



XB0[®] - Xenon short arc lamps

SEE THE WORLD IN A NEW LIGHT

OSRAM





Oscar-winning light show

OSRAM has set milestones in the photo-optical sector right from the early days of the electric light with the development of innovative lighting solutions. Consistent and focused development work has led to superior special lamps, frequently with a pioneering impact for the lighting sector – such as our XBO® lamps.

XBO® lamps are short arc discharge lamps on the basis of a stationary high-intensity arc discharge in pure Xenon gas and were developed by OSRAM in the 1950s.

From the beginning the application as a light source for commercial projection was dominant.

XBO® lamps gained particular popularity from about 1970 onwards when the efforts succeeded in designing lamps which could be operated also in horizontal position. As a result of this development it was possible to increase the screen brightness by about 30 %.

1949 Start of XBO® development

1952 XBO® 1000 W lamp for 35 mm projection

1954 First commercial film projection in the world: with first air cooled XBO® 1000 W lamp

1970 XBO® lamps for horizontal operation

1980 Introduction of ozone-free quartz glass OFR

1983 OSCAR

Over the past 20 years the reliability and the service life behaviour of XBO® lamps have been steadily improved by consistent development of:

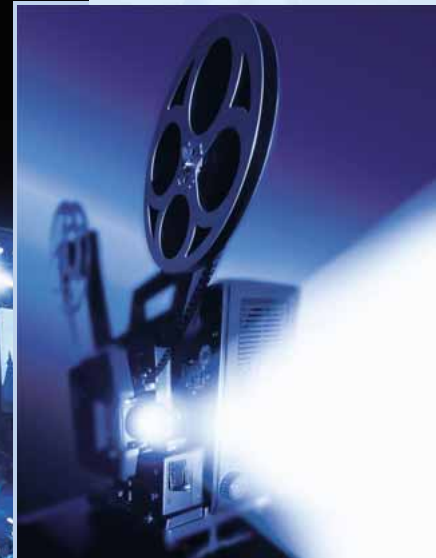
- Pre-materials (e.g. electrodes)
- Lamp components
- Production processes

Today OSRAM offers a lamp spectrum from 50 to 12000 W for all applications in the market. The main characteristics and benefits of XBO® lamps are:

- High luminance (point source)
- Daylight color temperature of approx. 6000 K
- Continuous spectrum in the visible range
- High color rendering index ($R_a > 95$)
- High arc stability
- DC operation
- Hot restart



Two OSCARS awarded by the Academy of Motion Pictures Arts and Sciences, for the development and consistent improvement of the OSRAM HMI® and XBO® lamps, which are so important and successful in the world of cinema, document in exemplary fashion their recognition worldwide.



Practical information

In this brochure you will find in compact and clear layout the most important technical data and other information on almost all XBO® lamps from OSRAM. The application in professional film projection is still the most important commercial area of use. We have not, however, included lamps of less than 250 W.

With this in mind, our small manual is meant in particular for cinema operators and film projectionists.

But also for all other users and areas of application, for example

- Architectural illumination and effects lighting
- Microscopy and medical optics
- Light measurement and solar simulation

It represents a helpful reference work on the subject of XBO® lamps.

The brochure focuses not only on the physical and lighting-technology principles of XBO® lamps but also on the practical requirements which have to be fulfilled to ensure safe and advantageous operation of the lamps.

In it you will find:

- the most important advantages
- key information about installation, electrical connection, cleaning, transport and disposal of the lamps
- a description of and possible solutions for the "most common" problems that can arise during operation
- a useful, easy-to-follow maintenance sheet

OSRAM not only sells innovative lamps, but also offers its customers and users wide-ranging technical and other service and support:

- fully, competent advice and help on the telephone
- prompt delivery of required products and information
- speedy concrete problem solving on site
- Because:
"Your show must go on!"

Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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XBO 250 W OFR ⁰⁾	69239	250	13	18	4800	530	26000	14--20	1200	–	s15	–	requ.	–	0.7x1.7	25	226	192	93	SFa16-8	SFa16-10
XBO 450 W ⁰⁰⁾	69241	450	17	25	13000	1300	35000	17--30	2000	–	s30	–	requ.	–	0.9x2.7	29	260	212	95.5	SFa20-8	SFa20-10
XBO 450 W/1	69242	450	17	25	13000	1300	45000	17--30	800	800	s100	–	requ.	requ.	0.7x2.2	29	260	212	95.5	SFa20-8	SFa20-10
XBO 450 W/2 OFR	69243	450	17	25	13000	1300	35000	17--30	2000	–	s30	–	requ.	–	0.9x2.7	29	177	–	79	SK19/36	SK19/36

1) Distance from end of base to tip of electrode (cold)

2) With vertical burning position: anode (+) on top

3) Measured in vertical burning position at rated wattage

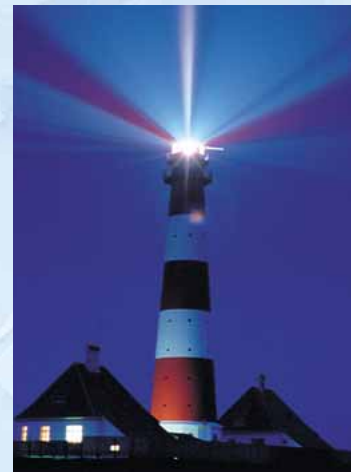
4) Design wattage

X) Also available in ozone-free version with the same data:

XBO 450 W OFR (NAED 69243)

0) Also available in Suprasil quartz version:

XBO 250 W/4, XBO 450 W/4 (NAED 69244)



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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XBO 500 W/H OFR	69257	500	17	28	14500	1450	40000	17--30	2000	2000	s30 p30	requ.	requ.	requ.	0.9x2.5	35	190	165	75	SFa16-8	SFa15-10
XBO 500 W/RC OFR	69259	420	14	30	13000	1800	260000	20--30	400	200	s120	–	requ.	requ.	0.7x0.8	25	139	134	65	Cable	SFa21-5
XBO 550 W/HTC OFR	69304	550	22	25	16000	1600	34000	17--27	600	600	s15 p15	–	requ.	requ.	0.9x3.1	25	143	129	65	Cable	SFc15-6
XBO 700 W/HS OFR	69260	700	18	37	20000	2000	40000	30--45	1500	1500	s20 p20	–	requ.	requ.	1.1x2.9	40	235	205	95	SFa27-11	SFcX27-8
XBO 700 W/HSC OFR	69131	700	18	37	20000	2000	40000	30--45	1500	1500	s20 p20	–	requ.	requ.	1.1x2.9	40	236	222	95	SK27/50	SFcX27-8

1) Distance from end of base to tip of electrode (cold)








2) With vertical burning position: anode (+) on top

3) Measured in vertical burning position at rated wattage

4) Design wattage



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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XBO 900 W OFR	69261	900	19	45	30000	3000	50000	30...53	2400	-	s30	-	-	-	1.1x3.3	40	325	277	123	SFa25-10	SFa25-12
XBO 1000 W/HS OFR	69263	1000	19	50	32000	3000	60000	30...55	2000	2000	s20 p20	-	requ.	requ.	1.1x2.8	40	235	205	95	SFa27-11	SFcX27-8
XBO 1000 W/HSC OFR	69264	1000	19	50	32000	3000	60000	30...55	2000	2000	s20 p20	-	requ.	requ.	1.1x2.8	40	236	222	95	SK27/50	SFcX27-8

C = Cable
 CA = Cable on anode base
 H = Suitable for horizontal burning position


requ. = Required W = Watt
 OFR = Ozone free
 S = Short

1) Distance from end of base to tip of electrode (cold)
 2) With vertical burning position: anode (+) on top

3) Measured in vertical burning position at rated wattage
 4) Design wattage



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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XBO 1000 W/HTP OFR	69265	1000	21	45	35000	3200	45000	30...55	2400	2400	s30 p30	requ.	-	-	1.0x4.0	46	330	277	123	SFa25-14	SFc25-14
XBO 1600 W/HS OFR	69268	1550	23	65	70000	5500	70000	50...70	2000	2000	s20 p20	-	requ.	requ.	1.0x3.2	46	235	205	95	SFa27-11	SFcX27-8
XBO 1600 W/HSC OFR	69269	1550	23	65	60000	5500	70000	50...70	2000	2000	s20 p20	-	requ.	requ.	1.0x3.2	47	236	222	95	SK27/50	SFcX27-8
XBO 1600 W OFR	69266	1600	24	65	60000	6000	65000	45...75	2400	-	s30	-	-	-	1.4x4.0	52	370	322	142.5	SFa27-10	SFa27-12
XBO 1600 W/CA OFR	69267	1600	24	65	60000	6000	65000	45...75	2400	-	s30	-	-	-	1.4x4.0	52	370	322	143	SFaX27-10	SFa27-12

C = Cable
 CA = Cable on anode base
 H = Suitable for horizontal burning position

OFR = Ozone free
 S = Short
 TP = Threaded pin

W = Watt
 requ. = Required

1) Distance from end of base to tip of electrode (cold)
 2) With vertical burning position: anode (+) on top

3) Measured in vertical burning position at rated wattage
 4) Design wattage



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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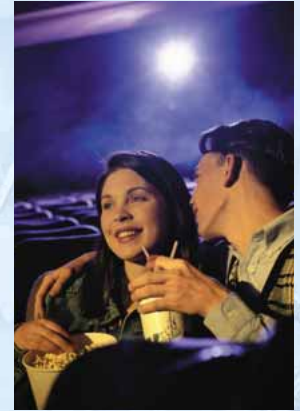
XBO 2000 W/H OFR	69258	2000	27	70	80000	7500	75000	50--85	2400	2400	s30 p30	requ.	-	-	1.3x4.8	52	370	322	142.5	SFaX27-10	SFaX27-12
XBO 2000 W/HS OFR	69270	2000	24	80	80000	7500	80000	50--85	2400	2400	s30 p30	-	requ.	requ.	1.3x4.0	60	342	302	145	SFaX27-95	SFaX27-9
XBO 2000 W/HTP OFR ⁹⁾	69247	2000	28	70	80000	7500	75000	50--85	2400	2400	s30 p30	requ.	-	-	1.3x4.8	52	375	322	142.5	SFa25-14	SFc25-14
XBO 2000 W/HTT OFR		2000	24	80	80000	7500	75000	50--85	2400	2400	s30 p30	requ.	-	-	1.3x4.8	52	370	322	142.5	SFcX25-10	SFcX25-10
XBO 2000 W/SHSC OFR ⁹⁾	69256	2000	27	70	80000	7500	80000	50--85	2000	2000	s20 p20	-	requ.	requ.	1.3x4.0	46	245	232	95	SK27/50	SFcX27-8
XBO 2500 W OFR	69248	2500	29	83	100000	9500	61000	60--95	2000	-	s30	-	-	-	1.5x6.0	60	428	382	167.5	SFaX27-13	SFaX27-14

H = Suitable for horizontal burning position
 OFR = Ozone free
 S = Short

SHSC = Super short
 TP = Threaded pin
 TT = Two threaded pins

W = Watt
 requ. = Required

- 1) Distance from end of base to tip of electrode (cold)
 2) With vertical burning position: anode (+) on top
 3) Same Dimensions as XBO 1600 W/HS OFR
 4) Measured in vertical burning position at rated wattage
 5) Design wattage
- X) Also available as XBO 2001 W/HTP OFR (NAED 69310) with 25 V at 80 A



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a [mm] ¹⁾		
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XBO 2500 W/HS OFR	69249	2500	28	90	100000	10000	80000	70--100	1500	1500	s30 p30	-	requ.	requ.	1.5x4.5	60	342	302	145	SFaX27-95	SFa27-9
XBO 3000 W/HTP OFR	69252	3000	29	100	130000	12000	85000	60--110	1500	1500	s30 p30	requ.	requ.	requ.	1.7x5.0	66	405	357	162.5	SFa27-14	SFc27-14
XBO 3000 W/H OFR	69251	3000	29	100	130000	12000	85000	60--110	1500	1500	s30 p30	requ.	requ.	requ.	1.7x5.0	66	428	382	167.5	SFaX27-13	SFaX27-14
XBO 3000 W/HS OFR	69250	3000	29	100	130000	12000	90000	60--110	1500	1500	s30 p30	-	requ.	requ.	1.7x5.0	60	342	302	145	SFaX27-95	SFa27-9
XBO 3000 W/HTC OFR		3000	29	100	130000	12000	85000	60--110	1500	1500	s30 p30	requ.	requ.	requ.	1.7x5.0	66	398	350	165	SFc28-13	SFaX28-13

H = Suitable for horizontal burning position
 OFR = Ozone free
 S = Short


TC = Thread, cable
 TP = Threaded pin

W = Watt
 requ. = Required

- 1) Distance from end of base to tip of electrode (cold)
 2) With vertical burning position: anode (+) on top
 3) Measured in vertical burning position at rated wattage
 4) Design wattage



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a ¹⁾ [mm]		
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XBO 3600 W/HTM OFR	69126	3600	28	120	160000	16000	85000	80--130	1000	1000	s15 p15	-	requ.	requ.	1.9x6.0	60	412	362	165	SFc28-13	SFc28-13
XBO 3600 W/HTC OFR		3600	28	120	160000	16000	85000	80--130	1000	1000	s15 p15	-	requ.	requ.	1.9x6.0	60	412	362	165	SFa28-14 ³⁾	SFc28-13
XBO 4000 W	69253	4000	32	120	180000	19000	70000	80--140	1000	-	s15	-	requ.	-	2.0x7.5	60	432	384	176	SFa30-18	SFa30-20
XBO 4000 W/HS OFR	69254	4000	29	135	155000	17000	90000	80--150	1000	1000	s20 p20	-	requ.	requ.	1.9x6.0	70	410	370	171	SFaX30-9.5	SFa30-7.9
XBO 4000 W/HTP OFR	69296	4000	30	130	155000	16000	90000	100--140	1000	1000	s20 p20	-	requ.	requ.	1.9x6.0	70	433	382	167.5	SFa27-14	SFc27-14
XBO 4000 W/HSA OFR		4000	29	135	160000	17000	105000	80--150	1000	1000	s20 p20	-	requ.	requ.	1.8x5.6	70	410	370	171	SFaX30-9.5	SFa30-7.9
XBO 4200 W/CA OFR ⁴⁾	69294	4200	29	140	190000	20000	100000	80--160	1000	-	s15	-	requ.	-	2.1x6.0	70	428	382	167.5	SFaX27-13	SFaX27-14

CA = Cable on anode base H = Suitable for horizontal burning position S = Short TP = Threaded pin

GS = Gap short

OFR = Ozone free

SA = Short arc

W = Watt

requ. = Required

1) Distance from end of base to tip of electrode (cold)

2) With vertical burning position: anode (+) on top

3) Base with axial cable (560 mm)








4) Also available as XBO 4200 W/GS with 60 mm bulb diameter and 500 h life

5) Measured in vertical burning position at rated wattage

6) Design wattage



Lamp reference

NAED	W ⁴⁾	V	A	lm ³⁾	cd ³⁾	cd/cm ² ³⁾	A	t[h]	t[h]						d [mm]	l1 max. [mm]	l2 max. [mm]	a ¹⁾ [mm]		
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XBO 5000 W/H OFR		5000	34	140	225000	27000	95000	100--150	1000	1000	s15 p15	requ.	requ.	requ.	2.2x6.5	70	433	382	167.5	SFaX30-16	SFa28-18
XBO 5000 W/HBM OFR		5000	34	140	225000	27000	95000	100--150	1000	1000	s15 p15	requ.	requ.	requ.	2.2x6.5	70	436	393	170.5	SFaX30-9.5	SFa30-7.9
		5000	34	140	225000	27000	95000	100--150	1000	1000	s15 p15	requ.	requ.	requ.	2.2x6.5	70	433	382	165	SFa27-14	SFc27-14
XBO 6000 W/HS OFR		6000	37	160	280000	40000	105000	110--165	600	600	s15 p15	requ.	requ.	requ.	2.0x7.5	78	433	393	170.5	SFaX30-9.5	SFa30-7.9
XBO 6000 W/HTP OFR		6000	37	160	280000	40000	105000	110--165	600	600	s15 p15	requ.	requ.	requ.	2.0x7.5	78	433	384	165	SFa30-14	SFc30-14
XBO 6500 W	69298	6500	40	160	325000	32000	95000	80--160	500	-	s10	-	requ.	requ.	2.3x9.0	60	483	434	200	SFa30-20	SFa30-22
XBO 7000 W/HS OFR	69295	7000	42	160	350000	35000	100000	110--165	500	500	s15 p15	requ.	requ.	requ.	2.6x10.0	78	433	393	170.5	SFaX30-9.5	SFa30-7.9
XBO 7000 W/HS OFR	?	7000	42	160	350000	35000	100000	110--165	500	500	s15 p15	requ.	requ.	requ.	2.6x7.5	78	433	393	170.5	SFaX30-9.5	SFa30-7.9
XBO 8000 W/HS OFR		8000	45	175	360000	40000	110000	110--180	500	500	s15 p15	requ.	requ.	requ.	2.3x10.5	90	433	393	170.5	SFaX30-9.5	SFa30-7.9
XBO 10000 W/HS OFR	69297	10000	50	195	500000	47500	90000	160--210	500	500	s15 p15	requ.	requ.	requ.	2.3x12.0	90	433	393	170.5	SFa30-9.5	SFa30-7.9
XBO 12000 W OFR		12000	56	205	550000	50000	90000	180--210	300	300	s115	requ.	requ.	requ.	2.6x14.0	90	483	434	200	SFa30-9.5	SFa30-15/110

BM = Base modified H = Suitable for horizontal burning position W = Watt

C = Cable

OFR = Ozone free

requ. = Required

S = Short

1) Distance from end of base to tip of electrode (cold)

2) With vertical burning position: anode (+) on top

3) Measured in vertical burning position at rated wattage

4) Design wattage

Safety:

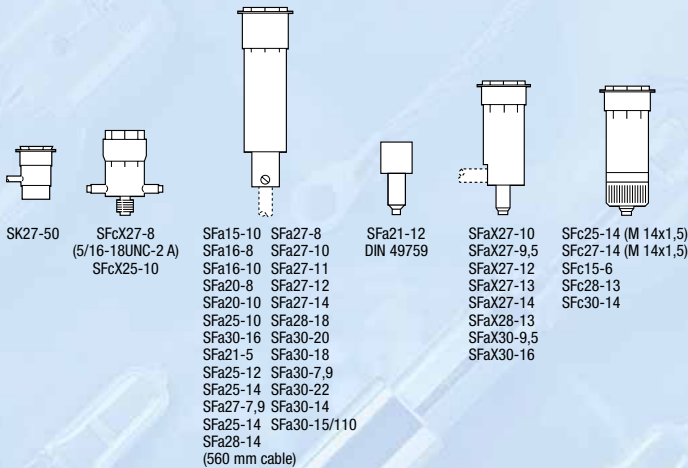
Because of their high luminance, UV radiation and internal pressure in both the hot and cold state, XBO® lamps may only be operated in enclosed lamp casings specially constructed for the purpose. Always use the safety boxes supplied when handling XBO® lamps. When handling the lamps without their safety boxes, always wear safety goggles, a face mask and gauntlets with wrist protectors. XBO® lamps with the OFR suffix do not generate any ozone during operation. Lamps with standard or Suprasil quartz emit intense UV radiation and produce ozone in the surrounding air.

Literature:

For further information on XBO® lamps and notes for manufacturers of control gear, please refer to the following publications, available on request from OSRAM:

- Guidelines for control gear and igniters XENON Short Arc Lamps Photo Optics
- Technology and applications, XBO® theatre lamps
- Manufacturers of control gear and igniters for special discharge lamps
- Magnetic stabilisation for XENON Short Arc Lamps
- Problems and Solutions

Bases



Symbols

Current (Ampere)	Luminous flux (Lumen)	Average/service life (hours)
Lamp voltage (Volt)	Luminous area w x h (mm)	Average/service life (hours) (Burning position horizontal)
Wattage (Watt)	Diameter d (mm)	Average/service life (hours) (Burning position vertical)
Watt or Ampere	Distance a (mm)	Burning position
Type of current	Length l ₁ max. (mm)	Forced cooling horizontal
Current control range	Length l ₂ max. (mm)	Forced cooling vertical
Luminous intensity (Candela)	Base anode	Magnetic arc stabilization
Average luminance	Base cathode	NAED Code

Handling of OSRAM XBO® lamps

Mechanical Installation

XBO lamps are extremely reliable and robust. But they are still made of quartz and need to be handled accordingly – in other words they must be protected against shock, impact and excessive force.

Certain precautions must therefore be observed when handling them:

- All XBO lamps are supplied in a safety cover. This protects users from possible spontaneous or induced bursting of the lamp. You should handle lamps only with safety cover. Store this safety cover for use during the removal of the lamp at the end of its service life.
- You should wear leather gloves covering the arteries and veins of your wrists and protective goggles or complete face protection covering the arteries and veins of your neck, such as a transparent plastic mask. See safety instruction send with every lamp.
- For some types of lamp the safety cover acts as a tool for fitting the cathode end of the lamp into its holder.
- Under no circumstances must force be exerted on the lamp during installation: For example, screwing in the cathode base by holding and turning the lamp at its anode base is grossly negligent.
- The lamp may only be clamped in position at one end, in order to allow for expansion and distortion of the housing. Small (short) lamps can be left free and unsupported at the other end. Larger (longer) lamps must have a soft, flexible support. It should support the lamp but allow unrestricted expansion, including expansion perpendicular to the lamp axis.
- Lamps may only be stored if suspended freely from their bases inside their safety covers. Leaving them to roll around unprotected on a desk or shelf can result in microcracks in the surface of the quartz glass, and burst lamps later on.
- If the lamp is inadvertently operated inside its safety cover, the sleeve will melt within a few seconds and the lamp will be unusable.
- When removing lamps, the reverse procedure must be followed: first put the safety cover or some protection around the lamp, then remove the lamp.

Electrical Connection

Similar precautions must be observed for connecting XBO lamps electrically as for handling them mechanically:

- Lamps without a cable connection often have their “loose” end connected to the supply unit with a gripping device. In these cases the gripping device must be fastened first, and only then can the lamp be fixed in its permanent connection, even if this is somewhat complicated. Otherwise there is a risk of unintentionally exerting strong bending forces on the lamp and it may break.
- The lamp must be connected electrically by means of the base components provided for this purpose, for example the base pins or cables. Under no circumstances must the cable be cut and the power supply connection passed through the base sleeve. This can result in a circuit which is not permissible and may result in destruction of the lamp.
- Connecting surfaces must be clean and offer the maximum contact area. In cases of doubt, it is better to recondition or preferably replace the contacts rather than risk lamp failure due to corroded and overheated contacts.
- In most cases good electrical contact is synonymous with good thermal contact to dissipate the heat produced by the lamp. Nickel or chromeplated brass or bronze are the main materials used; other metals such as aluminium are unsuitable.
- Care must be taken to ensure that the lamp is connected with correct polarity; the positive pole of the rectifier must be connected to the base marked “+”, the negative pole to the base marked “-”. Incorrect polarity results in total lamp failure within a few seconds.

Handling of OSRAM XBO® lamps

Cleaning the Lamp

XBO lamps may only be held by the base. If the quartz bulb or the shafts should ever be inadvertently touched with bare fingers (which should never happen, because unprotected lamps should only be handled with leather gloves), the fingerprints must be removed immediately. A lint-free cloth moistened with spirit is best for this, after which the lamp should be rubbed dry, taking care not to scratch the quartz glass surface. Damage to the quartz may cause the lamp to break during later operation.

If fingerprints are not removed they burn into the quartz glass surface where they act as a seed

for ever-expanding recrystallization of the quartz. This causes the quartz to lose its strength and increases the risk of bursting.

Transport

XBO lamps are supplied packed in printed cardboard boxes for shelf storage and in an outer transport packaging. Inside the transport packaging the shelf packaging is freely suspended and mechanically cushioned; in this condition lamps can be sent by mail without any problem.

Most lamps will break if transported in the shelf packaging only.

XBO lamps withstand the stresses of transport best if they are sent individually in a vertical position. Their resistance to sudden shock is about ten times greater along the lamp axis than perpendicularly to it.

If XBO lamp housings have to be transported, the lamps – especially highwattage lamps – should be removed and transported separately in their original packaging.

Disposal

Burnt-out XBO® lamps can either be returned to the manufacturer for appropriate disposal by methods consistent with modern recycling or they can be destroyed by the user.

Prior to destruction the lamps must be wrapped in a strong, coarse cloth, observing all the precautions given in the section "Mechanical Installation" and broken with a hammer.

The Xenon gas that escapes is not poisonous and returns to the atmosphere. The remains of the lamp can then be disposed of as normal rubbish.

Problems and Solutions

There are a number of reasons why a lamp may not give satisfactory performance. The following may help you to locate and correct the more common problems that can cause failure, and ensure longer life for the replacement lamp.

Symptom



Connector base discoloured



Blackening or clouding of quartz bulb



Severe cathode electrode damage, grey/brown deposits on quartz envelope



Abnormal anode electrode deterioration, blackening of lamp



Deposits on anode front



Asymmetrical blackening of lamp (horizontal burning position)

Fault

Connector base overheated, above 230°C, due to:

- Faulty electrical connection
- Improper lamp cooling
- Optical system out of alignment
- Improper operating current

Operational air infiltration due to:

- Crack in graded seal typically caused by overheated connector base; maximum temperature of 230°C exceeded

Reversed polarity due to:

- Electrical feed incorrectly supplied to lamp
- Faulty wiring

Arc instability due to:

- Lamp operated outside current control range
- Lamp operated with poor quality operational current
- Improper magnetic stabilization
- Improper forced cooling

Rectifier/power supply defect

- Run up current limit exceeded
- High current ripple

- Improper magnetic stabilization
- Lamp service life exceeded
- Lamp operated above current control range

Remedy

Check electrical connections:

- Tighten or renew
- Check cooling system
- Check/adjust optical system
- Check operating current

Ensure proper operational current, as noted for overheated base.

- Check electrical connections:
- Tighten or renew
 - Check cooling system
 - Check/adjust optical system
 - Check operating current

- Check polarity, transpose connections if necessary
- Lamp anode must always be on top if lamp is used in vertical burning position

- Check correct current setting
- Check magnetic stabilization
- Ensure proper quality current
- Ensure forced cooling as required by OSRAM

Check

- Rectifier/power supply
- Run up current
- Current ripple

- Readjustment of magnetic field
- Check hour meter
- Correct current setting



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