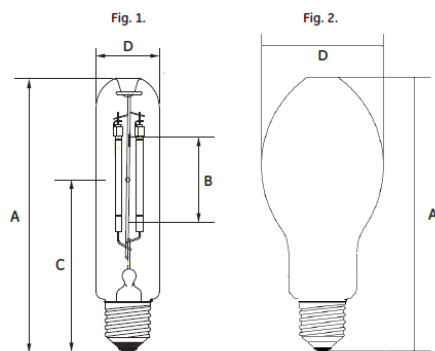
Lucalox XO Superlife – Tubular Clear

Product Code	93102223	93102221	93102213	93102214	93102215
Product Description	LU70/90/XO /SBY/T/E27 TU	LU100/100/XO /SBY/T/E40 TU	LU150/100/XO /SBY/T/E40 TU	LU250/XO /SBY/T/E40 TU	LU400/XO /SBY/T/E40 TU
Nominal Wattage [W]	70	100	150	150	250
Rated Wattage [W]	76	100	153	153	260
Weighted Energy Consumption [kWh/1000 hrs]	83.06	110.24	168.90	288.68	450.56
Volts [V]	90	100	100	100	100
Cap	E27	E40	E40	E40	E40
Nominal Lumen [lm]	6,600	10,500	17,500	33,000	55,800
Rated Lumen [lm]	6,800	10,510	17,600	33,150	55,880
Rated Lamp Efficacy [lm/W]	90	105	114	125	135
Energy Efficiency Class [EEC]	A+	A+	A+	A+	A++
Mercury Content [mg]	19.9	26.6	26.6	46.4	38.3
Rated Average Life [h]	50,000	60,000	60,000	55,000	55,000
Ambient Temperature [°C]	25	25	25	25	25
Bulb	Soft	Hard	Hard	Hard	Hard
Mass Weight [g]	65	140	145	155	174
Operating Position	Universal	Universal	Universal	Universal	Universal
Minimum Starting Temperature [°C]	-40	-40	-40	-40	-40

Lucalox XO Superlife – Elliptical Diffuse

Product Code	93102244	93102222
Product Description	LU50/85/XO/SBY/D/E27 TU	LU70/90/XO/SBY/D/E27 TU
Nominal Wattage [W]	50	70
Rated Wattage [W]	53	73
Weighted Energy Consumption [kWh/1000 hrs]	58.30	80.28
Volts [V]	85	90
Cap	E27	E27
Nominal Lumen [lm]	3,500	6,000
Rated Lumen [lm]	3,900	6,060
Rated Lamp Efficacy [lm/W]	73	83
Energy Efficiency Class [EEC]	A	A
Mercury Content [mg]	16.6	19.9
Average Rated Life [h]	40,000	50,000
Ambient Temperature [°C]	25	25
Bulb	Soft	Soft
Mass Weight [g]	70	67
Operating Position	Universal	Universal
Minimum Starting Temp. [°C]	-40	-40

Dimensions



Wattage	A Length [mm] Max.	D Diameter [mm] Max.	C LCL [mm] Nom.	B Arc Gap [mm] Nom.	Cap	Bulb Glass	Mass [g]	Operating Position	Minimum Starting Temp.
Lucalox XO Superlife Tubular Clear — Figure 1.									
70	156	39	102	38	E27	Soft	65	Universal	-40°C
100	211	48	132	44	E40/45	Hard	140	Universal	-40°C
150	211	48	132	55	E40/45	Hard	145	Universal	-40°C
250	260	48	158	65	E40/45	Hard	155	Universal	-40°C
400	283	48	175	86	E40/45	Hard	174	Universal	-40°C
Lucalox™ XO Superlife – Elliptical Diffuse – Figure 2.									
50	156	72	-	-	E27	Soft	70	Universal	-40°C
70	156	72	-	-	E40/45	Hard	140	Universal	-40°C

Photometric data

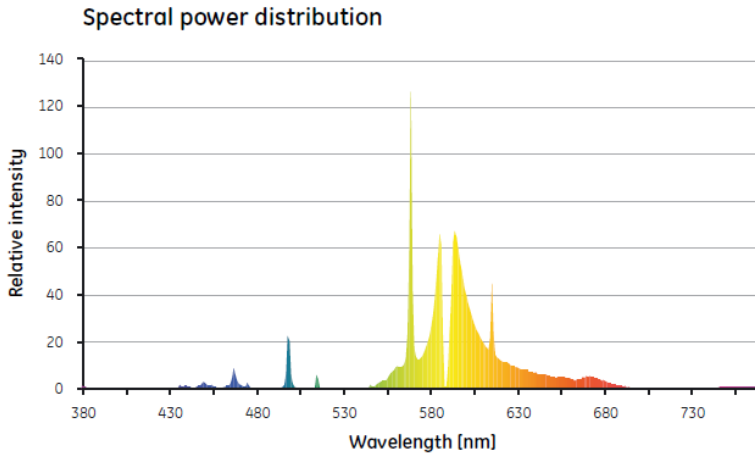
Watts	100hr Lumens	CCT [K]	CRI [Ra]	DIN5035 Class.
Lucalox XO Superlife Tubular Clear				
70	6,600	2100	25	4
100	10,500	2100	25	4
150	17,500	2100	25	4
250	33,000	2100	25	4
400	55,800	2100	25	4
Lucalox™ XO Superlife – Elliptical Diffuse				
50	3,500	2100	25	4
70	6,000	2100	25	4

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.

Watts	Volts ±15 [V]	Current [A]	Power [W]
Lucalox XO Superlife Tubular Clear			
70	90	0.98	70
100	100	1.2	100
150	100	1.8	150
250	100	2.9	250
400	100	4.5	400
Lucalox™ XO Superlife – Elliptical Diffuse			
50	85	0.76	50
70	90	0.98	70

Spectral power distribution

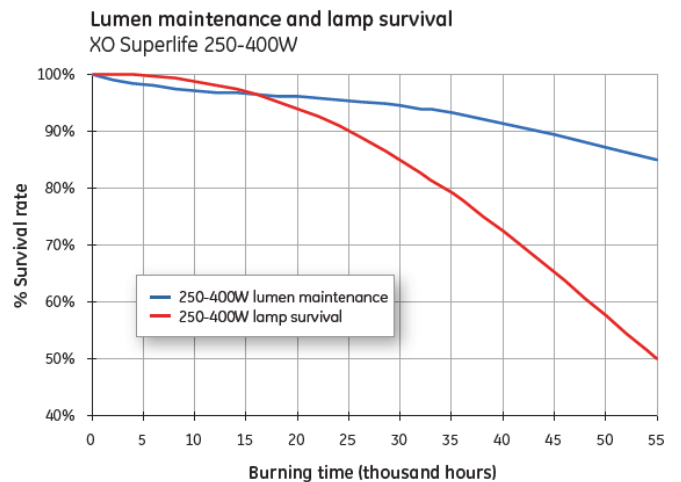
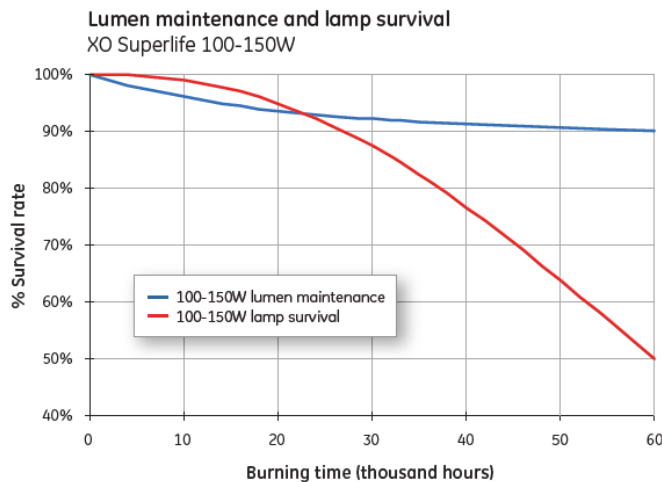
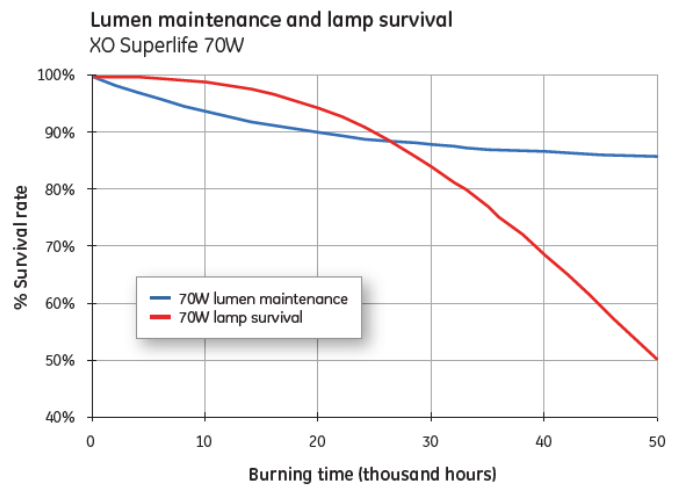
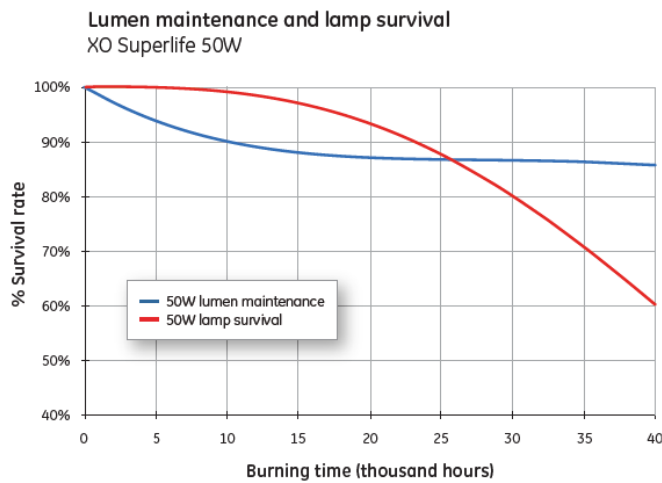


Survival rate and lumen maintenance

Average lamp life & lumen maintenance is based on laboratory tests of a large number of representative lamps under controlled conditions, including operation at 10 or more 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 (see Lamp Survival graph). For cost-of-light calculations involving these lamps, the following estimated operating times are suggested for 50% survival:

Lucalox XO Superlife

- 50W – 40,000 hours
- 70W – 50,000 hours
- 100-150W – 60,000 hours
- 250-400W – 55,000 hours

Wattage	50	70	100	150	250	400
B3 [h]	15,000	15,800	16,000	16,000	14,800	14,800
B5 [h]	18,000	19,100	19,900	19,900	18,500	18,500
B10 [h]	23,100	25,000	27,000	27,000	25,000	25,000

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).

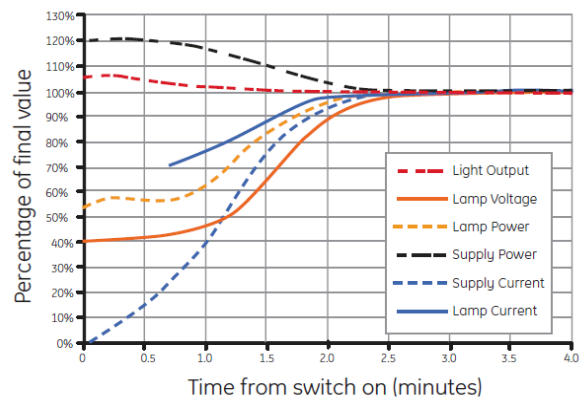
Data is based on a nominal lamp operating from a nominal choke (reactor) ballast with power factor correction. Supply power is based on a typical commercially available ballast.

Run-up characteristics

The graph shows typical run-up characteristics for a 150W Lucalox XO Superlife lamp. The time needed for the light output to reach 90% of the final value is determined by the supply voltage and ballast design. Typical values are:

Watts	50	70	100	150	250	400
Run-UP (Mins)	3	5	3.5	3.5	3	5

Typical warm-up characteristics



Hot restrike time

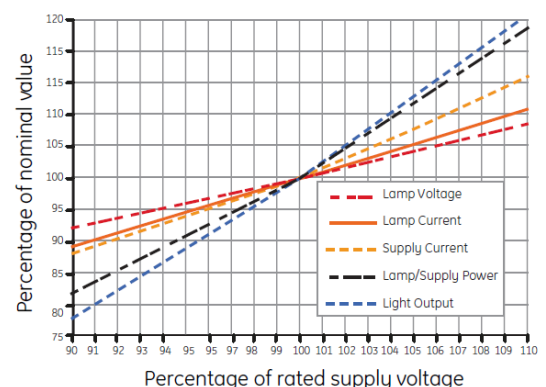
Due to the standby construction the 70 watt ratings restrike within 10 seconds and the 100-400 watt ratings restrike within 5 seconds following a short interruption in the power supply.

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.

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.

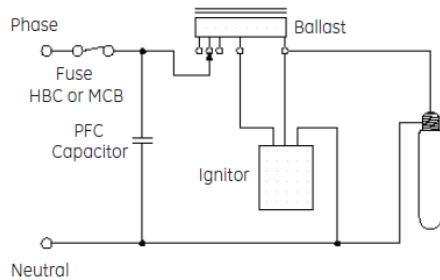
Effect of supply voltage variations on performance



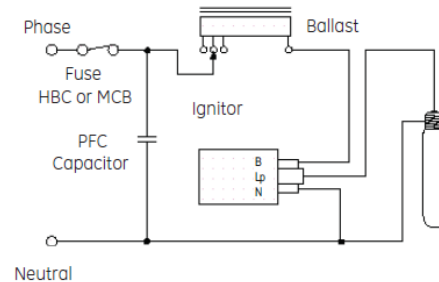
Ballast

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.

Typical impulser ignitor circuit



Typical superimposed ignitor circuit



Guidance for luminaire manufacturers

Lamp operating temperature limits

Lucalox XO Superlife

Wattage	Maximum Cap Temperature	Maximum Bulb Temperature
50-150W	210°C	310°C
250-400W	250°C	400°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:

Watts	50	70	100	150	250	400
Lucalox XO Superlife – Tubular Clear Voltage Rise (V)	-	5	7	7	10	12
Lucalox XO Superlife – Elliptical Diffuse Voltage Rise (V)	5	5	-	-	-	-

Ballasts

To achieve correct lamp starting, performance and life, it is important that the lamp and ballast are compatible and suitably rated for the supply voltage at the luminaire. Lucalox Superlife and Lucalox XO Superlife range is compatible with IEC60662 (High Pressure Sodium Lamps) and IEC62035 (HID Lamp Safety). Ballasts used to operate these lamps should comply with ballast standards IEC60922 & IEC60923 and incorporate adequate overload protective measures to ensure that safety is maintained under abnormal lamp end-of-life rectification conditions as prescribed by IEC60662, IEC62035 and draft changes to luminaire standard EN60598-1. Ballast thermal protection is one method of providing adequate protection.

Ballast voltage adjustment

Series choke (reactor) ballasts incorporating additional tappings 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.

Watts	Min. PulseVoltage[kV]1	Max. PulseVoltage[kV]2	Min. PulseWidth[μs]3	Min. PulseRepetitionRate4
50	1.8	2.5	2.0	1/½ cycle
70	1.8	2.3	1.95	1/½ cycle
100	2.8	5.0	1.95	1 cycle
150	2.8	5.0	1.95	1 cycle
250	3.3	5	1.95	1 cycle
400	3.3	5	1.95	1 cycle

1. When Loaded with 100 pF ; 2. When Loaded with 20pF.
3. At 90 % peak voltage ; 4. From ignitor into lamp during starting.

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 Tungsram 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±10% rated capacitors are recommended as follows:

Watts	50	70	100	150	250	400
PFC Capacitor (μF)	10	10	12	20	30	40