Owner's Manual

Model 2900

Tungsten Halogen Light Source

- 150 Watt High Intensity Output
- Cool, Quiet Operation
- Quick Change Color Filter Holder
- DC Regulated Output
- Specialty Lamps Available
- Auto Switching 100/120/230/240 VAC

CAUTION: To reduce risk of electric shock, do not operate in wet or damp areas. Disconnect power before relamping or servicing.

WARNING: To prevent risk of fire or burns, replace only with fuses and lamps listed on rear of unit. Let lamp cool before relamping.

ITPN 850-2900
Rev 2

Safety Instructions

CAUTION:

- **Read all of these instructions before operating the unit.**
- **Follow all warnings and instructions on this piece of equipment**
- **Failure to use this equipment in the manner specified in this manual may cause the protection features of the unit to be impaired.**

1. **Retain Instructions** - All safety and operating instructions should be retained for future reference.

2. **Follow Instructions** - All operating and use instructions should be followed.

3. **Water and Moisture** - The unit should not be used near water, or in any area where excessive moisture may come in contact with the unit.

Eau Et Moisissure: Le système ne doit pas être utilisé prés de l'eau, ou dans un environement où la moisissure pourait venir en contact avec le système.

4. **Mounting** - The unit should be mounted horizontally on a surface or platform, or vertically via fixture only as recommended by the manufacturer. Never mount with fiber receptacle pointing down.

5. **Ventilation** - The unit should be positioned such that its surroundings do not interfere with its proper ventilation. Ensure that there is adequate air flow below (intake) and in the rear (exhaust) of the unit.

6. **Heat** - The unit produces heat and infrared radiation. Do not place flammable materials on or near the unit at any time. Keep unit away from other sources of heat. The Lamp housing is marked with a HOT SURFACE CAUTION label to prevent accidental contact with it before it cools. Always allow time for the lamp and all surfaces surrounding the bulb to cool before attempting to replace lamp.

Chaleur: Le système développe de la chaleur et des radiations infrarouge. Ne pas placer de materiaux flammables sur le système ou proche quelquesoit le moment. Toujours prévoir du temps pour la lampe et les surfaces avoisinant la lampe pour refroidir avant d'essayer de remplacer la lampe.

7. Polymer Fiber - To avoid permanent damage and failure to accessories that are constructed from polymer fiber a KG - 3 filter must be used with this lightsource. (**it** part number 9546)

8. **Power Source** - The unit should be connected to a power source only of the type described in the operating instructions and as indicated by the power entry module.

9. **Grounding** - Precautions should be taken to ensure that proper grounding of the unit is assured.

10. **Power Cord** - Use only the approved power cord supplied with the unit, or an equivalent IEC 320 power cord with proper certifications. Power cord should be routed such that it will not be pinched, severed or walked on.

11. **Fuse** - DO NOT DEFEAT FUSE.. Replace only with fuses as described in the operating manual and as marked on the unit for the operating voltage that the unit is set for.

12. **Safety Interrupt** - DO NOT MANUALLY DEFEAT THE SAFETY INTERRUPT SWITCH.

Interrupteur De Sécurité: NE JAMAIS DEFAIRE MANUELLEMENT L'INTERRUPTEUR DE SECURITE.

13. **Cleaning** - The unit should be externally cleaned only using standard glass type cleaners. Do not use solvents, cleansers or petroleum distillates. Disconnect power cord before performing any cleaning operations.

14. **Liquid and Object Entry** - Care should be taken to avoid objects falling into, or liquids being spilled into the enclosure through openings.

15. **Nonuse Periods** - Disconnect power cord from outlet when unit will be left unused for a long period.

16. **Damage Requiring Service** - The unit should be serviced by qualified service personnel if it exhibits any marked change in performance; if the power cord or enclosure has been damaged; or if objects or moisture have entered the unit.

17. **Servicing** - The user should not service the unit beyond that described in this manual. All other servicing should be referred to qualified service personnel.

Description

The figures below reveal the main features and the reference items for this unit. The power switch, the intensity control and the fiber optic receptacle are located on the front panel. The thumbscrew, located on the receptacle, locks the fiber optic lightguides into the proper position. The top cover opens readily for replacing the lamp by sliding the cover latch towards the rear of the unit. Open the lamp housing cover by pulling up on the cover handle to access the lamp. The IEC power module on the rear panel accepts any of the IEC 320 type of international cord sets. The fuse drawer has a restricted access safety feature prohibiting access unless the power cord is removed.

1) Fiber Optic Receptacle
2) Cover Latch
3) Thumbscrew
4) Intensity Control Knob
5) Power Switch

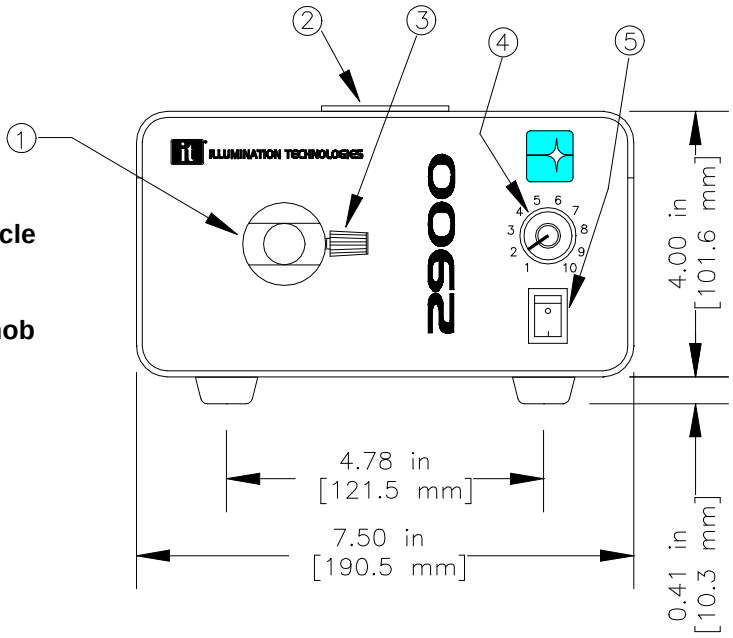


Figure 1: Front Panel Detail, Model 2900

6) IEC 320 Power Module
7) Fuse Drawer
8) Cooling Fan

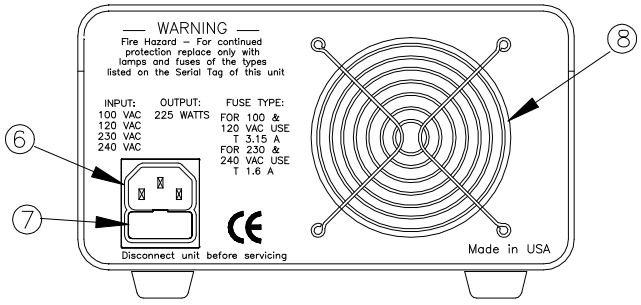


Figure 2: Rear Panel Detail, Model 2900

Operations

General Description:

This product provides DC regulated, cool, white light at high intensities for injection into fiber optic lightguides. The “Auto-switching” DC regulated power supply allows for operation from any International recognized voltage and frequency standard. The 2900 allows for operation anywhere in the world without flipping switches or changing fuse blocks. It employs an interference type IR filter, which allows it to accept polymer fiber lightguides when used in conjunction with accessory filter P/N 9546.

Functionally, the unit provides a variable powered output of up to 150 watts of spectrally pure white light from a tungsten halogen lamp. Power to the unit is controlled by switching the power switch on the front panel to the "1" position. Intensity of the lamp is controlled manually from the front panel via the control knob. Fiber optic lightguides are inserted into the receptacle on the front of the unit. A turn of the thumbscrew locks the lightguides into place. Custom receptacles and adapters can be supplied to allow the 2900 to accept lightguides from other manufacturers - See the accessories page of this manual. No tools are required to replace the lamp, which is accessible, by opening the top cover. Always disconnect the power cord before opening unit. The fuses are located in the fuse drawer, on the rear of the unit, in the lower part of the IEC power connector. This unit uses two 2.5A international type fuses (5x20mm) - replace only with the type recommended on the back panel of the unit. The cooling fan provides maximum airflow at minimum noise levels, providing both cool and quiet operation.

Operation:

Once the safety precautions are understood and committed to, one may proceed with familiarization with the unit and its operation. To begin, make sure the power is off by switching the power switch to the "0" position. Plug one end of the power cord into the IEC connector on the back of the unit and the other end into a power source which meets the specifications printed near the IEC connector. Verify that the top cover of the unit is firmly closed. Insert a fiber optic light guide, into the receptacle. Tighten the lightguide in place with the thumbscrew. Turn the power switch to the "1" position. Rotate the control knob to adjust the intensity of the lamp to the desired level.

Lamp Life:

Lamp life depends primarily on the evaporation rate of the tungsten alloy filament. This rate is proportional to the filament operating voltage. For the best operational lamp life the unit should be operated at the lowest possible setting for each particular application. For example if the lamp is operated at 90% of the rated voltage, the lamp life will be extended 2.5 times the manufacturers specified value. See the section on Technical information in this manual to optimize the set up of your unit.

Maintenance

General:

There is no scheduled or routine maintenance for this product. It has been designed, and tested to provide a lifetime of reliable performance. As with all electronic component assemblies, there is the probability of failure. If for any reason the unit does not operate as outlined, follow procedures below. If problems persist, refer to qualified service personnel.

Basic troubleshooting of this unit is similar to troubleshooting of any other electrical equipment. Check the most obvious possible causes first. The following troubleshooting guide gives a description of possible solutions for a unit that is not operating.

Troubleshooting:

If the fan is operating, but the lamp fails to operate, check the following in sequence:

Over Temp - This unit is equipped with an internal thermal cut-off mechanism which will remove power to the lamp upon an over temperature situation. Ensure proper airflow and ambient temperature. Once the over temperature condition is rectified the unit must be reset. The unit will not operate until it has been reset.

Lamp - The primary reason for light failure is that the lamp has burned out. To change lamp, disconnect unit from power. Let the lamp and bracket cool before opening the lightsource cover. Open the cover by sliding the latch toward the rear of the unit and lift the cover up. Locate the lamp housing in the front of the unit and pull up on the cover tang to open it. Push the release lever located on the lamp bracket toward the rear of the unit to eject the lamp from the socket. Remove the lamp from the unit and push lever back into forward position. Slide a new lamp into the ceramic socket and ensure that lamp is seated firmly into the base. Close the lamp housing cover and the top cover completely. **Using an incompatible lamp or failure to properly seat lamp in the bracket may cause erratic behavior or damage to the unit.**

<u>WARNING</u>! DO NOT ATTEMP TO VERIFY LAMP VOLTAGE MEASUREMENTS BY CONNECTING ACROSS THE LAMP. ANY ATTEMPT TO MEASURE THIS VOLAGE WILL RESULT IN DAMAGE TO THE UNIT AND THE LAMP.

Socket - If the unit still fails to operate, examine the lamp socket for a damage. Carbonized contacts, a cracked ceramic base, or frayed wires are typical indicators that this part has failed. If any of these conditions are evident, consult the factory for a replacement assembly. Do not attempt to repair this part for risk of fire or electric shock hazard.

If neither the lamp nor the fan is operational, check the following items in sequence:

Power - Ensure that the power cord is inserted completely into the IEC connector on the rear panel of the unit, and it is connected to a suitable power supply. Check the power cord for damaged or severed areas. Replace the cord immediately if it is defective.

Interlock - This unit has an interlock switch, which prohibits operation unless the top cover is closed tightly. Make sure the interlock mechanism is engaging the safety switch. DO NOT DEFEAT THE INTERLOCK MECHANISM FOR ANY REASON.

Fuse - Remove the power cord from the IEC connector. Slide the fuse drawer out and remove the fuses. Replace any blown fuse(s). REPLACE ONLY WITH THE FUSE TYPE INDICATED ON THE REAR PANEL OF THE UNIT! If unit continues to blows fuses, contact factory for service.

If unit cannot be made operational using above procedures, call factory for servicing.

Output Linearity

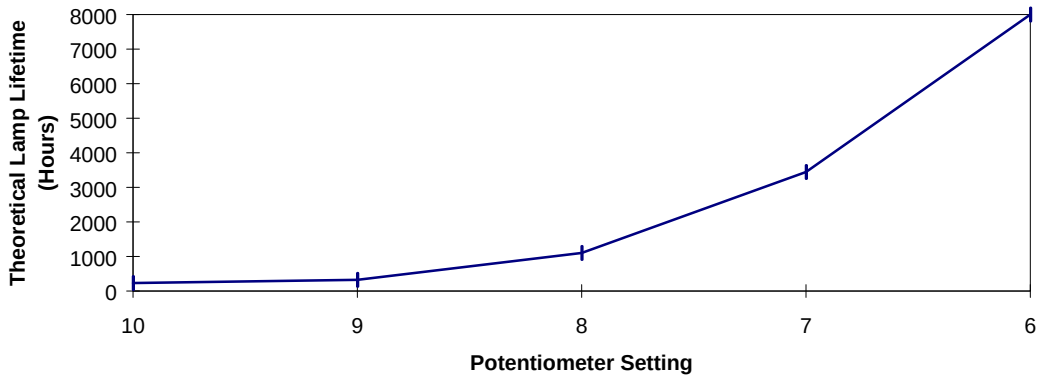
The 2900 light intensity varies with respect to the intensity control knob setting. The change of the knob position provides a change in the light output*. Typical values are shown in the graph and tables below.

Front Panel	Lamp Voltage	Lamp Intensity	Front Panel	Lamp Voltage	Lamp Intensity
1	3.4	0.19%	6	12.9	29.41%
2	4.9	0.94%	7	15.4	49.41%
3	6.4	2.74%	8	17.3	69.41%
4	8.4	7.54%	9	18.9	88.24%
5	10.7	16.40%	10	19.8	100.00%

Lamp Life:

The unit should be operated at the lowest possible setting of the intensity control Knob to maximize the life of the lamp in the system. A small reduction in the setting wills dramatically n crease the service life of a lamp. For example, changing the knob from 9 to 8 will increase the life of the lamp approximately 330%. For approximate life expectancy of knob settings see the graph and table below. Lifetime will be altered by service conditions and vary from lamp to lamp.

Theoretical Lamp Lifetime vs. Potentiometer Setting for Model 2900 Light Source



Front Panel	Lamp Voltage	Lamp Life (hrs)	Front Panel	Lamp Voltage	Lamp Life (hrs)
1	3.4	Note 2	6	13.6	Note 2
2	4.9	Note 2	7	15.8	3441
3	6.4	Note 2	8	17.7	1105
4	8.4	Note 2	9	20	326
5	10.7	Note 2	10	20.7	231

Note 1: The model 2900 light source is designed to assure the Tungsten Halogen lamp is operating in the halogen cycle.
Note 2: The lamp life for these values will be approximately 8000 hours depending on individual lamp and service conditions.
*Lamp Life is function of the voltage applied and varies between manufacturers. The data represented here is with respect to the factory recommended Ushio lamp, other lamps are not guaranteed to function within these specifications.

Specifications

Physical:

- Overall Dimensions

Height:	4.50" (115 mm)
Width:	7.50" (190 mm)
Length:	9.00" (230 mm)

- Weight/Mass (excluding power cable): 5.0 pounds (2.3 kilograms)
- Standard Cable Length: 8.0 feet (2.4 meters)

Electrical:

- Input Power:

100V/1.65A	165 VA	50/60 Hz
110V/1.48A	163 VA	
120V/1.35A	162 VA	
127V/1.27A	162 VA	60 Hz
200V/0.81A	162 VA	
220V/0.68A	141 VA	50/60 Hz
230V/0.61A	140 VA	
240V/0.59A	142 VA	50 Hz
250V/0.57A	143 VA	

- Inrush Current:

100V	1.85 A
110V	1.76 A
120V	1.87 A
127V	1.56 A
200V	0.97 A
220V	0.76 A
230V	0.97 A
240V	1.00 A
250V	1.00 A

- Lamp: EKE Type 150 W, 21V, MR-16 Style (Ushio Factory Recommended)
- Overvoltage Category: Category II

Environmental:

- Operating Temperature Range: 0 to 40°C
- Relative Humidity Range: 0 to 95% non-condensing
- Altitude Rating: 2000 Meters Maximum
- Pollution Rating: Pollution Degree 2

Spare Parts/Accessories

Spare Parts:

Description	P/N
EKE Lamp, 3200°K150 Watt, 21V	9582
EKE-HC Lamp, 4200°K150 Watt, 21V	9586
EKE-IR Lamp, 150Watt, 21 Volt	9588[1]
EKE-ER Lamp, 150 Watt, 21 Volt	9589[2]
Fuse T 2.5 Amp, 5x20 mm (pack of 10)	1010-203

[1] Must be used in a 2900-IR lightsource only
[2] Must be used in a 2900-ER lightsource only

Accessories:

Optional Fiber Optic Receptacles

Inside Diameter	Manufacturer	P/N
ϕ1.005	Dolan-Jenner	1010-401
ϕ.960	**it** (Large)	1010-405
ϕ.725	Fostec	1010-402
ϕ.478/.400	Schott	1010-406
ϕ.590	Volpi	1010-403

Quick Change Color Filters w/holders

Color	Spectral Range	Part Number
Red Filter	λ> 610nm	9541
Green Filter	500nm<λ< 590nm	9542
Orange	λ>580nm	9547
Yellow Filter	λ>520nm	9543
Blue Filter	λ<510nm	9544
Blue -Green Filter	λ<570nm	9548
Day Light Filter	Color Balancing	9545
IR Filter (KG3)*	Longwave Cutoff	9546
Color Filter Set	All 7 Filters Listed Above	9540
Customer Supplied	Filter Holder Blank - 20mm OD x 3mm Thick Filters	954x

***Used to protect Polymer Fiber from premature failure due to IR radiation.**

Warranty/Service

Warranty Statement:

Illumination Technologies' products are warranted to the original purchaser to be free from defects for a period of one year from the date of purchase. Illumination Technologies, Inc. will repair or replace, at its discretion, any defective unit within two (2) weeks of its receipt. This warranty is void if the unit in question has been visibly damaged by accident or misuse, if the unit has been serviced or modified by anyone other than an authorized representative of Illumination Technologies, Inc., or if any warranty seal has been broken. This is the only warranty expressed or implied by Illumination Technologies, Inc. Specifically excluded from this warranty is damage resulting from improper installation or neglect in the operation of the unit or misunderstanding of the properties of the unit.

Service Statement:

Illumination Technologies or an Illumination Technologies Authorized Service Representative must perform any service required for any reason. All service outside the warranty will be performed upon the purchaser's request according to normal service charges in affect at the time. To return any item, an RMA# (Return Materials Authorization) must be obtained from the Customer Service Department at Illumination Technologies. This number must be affixed to the shipping label in plain sight. All shipping must be prepaid. Illumination Technologies guarantees all repairs to be completed within two (2) weeks. All shipping charges will be the responsibility of the purchaser.

Liabilities:

Any warranty implied under State Law shall be limited to one year from original delivery to the original purchaser. Specifically excluded from Illumination Technologies liability is damage resulting from acts of any deity, malicious mischief, vandalism, riots, wars, improper installation or neglect in the operation or maintenance of the unit or misunderstanding of the properties of the unit. Under no circumstances shall Illumination Technologies be obligated for consequential or other damages of any kind or description, losses or expenses in connection with or by reason of the use of, or inability to use this unit for any reason. The stated warranty provides the purchaser with specific legal rights, and there may be additional rights that vary from state to state. Some states, for example, do not allow exclusion of consequential damage.