

Data Sheet
Discharge Lamps

SONXL-T
High Pressure Sodium Lamp
Extra Light Output
Clear Tubular
70W, 100W, 150W, 250W, 400W

Description

SONXL-T lamps consist of a high pressure sodium discharge operating in a sintered arc tube mounted in a clear tubular glass bulb.

Features

SONXL lamps have a higher Xenon gas pressure than standard SON lamps which results in higher efficacy of up to 18%.

The compact size and clear outer bulb result in a small luminous source which is ideal for good optical control when used in conjunction with a suitably designed luminaire.

Further advantage of these lamps are their exceptionally better lumen maintenance and equal long life to standard SON lamps.

Application

Road lighting, floodlighting and exterior lighting for security and amenity. SONXL lamps are also suitable for industrial lighting where efficacy is more important than good colour discrimination.

Physical Data

Dimensions:

Rating	70W	100W	150W	250W	400W
Max Bulb dia (mm)	38.5	47	47	47	47
Max Overall length (mm)	154	210	210	257	285
Cap	E27/27	E40/45	E40/45	E40/45	E40/45
Bulb glass	Soft	Hard	Hard	Hard	Hard
Weight (g)	55	140	150	180	200
Operating position	Universal				
Minimum starting temperature	-40°C				

Lamp Survival and Lumen Maintenance

The graph shows the survival of representative groups of lamps operated under control condition at 10 hrs/start. Lamp life in service will be affected by a number of parameters, such as mains voltage deviations, switching cycle, luminaire design and control gear. The information given is intended to be a practical guide in determining lamp replacement schedules.

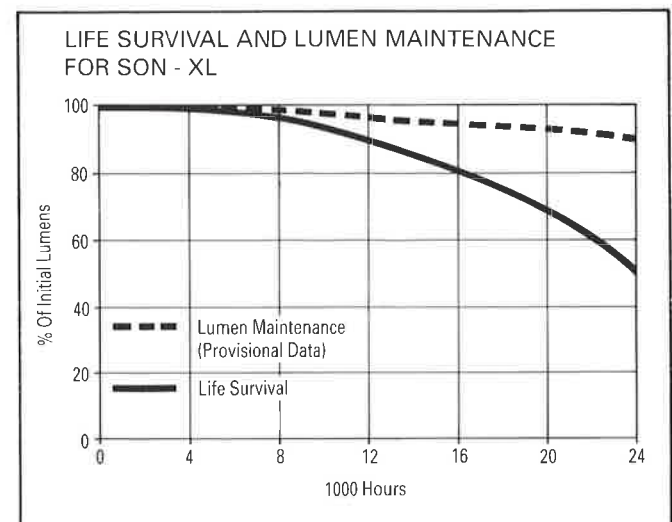
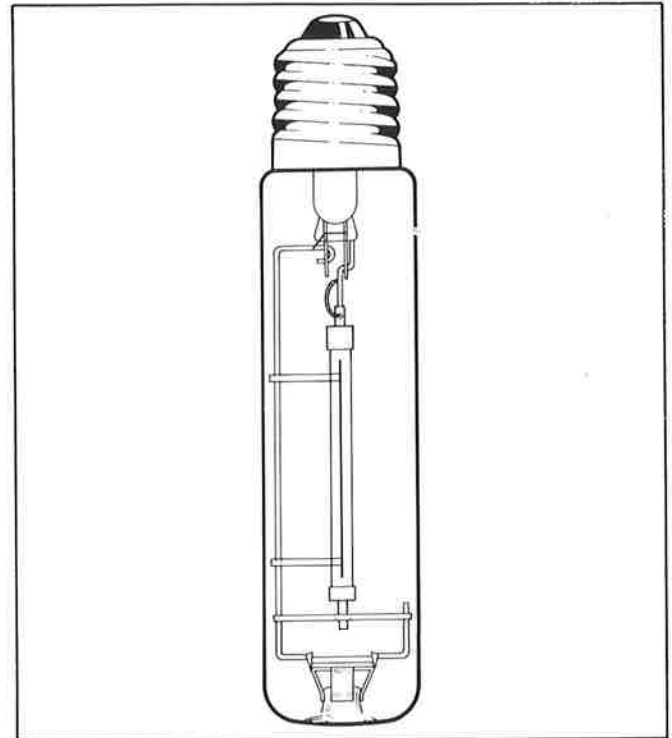
Run-up Characteristics

The graph shows typical run-up characteristics for a 150W SONXL-T lamp. Time will be affected by rating as shown in the table below:

Rating	70W	100W	150W	250W	400W
Run-up* (mins)	2.5	2.0	2.0	2.5	2.5
Hot Restrike	All ratings less than 1 minute				

*to 90% light output.

If the lamp is not re-energised within a few seconds then the re-strike period will be increased by 3-5 minutes. This is because the lamp will have cooled to a temperature at which the internal starting aid is required to re-establish the arc. This aid will not operate when the lamp is hot and the mechanism is thermally set, so the delay will vary with operating conditions.



Luminous Data

Nominal Light output (100 hours)

Rating	70W	100W	150W	250W	400W
Lumens	6500	10000	17500	33000	56500
Average luminance (cd/cm ²)	400	300	360	500	610

Colour Appearance

Chromacity co-ordinates	x 0.530
	y 0.430

Colour Temperature K

± 50K	2000
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Colour Rendering

General Colour Rendering Index	
Ra	25


Electrical Data

Rating	70W	100W	150W	250W	400W
Lamp Volts (± 15)	90	100	100	100	100
Lamp Current (A)	0.98±0.1	1.2±0.1	1.8±0.2	3.0±0.4	4.6±0.55

Supply Voltage:- In order to maximise lamp survival, lumen maintenance and colour uniformity, the supply voltage should be within variations of ±3%-±5% are permissible for short periods only.

It is important to operate SON lamps on control gear which is matched to the actual supply voltage.

The lamp is started by a high voltage pulse supplied by a separate ignitor which ceases to function once the lamp has started. External starting simplifies lamp construction and is very reliable.

ALL THORN Lighting SON lamps carry the Internationally agreed  symbol to indicate suitability for use with external ignitor circuits.

Approved ignitors for use with SONXL lamps:

	Type	Rating	Max. Cable Capacitance*
THORN	GS3434	50-70W	80pF
	G53455	100-400W	100pF

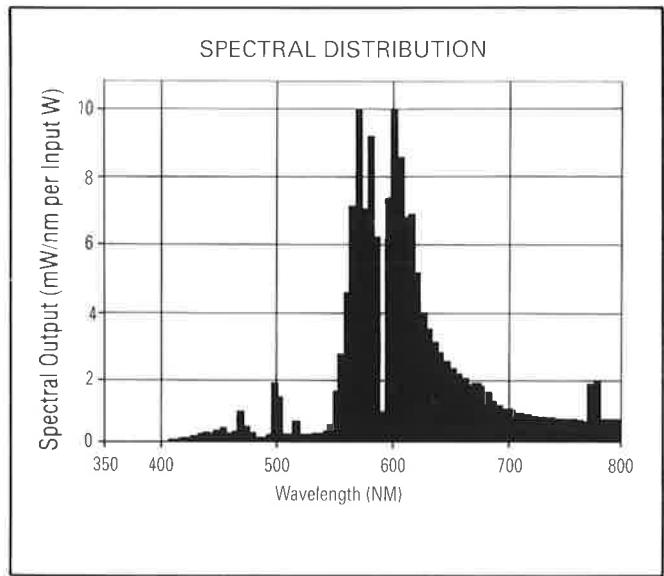
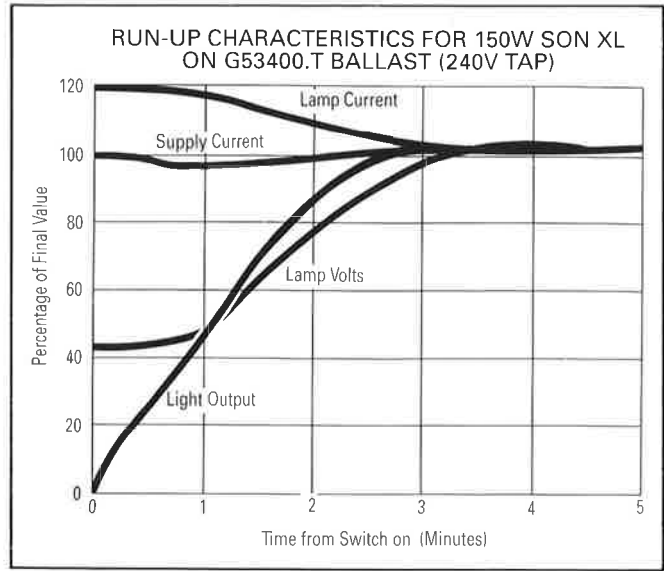
*For equivalent cable lengths refer to 'Control Gear Wallchart'.

Other ignitors can be used provided the following starting pulse requirements are met.

Lamp Rating	50-70W	100-250W	400W
Min. pulse peak height (kV)	1.8	2.8	3.5
Max. pulse peak height (kV)	2.3	4.5	4.5
Min. repetition rate	1/per half cycle	1/per cycle	1/per cycle
Min. pulse peak current (A)	0.7	1.0	1.0

Fusing

For a very short period after switch-on, a discharge lamp may act as a rectifier and as a result, the ballast may allow several times the normal circuit current to flow. To avoid fuse failures the ratings shown below should be used. For further information refer to Data Sheet 4:90.2. To prevent rectification occurring at end of life continuous operation of discharge lamps should be avoided and a switch off introduced at least once every 24 hours.



Recommended ratings for individual fusing of circuits:

Lamp rating	70W	100W	150W	250W	400W
HBC and MCB fuse rating (A)	4	4	4	10	16
Rewireable fuse rating (A)	5	5	5	5	10

Guidance for Luminaire Manufacturers

It is a characteristic of high pressure sodium lamps that there is a rise in arc voltage when run in an enclosure compared with that obtained when running in free air. It is important that for maximum life the luminaire is so designed that this arc voltage rise is limited to the value shown in the table below. It is the change in voltage that is important, not the absolute magnitude, as with all lamps there is an allowable manufacturing tolerance in their electrical characteristics (see Electrical Data). A true RMS reading instrument should be used to measure this voltage.

Rating	70W	100W	150W	250W	400W
Max. permissible rise (V)	5	7	5	10	12

Temperatures limits:

Rating	70W	100-400W
Max. bulb temperature	375°C	450°C
Max. cap temperature	210°C	250°C

Packaging

Rating	70W	100W	150W	250W	400W
Individual carton (mm)	40x40 x191	48x48 x248	48x48 x305	48x48 x330	48x48 x432
Bulk pack (mm)	265x265 x200	495x275 x210	495x275 x210	495x275 x210	495x275 x210
No. in bulk pack	25	10	10	10	10
Total weight (kg)	1.5	2.35	2.35	2.60	2.75

British and International Standards

Lamps conform to the following standards, where applicable:

IEC 662	High Pressure Sodium lamps
IEC 61-1	Lamp Caps
BS 5101	Part 1 Lamp Caps

Installation, Operation and Disposal

Important

The following information gives precautions for the safe handling, installation, use and disposal of SON lamps compliance with these instructions is essential.

Before Use

(All lamps should be installed and replaced by a competent electrician or suitably qualified person).

- (1) Isolate equipment before inserting/removing lamp. Ensure lamp is cool before touching.
- (2) Ensure that lamp is correct type for application, including operating position, voltage, wattage, cap and control gear. Incompatible equipment can damage lamp.
- (3) Lamps are made from glass and quartz which are inherently fragile and may implode if broken —protect personnel, equipment and property from lamp breakage.
- (4) Ensure correct location of lamp in lampholder. Tighten firmly but do not overtighten. Ensure lamp is not scratched or cracked before or during insertion.

During Use

- (1) Discharge lamps can take several minutes to warm up and also to restrike in the event of a momentary supply failure.
- (2) Prevent water or moisture coming into contact with lamp or shattering could occur. If the outer bulb is broken the lamp must not be operated.
- (3) In order to maximise lamp survival, lumen maintenance and colour uniformity, the supply voltage and ballast design voltage should be within $\pm 3\%$. Variations of $\pm 5\%$ are permissible for short periods only.
- (4) It is an inherent characteristic of all discharge lamps that colour may vary from lamp to lamp and that colour will change slightly with age.

Disposal

- (1) Small quantities of these lamps may be disposed of with ordinary refuse. The lamp should be placed in its original or similar packing before disposal.
- (2) Large quantities of lamps must be disposed of in accordance with the rules of the local authority.

THORN Lighting reserve the right to alter the specification without prior notice or public announcement.

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