

**CONSTANT CURRENT POWER SUPPLY C8849
AND STARTER C4251
FOR CONTINUOUS MODE SUPER-QUIET XENON
AND MERCURY-XENON LAMPS**

INSTRUCTION MANUAL



- Before operating, inspecting or servicing the equipment, read this manual carefully and make yourself familiar with the information provided. Do not attempt to operate or inspect the equipment until you thoroughly understand the contents of this manual. Never handle or operate the equipment in a manner not described in this manual, otherwise serious accidents may result.
- The operator or manager in charge of this equipment should not permit anyone who does not understand the contents of this manual to operate the equipment.
- Even after you have read this manual, keep it near the equipment so that you can easily refer to it as necessary.
- If this manual is lost or damaged, immediately contact Hamamatsu sales office near you to receive an additional copy.
- When this equipment is transferred or sold, ensure that this manual accompanies them, and explain to the new user the need to read through this manual.

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1. SAFETY PRECAUTIONS

Make sure to read these "Safety Precautions" carefully before starting to use the equipment and observe them during operation.

1-1 Classification of Warning Instructions

Warning instructions in this manual and on labels are classified as described below. As each word and symbol carry special meanings, familiarize yourself with them and observe the instructions.



Failure to follow DANGER instructions will result in severe injury or death to the operator or person servicing the product.



Failure to follow WARNING instructions could result in serious injury or death to the operator or person servicing the product.



Failure to follow CAUTION instructions may result in injury to the operator or the person servicing product, or damage to the product or peripheral equipment.



This warning symbol shows a caution or warning you must observe. A specific warning is sometimes indicated in this symbol. Read the warning instructions carefully to ensure correct and safe product use.



This type of symbol shows something you must NOT do. The specific prohibited item or action is often indicated in the symbol. Read the instructions carefully and never attempt the prohibited action



This type of symbol shows something you must DO. The specific instruction is often indicated in the symbol. Read the instructions carefully and always use the specified procedure.

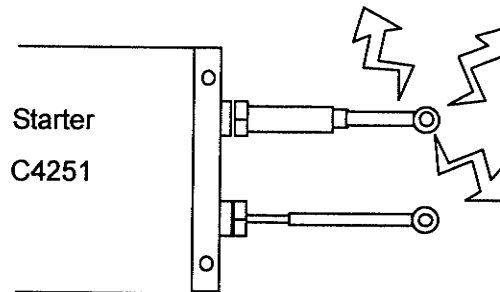
1-2 Safety Instructions

- **High voltage trigger -
Electrical shock hazard**



DANGER

Never turn on the power while no lamp is installed. There is the danger of an electrical shock since a high voltage (20 to 30kV) is output from the lamp starter (C4251) when the lamp is turned on.



- **Vibration and shock**



WARNING

Handle the equipment with extreme caution.
Internal components of the C8849/C4251 are precisely adjusted. Protect them from excessive shocks and vibrations, otherwise the adjustment may become unreliable and a fire or electrical shock may result.

- **Covers and internal components**



Do not remove the covers. Never adjust or alter any internal components. Internal components are precisely adjusted. Never adjust or alter them, otherwise abnormal operation may occur or a fire or electrical shock may result.

- **If any abnormality occurs**



If smoke, a peculiar odor, or unusual noise is noticed, immediately turn off the power switch of the C8849 power supply and then unplug the AC power cable from the outlet. Continuous operation with abnormality not corrected may result in a fire or electrical shock.

- **Connectors**



Securely connect the power supply connectors to prevent looseness or play. Loose connections may cause faulty operation.

- **Ground**



The power supply must be properly grounded by the outlet to prevent electrical shocks.

- **Output current selector switch**



Before turning on the lamp, check that the output current selector switch is correctly set. If not, this may shorten the lamp service life or damage the lamp. See pages 14 for more details.

- **Install location**



CAUTION

Avoid installing this power supply in locations with poor ventilation, at high temperatures, or at high humidity.

Allow a clearance of at least 10cm (4 inches) for exhaust and 5cm (2 inches) for intake.

Do not install in locations where the air vent holes are blocked. Malfunction or fire may otherwise result.

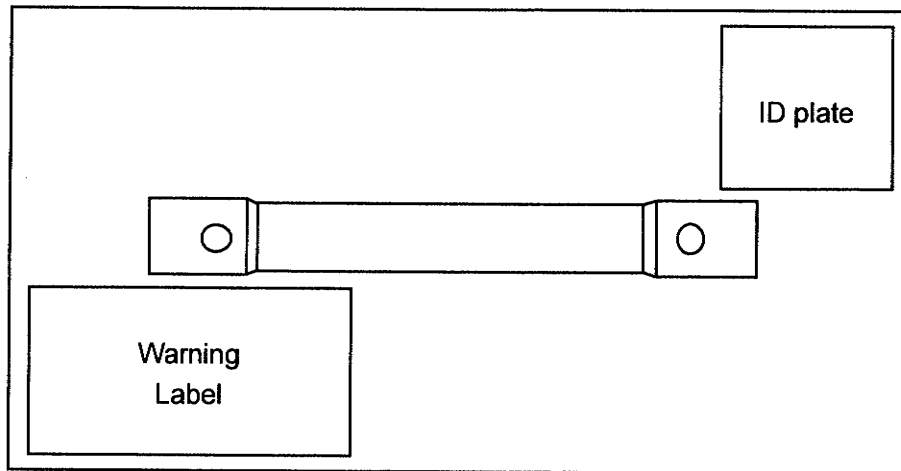
Install the power supply on a stable, flat, horizontal surface. Abnormal operation may otherwise result or the lamp housing may fall over during earthquake.

1-3 Warning Label Positions



These labels must be attached so that they are clearly visible all the time. If they come off or become dirty, replace them with new ones. Warning labels are available (chargeable) from our sales office. When it becomes necessary to replace any warning label, contact the nearby sales office.

C8849



C4251

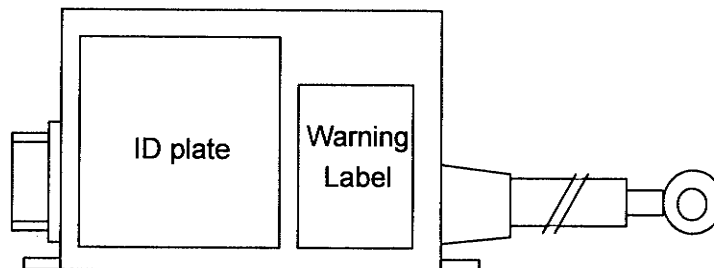


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The contents of this manual are subject to change without prior notice.

No part of this manual may be reproduced or copied without permission of Hamamatsu Photonics.

If any of the following problems are found in this manual, please contact our sales office.

* Unclear, inaccurate or omitted description

* Irregular pages or missing leaf

* This manual was missing or damaged

2. GENERAL

The C8849 is a constant current power supply designed to operate xenon lamps and mercury-xenon lamps (continuous mode). Compared to conventional dropper power supply, the C8849 power supply is compact, lightweight and output stability of the same grade. It can be operating various lamps ranging from 100W to 250W.

3. FEATURES

-Separate lamp starter ensures reliable and safe start

The lamp starter (C4251) is separated from the C8849 power supply and can be installed in the lamp housing to prevent possible high-voltage leakage.

-Highly regulated constant-current power supply

Discharge current is controlled by the highly regulated constant-current circuit. The radiant output from the lamp is extremely stable over extended periods of time.

-Compact and lightweight

Dimensions	C8849	(W)144 mm × (H)90 mm × (D)282 mm
	C4251	(W)100 mm × (H)60 mm × (D) 89 mm
Weight	C8849	Approx. 3 kg
	C4251	Approx. 810 g

4. CONFIGURATION

This equipment comes with the following items and accessories. After unpacking, check for any damage caused by an accident during transport and also check that all items and accessories are included as listed. If any part is missing or damage is found, contact your Hamamatsu sales office as soon as possible.

C8849 Power Supply

- Main unit 1
- Accessories
 - Output cable (approx. 2m) 1
 - AC power cable 1
- Instruction manual 1

C4251 Starter

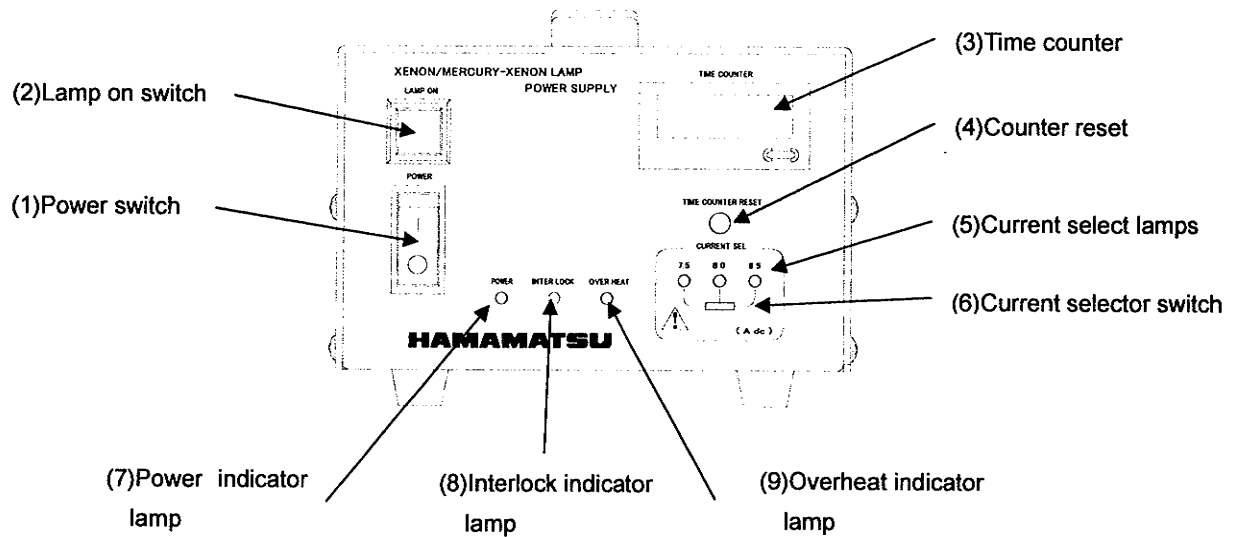
- Starter unit 1
- Output plug (attached to C4251) 1

NOTE: The C8849 power supply must be used in combination with the starter (C4251 series) or the lamp housing (E7536 series).

These cannot be used independently to operate a lamp.

5. PART NAMES AND FUNCTIONS

5-1 C8849: Front Panel



(1) POWER switch

This is the power switch to energize the power supply. When placed in the "I" position, the lamp is set for operation. At the same time, the indicator lamp of this switch illuminates.

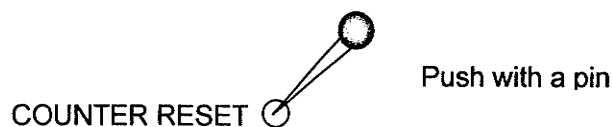
(2) LAMP ON switch

This is the switch to start lamp operation. When you press this switch for about 3 seconds, a high trigger voltage (20 to 30 kV) is applied to the lamp to start operation. When the lamp lights up, the indicator lamp of this switch also illuminates.

(3) TIME COUNTER

This indicates the accumulated operating time(unit:hours) of the lamp. Always reset this counter when you replace the lamp with a new one. To reset, push the COUNTER RESET (4) by pin.

(Reset button on TIME COUNTER cannot be used.)



(4) COUNTER RESET

Push with a pin when accumulated time of counter is reset.

(5)CURRENT SELECT (output current indicator) lamps

These lamps indicate the output current selected by the output current selector switch (6). The output current is preset to the operating current of lamp which is used with this power supply at the time of shipment.

(6)CURRENT SELLECT (output current selector) switch

This switch selects the output current. Set the lamp rating used by pin etc. before using. See page 16 for the lamp ratings. The output current is preset to the operating current of the lamp which is used with this power supply at the time of shipment.

(7)POWER indicator lamp

This LED lamp illuminates when the POWER switch is turned on.

(8)INTERLOCK indicator lamp

This LED lamp shows the operating status of the interlock circuit. It illuminates in yellow when the interlock circuit functions. To reset, check the interlock circuit and then turn the POWER switch off.

(9)OVERHEAT indicator lamp

This LED lamp illuminates in yellow if an abnormal temperature rise occurs inside the equipment. To reset, turn the POWER switch off.

Re-turning the POWER switch on after removing a cause, such as lowering circumference temperature.

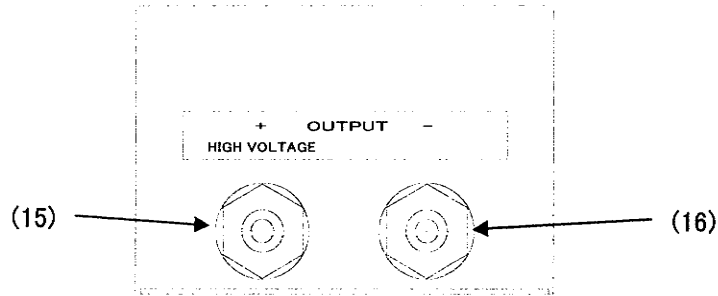
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5-4 C4251:High-Voltage Output Cable Side



(15) Plus (+) high voltage output cable

Connect this cable to the plus (+) terminal of the lamp.

(16) Minus (-) high voltage output cable

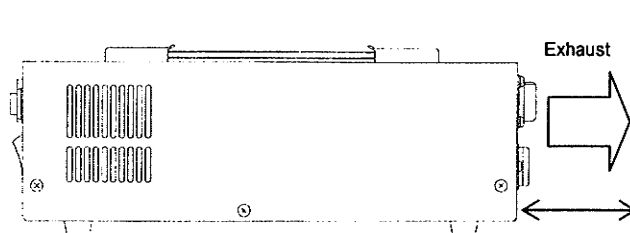
Connect this cable to the minus (-) terminal of the lamp.

6. INSTALLATION

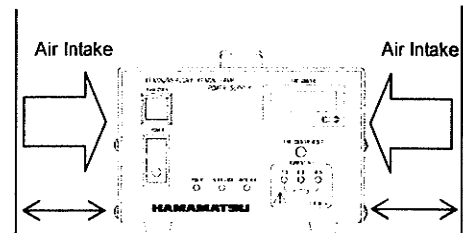


CAUTION

- Avoid installing the C8849/C4251 in locations at high temperature and high humidity.
- Install the C8849/C4251 in locations where air circulates well so that exhausted air from the cooling fan does not remain.
- Install the C8849 power supply on a level place, with the rubber feet facing down.
- Avoid installing this in locations with poor ventilation. Allow a clearance of at least 10cm (4 inches) for exhaust and 5cm (2 inches) for intake. (Refer to the following drawing.)



10cm or more



5cm or more

5cm or more

7. OPERATION

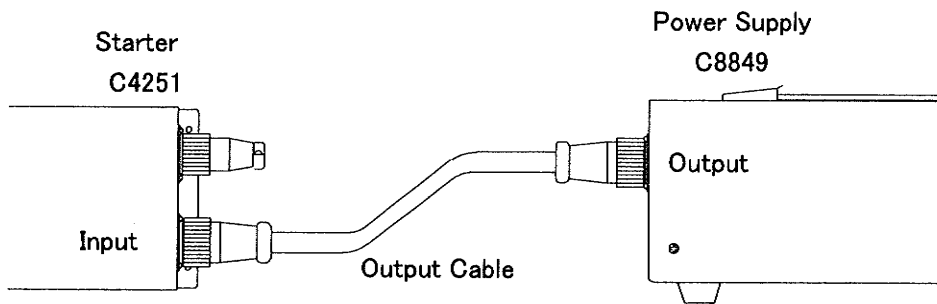
7-1 Preparation

Before using the C8849/C4251, check that the AC power cable is unplugged.

7-1-1 Connecting the C4251 starter

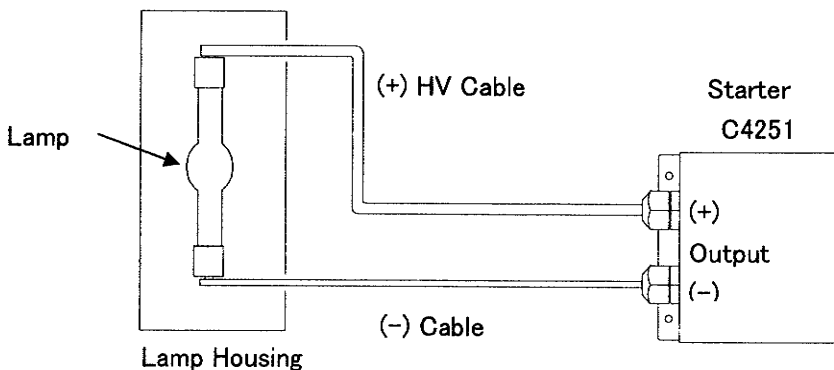
The C8849 power supply must be used in combination with the C4251 starter. Using the accessory output cable, make connections between the C8849 and the C4251 as shown below.

* Please see the lamp housing (E7536 series) manual when you use the C8849 with lamp housing.



7-1-2 Connecting the lamp

Two high-voltage cables are provided at the output of the C4251 starter. Connect each of the high-voltage cables to the lamp housing while checking the polarity. The plus high-voltage cable must be connected to the plus (+) side (marked on the metal base) of the lamp, and the minus cable to the minus (-) side of the lamp. Securely connect these high-voltage cables to prevent looseness or play and resulting contact failure.



7-1-3 Connecting the ground terminal

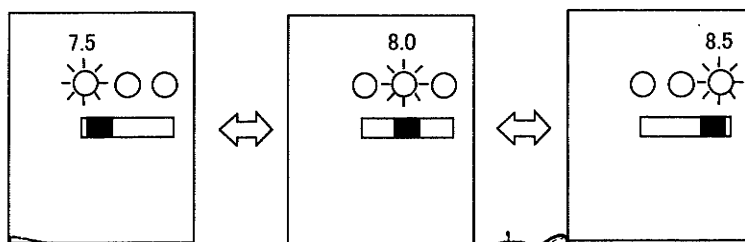
An extremely high voltage (20 to 30kV) is output from the C4251 starter. Be sure to provide proper grounding from the outlet to prevent electrical shock that could be caused by accidental short-circuits or electrical breakdowns.

7-2 Turning the Lamp ON (Starting the Lamp Discharge) #1

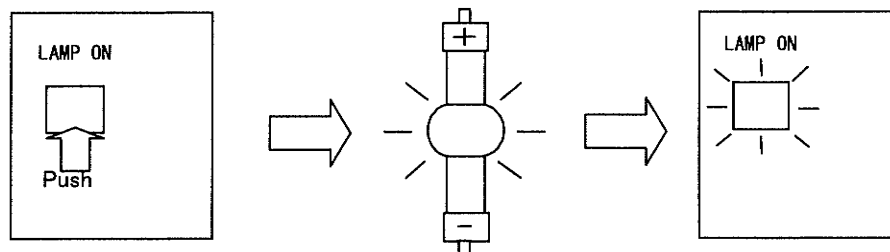
7-2-1 Plug in the AC power cable at the AC outlet, then turn ON("I" position) the POWER switch on the front of the C8849.

The POWER switch lamp illuminates and, at the same time, the CURRENT SELECT (output current indicator) lamp lights up.

7-2-2 Check that the output current indicator lamp shows the correct value. If not, change the position of the output current selector switch by using a slotted screwdriver, so that it matches the lamp you are using. (The output current selector switch is preset to the operating current of the lamp which is used with this power supply at the time of shipment.)



7-2-3 Press the LAMP ON switch for about 2 seconds, and a high voltage trigger (20 kV to 30 kV) is applied to the lamp to start operation. When the lamp lights up, the indicator lamp of this switch also illuminates.



CAUTION

- Do not turn "I" side the power switch unless the lamp is connected to the power supply. A high voltage pulse of 20 kV to 30 kV is output upon turning ON the power, causing the danger of an electrical shock.
- If the lamp fails to start lighting up, restart by turning "I" side the power switch again. But do not repeat more than 4 times. If the lamp failed to light up 3 times, the lamp, power supply or lamp housing probably has a problem. Please consult us in such cases.

7-3 Warm-up

The radiant output intensity of the lamp shows a fluctuation (drift) until it reaches thermal equilibrium. The output will normally become stable 10 to 20 minutes after the lamp is turned on, although this depends on the ambient temperature and lamp housing structure and heat capacity.

7-4 Turning the Lamp OFF #3

Place the POWER switch of the C8849 in the off position("O") and the lamp turns off.

8. ACCESSORY FUNCTIONS

8-1 Interlock

The C8849 provides an interlock output. This allows you to configure an interlock mechanism by installing a microswitch in the lamp housing and laying out the necessary wiring, so that the power supply output is shut off when the lamp housing cover is opened. This ensures the operator's safety.

《 Connections to the output connector of the C4251 starter 》

Between pin Nos. 4 and 5	Power supply output
Shorted.....	ON
Open	OFF

《 Interlock indication and resetting 》

The C8849 incorporates an abnormal operation indicator lamp which functions in response to the interlock output. If any abnormal operation occurs, the yellow LED lamp on the front panel illuminates. For example, when the interlock terminals (pin Nos. 4 and 5) of the C4251 starter output connector are open, the yellow LED lamp illuminates.

To reset, short between the interlock terminals and then turn OFF the POWER switch of the C8849.

The interlock terminals (pin Nos. 4 and 5) are shorted in the output socket at the time of shipment.

8-2 Cooling Fan Output

The C8849 provides an output of 24Vdc/0.2A Max. which is used for cooling the lamp housing. This cooling fan output is available from the output connector of the C4251 starter.

Pin No.1	(+)24 V
Pin No.2	0 V

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9. SPECIFICATIONS

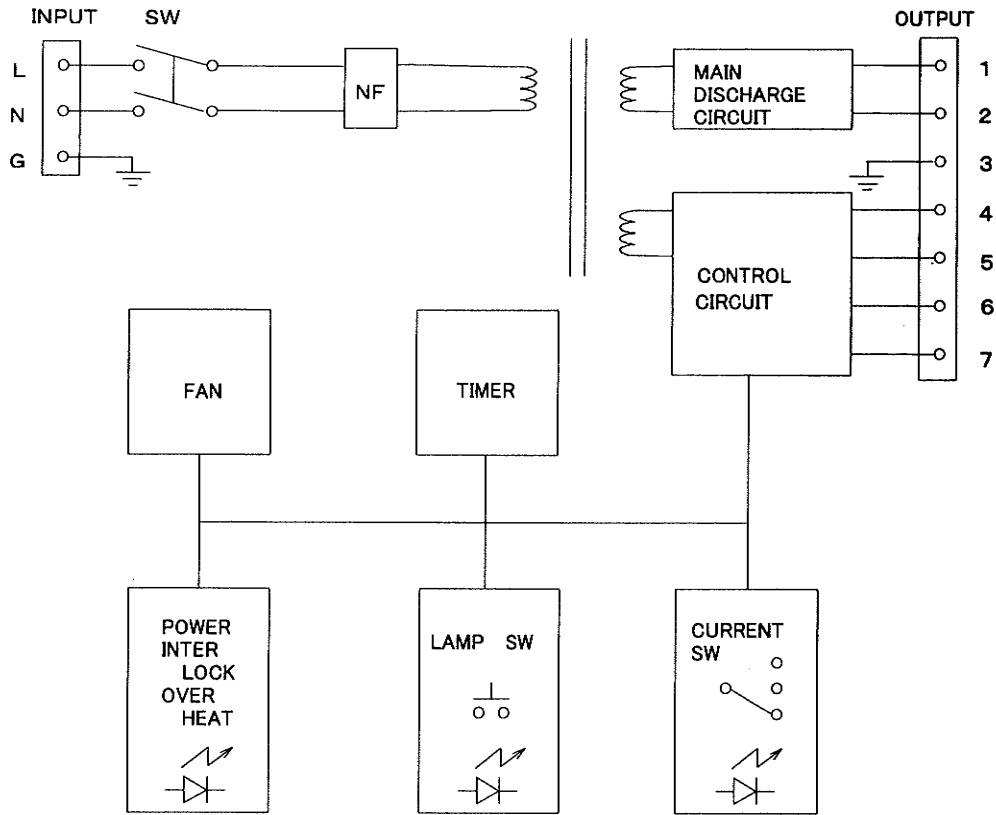
C8849	Output current (DC) (Switch on front panel)		7.5 A	8.0 A	8.5 A
	Steady operation voltage (DC)		20 V \pm 7V	25 V \pm 5V	24 V \pm 8 V
	Lamp wattage rating	Xenon lamps	100 W 150 W	-	150 W GS
		Mercury-xenon lamps	150 W	200 W	250 W
	Typical applicable lamps	Xenon lamps	L9289 L2175 L2195	-	L2273 L2274
		Mercury-xenon lamps	L2482	L2423 L2570	L8706
	Voltage for starting up the trigger (DC)		Approx. 150V (the first 5 seconds)		
	Output regulation		\pm 0.1 % or less (for \pm 10 % change in AC line input)		
	Ripple (p-p)		0.1 % or less (at rated input and output)		
	Drift		\pm 0.1 %/h or less		
	Temperature Drift		\pm 1 % or less (under changing in 0°C to 40°C)		
	AC input voltage		90 V to 253 V , 50 Hz/60 Hz (automatic)		
	Power consumption		350 VA		
Subsidiary power supply (DC)		24 V, 0.2 Amax			
Cooling method		Forced air cooling			
Dimensions (excluding projecting parts)		(W) 144 mm \times (H) 90 mm \times (D) 282 mm			
Weight		Approx. 3 kg			
C4251	Trigger voltage		20 kV to 30 kV		
	Cooling method		None (Natural cooling)		
	Dimensions (excluding projecting parts)		(W) 100 mm \times (H) 60 mm \times (D) 89 mm		
	Weight		Approx. 810 g		
Common	Ambient operating temperature		0 °C to +40 °C		
	Recommended ambient temperature		+5 °C to +35 °C		
	Ambient operating humidity		35 % to 85 % (no condensation)		
	Preservation temperature		-10 °C~+65 °C (no condensation, no freezing)		
	Preservation humidity		35 %~85 % (no condensation)		

NOTE:

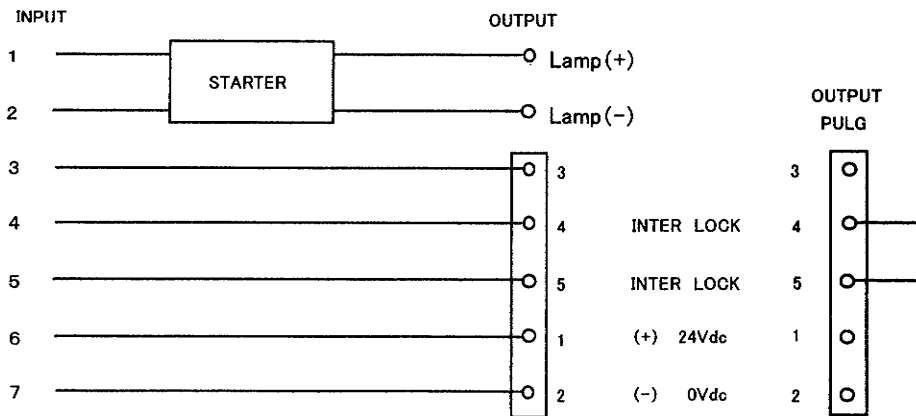
1. The C8849 power supply must be used in combination with the C4251 starter or the lamp housing (E7536 series).
2. The above specifications are measured at 23 °C \pm 5 °C after 30 minute warm-up.
3. Specifications are subject to change without prior notice due to performance improvement or other factors.

10. BLOCK DIAGRAMS

10-1 C8849

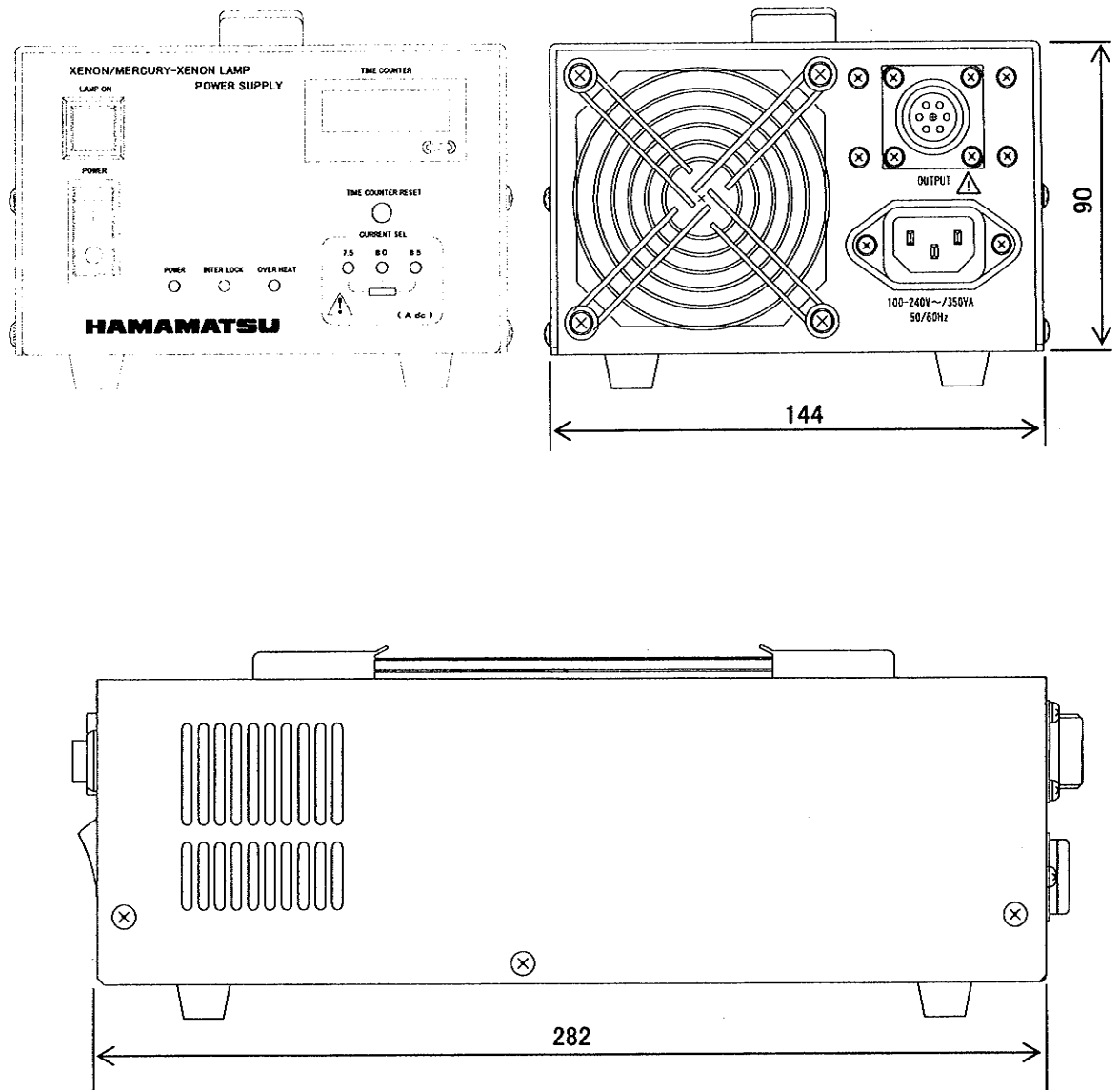


10-2 C4251



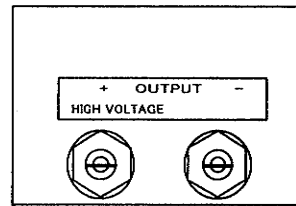
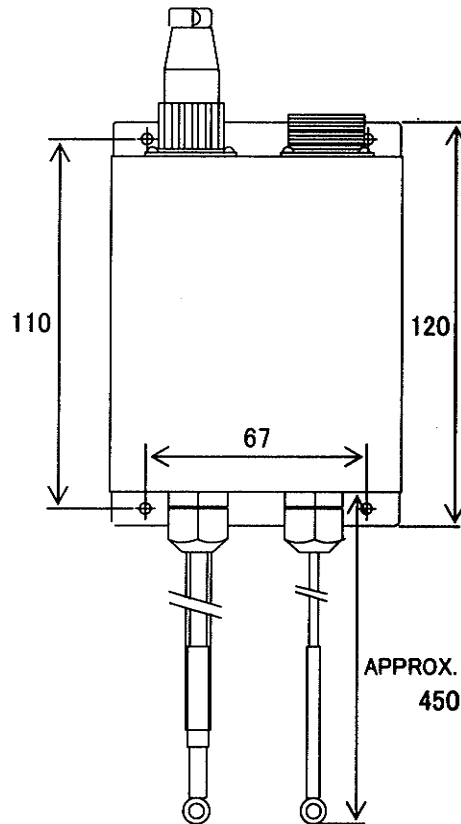
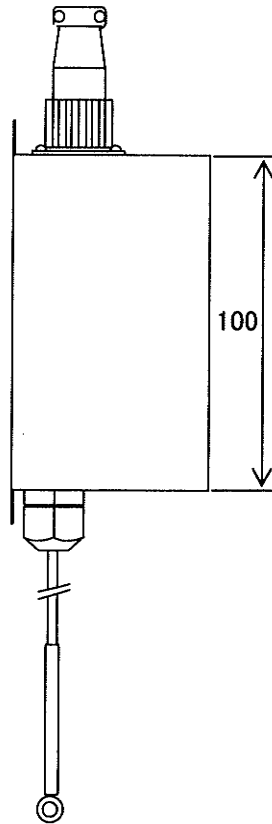
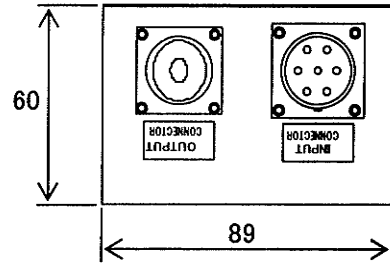
11. DIMENSIONAL OUTLINE

11-1 C8849



Unit: mm

11-2 C4251



Unit:mm

12. WARRANTY, MAINTENANCE AND DISPOSAL METHOD

Warranty

This equipment is warranted for a period of one year from the date of delivery. If any failure is found in the workmanship or materials within this warranty period, Hamamatsu will repair or replace the defective parts without charge. However, repair or replacement in the following cases will be charged even within the warranty period.

- (1) The equipment were misused with regard to the precautions and instructions described in this manual, or faults were caused by inadvertent handling.
 - (2) Faults were caused by electrical or mechanical modifications to the equipment.
 - (3) Faults were caused or induced by natural disaster or man-made accident.
- The warranty is limited to repair or replacement.

Maintenance

If problems arise due to the life end of parts after a long time of operation, return the equipment to our sales office. We will repair or replace the parts and make necessary adjustments.

While every effort is made to repair the returned equipment in as short a time as possible, the repair of equipment which has been purchased some time ago may require additional time. Please acknowledge that repair of equipment using parts which are not in current production or equipment which has been modified or severely damaged by the customer may be refused.

Disposal method

This product, when to be disposed of, should be treated properly according to the waste disposal law by user or by the industrial waste treatment firm duly authorized. When it is used and disposed of in any place outside of Japan, it should be treated properly according to the statutory regulations of the state and local governments applicable to that place.

NOTICE

For USA - California Only:

The CR Coin Cell Lithium Batteries in this product contain Perchlorate Material - special handling may apply,
See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>

HAMAMATSU

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