DEUTERIUM LAMPS

L2D2 LAMPS

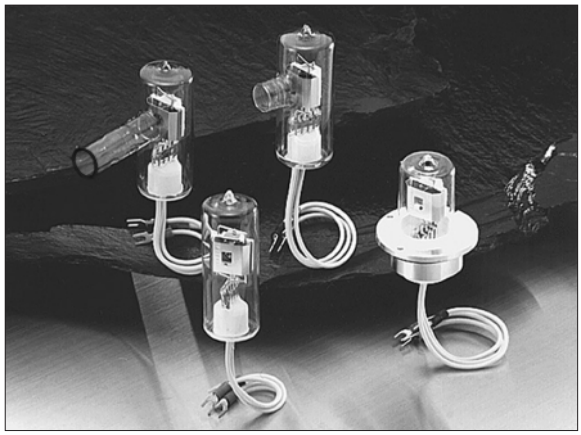
HAMAMATSU

PHOTON IS OUR BUSINESS

L2D2 LAMPS

Long Life Deuterium Lamps

The L2D2 lamps are deuterium lamps specifically developed for analytical instruments.
These L2D2 lamps offer excellent features essential for light sources in analytical instruments such as long service life, high stability and high output.



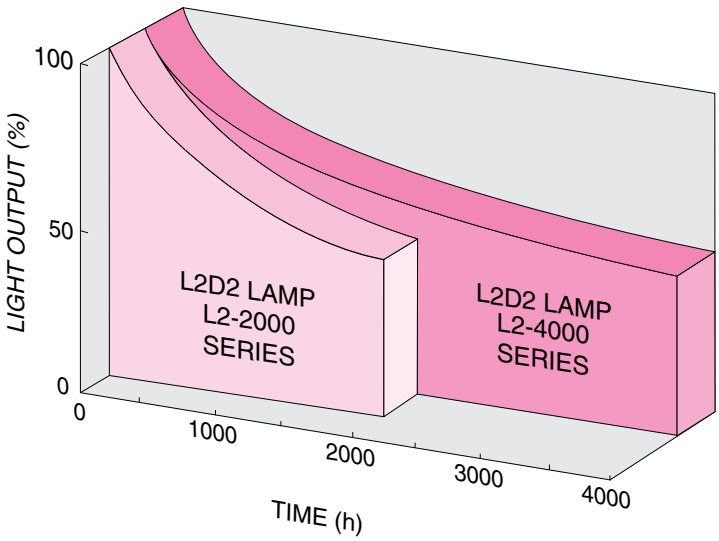
TLSOF0138

APPLICATIONS

- **HPLC (High Performance Liquid Chromatography)**
- **UV-VIS Spectrophotometer**
- **CE (Capillary Electrophoresis)**
- **Atomic Absorption Spectrophotometer**
- **Thin Layer Chromatography**
- **Film Thickness Gauge**
- **Photoionization Light Source**
- **Semiconductor Testing Equipment**
- **Water Quality, Air Pollution and Other Environmental Analyzer**
- **UV Resistance Evaluation of Materials**
- **Static Electricity Removal by Vacuum UV Light**

LONG LIFE : 4000 HOURS

■ Life Characteristics

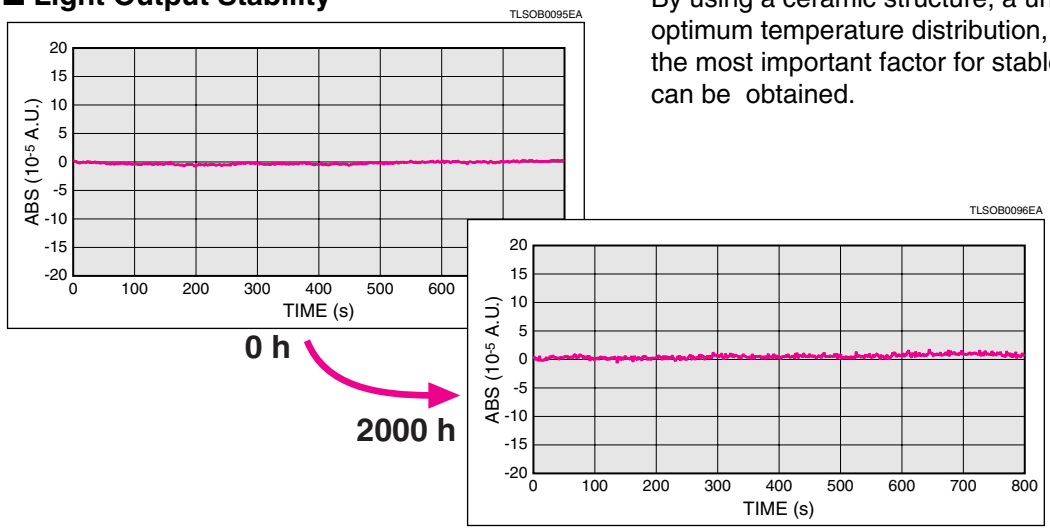


TLSOB0050EB

The L2-4000 series lamps assure an operating life of 4000 hours. This is the longest operating life of any deuterium lamp.

HIGH STABILITY : Fluctuation 0.005 % (p-p) Typ. (Equivalent to 2 × 10^{-5} A.U.) Drift ±0.3 %/h

■ Light Output Stability



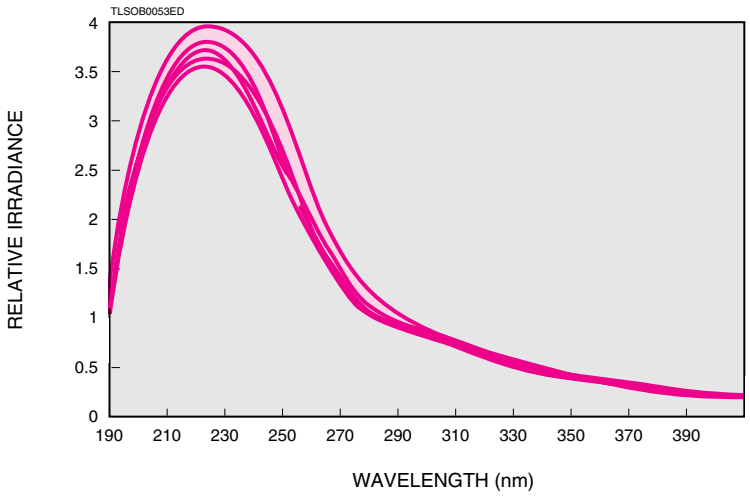
By using a ceramic structure, a uniform and optimum temperature distribution, which are the most important factor for stable operation, can be obtained.

EXCELLENT TEMPERATURE CHARACTERISTICS

Use of a ceramic structure with excellent thermal stability ensures stable lamp operation even in the presence of ambient temperature variations.

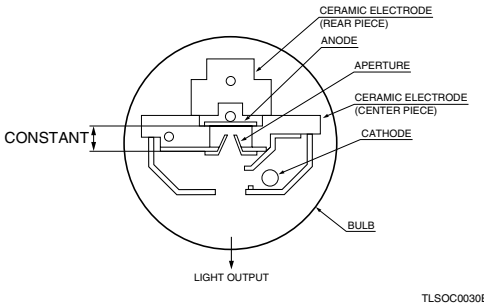
SMALL INTENSITY VARIATIONS

■ Intensity Variation



Ceramic electrodes ensure a fixed distance between each electrode. This precise spacing minimizes variation in output light intensity from one lamp to another.

Construction



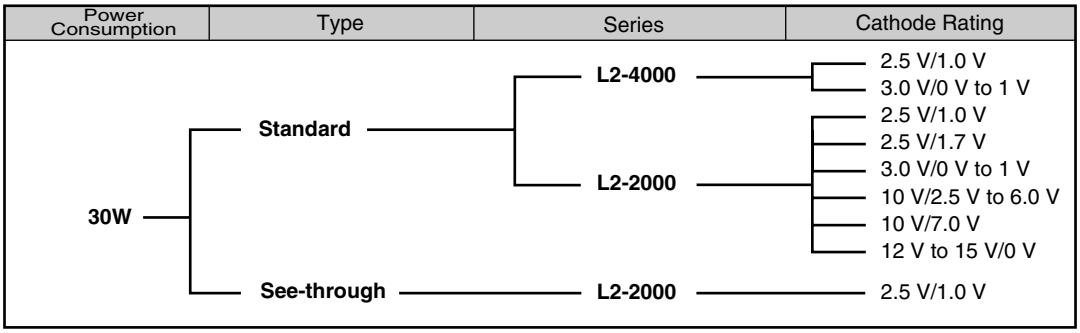
TLSOC0030EB

LESS MOVEMENT OF ARC EMISSION POINT

Since the ceramic structure has a small thermal expansion coefficient, there is virtually no movement of the arc emission point during operation.

SPECIFICATIONS

SELECTION GUIDE



SPECIFICATIONS

STANDARD TYPE

Series	Type No.	Ⓐ Dimensional Outline	Window Material	Spectral Distribution (nm)	Ⓑ Aperture Diameter (mm)	Output Stability at 230 nm: Drift Max. (%/ h)	Output Stability at 230 nm: Fluctuation (p-p) Typ. (%)	Ⓒ Guaranteed Life at 230 nm (h)	Ⓓ Required Discharge Starting Voltage Max. (V dc)	Anode Current (mA dc)	Tube Voltage Typ. (V dc)
L2-4000	L6565	❶	UV glass	185 to 400	1.0	±0.3	0.005	4000	350	300±30	80
	L6566	❷									
L2-2000	L6301	❶	UV glass	185 to 400	0.5	±0.3	0.005	2000	400	300±30	80
	L6301-50	❾									
	L6303	❶									
	L6305	❷									
	L6307	❸									
	L6309	❸									
	L7296	❺	Synthetic silica	160 to 400							
	L7296-50	❼									
	L6311	❹	UV glass	185 to 400							
	L6311-50	❽									
	L7292	❻	MgF_2	115 to 400	1.0	—	—	2000 Ⓔ	350		
	L7293	❻									
	L7293-50	❿									

SEE-THROUGH TYPE

Series	Type No.	Ⓐ Dimensional Outline	Window Material	Spectral Distribution (nm)	Ⓑ Aperture Diameter (mm)	Output Stability at 230 nm: Drift Max. (%/ h)	Output Stability at 230 nm: Fluctuation (p-p) Typ. (%)	Ⓒ Guaranteed Life at 230 nm (h)	Ⓓ Required Discharge Starting Voltage Max. (V dc)	Anode Current (mA dc)	Tube Voltage Typ. (V dc)
L2-2000	L6999	❶	UV glass	185 to 400	0.5	±0.3	0.005	2000	400	300±30	80
	L6999-50	❾									
	L9030	❺	Synthetic silica	160 to 400							
	L9030-50	❼									

NOTE: ⒶSee pages 5 and 6.

Ⓑ Lamps with a 0.5 mm aperture provide 1.4 times higher radiant intensity than lamps with a 1.0 mm aperture. (See page 8.)

Ⓒ Lamp life end is defined as the point when light output at 230 nm falls to 50 % of its initial value or when output fluctuation exceeds 0.05 % (p-p).

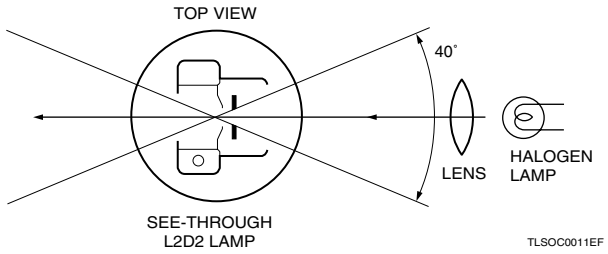
Ⓓ A pulse voltage higher than this value must be supplied to start reliable lamp discharge. (See Figure 5 on page 9.)

Ⓔ Operating life may differ depending on environmental operating conditions (vacuum atmosphere). It is recommended that these lamps be used in an oil-free environment.

SEE-THROUGH TYPE

The see-through type electrode structure enables straight-line arrangement of the halogen lamp, deuterium lamp, optical system and optical passage. This simplifies optical design of UV-VIS spectrophotometer etc., and eliminates loss of light amount caused by the half mirror.

An Example for optics of See-through type



Filament Ratings					Applicable Power Supply ⓘ		Lamp House	Type No.
Warm-up			Operating		AC Input Type	DC Input Type		
Voltage Ⓕ (V dc, ac)	Current Typ. (A dc, ac)	Time Min. (s)	Voltage (V dc)	Current Typ. (A dc)				
2.5±0.25	4	20	1.0±0.1	1.8	C9598-2510	M9596-2510	—	L6565
3.0±0.3	5		0 to 1	0 to 1.8	C9598-3000	M9596-3000		L6566
2.5±0.25	4	20	1.0±0.1	1.8	C9598-2510	M9596-2510	—	L6301
							E9522	L6301-50
			1.7±0.2	3.3	C9598-2517	M9596-2517	—	L6303
3.0±0.3	5		0 to 1	0 to 1.8	C9598-3000	M9596-3000		L6305
10±1	0.8		2.5 to 6.0Ⓖ	0.3 to 0.6	C9598-1035	M9596-1035		L6307
	1.2		7.0±0.5	1	C9598-1070	M9596-1070		L6309
								L7296
							E9558	L7296-50
12 to 15	0.5 to 0.55		0 Ⓗ	0 Ⓗ	C9598-1555	M9596-1555	—	L6311
								L6311-50
10±1	0.8		2.5 to 6.0Ⓖ	0.3 to 0.6	C9598-1035	M9596-1035		L7292
2.5±0.25	4		1.0±0.1	1.8	C9598-2510	M9596-2510		L7293
								L7293-50

Filament Ratings					Applicable Power Supply ⓘ		Lamp House	Type No.
Warm-up			Operating		AC Input Type	DC Input Type		
Voltage Ⓕ (V dc, ac)	Current Typ. (A dc, ac)	Time Min. (s)	Voltage (V dc)	Current Typ. (A dc)				
2.5±0.25	4	20	1.0±0.1	1.8	C9598-2510	M9596-2510	—	L6999
								L6999-50
								L9030
								L9030-50

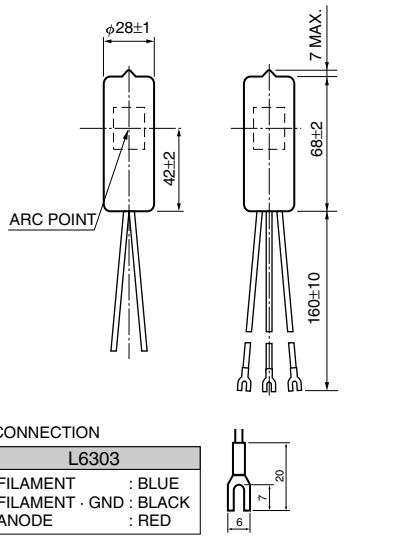
NOTE: Ⓕ The heater current during pre-heating is extremely high, so if the cable between the lamp and power supply is too long, the voltage supplied to the lamp will be too low due to a voltage drop in the cable.
The power supply for the heater should be designed to supply the specified voltage at the lamp input terminal.
Ⓖ Recommended operating voltage is 3.5 V ± 0.5 V.
Ⓗ During lamp operation a discharge current flows into the filament so no external power supply is needed to maintain the filament temperature.
ⓘ We recommend using Hamamatsu dedicated power supplies in order to obtain full performance from our deuterium lamps. (See pages 7 and 9.)

DIMENSIONAL OUTLINES

(Unit : mm)

❶ L6301, L6565, L6303, L6999

See-through Type



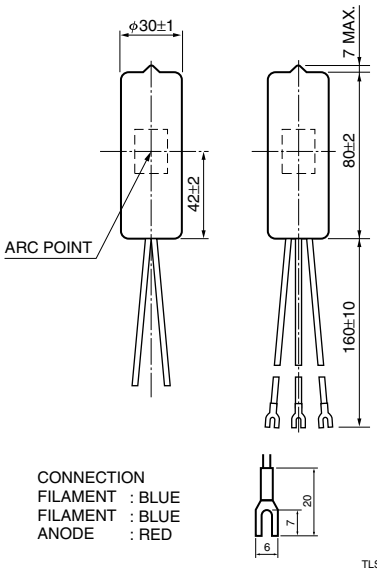
CONNECTION

L6303	
FILAMENT	: BLUE
FILAMENT · GND	: BLACK
ANODE	: RED

L6301, L6565, L6999	
FILAMENT	: BLUE
FILAMENT	: BLUE
ANODE	: RED

TLSOA0040ED

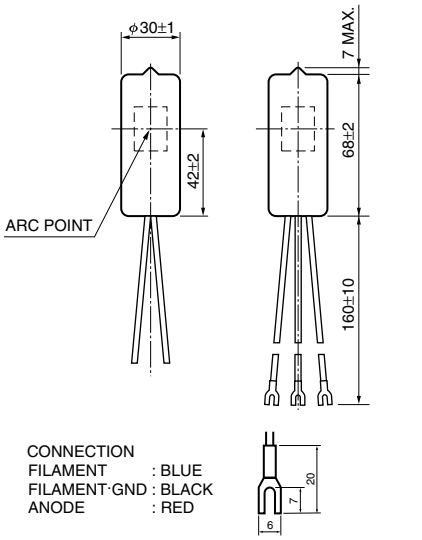
❷ L6305, L6566



CONNECTION
FILAMENT : BLUE
FILAMENT : BLUE
ANODE : RED

TLSOA0041EE

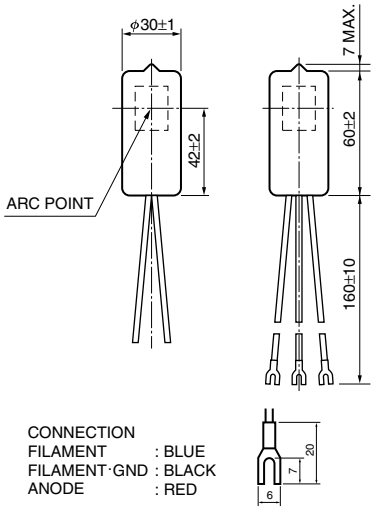
❸ L6307, L6309



CONNECTION
FILAMENT : BLUE
FILAMENT·GND : BLACK
ANODE : RED

TLSOA0018EF

❹ L6311

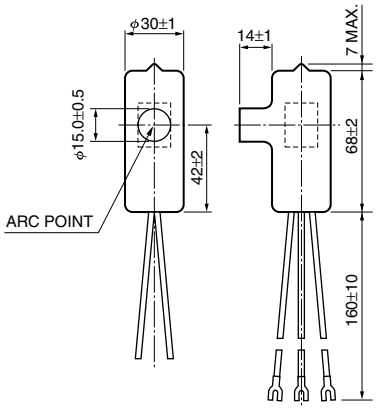


CONNECTION
FILAMENT : BLUE
FILAMENT·GND : BLACK
ANODE : RED

TLSOA0039EF

❺ L7296, L9030

See-through Type



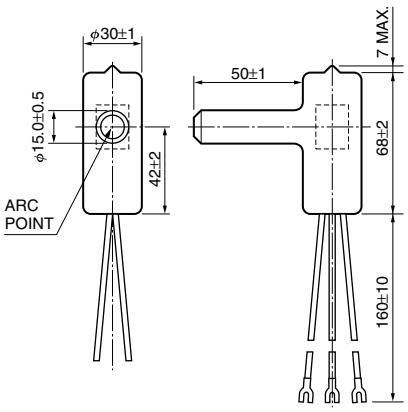
CONNECTION

L7296	
FILAMENT	: BLUE
FILAMENT·GND	: BLACK
ANODE	: RED

L9030	
FILAMENT	: BLUE
FILAMENT	: BLUE
ANODE	: RED

TLSOA0017EG

❻ L7292, L7293



CONNECTION

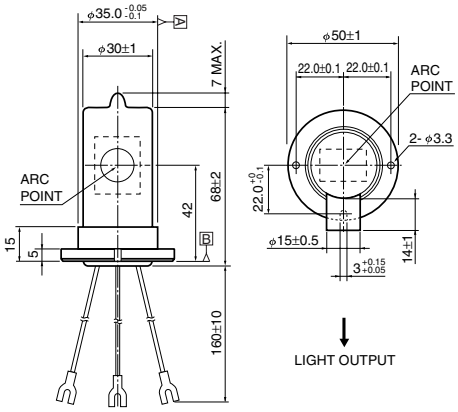
L7292	
FILAMENT	: BLUE
FILAMENT·GND	: BLACK
ANODE	: RED

L7293	
FILAMENT	: BLUE
FILAMENT	: BLUE
ANODE	: RED

TLSOA0011EE

See-through Type

⑦ L7296-50, L9030-50



CONNECTION

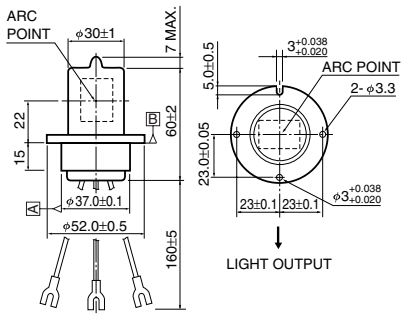
L7296-50	
FILAMENT	: BLUE
FILAMENT-GND	: BLACK
ANODE	: RED

L9030-50	
FILAMENT	: BLUE
FILAMENT	: BLUE
ANODE	: RED

Tolerance of emitting point (center)
With respect to axial line A: ±0.1
With respect to plane B: ±0.1

TLSOA0075EE

⑧ L6311-50



CONNECTION

FILAMENT	: BLUE
FILAMENT-GND	: BLACK
ANODE	: RED

Tolerance of emitting point (center)
With respect to axial line A: ±0.1
With respect to plane B: ±0.1

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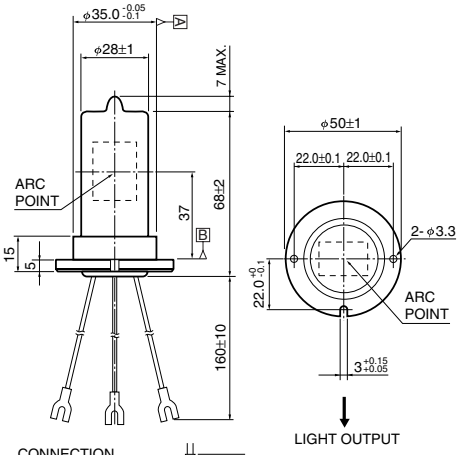
See-through Type

⑨ L6301-50, L6999-50



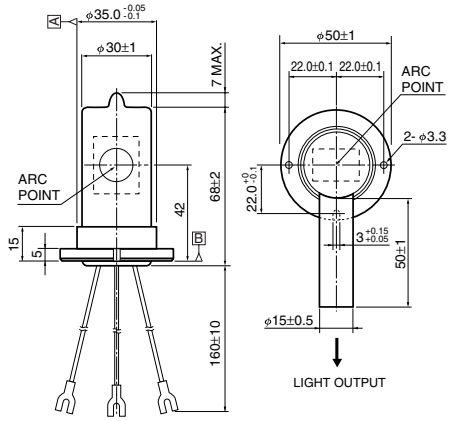
CONNECTION

FILAMENT:	BLUE
FILAMENT:	BLUE
ANODE	: RED

Tolerance of emitting point (center)
With respect to axial line A: ±0.1
With respect to plane B: ±0.1

TLSOA0051ED

⑩ L7293-50



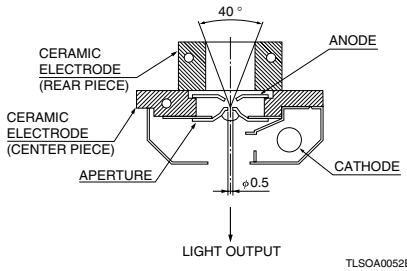
CONNECTION

FILAMENT:	BLUE
FILAMENT:	BLUE
ANODE	: RED

Tolerance of emitting point (center)
With respect to axial line A: ±0.1
With respect to plane B: ±0.1

TLSOA0088EC

Cross section of see-through type



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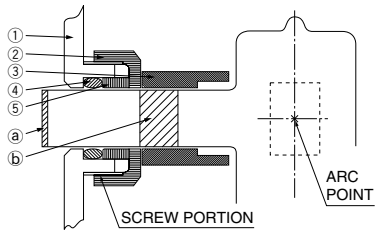
Mounting example on the vacuum system (L7292, L7293, L7293-50)

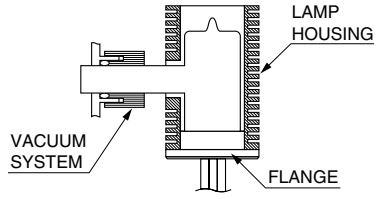


①VACUUM SIDE FLANGE
②TIGHTENING SCREW
③STOPPER
④O-RING (JIS B2401)
CALL No. V15
(15 mm I.D.
4 mm WIDTH)
⑤SPACER
ⓐMgF_2 WINDOW
ⓑGRADED SEAL

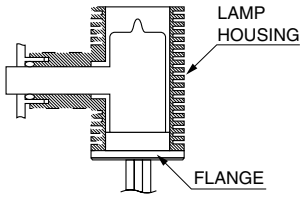
TLSOC0010EB

Precaution for use L7293-50

GOOD SEPARATED TYPE



BAD UNIFIED TYPE

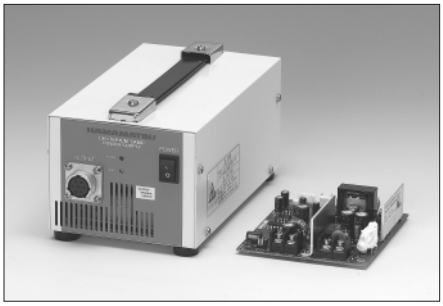


When the flange of L7293-50 is used as purpose of lamp cooling, vacuum system part should be separated from the lamp housing part. If vacuum system part is unified to lamp housing part and the lamp flange is fixed to the lamp housing, it may induce broken of lamp snout part.

TLSOC0045EA

POWER SUPPLY

Applications using L2D2 lamps require a very stable light output, so using a Hamamatsu dedicated power supply is recommended to operate these lamps. Our dedicated power supplies use a constant-current circuit and constant-voltage circuit that deliver stable and reliable lamp ignition.
Two types of power supplies are available: AC input (100 V to 240 V) type C9598 and 24 V dc input type M9596. Please select the power supply that matches your application.



Left: C9598, Right: M9596

SPECIFICATIONS (Characteristics are measured at 25 °C ± 1 °C after 30 min of warming up.)

Parameter			C9598	M9596	Unit
Input	Input Voltage		AC100 V to AC240 V (100 V/200 V Auto Switching) Single Phase 50 Hz/60 Hz	DC24 V ± DC2.4 V	—
	Input Current (Max.)		0.9	2	A
Output	Output Voltage (DC)	With Load (Typ.)	80		V
		Without Load (Min.)	200		V
	Output Current (DC)		300 ± 30		mA
	Current Fluctuation (p-p) (Typ.)		0.005		%
	Current Drift at +25 °C (Typ.)		±0.02		%/h
	Warm-up Time		Approx. 20		s
	Trigger Voltage		Approx. 600		V peak
Cooling Method			—	0.3 m^3/min of Forced Air Cooling	—
Operation Ambient Temperature			0 to +40		°C
Storage Temperature			-10 to +60		°C
Operating and Storage Humidity			Below 80 (No condensation)		%
Weight			Approx. 1.8	Approx. 0.18	kg
Conformance Standards		EN (CE Marking)	Yes	Yes	—
		UL (File No. E249677)	No	Yes	—

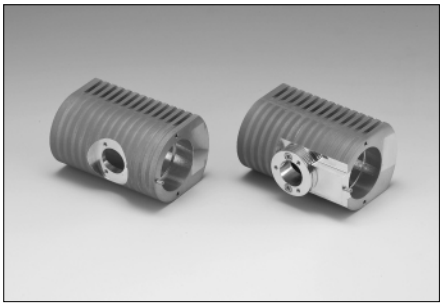
FILAMENT RATINGS

Type No.	Warm-up		Operation		Applicable Lamps
	Voltage (V dc)	Current (A dc) (Typ.)	Voltage (V dc)	Current (A dc) (Typ.)	
C9598/M9596-2510	2.5 ± 0.2	4	1 ± 0.1	1.8	L6565, L7293, L6999, L6999-50, L7293-50 L6301, L6301-50, L9030, L9030-50
C9598/M9596-2517	2.5 ± 0.2	4	1.7 ± 0.2	3.3	L6303
C9598/M9596-3000	3 ± 0.2	5	0	0	L6566, L6305
C9598/M9596-1035	10 ± 0.5	0.8	3.5 ± 0.2	0.3	L6307, L7292
C9598/M9596-1070	10 ± 0.5	1.2	7 ± 0.4	1	L7296, L6309, L7296-50
C9598/M9596-1555	13.5 ± 0.7	0.5	5.25 ± 0.25	0.3	L6311, L6311-50

LAMP HOUSING

These lamp housings are designed for Hamamatsu L2D2 lamps with a mounting flange. Despite being low cost and compact, these lamp housings also function as efficient heat radiator housings to allow stable L2D2 lamp operation.
The window and mounting surface of these lamp housings are finish-machined and have tapped holes, making it easier to install them in equipment.
These lamp housings are ideal for designing photometric equipment that uses L2D2 lamps.
E9522: For L6301-50
E9558: For L7296-50

* Custom lamp housings for see-through type lamps (L6999-50, L9030-50) are also available.



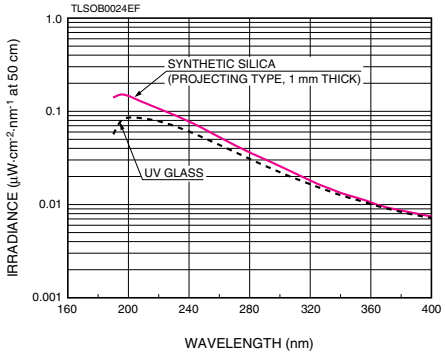
Left: E9522, Right: E9558

TECHNICAL INFORMATION

■Spectral Distribution

Deuterium lamps emit high intensity light in the UV range at wavelengths shorter than 400 nm. Light intensity on the short wavelength side is determined by the window material used.

Figure 1: Spectral Distribution



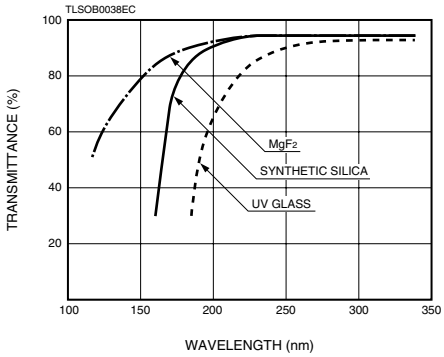
■Window Material

The following three types of window material are available for deuterium lamps.

① UV glass ② Synthetic silica ③ MgF_2

Figure 2 shows the transmittance of various window materials.
UV light at wavelengths shorter than 190 nm attenuates greatly due to its absorption by oxygen. To obtain the fullest performance in window transmittance, it is recommended that the inside of the equipment be filled with nitrogen or vacuum-evacuated to eliminate this absorption effect.

Figure 2: Typical Transmittance of Various Window Materials



①UV glass

UV glass has a higher ultraviolet transmittance than normal optical glass (borosilicate glass). It has the longest cut off wavelength of 185 nm among the three types. However the generation of ozone is lower than other window material types, it is not necessary to have special anti-ozone treatments.

②Synthetic silica

Synthetic silica is obtained by fusing a silica crystal that is artificially grown. Although its cut off wavelength is 160 nm, it contains less impurities than fused silica, and transmittance at 200 nm has been improved by approx. 50 %.

③MgF_2

MgF_2 is a crystallized form of alkali metal halide that has an excellent ultraviolet transmittance, a low deliquescence and is used as window material for vacuum ultraviolet applications. Its cut off wavelength is 115 nm.

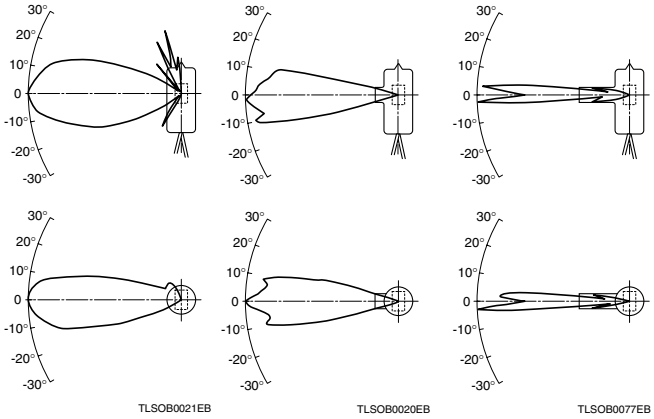
■External View

①Non-projecting type (UV glass) ②Projecting type (Synthetic silica) ③Long-nose projecting type (MgF_2)

①Non-projecting type uses the side of the cylindrical glass bulb as the light-emission window. This type allows effective use of emitted light since it requires less space and has wider directivity since there is no projection.
②Projecting type uses a flat glass attached to the tip of the projection on the bulb.
③Long-nose projecting type uses an MgF_2 window and is ideal for vacuum ultraviolet applications. This type is used with the tip of the long-nose window inserted into vacuum equipment.

■Directivity (Light Distribution)

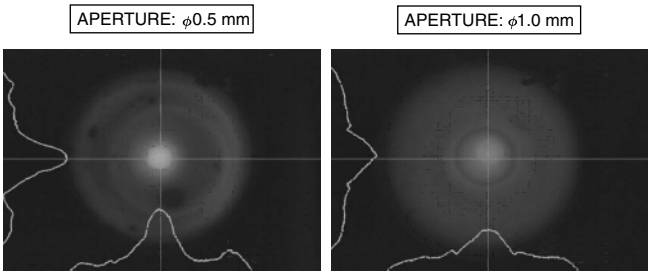
①Non-projecting type (UV glass) ②Projecting type (Synthetic silica) ③Long-nose projecting type (MgF_2)



■Light Intensity Distribution

Light intensity of deuterium lamps is determined by the aperture (light exit) size. Figure 3 shows typical light intensity distributions for lamps with different aperture sizes. At the same input current and voltage, lamps with a 0.5 mm aperture provide 1.4 times higher intensity than lamps with a 1.0 mm diameter aperture. The half width of spectral distribution also becomes narrower with a smaller aperture size.
Using 0.5 mm aperture lamps is recommended in applications where higher intensity is required or where light must be irradiated onto a very small area.

Figure 3: Arc Distribution

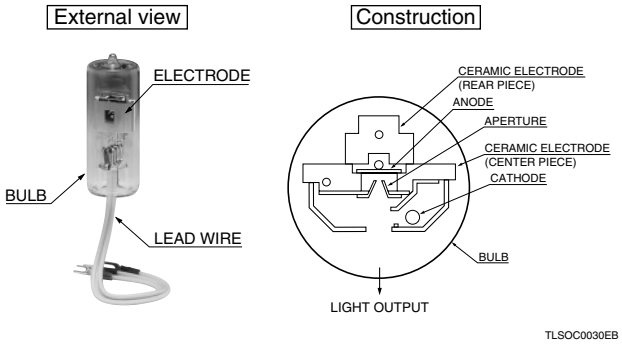


TECHNICAL INFORMATION

■Construction

Figure 4 shows an external view and internal structure of a deuterium lamp. The anode is covered with ceramic to prevent abnormal discharge. The cathode uses a highly durable electrode that ensures minimum wear over a long operating life. Since deuterium lamps utilize the positive column of arc discharge, the cathode is shifted sideways from the optical axis and an aperture is located in front of the anode to obtain high intensity. The aperture plate placed between the anode and cathode may be used as an auxiliary electrode for reliable lamp ignition.

Figure 4: External View and Electrode Construction



■Terminology

①Solarization

Transmittance of light through UV glass and fused silica gradually decreases as it is used over a long period of time. This is caused by a drop in transparency of the glass resulting from contaminants adhering to the inner wall of the glass bulb and the effect of ultraviolet rays. In worst cases, the glass becomes cloudy and the lamp service life is shortened. The loss of transmittance due to ultraviolet rays is called "solarization" and occurs more markedly at shorter wavelengths. Synthetic silica, however, is highly resistant to this solarization. Lamps with an MgF2 window emit strong UV light. If they are used in air, a thin film will be deposited on the window by CVD (chemical vapor deposition) that might reduce the transparency of the window. To avoid this problem, the lamps should be used in a vacuum or nitrogen atmosphere.

②Discharge starting voltage

When the cathode is sufficiently heated and ready for arc discharge, applying a pulse trigger across the anode and cathode will start discharge. This discharge starting voltage is typically 350 V (400 V at most) for 30 W lamps. However since the discharge starting voltage rises with the lamp operation time, applying a voltage of 500 V dc to 600 V dc is recommended for reliable trigger discharge each time. The discharge starting voltage varies according to the trigger method and trigger constant.

③Light output stability

●Drift

Drift refers to variations in light output over a long period of time that are caused by changes in thermal electron emission characteristics of the cathode, changes in gas pressure inside the bulb, and contaminants on the window. Drift is usually expressed in variation per hour. In the case of Hamamatsu L2D2 lamps, it takes at least 10 minutes to 15 minutes until the inside of the lamp reaches thermal equilibrium after discharge starts, so pre-heating for 20 minutes to 30 minutes is required.

●Fluctuation

Fluctuation refers to the peak-to-peak variation in light output over a short period of time. Hamamatsu L2D2 lamps deliver high stability with fluctuation down to 0.005 % (p-p).

Fluctuation greatly depends on changes in cathode electron emission capability that might be due to cathode deterioration and other factors. Hamamatsu L2D2 lamps maintain initial small fluctuations even near the end of the guaranteed lamp life.

④Life

●Fluctuation in light output

Life end is defined as the point at which the fluctuation in light output exceeds 0.05 % (p-p).

●Drop in light output

Life end is defined as the point at which the total emitted energy drops to 50 % of the initial value.

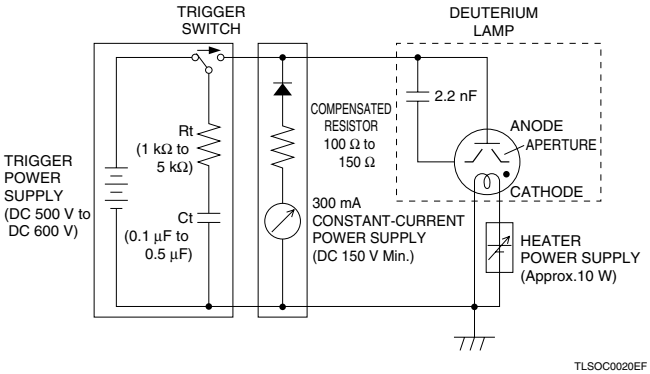
■Power supply

A deuterium lamp power supply usually includes the following three sections.

- ●Constant current power supply
- ●Trigger power supply
- ●Heater power supply

The aperture plate located between the anode and cathode can be used as an auxiliary electrode to make sure that discharge starts without fail.

Figure 5: Example Circuit Diagram



When using the above circuit to operate a deuterium lamp with a 0.5 mm aperture, setting the trigger resistance to 1 kΩ and the trigger capacitance to 0.5 μF as the CR constant is recommended in order to ensure reliable lamp ignition.

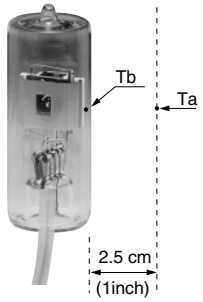
OPERATING TEMPERATURE

To obtain high stability and long operating life, adequate care must be paid to operating conditions including the lamp operating temperature. As the ambient temperature (Ta) rises, the lamp bulb temperature (Tb) also rises. When the ambient temperature is +25 °C, the bulb temperature rises to about +245 °C to +290 °C. The bulb temperature (Tb) varies according to the lamp type, heater voltage and lamp housing. Hamamatsu L2D2 lamps are designed to operate at an optimal lamp temperature when used at room temperatures. However, to maintain high stability over a long period of time, comply with the operating temperature range shown in Table 1.

Table1: Allowable Operating Temperature Range for Deuterium Lamps

Ambient temperature: Ta	+10 °C to +50 °C (+20 °C to +30 °C)*
Bulb wall temperature: Tb	+245 °C to +290 °C
Maximum allowable bulb wall temperature: Tb Max.	+300 °C Max.

*Temperature enclosed by ( ) indicates the optimum ambient temperature.



Ta: Temperature measured at a position 2.5 cm (1 inch) away from the bulb wall
Tb: Temperature on the bulb wall (cathode side)

As the ambient temperature (Ta) rises, the cathode temperature increases, resulting in evaporation of the cathode. If the ambient temperature (Ta) drops, the gas pressure inside the lamp bulb lowers and the gas and ion kinetic energy increases. This causes spattering of the cathode electron emitting materials. In both cases, the gas inside the bulb is rapidly consumed so that the lamp stability and radiant intensity drop, drastically shortening the operating life.
To ensure stable operation of L2D2 lamps, care must be used when installing the lamps so that the bulb wall temperature (Tb) will not exceed +300 °C.

HANDLING PRECAUTION

1. Deuterium lamps emit ultraviolet rays which can be harmful to eyes and skin. Do not look directly at the emitted light or allow direct exposure to skin. Always wear protective glasses or goggles and clothing when operating the lamps. (Refer to JIS T 8141 or equivalent safety standards).
2. Since the bulb wall temperature reaches a high temperature (over 200 °C) during lamp operation, do not touch it with bare hands or bring inflammable objects near it.
3. Do not apply vibrations or mechanical shocks to the lamp. These might cause light output stability to deteriorate.
4. Graded sealing of synthetic silica and MgF_2 window
   On bulbs using synthetic silica or MgF_2 window, the window is formed by so-called "graded sealing" which connects different glasses with slightly different expansion rates. Since the mechanical strength of the seams of this graded sealing is low, use caution when securing the lamp so that no force is exerted on those seams during use.
5. Before turning on the lamp, wipe the bulb and window gently using alcohol or acetone. Do not handle the lamp with bare hands. Dirt or smears on the window will cause a significant drop in ultraviolet transmittance.
6. High voltage is used to operate these lamps.
   Use extreme caution to prevent electrical shock.

WARRANTY

Lamps are warranted for a period of one year from the date of shipment. If a lamp is found to be defective within this warranty period, Hamamatsu will replace the defective lamp without charge. (This warranty is limited to replacement of the defective lamp.) Even if within the warranty period (one year), the warranty shall not apply to cases where the lamp operation time has exceeded the guaranteed life, or the trouble was caused by incorrect operation or natural or man-made disasters.

DISPOSAL OF LAMPS

When disposing of the used lamp, take appropriate measures in compliance with applicable regulations regarding waste disposal and correctly dispose of it yourself, or entrust disposal to a licensed industrial waste disposal company.
In any case, be sure to comply with the regulations in your country, state, region or province to ensure the used lamp is disposed of legally and correctly.

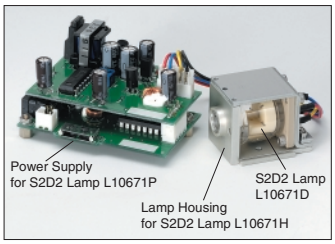
RELATED PRODUCTS

X2D2 Lamp

The X2D2 lamps emit UV light with high luminance - twice that of the L2D2 lamps. The X2D2 lamps help enhance the sensitivity and throughput of various instruments utilizing UV light.

S2D2 Module

The S2D2 compact deuterium lamp is a UV point light source with a drastically reduced size compared to ordinary deuterium lamps. This compact size of the S2D2 module makes it easy to install in all types of equipment. The dedicated lamp housing and power supply are designed to extract maximum performance from the S2D2 lamp.



Lamp housing is supplied with attached cover.

High Power UV-VIS Fiber Light Source L10290

Using an X2D2 lamp, the L10290 outputs light of 200 nm to 1100 nm from a light guide (sold separately). Besides a compact size and light weight for convenient to carry, the L10290 is specially designed for easy use. These features make the L10290 useful for various types of portable devices.

Light guide is sold separately. TLSXF0181

High Brightness VUV Light Source Unit L10366 Series

Using an X2D2 lamp, the L10366 series produces a spectrum from 115 nm to 400 nm with high intensity especially in the vacuum UV range. Its air-cooled housing and vacuum flange mount minimize restriction on the usage location and the installation angle, allowing greater ease of use.

Left: Power supply, Right: Light source TLSZF0004

Compact UV-VIS S2D2 Fiber Light Source L10671

The L10671 uses a compact deuterium lamp (S2D2 lamp). Despite its compact size, this light source offers high output and high stability.

Light guide is sold separately. TLSXF0192

S2D2 VUV Light Source Unit L10706

The L10706 uses a compact deuterium lamp (S2D2 lamp) with an MgF_2 window. This unit makes it easy to irradiate an object in close proximity and allows the installation and operation under depressurized conditions.

Left: Light source, Right: Power supply TLSZF0037

Water-Cooled Type 150 W Deuterium Lamps L1314, L1835

These lamps provide a radiant output 3 to 4 times higher than the L2D2 lamps. Two types of window materials, synthetic quartz (L1314) and MgF_2 (L1835) are available.

Left: L1835, Right: L1314 TLSOF0140

Calibrated Deuterium Lamp Light Source L7820, L7820-02 (made-to-order products)

These are highly stable light sources with calibrated radiant intensity. Since we are certified as an ASNITE-calibration laboratory, we calibrate spectral irradiance in a range from 200 nm to 400 nm (L7820-02).

Left: Lamp housing, Right: Power supply TLSXF0159

For details, please refer to the catalogs which are available from our sales office.

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