

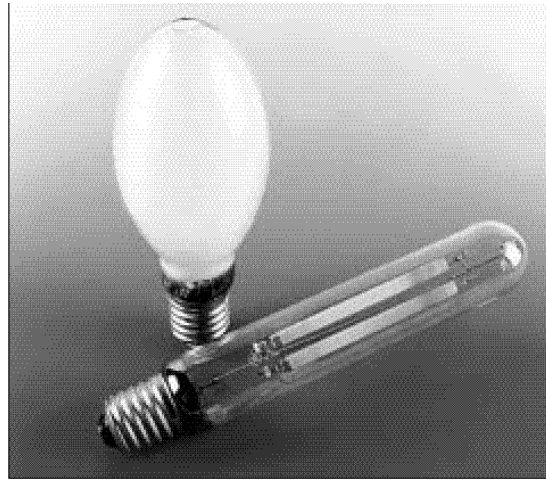


Lucalox™ Superlife

Lucalox™ Superlife High Pressure Sodium Lamps

Lucalox™ Superlife Clear Tubular
50W, 70W, 100W, 150W, 250W & 400W

Lucalox™ Superlife Diffuse Elliptical
50W, 70W, 100W, 150W, 250W & 400W



Description

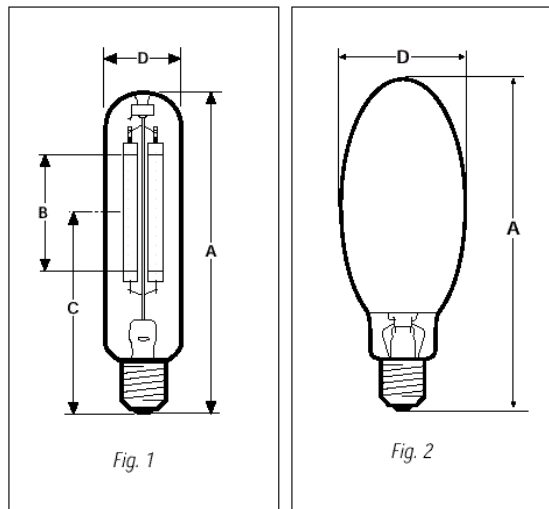
Lucalox™ Superlife lamps comprise a sodium discharge system operating at a high pressure within a ceramic arc tube which is mounted in an outer glass bulb. All lamps have two arc tubes, each having the patented amalgam reservoir outside the arc tube. The second arc tube will instantly light when power is reapplied after a momentary power interruption.

- Extremely long rated life up to 55 000 hours.
Extended replacement cycles up to six years.
- Dual arc tubes provide immediate recognition eliminating hot restrike time
- Retrofit standard HPS lamps

Applications

The application possibilities include industrial and exterior applications, such as security, roadway, floodlighting and industrial interior illumination. They are especially suitable for relamp areas which are narrow and/or difficult to access.

They are ideal for places where the switch on and off could happen within 4 -5 minutes, ensuring instant light when power is reapplied.



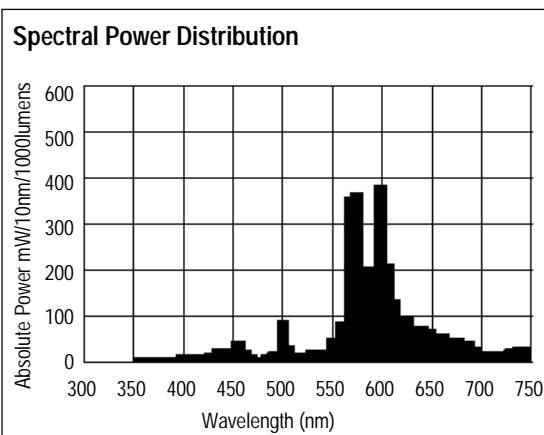
Physical Data

Watts	A Length (mm)	D Diameter (mm)	C LCL (mm)	B Arc Gap (mm)	Cap	Bulb Glass	Mass (g)	Operating Position	Minimum Starting Temp.
Lucalox™ - Superlife Clear Tubular – Fig. 1									
50	156	38.5	97	34.8	E27	Soft	75	Universal	-40°C
70	156	38.5	97	34.8	E27	Soft	75	Universal	-40°C
100	211	48	133	42.3	E40/45	Hard	155	Universal	-40°C
150	211	48	133	48.3	E40/45	Hard	160	Universal	-40°C
250	260	48	158	64.3	E40/45	Hard	195	Universal	-40°C
400	278	48	175	85.3	E40/45	Hard	220	Universal	-40°C
Lucalox™ - Superlife Diffuse Elliptical – Fig. 2									
50	156	72	-	-	E27	Soft	75	Universal	-40°C
70	156	72	-	-	E27	Soft	75	Universal	-40°C
100	186	76	-	-	E40/45	Hard	130	Universal	-40°C
150	227	91	-	-	E40/45	Hard	160	Universal	-40°C
250	227	91	-	-	E40/45	Hard	220	Universal	-40°C
400	282	122	-	-	E40/45	Hard	230	Universal	-40°C

Photometric Data

Watts	100 Hr. Lumens	Colour Temp.(K)	Chromaticity		Colour Rendering	DIN 5035 Class
			Co-ordinates		Properties	
			x	y	CRI (Ra)	
Lucalox™ - Superlife Clear Tubular						
50	3,400	2,000	0.530	0.430	25	4
70	6,000	2,000	0.530	0.430	25	4
100	9,500	2,000	0.530	0.430	25	4
150	15,000	2,000	0.530	0.430	25	4
250	27,500	2,000	0.530	0.430	25	4
400	50,000	2,000	0.530	0.430	25	4
Lucalox™ - Superlife Diffuse Elliptical						
50	3,300	2,000	0.530	0.430	25	4
70	5,800	2,000	0.530	0.430	25	4
100	9,200	2,000	0.530	0.430	25	4
150	14,500	2,000	0.530	0.430	25	4
250	26,000	2,000	0.530	0.430	25	4
400	47,500	2,000	0.530	0.430	25	4

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



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 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 pre 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:

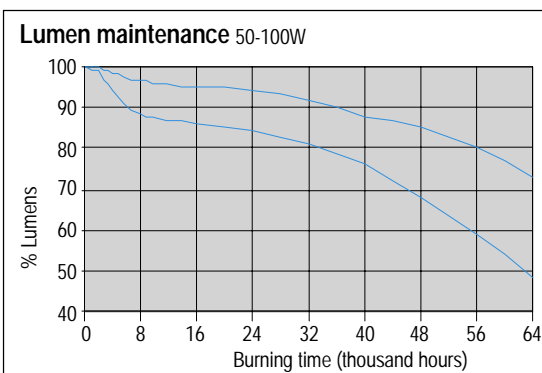
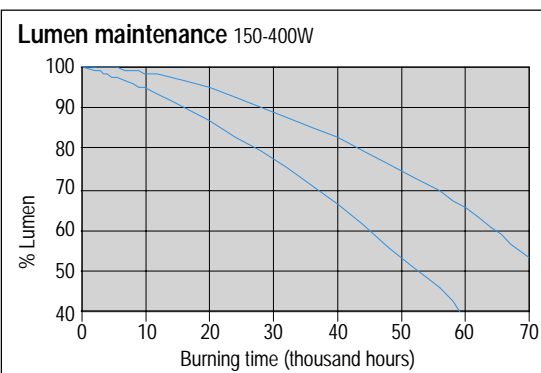
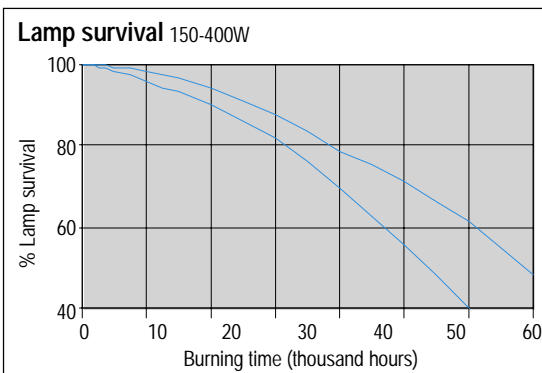
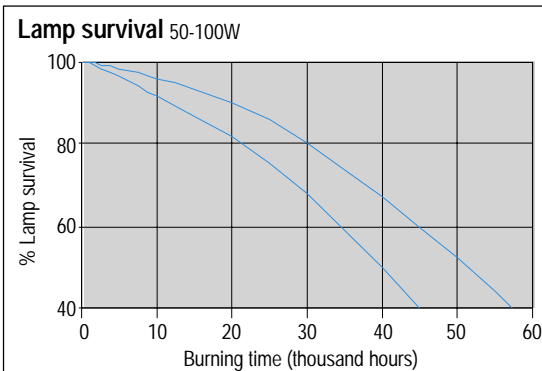
- 50-100W – 40000 hours
- 150W – 45000 hours
- 250-400W – 55000 hours

Lumens

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).

Lamp Data

Watts	Volts ±15 (V)	Current (A)	Power (W)	Current Crest Factor
Lucalox™ - Superlife Clear Tubular				
50	85	0.76	50	1.45
70	90	0.98	70	1.45
100	100	1.20	100	1.45
150	100	1.80	150	1.45
250	100	3.00	250	1.45
400	100	4.60	392	1.45
Lucalox™ - Superlife Diffuse Elliptical				
50	85	0.76	50	1.45
70	90	0.98	70	1.45
100	100	1.20	100	1.45
150	100	1.80	150	1.45
250	100	3.00	250	1.45
400	105	4.45	400	1.45



Run-Up Characteristics

The graph shows typical run-up characteristics for a 150W Lucalox® 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)	4	<5	4	4	5	3

Hot Restrike Time

Due to the standby construction the 50-70 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

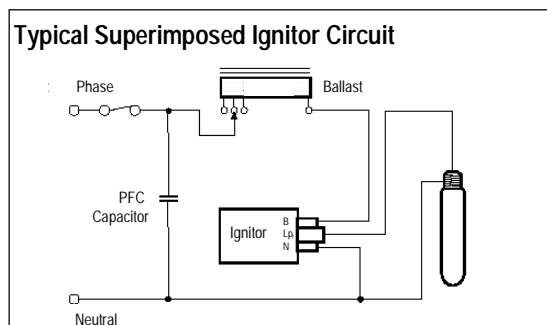
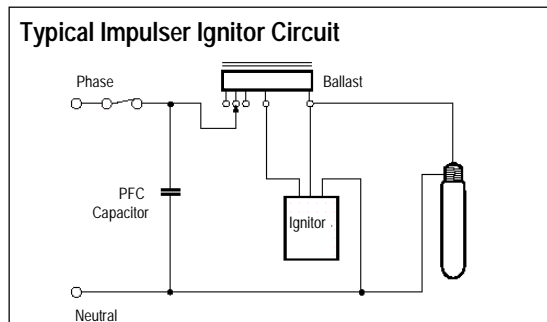
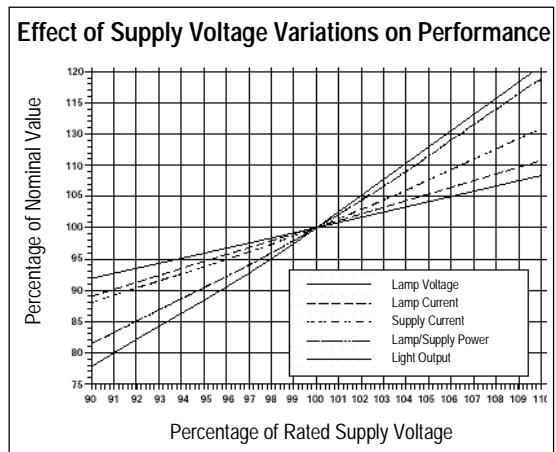
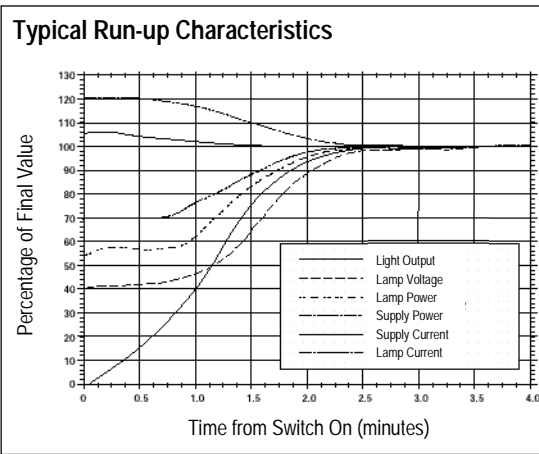
Lamps are suitable for supplies in the range 220V to 250V 50/60Hz for appropriately rated series choke (reactor) ballasts. Supplies outside this range require a transformer (conventional, high reactance or CWA), if it is suitable for standard lamps; to ensure correct lamp operation. Lamps start and operate 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.

Ballasts

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.



GUIDANCE FOR LUMINAIRE MANUFACTURERS

Lamp Operating Temperature Limits

	50/70W	100-400W
Maximum Cap Temperature	210°C	250°C
Maximum Bulb Temperature	400°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™ - Superlife Clear Tubular						
Voltage Rise (V)	5	5	7	7	10	12
Lucalox™ - Superlife Diffuse Elliptical						
Voltage Rise (V)	5	5	5	5	10	7

Ballast

To achieve correct lamp starting, performance and life it is important that lamp and ballasts are compatible and suitably rated for the supply voltage at the luminaire. Lamps are fully compatible with ballasts manufactured for high pressure sodium lamps to IEC60662. Ballasts should comply with specifications IEC60922 and IEC60923.

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

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 over loaded due to excessive supply voltage.

Ignitors

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

Watts	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)
50	1.8	2.3	1.95	1 / 1/2 cycle	0.2
70	1.8	2.3	1.95	1 / 1/2 cycle	0.2
100	2.8	4.5	1.95	1 / cycle	0.2
150	2.8	4.5	1.95	1 / cycle	0.2
250	2.8	4.5	0.95	1 / cycle	0.2
400	2.8	4.5	0.95	1 / cycle	0.2

1. When Loaded with 100 pF 2. When Loaded with 20pF
 3. At 90% peak voltage 4. From ignitor into lamp during starting
 Pulse Phase Angle: 60-90° el and/or 240-270° el.

Timed Ignitors — Use of a “timed” or “cut-out” ignitor is not recommended because of a very short restrrike time of the standby construction HPS lamps (see “Hot Restrike Time”).

During the production process, GE Lucalox lamps are start tested according to the requirements of the IEC60662 Standards and will therefore be compatible with ignitors designed for lamps to this Standard and which comply with the relevant ignitor Standards (IEC 60926 & 60927). Examples of commercial ignitors/manufacturers are:

BAG Turgi	MZN 70S (50/70W), MZN150S, MZN150SE-C (100/150W), MZN250SE (100/150/250W), MZN400S(R) (100/150/250/400W) MZN400SU (100/150/250/400W) MZN1000S (1000W) 640006 (100-400W)
ERC	640006 (100-400W)
May & Christe	ZG1.0SE (50/70W) ZG2.0SE (100/150W) ZG4.5SE (100/150/250/400W)
Parry	PB070#, PBE070, PXE070 (50/70W) PBO19#, PTH150# (150W) PB404# (250W/400W) PAE400, PXE400, PWE400 (150/250/400W)
Thorn	G53503#, G53353.4#, G53353.2#, G53434 (50/70W) G53504#, G53511, G53476, G53455, G53250 (100/150/250/400W) G53282/B# (150/250/400W) G53316 (1000W)
Tridonic	ZRM2-ES, ZRM2-IS (50/70W) ZRM1.8ES/2 (100/150W) ZRM6-ES (100/150/250/400W) ZRM12-ES (1000W)

Impulser type - approved only when used with a suitable ballast.

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 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:

Watts	50	70	100	150	250	400
PFC Capacitor (μF)	8	10	12	20	30	40



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GE Lighting is constantly developing and improving its products. For this reason, all product descriptions in this publication are intended as a general guide, and we may change some specifications from time to time in the interest of product improvement. Lucalox™ Superlife data sheet v.3 - July 2001