

Xenon Lamp

for Cinema Projector

Xenon Lamp for Cinema Projector Operation Manual



USHIO

Xenon Lamp for Cinema Projector Operation Manual

Please read this manual carefully to learn about correct and safe usage of the lamp. Keep this manual on hand for future reference whenever needed.

Contents

1. Introduction

- 1-1 Structure, Functions, and Material Components
- 1-2 Lamp Appearance Standards
(for general xenon lamps for cinema projectors, excluding water-cooled lamps)

2. Handling Steps and Precautions

- 2-1 Transporting
- 2-2 Removing from the individual packaging box
- 2-3 Installation
- 2-4 Igniting
- 2-5 Removal
- 2-6 Storing
- 2-7 Actions to take in the event of bursting or damage
- 2-8 Disposal
- 2-9 Sending back a deficient lamp

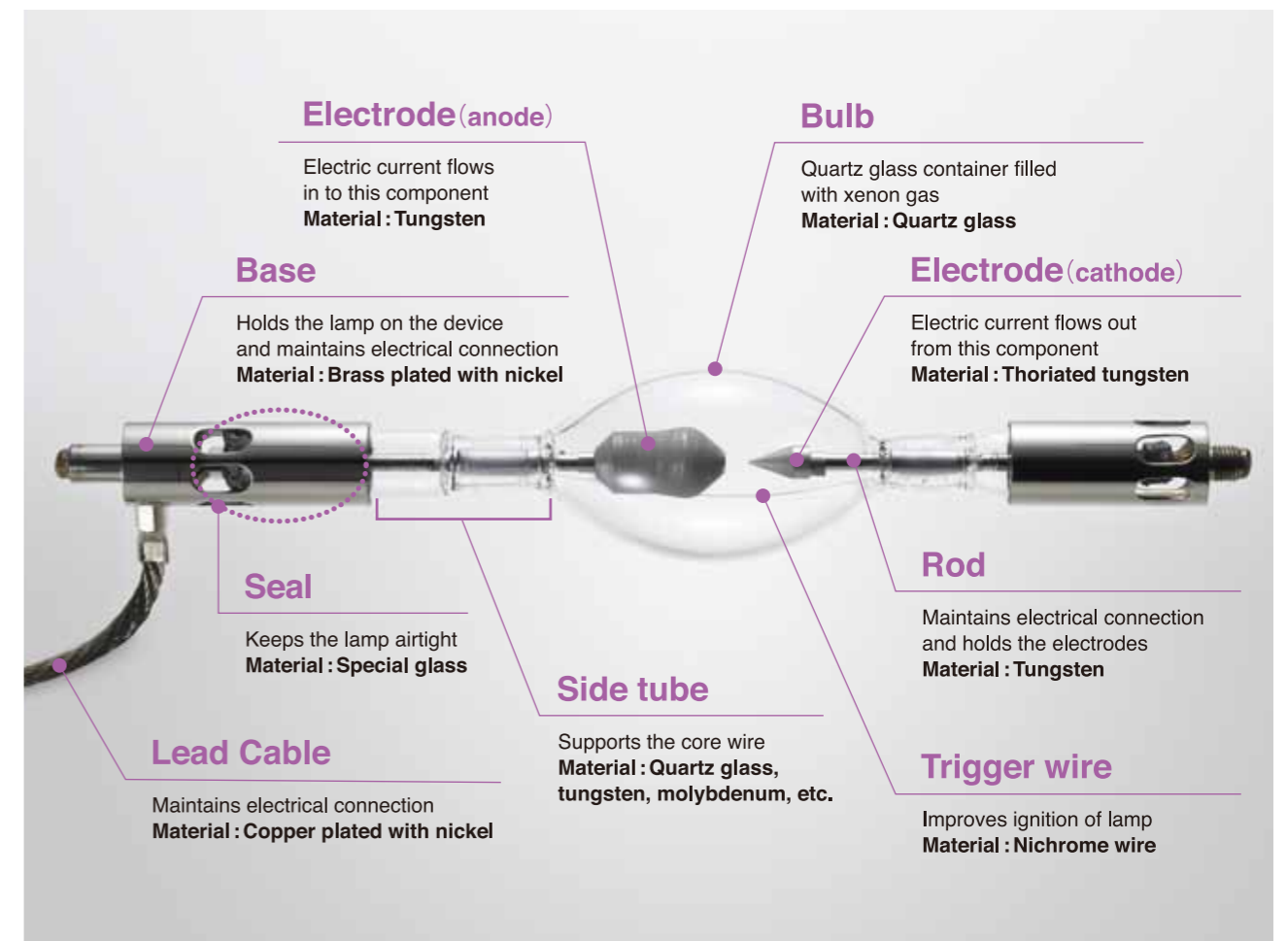
3. Preventing Lamp Trouble

- 3-1 Use of compatible lamps
- 3-2 Lamp setting
- 3-3 Lamp optical axis adjustment
- 3-4 Turn off during interludes

4. Troubleshooting

1-1 Structure, Functions, and Material Components

This section describes the lamp's structure, the functions of its components and their primary materials in order to sort by material at the time of disposal. Some lamps may contain specialized materials. If you have any questions, please contact your sales agent.



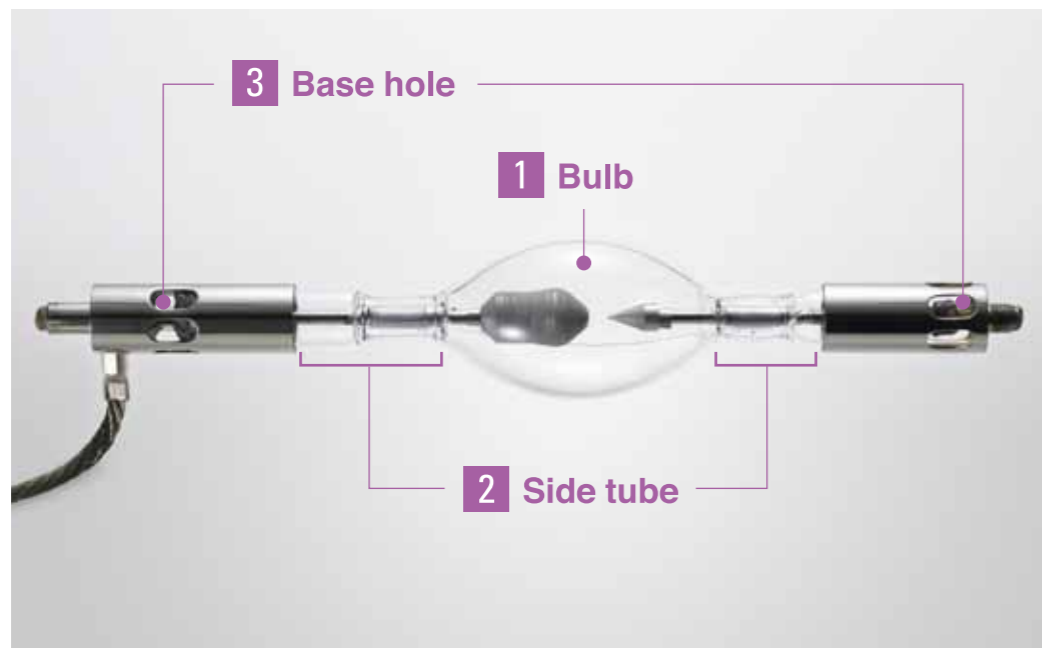
1 Introduction

1-2 Lamp Appearance Standards

(for general xenon lamps for cinema projectors, excluding water-cooled lamps)

The following standards are set for the lamp's appearance at the time of shipment since we regard appearance as one of the product's primary quality features. Prior to shipment, lamps are inspected based on these standards to ensure your worry-free usage of the product.

※ Bubbles, foreign particles or stripes within the limits set by the appearance standards below will have no adverse impact on the lamp's characteristics.



1 Bulb

Bubbles in the bulb

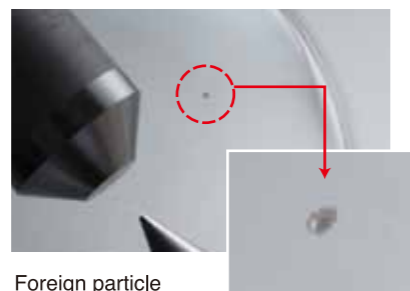
Standard : Size
 $d \leq \phi 1.8\text{mm}$ Acceptable
 $\phi 1.8\text{mm} < d$ Unacceptable



Bubbles in the glass
 ※ Bubbles are enclosed in the glass and have no impact on quality.

Foreign particles adhering to the bulb

Standard : Size
 $d \leq \phi 6.0\text{mm}$ Acceptable
 $\phi 6.0\text{mm} < d$ Unacceptable



Foreign particle adhering to the bulb
 ※ Some materials, etc. used in the lamp may adhere to the bulb during the manufacturing process, but have no impact on quality.

Stripes on the bulb

Standard : Length
 $d \leq 25.0\text{mm}$ Acceptable
 $25.0\text{mm} < L$ Unacceptable



Bubbles or adhered foreign particles with a stripe-like appearance
 ※ These have no impact on quality.

2 Side tube

Bubbles in the side tube

Standard : Size
 $d \leq \phi 1.8\text{mm}$ Acceptable
 $\phi 1.8\text{mm} < d$ Unacceptable



Bubbles in the glass
 ※ Bubbles are enclosed in the glass, but have no impact on quality.

Foreign particles adhering to the side tube

Standard : Size
 $d \leq \phi 8.0\text{mm}$ Acceptable
 $\phi 8.0\text{mm} < d$ Unacceptable



Foreign particle attached on the bulb
 ※ Some materials, etc. used in the lamp may adhere to the side bulb during the manufacturing process, but have no impact on quality.

Stripes on the side tube

Bubbles or adhered foreign particles with a stripe-like appearance

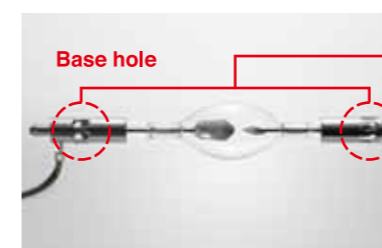
Standard : Length
 $d \leq 25.0\text{mm}$ Acceptable
 $25.0\text{mm} < L$ Unacceptable

Stripes like those shown below, however, have no impact on quality.

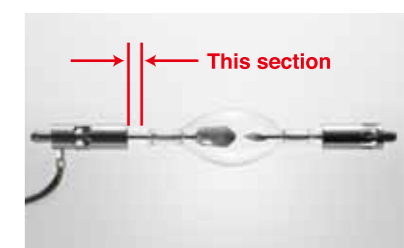


3 Base hole

Protruding adhesive ※ Protrusions like those shown below have no impact on quality.



Adhesive is seen from the base hole



Adhesive is over the edge of the base

2 Handling Steps and Precautions

Introduction

- ❑ This lamp is a glass product filled with high-pressure xenon gas. Impact or friction may cause the lamp to break or burst. Carefully observe the following instructions to ensure your own safety and for satisfactory usage of the product. If the lamp is subject to impact due to a fall or other such action, for safety, stop using it and contact your sales agent.
- ❑ If any scratches or cracks occur on the surface of the bulb when handling the lamp, immediately stop using it since continued use could cause bursting and/or other problems.
- ❑ Failure to observe the steps and precautions for handling may result in accident, injury and other events described below.
 - (1) If the lamp breaks or bursts, airborne glass shards could cause injury.
 - (2) Not observing the precautions could cause the lamp to break or burst, or its life could be shortened.
 - (3) Directly looking at the burning lamp may cause eye pain and/or visual impairment.
 - (4) Direct contact with the skin may cause skin irritation.
 - (5) Installing or removing the lamp without switching off the projector may cause electric shock.
 - (6) Igniting non-ozone-free lamps without sufficient ventilation may cause headaches, nausea, dizziness and/or other problems.
 - (7) Physical contact with the lamp before it sufficiently cools down will cause burns.
 - (8) Setting paper, cloth or any other flammable objects closely to a lamp that has not sufficiently cooled may cause fire.
 - (9) Use of the lamp in flammable environments with gasoline, sprays containing flammable substances, thinner, lacquer, dust or similar materials may cause fire or explosion.

2-1 Transporting

■ Transporting by hand

This lamp, new or used, is a glass product filled with high-pressure xenon gas. It may burst even when it is not burning. When transporting it by hand, be sure to cover it with the specialized protective sheet and cover or put it in the specialized individual packaging box. (Based on the specifications, your lamp may not have come with a specialized protective sheet.)



Specialized individual packaging box
Specialized protective cover

Specialized protective sheet

❌ Incorrect
Always insert the special protective cover and protective sheet.



■ Transporting on a truck or trolley

- ① Use the specialized protective sheet, protective cover and individual packaging box* then place it in the specialized transport box (or equivalent outer box) making sure that the lamp's cathode (smaller) electrode is on the side of the packaging box marked UP. The lamp anode is very heavy. If the anode side is placed at the top, the anode will shift from the center line due to its weight, which may terminally damage the lamp. Accordingly, always place the anode at the bottom when transporting the lamp. You can avoid damage to the lamp due to the weight of the anode by placing the cathode on the side with the UP mark. (Based on the specifications, your lamp may not have come with a specialized protective sheet.)



Specialized transport box
(outer box)

* Please note that the specialized protective sheet, protective cover and individual packaging box may be subject to design change without prior notice.



Place the cathode on the side with the UP mark.
Use the markings on the individual packaging box as guides.

- ② Hold the individual packaging boxes with the UP mark at the top, and insert vertically into the special transportation box (or equivalent outer box). If there are any gaps in the special transportation box (or equivalent outer box), fill the gaps with cushioning material.



UP mark at the top, and insert vertically.



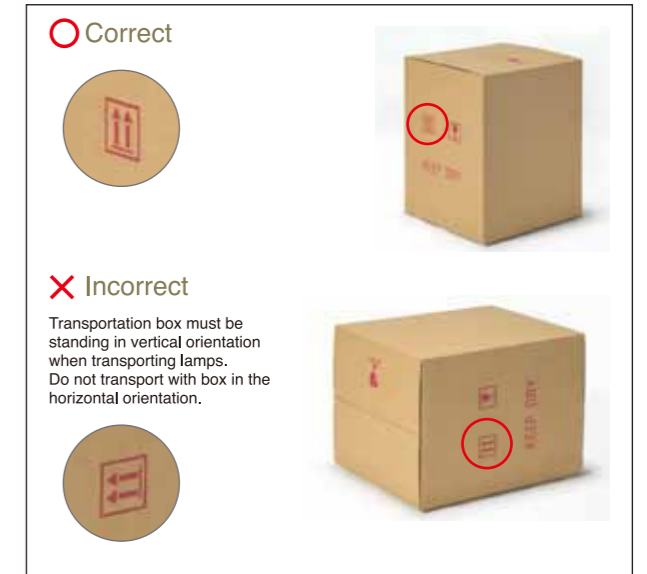
Insert sufficient cushioning material so that the lamps cannot move.

Do not transport lamps lying horizontally.



The UP marks for all lamps must be pointing up.

- ③ Check that the UP mark on the transport box (or equivalent outer box) is on the same side as the individual packaging box. Be careful to avoid turning the box upside down.



- ④ Do not throw or drop the box containing the lamp. Be careful not to use a trolley without cushioning and avoid transport on rough road surfaces for long periods.

2 Handling Steps and Precautions

2-2 Removing from the individual packaging box

■ Precautions when removing

- ① When handling the lamp, always wear a protective mask, gloves, and clothing to protect your face and neck. If the lamp breaks, there is a risk of injury.
- ② This lamp is a glass product filled with high-pressure xenon gas. Avoid bumping, scratching or applying any excessive force.
- ③ Do not subject the lamp to vibration or impact.
- ④ Do not twist, bend or apply other such force to the lamp.
- ⑤ Do not use the lamp in flammable environments with gasoline, sprays containing flammable substances, thinner, lacquer, dust or similar.
- ⑥ Even from a height of only a few centimeters, dropping the lamp could cause damage. Be especially careful that you avoid dropping it. If it is subject to a fall, for safety, stop using it.



■ Removing from the individual packaging box

- ① Open the front side of the individual packaging box.



- ② Grasp the protective sleeves at the left and right ends of the lamp, and pull the lamp up and out.



- ③ Remove the protective sleeves from the left and right ends of the lamp.



※ If storing a lamp in the individual packaging box, insert the lamp in the reverse order of removal.

2-3 Installation

- ◎ Check that the projector is switched off before installing the lamp.
- ◎ When handling the lamp, always wear a protective mask, gloves, and clothing to protect your face and neck. If the lamp breaks, there is a risk of injury.
- ◎ For details about installing the lamp, refer to the manual from the projector manufacturer.

- ① When handling the lamp, always wear a protective mask, gloves, and clothing to protect your face and neck. If the lamp breaks, there is a risk of injury.
- ② When installing, be especially careful that you keep the lead cable from touching the bulb or mirror. Ensure that the lead cable will never come in contact with any metallic part around it.
- ③ Be especially careful that you keep the bulb from touching the mirror, cooling nozzle or other projector components and do not twist, bend or apply other force to the lamp when installing it.
- ④ Install the lamp in a manner that ensures that the lead cable does not touch the mirror, cooling nozzle or other projector components and that the lead is not subject to any tension.
- ⑤ Fix the lamp terminals at the designated positions on the projector securely enough to prevent moving.
- ⑥ Check that the electrical connections have no rust, burns or discoloration; then securely make the connections.
- ⑦ Make sure not to leave the special protective sheet and protective cover inside the projector unit. Also, remove the special protective sheet (special protective sheet may not be included, depending on the lamp specification).

2-4 Igniting

- ① Before turning on the lamp, check that the lamp model number matches the projector lamp setting (the projector automatically adjusts the lamp lighting conditions. For details about selecting a projector lamp, refer to the manual from the projector manufacturer).
- ② When the lamp is lit, do not look into the projector lens or into the front panel of the projector. The intense light can cause blurred vision or eye pain.
- ③ Ushio digital cinema lamps are specified ozone-free.
- ④ Lamps that are lit continuously for extended periods may undergo premature flickering due to the sustained load placed on the lamp. Continued use of lamps that are flickering may lead to lamp failure and should not be used.
- ⑤ Set and light the lamp according to the instructions in the manual from the projector manufacturer.

2-5 Removal

- ◎ For the procedure and precautions when removing the lamp from the projector, refer to the manual from the projector manufacturer.
- ◎ Used lamps are fragile and the risk of breakage is high, so use extreme care when removing lamps.
- ◎ Do not attempt to remove the lamp from a projector immediately after the lamp is turned off. The lamp is extremely hot when it is turned off, and may cause burns. At a minimum, do not remove the lamp until the projector cooling time has elapsed. For details about cooling times, refer to the manual from the projector manufacturer.

- ① When handling the lamp, always wear a protective mask, gloves, and clothing to protect your face and neck. If the lamp breaks, there is a risk of injury.
- ② When removing the lamp from the projector, be especially careful that you keep the bulb from touching the mirror, cooling nozzle or other projector components. Be sure no twisting or other force is applied to the lamp when removing it.
- ③ When removing the lamp, be especially careful that you keep the lead cable from touching the bulb or mirror.
- ④ After removing the lamp, be sure to cover it with the specialized protective sheet and cover or put it in the specialized individual packaging box. (Based on the specifications, your lamp may not have come with a specialized protective sheet.)
- ⑤ Be sure that the lamp's cathode (smaller) electrode is on the side of the packaging box marked UP.

2-6 Storing

- ① Whether the lamp is new or used, use the specialized protective sheet and cover or specialized individual packaging box for storage. (Based on the specifications, your lamp may not have come with a specialized protective sheet.)

○ Correct



✗ Incorrect

Always attach the special protective sheet and protective cover to the lamp.



- ② Store the lamp in the specialized transport box (or equivalent outer box). To store it in the packaging box, place it in a horizontal position to prevent it from falling over.

※ Lamps stored in an upright position could fall over and break.
 ※ For information about transporting the lamp, see "2-1 Transporting."



When placing the lamp in the special transportation box, make sure that the UP mark on the individual packaging box is at the top.

○ Correct



✗ Incorrect

If inserted upside down, the lamp may fall when it is turned on.



2 Handling Steps and Precautions

2-7 Actions to take in the event of bursting or damage

- ① If the lamp bursts or is damaged while burning, switch off its main power supply and turn off the breaker.
- ② For any action taken after bursting or damage, wear a protective mask, protective gauntlets and a thick, long-sleeved garment.
- ③ If the lamp is damaged or ruptured, make sure the lamp housing has sufficiently cooled before working with the lamp.
- ④ If possible, take photos of the lamp after bursting or damage to understand its condition. This information will help investigation into the cause.
- ⑤ Collect all lamp debris, as far as is possible, remaining inside the projector, place it in the special individual packaging box, and return the lamp to the sales agent. The collected lamp debris is used when investigating the cause of the lamp failure. Take care not to injure yourself when collecting the lamp debris.
- ⑥ Make sure there are no pieces of glass remaining inside the projector. If replacing with a new lamp, any glass shards may be picked up by the cooling air flow and strike the lamp, potentially causing the lamp to rupture.

2-8 Disposal

High-pressure xenon gas is sealed within the lamp. When disposing of the lamp, always break the glass to release the gas before disposing of the lamp. If the lamp is disposed without breaking the glass, the lamp could explode in the waste disposal facility, and may cause an injury.

2-9 Sending back a defective lamp

- ◎ If any defect is found, please contact your sales agent. Do not dispose of your lamp immediately since you may be asked to send it back.
- ◎ When contacting your sales agent, fill in the "Warranty Claim Form" provided with the lamp or provide an equivalent report.

■ Sending back a defective lamp

Cover the lamp with the specialized protective sheet and cover and put it in the specialized individual packaging box in the same state as when it was delivered. (Based on the specifications, your lamp may not have come with a specialized protective sheet.)

Be sure that the lamp's cathode (smaller) electrode is on the side of the packaging box marked UP.

Hold the individual packaging boxes with the UP mark at the top, and insert vertically into the special transportation box (or equivalent outer box). If there are any gaps in the special transportation box (or equivalent outer box), fill the gaps with cushioning material.

※ For more about transporting the lamp, see page 4, section 2-1.

3 Preventing Lamp Trouble

3-1 Use of compatible lamps

Use lamps that are compatible with the projector.

Ushio digital cinema lamps employ a design optimized for individual projectors, and the brightness and life performance of the lamp is maximized when used in compatible projectors. The use of lamps not designed for use in the projector may cause reduced brightness, flickering, shortened working life, or even failure.

The projector manufacturer certifies which lamps can be used with the projector.

If a lamp that has not been certified is used or the specified lamp has been modified without permission, it may lead to major damage, loss, or safety problems. Accordingly, always use certified lamps.

3-2 Lamp setting

Select the lamp model on the front panel that matches the lamp installed in the projector.

If a lamp model is selected that is different from the actual installed lamp, the permitted electrical characteristic ranges may be exceeded when the lamp is turned on, leading to reduced brightness, flickering, shortened working life, or even lamp failure.

3-3 Lamp optical axis adjustment

When replacing the lamp, adjust the optical axis.

When replacing a lamp, adjust the optical axis to obtain the appropriate brightness.

The brightness may not be maximized depending on the position of the lamp when it is replaced.

In addition, the electrodes are slowly consumed as the lamp running time progresses, causing the optical axis to shift. The decrease in brightness that occurs over an extended period of lamp use may be reduced by adjusting the optical axis again.

3-4 Turn off during interludes

During interludes of use, turn the lamp off.

Continuous lighting of a lamp for an extended period places a sustained load on the lamp, causing wear of the electrode tips, reduced brightness, flickering, shortened working life, or even failure. When the lamp is turned on, a large startup current flows into the lamp. Restarting the lamp at moderate frequency has the effect of refreshing the shape of the electrode tips.

Turning the lamp off for short periods increases the working life of the lamp, in comparison to a lamp that is lit continuously. You can extend the life of the lamp by turning the lamp off for short periods of five minutes or longer.

However, note that if the lamp is only turned on for a short length of time due to repeated switching of the lamp on/off, this may shorten the working life of the lamp.

3 Troubleshooting

The flowchart below explains related problems if failure occurs when using the lamp, along with the corresponding methods for troubleshooting.

	Problem or phenomenon	Cause	Action
Failure to ignite	Bulb is discolored	Gas leak	Contact your sales agent. Even minor vibration or impact can break the lamp, causing gas to leak from the damaged part. Handle it with extreme care. Pay attention to cooling, electric current and voltage for operation, since high lamp temperatures could damage the specialized glass near the base and result in gas leakage.
		Operation in reverse polarity	Contact your sales agent. Operation in reverse polarity, with the anode and cathode electrodes set backward, renders the lamp inoperable.
	Base, lead or terminal is discolored	Incorrect installation	Check if the connector is loose.
		Incorrect cooling	Check for faults with the cooling.
		Operation with electric current or voltage beyond the specified limit	Check the lamp setting on the projector. Operation outside the specified range may shorten the working life of the lamp.
		Rust, burn or discoloration of the connector	Check if the connector has rust, burns, discoloration or other abnormalities as these can cause the lamp to not ignite.
		Exposure of the base or lead to focused light	Check if the lamp is installed in the correct position. Installing in an incorrect position oxidizes the base or lead due to exposure to focused light and cause the lamp to not ignite.
	Lead or other wiring of the conductive parts is close to other metallic parts	Leak of high voltage	Keep the lead at a distance of at least 50 mm from surrounding metallic parts.
	Lamp is in operation under low input condition	Low level of electric current when starting	The lamp may not turn on if the startup current is too low. Check the lamp setting on the projector.
	Problem other than those listed above	—	Contact your sales agent.
Inadequate starting brilliance	Bulb is discolored	Gas leak	Contact your sales agent. Even minor vibration or impact can break the lamp, causing gas to leak from the damaged part. Handle it with extreme care. Pay attention to cooling, electric current and voltage for operation, since high lamp temperatures could damage the specialized glass near the base and result in gas leakage.
		Operation in reverse polarity	Contact your sales agent. Operation in reverse polarity, with the anode and cathode electrodes set backward, renders the lamp inoperable.
		The lamp is used with electric current or voltage outside of the specified range.	Check the lamp setting on the projector. Operation outside the specified range may cause inadequate brightness.
	Bulb is not discolored (no abnormality in appearance is seen)	Improper optical adjustment	Check that the lamp position has not shifted and that the optical axis is adjusted properly. If the optical axis adjustment is not correct, it may cause inadequate brightness.
		Reflector deterioration	Check for any problems with the reflector.
Problem other than those listed above	—	Contact your sales agent.	

	Problem or phenomenon	Cause	Action
Early decline of brilliance	Bulb is discolored	Gas leak	Contact your sales agent. Even minor vibration or impact can break the lamp, causing gas to leak from the damaged part. Handle it with extreme care. Pay attention to cooling, electric current and voltage for operation, since high lamp temperatures could damage the specialized glass near the base and result in gas leakage.
		The lamp is used with electric current or voltage outside of the specified range.	Check if the electric current and voltage are within their specified ranges. Operation outside those ranges results in decreased brilliance.
		Short burning time per session due to frequently switching the lamp on and off	Short burning time per session due to frequently switching the lamp on and off makes the electrode tips more prone to wear and tear and causes decreased brilliance.
		Lamp is not turned off during short interludes	The electrode tips are more prone to wear and may cause inadequate brightness. It is recommended that the lamp be turned off during short interludes.
		Lamp is burning under variable electric current and voltage conditions	Operation under variable electric current and voltage conditions makes the electrode tips more prone to wear and tear and causes decreased brilliance.
		Incorrect cooling	Check for faults with the cooling.
	Bulb is not discolored (no abnormality in appearance is seen)	Lamp current variation is large	If the current variation (current ripple) is large, the electrode tips are more prone to wear and may cause inadequate brightness.
		Improper optical adjustment	Check that the lamp position has not shifted and that the optical axis is adjusted properly. If the optical axis adjustment is not correct, it may cause inadequate brightness.
	Problem other than those listed above	Reflector deterioration	Check for any problems with the reflector.
		—	Contact your sales agent.
Burst or breakage	Lamp bursts while it is burning	—	Collect as many shards as possible in order to analyze the cause, and contact your sales agent. For details on actions to address the burst, see page 7, section 2-8.
	Lamp arrived broken	Breakage due to vibration and impact in transit	Contact the carrier and check if the lamp was properly packed when you received it. For proper packing, see page 4, section 2-1.
Loose base	Base is loose	Twisting, bending or other force was applied.	Be careful not to twist, bend or apply other force when installing the lamp.
		Problem other than those listed above	Contact your sales agent.

3 Troubleshooting

The flowchart below explains related problems if failure occurs when using the lamp, along with the corresponding methods for troubleshooting.

Problem or phenomenon	Cause	Action
Flickering	The lamp is used with electric current or voltage outside of the specified range.	Check the lamp setting on the projector. Operation outside those ranges causes flickering.
	Short burning time per session due to frequently switching the lamp on and off	Short burning time per session due to frequently switching the lamp on and off makes the electrode tips more prone to wear and tear and causes flickering.
	Lamp is not turned off during short interludes	The electrode tips are more prone to wear and may cause the lamp to flicker. It is recommended that the lamp be turned off during short interludes.
	Lamp is burning under variable electric current and voltage conditions	Operation under variable electric current and voltage conditions makes the electrode tips more prone to wear and tear and causes flickering.
	Incorrect cooling	Check for faults with the cooling.
	Improper optical adjustment	Readjust the optics. Incorrect optical adjustment may cause flickering due to convection of the xenon gas in the bulb.
	Lamp current variation is large	If the current variation (current ripple) is large, the electrode tips are more prone to wear and may cause the lamp to flicker.
	Problem other than those listed above	Contact your sales agent.
Base, lead or terminal is discolored	Incorrect installation	Check if the connector is loose.
	Incorrect cooling	Check for faults with the cooling.
	Operation with electric current or voltage beyond the specified limit	Check the lamp setting on the projector. Operation outside the specified range may cause discoloring of the metal base and lead wire.
	Rust, burn or discoloration of the connector	Check if the connector has rust, burns, discoloration or other abnormalities as these can cause the lamp to not ignite.
	Exposure of the base or lead to focused light	Check if the lamp is installed in the correct position. Installing in an incorrect position oxidizes or discolors the base or lead due to exposure to focused light.

Problem or phenomenon	Cause	Action
Bulb is discolored	Gas leak	Contact your sales agent. Even minor vibration or impact can break the lamp, causing gas to leak from the damaged part. Handle it with extreme care. Pay attention to cooling, electric current and voltage for operation, since high lamp temperatures could damage the specialized glass near the base and result in gas leakage.
	The lamp is used with electric current or voltage outside of the specified range.	Check the lamp setting on the projector. Operation outside the specified range may cause discoloring of the bulb.
	Short burning time per session due to frequently switching the lamp on and off	Short burning time per session due to frequently switching the lamp on and off makes the electrode tips more prone to wear and tear and causes bulb discoloration.
	Lamp is not turned off during short interludes	The electrode tips are more prone to wear and may cause discoloring of the bulb. It is recommended that the lamp be turned off during short interludes.
	Lamp is burning under variable electric current and voltage conditions	Operation under variable electric current and voltage conditions makes the electrode tips more prone to wear and tear and causes bulb discoloration.
	Incorrect cooling	Check for faults with the cooling.
	Lamp current variation is large	If the current variation (current ripple) is large, the electrode tips are more prone to wear and may cause discoloring of the bulb.

※ If the same problem or phenomenon repeatedly occurs with the same projector, the projector may be faulty. Contact the dealer from which you purchased the projector.