

## **Preface**

Dear customers, first of all, thanks for your trusting and using KN-4000 UV radiation treatment system.

In order to operate it more proficient and convenient for our customers, we make detailed user manual. Please do read this manual and all other information with the machine carefully before your installation and using this system at the first time.


To satisfy the demand of the market and the customer, we will continuously upgrade our product. We will announce you immediately if take some amendment. Thanks in advance if you correct it after finding any mistake or oversight.

The contents of this manual is protected by copyright law. Nobody is allowed to copy, take photo or translate into other languages without the prior written permission of the company.

## Important Notice

If you meet problem or need help in using, please contact our technical service center for help in time. We will give you technical support or arrange professional technical expert for service. Use correctly can extend the life of machine, also make fully usability of machine by farthest.

Abnormal operation will do harm to machine or person. Our company will not be liable for injury no matter on human body or instrument under the operation which goes against the content of this user manual. Furthermore, if there are some relative damage and decreasing of Instrument performance, reliability and safety performance index because the inaccurate operation, company will not shoulder the responsibility. Any faults arising from such non-observance will invalidate the warranty!

Need read "safety requirement", "notice" and special warning “” content carefully before using.

If you want to get more accurate information and perfect service, please log in [www.kerneluvb.com](http://www.kerneluvb.com).

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## **Chapter I Safety Requirement and Attentions**

(Read the chapter carefully before using it)

- **Avoid using in inflammable and explosive environment**
- **Must be well connected to the grounding**
- **Please carefully confirm the indications and any possible adverse reaction before treatment**
- **The goggles must be worn before treatment, the normal body parts should be covered**
- **Operator must know the patient's MED or dosage before treatment**
- **Everyone should wear goggles when he observed the patient under the UV light, the patient is prohibited to operate the device**
- **Adjust the treatment time according to patient's skin condition**
- **Please ask the dermatologist for solution if lump, pain or pigment spot appears after treatment**
- **In order to prolong the usage life of the lamp and the equipment, please cut off the power when not in use**

### **1.1 Safety Requirement**

- Device can assure the safety and correction only when it is connected to devices supplied by Kernel company, can not assure safety for other device supplied by other company.
- Equipment power is sudden off during normal use, it will not make operator or patient injury, Please follow the manual steps, and close the proceedings, when power is on again, operate the equipment normally in accordance with the manual
- Electromagnetic fields may interfere with the normal work of the system. Therefore, make sure that the working device near this one comply with EMC requirements. X-ray machine or magnetic resonance device is possible interference source, because they can produce high intensity electromagnetic radiation. Meanwhile, far away from mobile phones or other communications equipment.

## 1.2 Attentions

- Attention that the following patients can not be treated by UV Phototherapy: Solar dermatitis, lupus erythematosus, malignant tumor, xeroderma pigmentosum, Bloom syndrome, dermatomyositis. Pregnant women, and etc.
- Instrument can only be operated by trained medical staff who have a skilled operation skills and possess necessary clinical knowledge.
- No matter the operator, patient or someone who is in the

irradiation area must wear UV protective goggles.

- Try to avoid staring at UV radiation source when it is on the state of outputting.
- Do not use the instrument under inflammable or explosive environment such as where anesthesia are placed, in case of any fire or explosion.
- please don't open the device case at random, otherwise there may be danger of electric shock. For equipment maintenance and upgrades, it must be performed by the staff who trained by our company or by authorized service personnel.
- If the supply voltage fluctuation is too large, it should be with an accuracy of 2% AC power supply
- In order to avoid electric shock and reduce device failure, do not make water into device. If liquid is fallen into the machine, please shut down machine immediately, and contact with our service people.
- Before using the machine, please check and make sure all cables are in the safe condition. If no, please replace bad cables and connector immediately.
- After the lamp turning on, the temperature of irradiator's surface will up to over 41°C , don't touch this part at this time.
- The operator should pay attention to the accumulation of exposure dose.
- The equipment should be started only after the operator confirm the correct input of dosage or time .

- Decrease or increase the radiation dosage according to occur in patients with erythema increase or decrease.
- Don't treat more than once a day.
- During treatment, please do not have sunbathing.
- If lamps breakage, please timely recycling, avoid debris harm the body.
- To ensure the safe operation of equipment, all replacement parts , accessories and all kinds of supplies that the instruments are equipped with, please use the product models provided or designated by the company

- **Handling of accessories and device**

Need to handle packing materials accordingly to local waste disposal rules, avoid to let child touch.

Device life is 5 year. Need to handle device and accessories according to relative rules. Any query, please contact our company or our agency.

- **User manual**

In order to assure using this device safety, must obey this manual. But this manual can not replace acknowledged plastic experience of patient nursed.

Please send this manual placed in monitor nearby, so that when necessary, can facilitate timely acquisition.

## Chapter II Summary

Ultraviolet light therapy originated in the twenties, as the development of technology, artificial light source technology has been rapid developed, for the representation :the UVA, UVB therapy, have become an effective treatment of various skin diseases methods in Europe, the United States and other developed countries.

In recent years, the skin of patients are in the growing trend, but the traditional drug therapy are not accepted for a long time, side effects, easy to relapse and other shortcomings. In order to reduce the suffering of patients with skin disease, our company developed the KN-4000 Series UV light therapy apparatus. Clinically proven to the psoriasis, pityriasis rosea, eczema, skin has a certain effect.

### 2.1 Function summary



#### **Range of application :**

On the clinical, checkup with Vitiligo, psoriasis, rose bran diagnosis, eczema etc.



#### **Contraindication**

- **Contraindication absolutely**
  - a) Xeroderma pigmentosum;
  - b) Salient photosensitization dermatosis;



- c) Schematized lupus erythematosus;
  - d) Basal cell nevus syndrome;
  - e) Lactation period woman;
  - f) Pregnant period woman.
- **Relatively Contraindication ( Can be treated but doctors should put more attention on them during treatment period);**
- a) Porphyria;
  - b) Cataract;
  - c) Pemphigus;
  - d) Family history black tumor patients;
  - e) Treat with radioactive or arsenic substance;
  - f) Liver function is abnormality.



**Device features:**

- The light of treatment is produced by Philips which is special ultraviolet lamp with high stability, and long life
- Fashionable touch buttons, gently touch can be realized.
- Small size, save a space
- The operation is convenient, and can be used in the family;
- The computer automatic control radiation dose and the irradiation time, may guarantee the treatment precision

through the establishment dosage, or uses traditional the timing control way, is advantageous for the medical personnel to grasp

- Increases the illuminator design, may raise the radiation efficiency
- The unique antijamming technology, guarantees the equipment to work normally under the strong magnetic field
- Adopt the special protective shield to prevent patients from touching lamps.

## 2.2 Configuration

This device is consist of light tube, radiation device, control circuit. Like Fig.2-1.

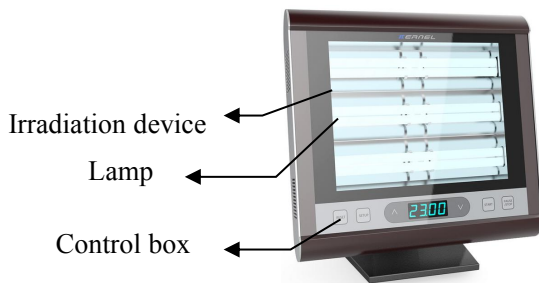


Fig 2-1

## 2.3 External ID Description



Fig 2-2



Attention! Please read attached catalogue



Attention the ultraviolet radiation radioprotection



goggles necessary

I

Power is on

O

Power is off



Refer to user's manual



Recycling symbol mark

## 2.4 Instrument parameters



### Instrument Type

- Security Classification: Class I
- Operation mode: continuous operation.

- General Equipment (closure device without preventing the liquid )
- Can not be used in following situation: a flammable anesthetic mixture with air or with oxygen or nitrous oxide gas mixture of flammable gas under anesthesia



**Technical Parameter**

Table 2-1 Product Model comparison

Parameter Model	Quantity of light		Spectral scope (nm)	
	UVA	UVB	UVA	UVB
KN-4006A1	6	--	350~400	--
KN-4006B1	--	6	--	311~312

- **Work Voltage :** AC 230V±10% , 50Hz±2% or AC 120V±10%, 60Hz±2% (Note: the products meets only one which is subject to the nameplate marking)
- **Rated Powe:** 130VA;
- **Specifications and ratings of fuse: :** T1.0AL φ5×20
- **Work enviroment:**  
 TEM.: 5~40°C  
 Relitive Moisture: ≤85%  
 Atmospheric pressure: 700hPa~1060hPa
- **Display mode:** LED Display
- **Effective Radiation Size:** 510cm<sup>2</sup>±2%
- **Radiation housing temperature:** <60°C

● **Radiation Intensity:**

Table2-2 Radiation Intensity in Normal

Amount Model (mW/cm <sup>2</sup> ) Wave sort	KN-4006A1	KN-4006B1
UVA	1~50	--
UVB	--	0.3~20

● **Radiation dosage:**

- a) UVA setting scope  $\leq 20\text{J/cm}^2$ ;
- b) UVB setting scope  $\leq 5\text{J/cm}^2$ ;
- c) Setting accuracy:  $0.01\text{J/cm}^2$ .

● **Radiation time:**

- a) Scope 0~30min; testing accuracy  $\leq \pm 1\%$ .
- b) Setting accuracy: 1s.



**Work Theory**

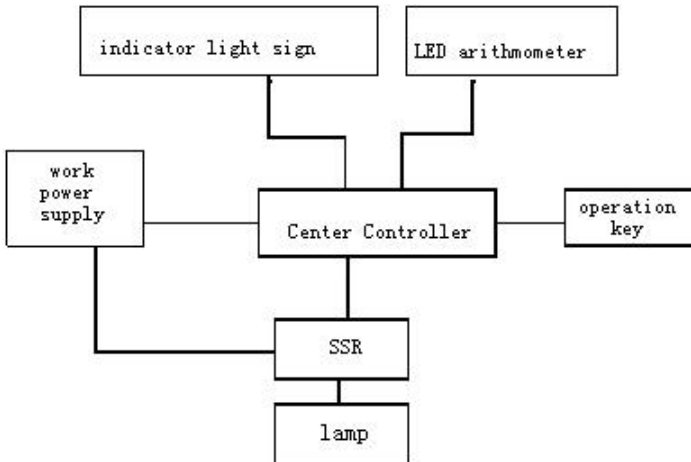


Fig 2-2

## Chapter III Installation and Connection



Figure. 3-1

- Take out the instrument from the box, unfold the base stand (like figure 3-1), and put it in a safe, stable and visible position.
- Check all the accessories in accordance with the packing list to ensure the integrity of parts.
- Insert the three-core cable into three-phase AC power socket.

**Attention:** —Equipment must be connected to a single socket and can not be shared with other electrical equipment . Recommended to equip with a voltage stabilizer in the region of voltage instability.

— The electrical equipment which is not provided in this instrument can not be connected with it.

- Instruments should not be placed in vibration or shaking place
- Leave enough space around the instrument to ensure normal ventilation
- Ensure the request normal working environment when operation the instruments

## Chapter IV Operation and Usage


### 4.1 Preparation before treatment

#### 4.1.1 Treatment preparation

Doctor — Dermatologists establish treatment programs according to symptoms of patient to determine treatment location, work mode, initial dose, course of treatment and interval time.

Patient — Cleaning the whole body and cosmetics  
Took off his clothes to reveal parts of needed radiation, and cover the normal skin with a cloth or other methods.

— If necessary, lubricate the skin cream spread on the area irradiated

— Wear UV goggles 

**NOTICE:** For the newly diagnosed patients, test skin minimum phototoxic (MPD) and minimal erythema dose (MED) according to the UNA radiation type which will be applied. If can not be tested, can propose initial dose according to average MPD or MED combined with specific trait of the patient (skin pigment and external factors that impact body sensitivity), then adjust dose in compliance with



**the response after exposure.**

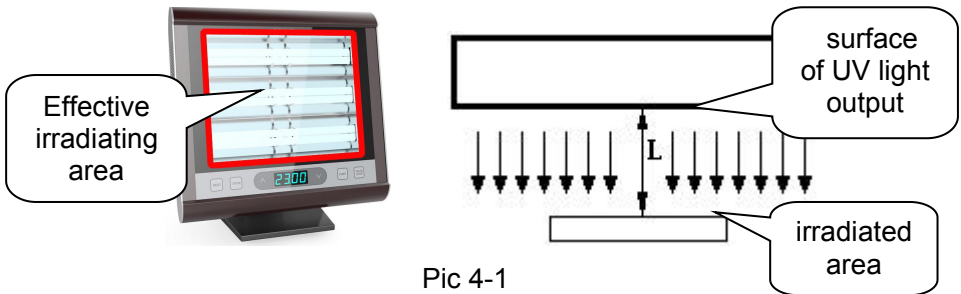


MPD or MED test: Because of individual sensitivity differences to UVA, so make the biological dose (MPD or MED) as the unit of UV treatment. The definition of biological dose: The time from UVA light first radiates on the skin till visible erythema can be seen (identified by naked eyes). Determination of the best results best be observed 24 hours after irradiation. Determination of the value shall help choose the right treatment dose in the initial therapy. For more details please see Appendix C.

**4.1.2 Equipment operation**

- Start** Turn on power switch, start the instrument, the value for last treatment is showing on the display window.
- Check** Check the equipment to find whether it works normally.  
Confirm the preset irradiation intensity is correct or not; Details please see Chapter 4.3.2.
- Setting** Treatment dosage and time
- Patient** The effective irradiating area of the instrument (please see Fig. 4-1) is a rectangle of 26.2cm\*19.6cm. And the irradiating area is 510cm<sup>2</sup>. Put the needed irradiating parts right toward the surface of UV light output of the

instrument. from instrument L (around 3 cm), as  
Pic 4-1:



Pic 4-1

**Operator** Wear the UV goggles ,press the button “▶”, the treatment starts.

**Treatment procedures** If needs to suspend the treatment in the midway, the operator can press down the button “■/■” of the main control panel, suspends the treatment; If wants to resume the treatment, presses down the button “▶”, continues to treat; If wants to terminate the treatment, pressed down the button “■/■”, the conclusion treatment

**The end of treatment** Dose or time get zero, the lump goes off.

**Turn off the instrument** End of the treatment or not operating the instrument for a long time,please turn off the power switch.

**Instruction:** When instrument turning on, the light source output part of front-end instrument has UV irradiation, so operator, patient

and someone who is in the irradiating area should wear UV goggles or use the light-proof objects to cover. When the instrument is laid aside or turned off, without UV irradiation, no special protection is needed.

#### 4.1.3 Description of Treatment

**Summary** Light therapy is an effective therapy method, doctors should have knowledge and experience of light therapy, absolutely not allow to consider the treatment process as a learning process

**UV Goggles** Make sure the patient wears UV goggles before treatment.

**Basic information** The reference dose of light therapy listed in Appendix B is not appropriate for every patient, the operator can be selected according to specific conditions of patients.

**Individual response** Radiation dose must be based on individual patient response to be adjusted. During each new therapy, and must be suspected.

**Solar dermatitis** If patients with solar dermatitis after the light treatment started, please check whether the patient received excessive solar radiation, whether taking an enhanced photosensitivity of the drug, whether to stop using the past has been used with some

photosensitivity of sunscreen, aromatic cosmetics, shower gel, or Tea

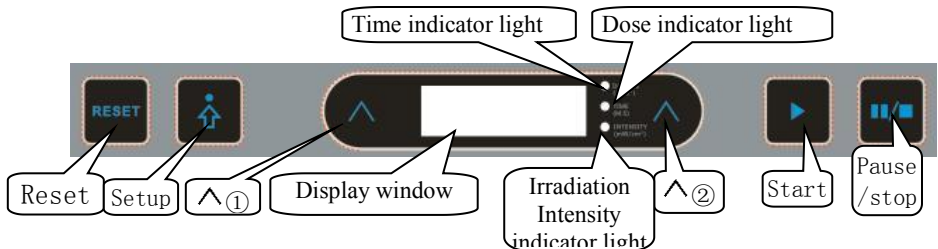
**Protection before treatment** Before treatment, it is recommended to apply some in the Skin Lesions of ultraviolet radiation on the role of stratum corneum from the skin penetration oil (such as mineral oil), it can increase the UV radiation penetrating the stratum corneum to enhance the therapeutic effect of ultraviolet radiation.

**Attention: Skin oil can not use too much! Use too much oil left in the skin, influence and weaken the effect of ultraviolet radiation**

**Protection after treatment** Ultraviolet radiation therapy causes dry skin, can wipe the skin after treatment with some moisturizing

## 4.2 Control Panel

Treatment model can be set, and control the treatment process, from health care operations, like Pic 4-2



Pic 4-2 Main control panel

### 4.2.1 Indicator light

**Dose indicator light** It shows the value of current dose on the display window if the light is on, unit  $J/cm^2$

**Time indicator light** It shows the value of current time on the display window if the light is on, unit min.sec

**The indicator light of irradiation intensity** It shows the value of current irradiation dose on display window if the light is on, unit  $mW/cm^2$

### 4.2.2 Button

**RESET** Press this button, display window rest, it shows 0.00 on the display window.



Used to choose work mode

— Used to cut dose and time mode. Press "↑" button, the time indicator light up, it shows the time mode; Press this button again, it is back to the dose mode again.

— Simultaneously press ↑ and ^① button is used to set the irradiation intensity.

▶ After finishing the setting of work mode, press this button, lamps will light up and working.




Press this button when working to suspend work for the radiation, UV lamp off, dose or time value will be frozen. Press this button when suspend work to stop the irradiation work.




^ ① Button is used to adjust the value of first and second nixietube. ^ ② Button is used to adjust the value of third and fourth nixietube. Press once, the value increased by 1. Press ^ button, value increase continuously.


## 4.3 Software operation


### 4.3.1 Mode setting

**Dosage mode:** When the display window shows 00.00, press “” button, the dosage indicator light is on, enter the dose setting mode, Press ^ ① button to set the value of first and second nixietube, means the integer of dosage value, Press ^ ② button to set the value of third and fourth nixietube, means the decimals of dosage value.




**Time mode:** When the display window shows 00.00, press “” button, the time indicator light is

on, enter time setting mode. Press  $\wedge$  ① button to set the value of first and second nixietube, means the minutes. Press  $\wedge$  ② button to set the value of third and fourth nixietube, means seconds.

Method of clear the display window: Press “” or “RESET” button to clear the display window.

If want to come back to the last irradiation time or dosage when under the state of 00.00, please press “” button.

### 4.3.2 Irradiation intensity settings

Press “+ $\wedge$  ①” button, Intensity indicator will be on. The display window shows the intensity of the current setting value. Press  $\wedge$  ① button to set the value of first and second nixietube, means the integer of dosage value, Press  $\wedge$  ② button to set the value of third and fourth nixietube, means the decimals of dosage value. Press “” button to save setting and exit, press “” button will not save setting.

**Attention: Intensity is set up before out of the factory, its accuracy determines the accuracy of the treatment, Please do not modify the intensity. If need to reset, please reset it in accordance with the value of intensity in Appendix A**

### 4.3.3 Start, stop, pause of the equipment

When the equipment is standby after the parameter is set, press "▶" button to start the lamps and into the treatment status. If you set the dose mode, the display window shows the dose decrease; If you set the time mode, the display window shows the time decreased.

When you press "■/■" button, the treatment is suspended, lamps go out, dose or time is frozen. Press the "▶" button, to continue treatment.

When In the state of suspended, press "■/■" button, the dose or time go zero, the lamp is off, the treatment will be end.



## **Chapter V Maintenance of the Machine**

To ensure the equipment works well, extend equipment life, please pay attention to maintain the machine according to the specification.

### **5.1 Maintenance of equipment and accessories**

To ensure the normal safety, equipment and accessories should be accepted a preventive check-ups for every 6 months (including the performance of inspection and safety inspection)and maintenance, this in order to prove that the equipment work properly good and in good working condition, for that the medical staff and patients are safe and meet the required clinical accuracy.

1. Ensure that the equipment grounding good.
2. Note that the local power grid voltage fluctuations, if beyond the allowable range, proposed a new regulation equipment.
3. Do not open the case of the equipment without permission, in order to avoid undue troubles.
4. accessories shall be gently to take, do not throw, hit, pull, do not containing corrosive chemicals wipe!
5. To reduce the times to plug of the annex to extend its service life.
6. Do not touch the lamp and reflector, to avoid contamination of fingerprints and reduce the radiation effect.
7. Do not make lamp long vacant, in order to prevent the dust or oxidation falling into the metal contact points, resulting in poor contact tube

8. Equipment and accessories shall be inspected at the hospital in accordance with the provisions of the calibration cycle, please contact the manufacturer after the examination period. Recommend that users check in daily operation of equipment and accessories to make some treatment; and do a comprehensive technical inspection to detect mechanical damage and cable damage every six months.
9. This instrument shall be regularly for maintenance in accordance with the relevant provisions of the hospital, the instrument shall be powered up once every two months when it is not used for long time.
10. If equipment and accessories life expired, in accordance with the relevant provisions dealt with electronics waste.

## 5.2 Cleaning equipment

**WARNING: Please cut off the electrical before the cleaning.**



1. Cleaning equipment can use commonly used hospital cleaning and non-corrosive liquid detergents, but note that many of them must be diluted before use, please follow the detergent manufacturer's instructions.
2. Avoid using alcohol-based, amino-or acetone-based cleaner.
3. Instrument case and screen should be kept free from dust pollution, use a soft cloth or infiltrated sponge to wipe.

**Note: -- Do not pour the liquid on the machine, make sure that no liquid into it.**

**-- To avoid the lump off for wiping or shaking,**

**recommend to remove the lamp when cleaning equipment.**

4. Prohibit use such as steel wire brush or metal polishing agent abrasive materials, which would damage instrument panel and display screen.
5. When the cable connectors is wet occasionally, please use a distilled or deionized water rinse, and then at 40 °C to 80 °C dry environment at least one hour.
6. If oxidation of the metal contacts occurred on Lamps and lamp, you can use cotton swabs to wipe with dipped alcohol
7. If there is contaminated fingerprints or other stains on the reflectors, use a soft cloth or infiltrated sponge dipped in alcohol to wipe.

### **5.3 Storage**

If Instruments long time unused, please wipe clean and cover with dust proof, store in a dry and clean place.

### **5.4 Transport and storage**

**Transport:** The instrument should avoid the rain and snow, and does not have the corrodent in the gas mixed load situation, and permission uses any transport mode.

**Storage:** The completely packing product should store in ventilate, non-corrosiveness material dry, no intense magnetic field storehouse.

**Transport and storage environmental conditions:**

temperature: -40 ~ 55 °C

Atmospheric pressure: 500 ~ 1060hpa

Relative humidity: ≤ 95%

## 5.5 Lamp change

The UVA, UVB lamps were produced by Philips company, and their power is 9W.

Normal UV lamp life is 1000 hours (The data was provided by the Supplier), but with the accumulation of time, and frequent switching or excessive ambient temperature, there will be some attenuation of intensity values. When the light flashed or lamps do not shine need to replace the lamp timely. At the same time in order to ensure the effectiveness of the treatment of the machine, it is recommended that users shall replace the lamps when the intensity of the lamps obviously drop in, so as not to reduce treatment effectiveness.

### **Attention:**

- Must change with the same type of lamp to ensure instrument normal work.**
- Lamp is fragile items, in the process of demolition and installation must pay attention to moderate intensity.**
- Waste lamps in accordance with special waste processing**

**WARNING: Power off the machine, and disconnect the power cord.**

- Remove the left fixed baffle

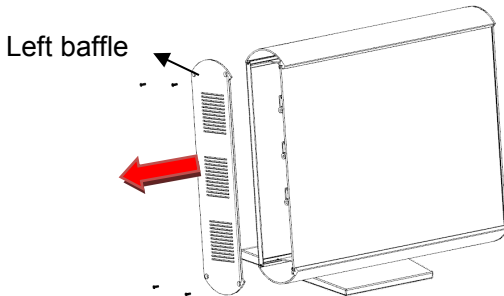


Figure 5-1

- Pull out the front panel gently .

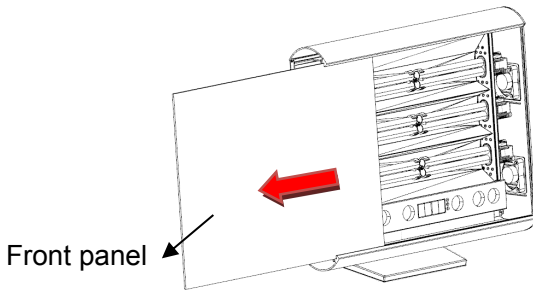


Figure 5-2

- Remove the two clamps of needed replaced lamps.

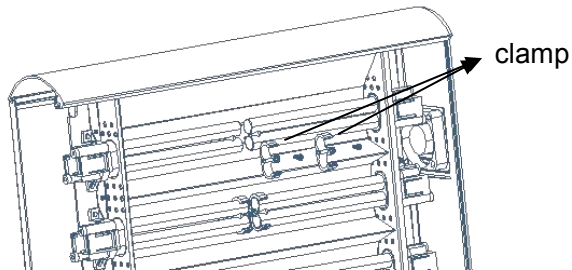


Figure 5-3

- Take out the needed replaced lamp according to the direction of the figure.

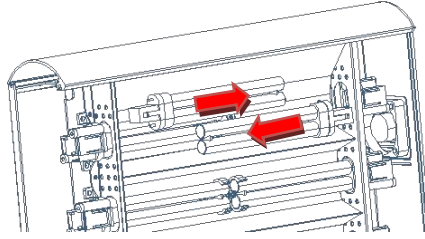


Figure 5-4

- Install the new lamp, and fix clamps of the two lamps.
- Installation of front panel. **Notice: when installation, Press every button spring one by one to the bottom of front panel, along the chute drive front panel slowly to the right, till the baffle embedded in the right fixed into chute.**

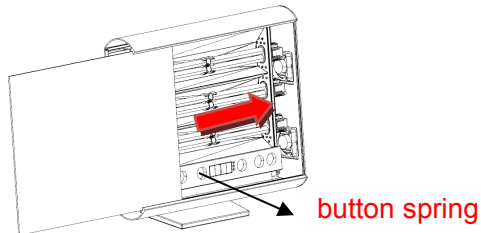


Figure5-5

- Installation of the left fixed baffle.

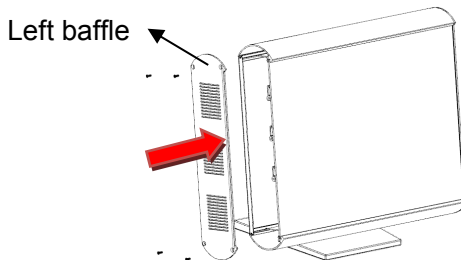


Figure 5-6

## Chapter VI Troubles shooting

Common equipment fault analysis and troubleshooting the contents of Table 6-1. If you can not determine or resolve equipment failure, please call our service center

**Table 6-1 Troubles shooting**

NO.	Failure phenomenon	Possible Cause	Troubleshooting
1	One or several lamps do not light	Loose tube	Re-install the lamp
		Lamp and lamp holder contacts occurred the black oxide layer	Scrapes off the metal oxide layer with the bit
		1) the lamp is bad 2) the ballast is bad	Note the manufacturer
2	lamps are all not light when the machine start	Voltage is too low	Check the voltage, if it belows the rated voltage more than 10%, stop using
3	The power LED is not lit	Power supply system is not normal	Check the power cord connection has loose or not
4	Turn on the power switch, the display not show	Control circuit is failure	Note the manufacturer

## Chapter VII After Service

1. We will not supply free repair if the malfunction caused by:
  - 1) Making bold to dismantle and refit the instrument
  - 2) Not careful to knock and lower in course of work or transportation
  - 3) Lack of proper maintenance and not satisfy request of working environment
  - 4) Handle breaching User's Manual
  - 5) Mangle and burn out of instrument and accessories factitiously
  - 6) Self-maintain instrument without our permission
  - 7) Burn out the instrument without stable voltage
  - 8) Malfunction and damnification by visitation, fire, earthquake and etc.
2. when you need maintenance service or relevant information ,please directly contact our Technology Service Center by phone, telex, letter and fax . It is possible that message was intermitted in transfer if you contact with other staff or department. It will influence your normal work and our repair speed!
3. The schematic,parts,and other technical information,these can be forward to our authorized technical servicer when it's necessary.



## Appendix A Radiation intensity

Irradiation intensity value before out of factory is recorded in Table A-1 .

**Table A-1 Irradiation intensity settings**

<b>Wave band type</b>	<b>Radiation Intensity (mW/cm<sup>2</sup>)</b>
<b>UVA</b>	
<b>UVB</b>	

Notice: After a period of the usage of lamp, the value of the irradiation intensity will attenuate correspondingly and should be adjusted in time according to the condition (For example, every usage of 100 hours or less time,feeling the intensity attenuate obviously,after the replacement of lamp, or other any may cause the change of the irradiation intensity value )of the usage of lamp,and should be acquired after determination of special tools.If it's unable to determine the accuracy of the irradiation intensity value , please contact the distributor or manufacturer to help you determine.The specific adjustable method of the irradiation intensity value please see chapter 4.3.2.

## Appendix B UV Phototherapy Doses

### Reference Table

#### 1. Skin Type

According to regional differences and population differences, human skin can be broadly divided into six kinds (I ~ VI). I ~ IV by asking patients' skin reaction after 30 minutes sun exposure at noon of early summer to determine the skin type, V and VI skin types depend on the skin color (see Table B-1).

Table B-1 Skin Type

Skin Type	Sun Reaction	Skin Color
I	Easy to sunburn, never tan	Blue eyes, red hair, extraordinarily white skin
II	Easy to sunburn occasional tan	Blue / green / gray eyes, less skin spots, blond or brown hair, white skin
III	Sometimes sunburn, easy to tan	Gray / brown eyes, no skin spot, dark brown hair, white to light brown skin
IV	Never sunburn, easy to tan	Black eyes, no skin spot, dark brown hair, light brown skin
V		Brown Skin
VI		Black Skin

#### 2. Dose Program

Table B-2 ~ Table B-4 list the doses used in various treatment programs, for medical staffs' reference only, actual operation should be based on the actual situation of patients:

- PUVA treatment: UVA Radiation and photosensitizer treatment.

Table B-2 PUVA Dose

<b>Skin Type</b>	<b>The Initial Dose (J/cm<sup>2</sup>)</b>	<b>Increasing Dose (J/cm<sup>2</sup>)</b>	<b>Maximum Dose (J/cm<sup>2</sup>)</b>
<b>I</b>	0.5	0.5	8
<b>II</b>	1.0	0.5	8
<b>III</b>	1.5	0.5	8
<b>IV</b>	2.0	1.0	12
<b>V</b>	2.5	1.0	12
<b>VI</b>	3.0	1.0	12

- UVA treatment: only UVA Radiation Treatment.

Table B-3 UVA Dose

<b>Skin Type</b>	<b>The Initial Dose (J/cm<sup>2</sup>)</b>	<b>Increasing Dose (J/cm<sup>2</sup>)</b>	<b>Maximum Dose (J/cm<sup>2</sup>)</b>
<b>I</b>	2	1	10
<b>II</b>	2	1	10
<b>III</b>	4	1	20
<b>IV</b>	4	1	20
<b>V</b>	6	1	35
<b>VI</b>	6	1	35

- Narrow spectrum UVB treatment: Narrow spectrum UVB Radiation Treatment.

Table B-4 Narrow Spectrum UVB Dose

<b>Skin Type</b>	<b>The Initial Dose (J/cm<sup>2</sup>)</b>	<b>Increasing Dose (J/cm<sup>2</sup>)</b>	<b>Maximum Dose (J/cm<sup>2</sup>)</b>
<b>I</b>	0.2	0.05	2
<b>II</b>	0.2	0.05	2
<b>III</b>	0.3	0.10	3
<b>IV</b>	0.3	0.10	3
<b>V</b>	0.4	0.15	5
<b>VI</b>	0.4	0.15	5

- Notice:**
- Although the method that determine radiation dosage by skin type is simple, but not as accurate as MPD or MED.
  - Specific drugs may increase the skin sensitivity to light, thereby to affect the determination of skin type.
  - It is also important to learn about the patient's reaction after long-term sun exposure to determine radiation dose. If two patients are the same skin type, the slow tanned one should adopts a lower dose.

## Appendix C MPD / MED Determination

1. Please confirm the patient's skin type according to appendix B B-1.
2. Select the test area. Test area can be flexor side arm, abdomen, back, thighs (see photo) and other non-lesions non-exposed parts, the surrounding skin should be no deformity, ulceration and pigmentation. The patient's skin has not received phototherapy in three weeks.
3. Clean the skin which will be tested, other exposed parts should be covered with multilayer clothing or anti-light stabilizers
4. Doctor and patient should wear UV protective goggles.

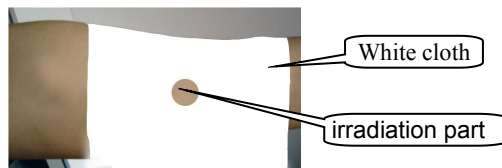


Figure C-1

5. Required for the test of five different irradiation doses, dose selection according to skin type, and then a hole 1-5 in Appendix D of the dose in terms of the exposure time , respectively , according to the order value is output five doses . Instruments should be aligned holes irradiation, each completed a dose of irradiation to replace an irradiated sites. (Note: For inside & outside forearm, outside upper arm, Due to sensitivity against UV light are less than other parts, so the dosage is higher than other parts so the forearm flexor side ,

upper arm extensor side of the forearm extensor side of these special parts of . when testing, each hole tested dose values in Table C-2 and C-4 table doses given in the remaining parts of the test in accordance with the normal dose values in Table C-1 and C-3 in the table given in the test. name of body parts in Figure C-2.)

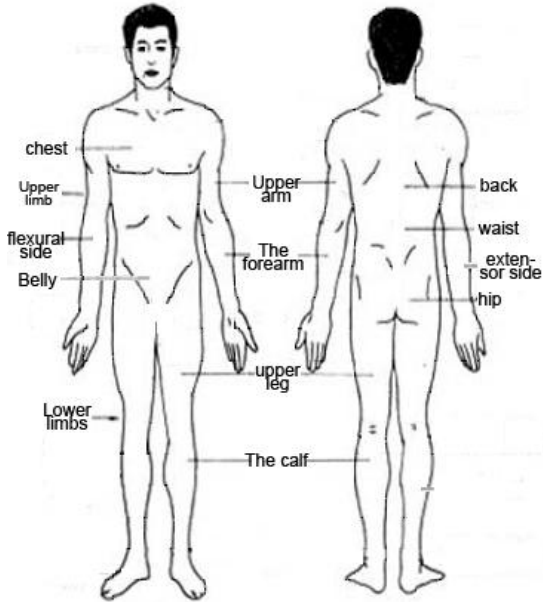


Figure C-2 every part name of the body

Table C-1 normal part of MPD test dose values corresponding to each hole

Dose (J/cm <sup>2</sup> ) Sequence	Skin Type	I	II	III	IV	V	VI
		1	2	3	5	7.5	9
2	1.6	2.4	4	6	7.2	9.6	
3	1.2	1.8	3	4.5	5.4	7.2	
4	0.8	1.2	2	3	3.6	4.8	

<b>5</b>	0.4	0.6	1	1.5	1.8	2.4
----------	-----	-----	---	-----	-----	-----

Table C-2 special parts MPD test dose values corresponding to each hole

Dose (J/cm <sup>2</sup> ) Sequence	Skin Type	I	II	III	IV	V	VI
		<b>1</b>	2.5	3.6	6	9	11
<b>2</b>		2	2.88	4.8	7.2	8.8	11.6
<b>3</b>		1.5	2.16	3.6	5.4	6.6	8.7
<b>4</b>		1	1.44	2.4	3.6	4.4	5.8
<b>5</b>		0.5	0.72	1.2	1.8	2.2	2.9

Table C-3 normal part of MED test dose values corresponding to each hole

Dose (J/cm <sup>2</sup> ) Sequence	Skin Type	I	II	III	IV	V	VI
		<b>1</b>	0.4	0.65	0.9	1.2	1.5
<b>2</b>		0.32	0.52	0.72	0.96	1.2	1.28
<b>3</b>		0.24	0.39	0.54	0.72	0.9	0.96
<b>4</b>		0.16	0.26	0.36	0.48	0.6	0.64
<b>5</b>		0.08	0.13	0.18	0.24	0.3	0.32

Table C-4 special parts MED test dose values corresponding to each hole

Dose (J/cm <sup>2</sup> ) Sequence	Skin Type	I	II	III	IV	V	VI
		<b>1</b>	0.5	0.8	1.4	1.8	2.3
<b>2</b>		0.4	0.64	1.12	1.44	1.84	2
<b>3</b>		0.3	0.48	0.84	1.08	1.38	1.5
<b>4</b>		0.2	0.32	0.56	0.72	0.92	1

5	0.1	0.16	0.28	0.36	0.46	0.5
---	-----	------	------	------	------	-----

**Example:** to test MED, if the patient's skin type is IV, Test site is the upper arm flexor side, look for it from C-3: the first hole's radiate dosage is  $1.2\text{J}/\text{cm}^2$ , The second is  $0.96\text{J}/\text{cm}^2$ , the third is  $0.72\text{J}/\text{cm}^2$ , the fourth is  $0.48\text{J}/\text{cm}^2$  the fifth is  $0.24\text{J}/\text{cm}^2$ . Then shift each dosage to radiation time to output.

6. Mark the locations of each hole
7. Within 24 hours after irradiation, the test parts need to avoid any artificial and natural UV light irradiation;
8. 24 hours later, the patient should be returned to hospital to determine doses in accordance with different erythema parts.
9. The dosage which can first cause slight erythema is the patient's MPD or MED. As figure C-3, the patient first have MED test, skin type is IV, Test site is the upper arm flexor side. The third hole erythema is the slight erythema. Known from table C-3, the third hold's dosage is  $0.72\text{J}/\text{cm}^2$ , so the patient's MED is  $0.72\text{J}/\text{cm}^2$ .



Figure. C-3

10. If there are serious erythema or blisters, can use external corticosteroids.



**Suggestion: use my company's MPD / MED tester for testing irradiated only once, eliminating the trouble of repeatedly setting.**

## Appendix D Radiation Dosage/Intensity/Time calculation method

### Method 1: According to the table

Users can find the radiation time directly from Appendix D. Common dosage/intensity/time calculation value are in below table. The first line is radiation intensity, the unit is  $\text{mW}/\text{cm}^2$ ; the first column is radiation dosage, the unit is  $\text{J}/\text{cm}^2$ ; the values in the middle of the table are "radiation time", the unit are "Min.: Sec.":

Radiation time (Min:Sec) \	Radiation Intensity ( $\text{mW}/\text{cm}^2$ ) ↓										
	01.00	01.20	01.40	01.60	01.80	02.00	02.20	02.40	02.60	...	
Radiation Dosage ( $\text{J}/\text{cm}^2$ ) ↑	0.04	00:40	00:33	00:29	00:25	00:22	00:20	00:18	00:17	00:15	...
0.05	00:50	00:42	00:36	00:31	00:28	00:25	00:23	00:21	00:21	00:19	...
0.06	01:00	00:50	00:43	00:38	00:33	00:30	00:27	00:25	00:23	00:23	...
0.07	01:10	00:58	00:50	00:44	00:39	00:35	00:32	00:29	00:27	00:27	...
0.08	01:20	01:07	00:57	00:50	00:44	00:40	00:36	00:33	00:31	00:31	...
0.09	01:30	01:15	01:04	00:56	00:50	00:45	00:41	00:38	00:35	00:35	...
...	...	...	...	...	...	...	...	...	...	...	...

**For example:** If the radiation intensity is  $5.0\text{mW}/\text{cm}^2$  (the actual value, please see table A-1 of appendix A), and it needs the radiation dosage for  $2.5\text{J}/\text{cm}^2$ , then we can find the radiation time is 8:20 from table D-2, that is 20sec past 8min.

Radiation time (Min:Sec) \	Radiation Intensity ( $\text{mW}/\text{cm}^2$ ) ↓										
	04.00	04.20	04.40	04.60	04.80	05.00	05.20	05.40	05.60	...	
Radiation Dosage ( $\text{J}/\text{cm}^2$ ) ↑	2.10	08:45	08:20	07:57	07:37	07:18	07:00	06:44	06:29	06:15	...
2.20	09:10	08:44	08:20	07:58	07:38	07:20	07:03	06:47	06:33	06:33	...
2.30	09:35	09:08	08:43	08:20	07:59	07:40	07:22	07:06	06:51	06:51	...
2.40	10:00	09:31	09:05	08:42	08:20	08:00	07:42	07:24	07:09	07:09	...
2.50	10:25	09:55	09:28	09:03	08:41	08:20	08:01	07:43	07:26	07:26	...
2.60	10:50	10:19	09:51	09:25	09:02	08:40	08:20	08:01	07:44	07:44	...
2.70	11:15	10:43	10:14	09:47	09:23	09:00	08:39	08:20	08:02	08:02	...
2.80	11:40	11:07	10:36	10:09	09:43	09:20	08:58	08:39	08:20	08:20	...
...	...	...	...	...	...	...	...	...	...	...	...

**Method 2: Formula method**

If the users can not find the value from appendix D, can use formula to calculation:

$$\text{radiation time(s)} = \frac{\text{dosage [J/cm}^2\text{]} \times 1000}{\text{intensity [mW / cm}^2\text{]}}$$

**For example:** If the radiation intensity is 4.0mW/cm<sup>2</sup> (the actual value please see table A-1 of appendix A), and need the radiation dosage 6.0J/cm<sup>2</sup>, we can calculate as follows :

$$\text{radiation time} = \frac{6.0\text{J/cm}^2 \times 1000}{4.0\text{mW/cm}^2} = 1500 \text{ (s)} = 25 \text{ (min)}$$

That means it needs 25min .

**Appendix:**

Table D-1 General Parameter List 1 (Radiation Intensity 1.0~3.8mW/ cm<sup>2</sup>)

Table D-2 General Parameter List 2 (Radiation Intensity 4.0~6.8mW/ cm<sup>2</sup>)

Table D-3 General Parameter List 3 (Radiation Intensity 7.0~9.8mW/ cm<sup>2</sup>)

Table D-4 General Parameter List 4 (Radiation Intensity 10.0~12.8mW/ cm<sup>2</sup>)

Table D-5 General Parameter List 5 (Radiation Intensity 13.0~15.8mW/ cm<sup>2</sup>)

Table D-1 General Parameter List 1 (Radiation Intensity 1.0~3.8mW/cm<sup>2</sup>)

Radiation time (Min:Sec) ↘	Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
	01.00	01.20	01.40	01.60	01.80	02.00	02.20	02.40	02.60	02.80	03.00	03.20	03.40	03.60	03.80
<b>0.04</b>	00:40	00:33	00:29	00:25	00:22	00:20	00:18	00:17	00:15	00:14	00:13	00:13	00:12	00:11	00:11
<b>0.05</b>	00:50	00:42	00:36	00:31	00:28	00:25	00:23	00:21	00:19	00:18	00:17	00:16	00:15	00:14	00:13
<b>0.06</b>	01:00	00:50	00:43	00:38	00:33	00:30	00:27	00:25	00:23	00:21	00:20	00:19	00:18	00:17	00:16
<b>0.07</b>	01:10	00:58	00:50	00:44	00:39	00:35	00:32	00:29	00:27	00:25	00:23	00:22	00:21	00:19	00:18
<b>0.08</b>	01:20	01:07	00:57	00:50	00:44	00:40	00:36	00:33	00:31	00:29	00:27	00:25	00:24	00:22	00:21
<b>0.09</b>	01:30	01:15	01:04	00:56	00:50	00:45	00:41	00:38	00:35	00:32	00:30	00:28	00:26	00:25	00:24
<b>0.10</b>	01:40	01:23	01:11	01:03	00:56	00:50	00:45	00:42	00:38	00:36	00:33	00:31	00:29	00:28	00:26
<b>0.12</b>	02:00	01:40	01:26	01:15	01:07	01:00	00:55	00:50	00:46	00:43	00:40	00:38	00:35	00:33	00:32
<b>0.14</b>	02:20	01:57	01:40	01:28	01:18	01:10	01:04	00:58	00:54	00:50	00:47	00:44	00:41	00:39	00:37
<b>0.16</b>	02:40	02:13	01:54	01:40	01:29	01:20	01:13	01:07	01:02	00:57	00:53	00:50	00:47	00:44	00:42
<b>0.18</b>	03:00	02:30	02:09	01:53	01:40	01:30	01:22	01:15	01:09	01:04	01:00	00:56	00:53	00:50	00:47
<b>0.20</b>	03:20	02:47	02:23	02:05	01:51	01:40	01:31	01:23	01:17	01:11	01:07	01:03	00:59	00:56	00:53
<b>0.30</b>	05:00	04:10	03:34	03:08	02:47	02:30	02:16	02:05	01:55	01:47	01:40	01:34	01:28	01:23	01:19
<b>0.40</b>	06:40	05:33	04:46	04:10	03:42	03:20	03:02	02:47	02:34	02:23	02:13	02:05	01:58	01:51	01:45
<b>0.50</b>	08:20	06:57	05:57	05:13	04:38	04:10	03:47	03:28	03:12	02:59	02:47	02:36	02:27	02:19	02:12
<b>0.60</b>	10:00	08:20	07:09	06:15	05:33	05:00	04:33	04:10	03:51	03:34	03:20	03:08	02:56	02:47	02:38
<b>0.70</b>	11:40	09:43	08:20	07:18	06:29	05:50	05:18	04:52	04:29	04:10	03:53	03:39	03:26	03:14	03:04
<b>0.80</b>	13:20	11:07	09:31	08:20	07:24	06:40	06:04	05:33	05:08	04:46	04:27	04:10	03:55	03:42	03:31
<b>0.90</b>	15:00	12:30	10:43	09:23	08:20	07:30	06:49	06:15	05:46	05:21	05:00	04:41	04:25	04:10	03:57
<b>1.00</b>	16:40	13:53	11:54	10:25	09:16	08:20	07:35	06:57	06:25	05:57	05:33	05:13	04:54	04:38	04:23
<b>1.10</b>	18:20	15:17	13:06	11:28	10:11	09:10	08:20	07:38	07:03	06:33	06:07	05:44	05:24	05:06	04:49
<b>1.20</b>	20:00	16:40	14:17	12:30	11:07	10:00	09:05	08:20	07:42	07:09	06:40	06:15	05:53	05:33	05:16
<b>1.30</b>	21:40	18:03	15:29	13:33	12:02	10:50	09:51	09:02	08:20	07:44	07:13	06:46	06:22	06:01	05:42
<b>1.40</b>	23:20	19:27	16:40	14:35	12:58	11:40	10:36	09:43	08:58	08:20	07:47	07:18	06:52	06:29	06:08
<b>1.50</b>	25:00	20:50	17:51	15:38	13:53	12:30	11:22	10:25	09:37	08:56	08:20	07:49	07:21	06:57	06:35
<b>1.60</b>	26:40	22:13	19:03	16:40	14:49	13:20	12:07	11:07	10:15	09:31	08:53	08:20	07:51	07:24	07:01
<b>1.70</b>	28:20	23:37	20:14	17:43	15:44	14:10	12:53	11:48	10:54	10:07	09:27	08:51	08:20	07:52	07:27
<b>1.80</b>	30:00	25:00	21:26	18:45	16:40	15:00	13:38	12:30	11:32	10:43	10:00	09:23	08:49	08:20	07:54
<b>1.90</b>	31:40	26:23	22:37	19:48	17:36	15:50	14:24	13:12	12:11	11:19	10:33	09:54	09:19	08:48	08:20
<b>2.00</b>	<b>33:20</b>	27:47	23:49	20:50	18:31	16:40	15:09	13:53	12:49	11:54	11:07	10:25	09:48	09:16	08:46

continued table D-1:

Radiation time (Min:Sec) ↘		Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
		01.00	01.20	01.40	01.60	01.80	02.00	02.20	02.40	02.60	02.80	03.00	03.20	03.40	03.60	03.80
Radiation Dosage (J/cm <sup>2</sup> ) ↓	2.10	35:00	29:10	25:00	21:53	19:27	17:30	15:55	14:35	13:28	12:30	11:40	10:56	10:18	09:43	09:13
	2.20	36:40	30:33	26:11	22:55	20:22	18:20	16:40	15:17	14:06	13:06	12:13	11:28	10:47	10:11	09:39
	2.30	38:20	31:57	27:23	23:58	21:18	19:10	17:25	15:58	14:45	13:41	12:47	11:59	11:16	10:39	10:05
	2.40	40:00	33:20	28:34	25:00	22:13	20:00	18:11	16:40	15:23	14:17	13:20	12:30	11:46	11:07	10:32
	2.50	41:40	34:43	29:46	26:03	23:09	20:50	18:56	17:22	16:02	14:53	13:53	13:01	12:15	11:34	10:58
	2.60	43:20	36:07	30:57	27:05	24:04	21:40	19:42	18:03	16:40	15:29	14:27	13:33	12:45	12:02	11:24
	2.70	45:00	37:30	32:09	28:08	25:00	22:30	20:27	18:45	17:18	16:04	15:00	14:04	13:14	12:30	11:51
	2.80	46:40	38:53	33:20	29:10	25:56	23:20	21:13	19:27	17:57	16:40	15:33	14:35	13:44	12:58	12:17
	2.90	48:20	40:17	34:31	30:13	26:51	24:10	21:58	20:08	18:35	17:16	16:07	15:06	14:13	13:26	12:43
	3.00	50:00	41:40	35:43	31:15	27:47	25:00	22:44	20:50	19:14	17:51	16:40	15:38	14:42	13:53	13:09
	3.10	51:40	43:03	36:54	32:18	28:42	25:50	23:29	21:32	19:52	18:27	17:13	16:09	15:12	14:21	13:36
	3.20	53:20	44:27	38:06	33:20	29:38	26:40	24:15	22:13	20:31	19:03	17:47	16:40	15:41	14:49	14:02
	3.30	55:00	45:50	39:17	34:23	30:33	27:30	25:00	22:55	21:09	19:39	18:20	17:11	16:11	15:17	14:28
	3.40	56:40	47:13	40:29	35:25	31:29	28:20	25:45	23:37	21:48	20:14	18:53	17:43	16:40	15:44	14:55
	3.50	58:20	48:37	41:40	36:28	32:24	29:10	26:31	24:18	22:26	20:50	19:27	18:14	17:09	16:12	15:21
	3.60	60:00	50:00	42:51	37:30	33:20	30:00	27:16	25:00	23:05	21:26	20:00	18:45	17:39	16:40	15:47
	3.70	61:40	51:23	44:03	38:33	34:16	30:50	28:02	25:42	23:43	22:01	20:33	19:16	18:08	17:08	16:14
	3.80	63:20	52:47	45:14	39:35	35:11	31:40	28:47	26:23	24:22	22:37	21:07	19:48	18:38	17:36	16:40
	3.90	65:00	54:10	46:26	40:38	36:07	32:30	29:33	27:05	25:00	23:13	21:40	20:19	19:07	18:03	17:06
	4.00	66:40	55:33	47:37	41:40	37:02	33:20	30:18	27:47	25:38	23:49	22:13	20:50	19:36	18:31	17:33
4.10	68:20	56:57	48:49	42:43	37:58	34:10	31:04	28:28	26:17	24:24	22:47	21:21	20:06	18:59	17:59	
4.20	70:00	58:20	50:00	43:45	38:53	35:00	31:49	29:10	26:55	25:00	23:20	21:53	20:35	19:27	18:25	
4.30	71:40	59:43	51:11	44:48	39:49	35:50	32:35	29:52	27:34	25:36	23:53	22:24	21:05	19:54	18:52	
4.40	73:20	61:07	52:23	45:50	40:44	36:40	33:20	30:33	28:12	26:11	24:27	22:55	21:34	20:22	19:18	
4.50	75:00	62:30	53:34	46:53	41:40	37:30	34:05	31:15	28:51	26:47	25:00	23:26	22:04	20:50	19:44	
4.60	76:40	63:53	54:46	47:55	42:36	38:20	34:51	31:57	29:29	27:23	25:33	23:58	22:33	21:18	20:11	
4.70	78:20	65:17	55:57	48:58	43:31	39:10	35:36	32:38	30:08	27:59	26:07	24:29	23:02	21:46	20:37	
4.80	80:00	66:40	57:09	50:00	44:27	40:00	36:22	33:20	30:46	28:34	26:40	25:00	23:32	22:13	21:03	
4.90	81:40	68:03	58:20	51:03	45:22	40:50	37:07	34:02	31:25	29:10	27:13	25:31	24:01	22:41	21:29	
5.00	83:20	69:27	59:31	52:05	46:18	41:40	37:53	34:43	32:03	29:46	27:47	26:03	24:31	23:09	21:56	

Table D-2 General Parameter List 2 (Radiation Intensity 4.0~6.8mW/cm<sup>2</sup>)

Radiation time (Min:Sec) ↘	Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
	04.00	04.20	04.40	04.60	04.80	05.00	05.20	05.40	05.60	05.80	06.00	06.20	06.40	06.60	06.80
<b>0.04</b>	00:10	00:10	00:09	00:09	00:08	00:08	00:08	00:07	00:07	00:07	00:07	00:06	00:06	00:06	00:06
<b>0.05</b>	00:13	00:12	00:11	00:11	00:10	00:10	00:10	00:09	00:09	00:09	00:08	00:08	00:08	00:08	00:07
<b>0.06</b>	00:15	00:14	00:14	00:13	00:13	00:12	00:12	00:11	00:11	00:10	00:10	00:10	00:09	00:09	00:09
<b>0.07</b>	00:18	00:17	00:16	00:15	00:15	00:14	00:13	00:13	00:13	00:12	00:12	00:11	00:11	00:11	00:10
<b>0.08</b>	00:20	00:19	00:18	00:17	00:17	00:16	00:15	00:15	00:14	00:14	00:13	00:13	00:13	00:12	00:12
<b>0.09</b>	00:23	00:21	00:20	00:20	00:19	00:18	00:17	00:17	00:16	00:16	00:15	00:15	00:14	00:14	00:13
<b>0.10</b>	00:25	00:24	00:23	00:22	00:21	00:20	00:19	00:19	00:18	00:17	00:17	00:16	00:16	00:15	00:15
<b>0.12</b>	00:30	00:29	00:27	00:26	00:25	00:24	00:23	00:22	00:21	00:21	00:20	00:19	00:19	00:18	00:18
<b>0.14</b>	00:35	00:33	00:32	00:30	00:29	00:28	00:27	00:26	00:25	00:24	00:23	00:23	00:22	00:21	00:21
<b>0.16</b>	00:40	00:38	00:36	00:35	00:33	00:32	00:31	00:30	00:29	00:28	00:27	00:26	00:25	00:24	00:24
<b>0.18</b>	00:45	00:43	00:41	00:39	00:38	00:36	00:35	00:33	00:32	00:31	00:30	00:29	00:28	00:27	00:26
<b>0.20</b>	00:50	00:48	00:45	00:43	00:42	00:40	00:38	00:37	00:36	00:34	00:33	00:32	00:31	00:30	00:29
<b>0.30</b>	01:15	01:11	01:08	01:05	01:03	01:00	00:58	00:56	00:54	00:52	00:50	00:48	00:47	00:45	00:44
<b>0.40</b>	01:40	01:35	01:31	01:27	01:23	01:20	01:17	01:14	01:11	01:09	01:07	01:05	01:03	01:01	00:59
<b>0.50</b>	02:05	01:59	01:54	01:49	01:44	01:40	01:36	01:33	01:29	01:26	01:23	01:21	01:18	01:16	01:14
<b>0.60</b>	02:30	02:23	02:16	02:10	02:05	02:00	01:55	01:51	01:47	01:43	01:40	01:37	01:34	01:31	01:28
<b>0.70</b>	02:55	02:47	02:39	02:32	02:26	02:20	02:15	02:10	02:05	02:01	01:57	01:53	01:49	01:46	01:43
<b>0.80</b>	03:20	03:10	03:02	02:54	02:47	02:40	02:34	02:28	02:23	02:18	02:13	02:09	02:05	02:01	01:58
<b>0.90</b>	03:45	03:34	03:25	03:16	03:08	03:00	02:53	02:47	02:41	02:35	02:30	02:25	02:21	02:16	02:12
<b>1.00</b>	04:10	03:58	03:47	03:37	03:28	03:20	03:12	03:05	02:59	02:52	02:47	02:41	02:36	02:32	02:27
<b>1.10</b>	04:35	04:22	04:10	03:59	03:49	03:40	03:32	03:24	03:16	03:10	03:03	02:57	02:52	02:47	02:42
<b>1.20</b>	05:00	04:46	04:33	04:21	04:10	04:00	03:51	03:42	03:34	03:27	03:20	03:14	03:08	03:02	02:56
<b>1.30</b>	05:25	05:10	04:55	04:43	04:31	04:20	04:10	04:01	03:52	03:44	03:37	03:30	03:23	03:17	03:11
<b>1.40</b>	05:50	05:33	05:18	05:04	04:52	04:40	04:29	04:19	04:10	04:01	03:53	03:46	03:39	03:32	03:26
<b>1.50</b>	06:15	05:57	05:41	05:26	05:13	05:00	04:48	04:38	04:28	04:19	04:10	04:02	03:54	03:47	03:41
<b>1.60</b>	06:40	06:21	06:04	05:48	05:33	05:20	05:08	04:56	04:46	04:36	04:27	04:18	04:10	04:02	03:55
<b>1.70</b>	07:05	06:45	06:26	06:10	05:54	05:40	05:27	05:15	05:04	04:53	04:43	04:34	04:26	04:18	04:10
<b>1.80</b>	07:30	07:09	06:49	06:31	06:15	06:00	05:46	05:33	05:21	05:10	05:00	04:50	04:41	04:33	04:25
<b>1.90</b>	07:55	07:32	07:12	06:53	06:36	06:20	06:05	05:52	05:39	05:28	05:17	05:06	04:57	04:48	04:39
<b>2.00</b>	08:20	07:56	07:35	07:15	06:57	06:40	06:25	06:10	05:57	05:45	05:33	05:23	05:13	05:03	04:54

continued table D-2:

Radiation time (Min:Sec) \	Radiation Intensity (mW/cm <sup>2</sup> ) ↓															
	04.00	04.20	04.40	04.60	04.80	05.00	05.20	05.40	05.60	05.80	06.00	06.20	06.40	06.60	06.80	
Radiation Dosage (J/cm <sup>2</sup> ) ↑	2.10	08:45	08:20	07:57	07:37	07:18	07:00	06:44	06:29	06:15	06:02	05:50	05:39	05:28	05:18	05:09
	2.20	09:10	08:44	08:20	07:58	07:38	07:20	07:03	06:47	06:33	06:19	06:07	05:55	05:44	05:33	05:24
	2.30	09:35	09:08	08:43	08:20	07:59	07:40	07:22	07:06	06:51	06:37	06:23	06:11	05:59	05:48	05:38
	2.40	10:00	09:31	09:05	08:42	08:20	08:00	07:42	07:24	07:09	06:54	06:40	06:27	06:15	06:04	05:53
	2.50	10:25	09:55	09:28	09:03	08:41	08:20	08:01	07:43	07:26	07:11	06:57	06:43	06:31	06:19	06:08
	2.60	10:50	10:19	09:51	09:25	09:02	08:40	08:20	08:01	07:44	07:28	07:13	06:59	06:46	06:34	06:22
	2.70	11:15	10:43	10:14	09:47	09:23	09:00	08:39	08:20	08:02	07:46	07:30	07:15	07:02	06:49	06:37
	2.80	11:40	11:07	10:36	10:09	09:43	09:20	08:58	08:39	08:20	08:03	07:47	07:32	07:18	07:04	06:52
	2.90	12:05	11:30	10:59	10:30	10:04	09:40	09:18	08:57	08:38	08:20	08:03	07:48	07:33	07:19	07:06
	3.00	12:30	11:54	11:22	10:52	10:25	10:00	09:37	09:16	08:56	08:37	08:20	08:04	07:49	07:35	07:21
	3.10	12:55	12:18	11:45	11:14	10:46	10:20	09:56	09:34	09:14	08:54	08:37	08:20	08:04	07:50	07:36
	3.20	13:20	12:42	12:07	11:36	11:07	10:40	10:15	09:53	09:31	09:12	08:53	08:36	08:20	08:05	07:51
	3.30	13:45	13:06	12:30	11:57	11:28	11:00	10:35	10:11	09:49	09:29	09:10	08:52	08:36	08:20	08:05
	3.40	14:10	13:30	12:53	12:19	11:48	11:20	10:54	10:30	10:07	09:46	09:27	09:08	08:51	08:35	08:20
	3.50	14:35	13:53	13:15	12:41	12:09	11:40	11:13	10:48	10:25	10:03	09:43	09:25	09:07	08:50	08:35
	3.60	15:00	14:17	13:38	13:03	12:30	12:00	11:32	11:07	10:43	10:21	10:00	09:41	09:23	09:05	08:49
	3.70	15:25	14:41	14:01	13:24	12:51	12:20	11:52	11:25	11:01	10:38	10:17	09:57	09:38	09:21	09:04
	3.80	15:50	15:05	14:24	13:46	13:12	12:40	12:11	11:44	11:19	10:55	10:33	10:13	09:54	09:36	09:19
	3.90	16:15	15:29	14:46	14:08	13:33	13:00	12:30	12:02	11:36	11:12	10:50	10:29	10:09	09:51	09:34
	4.00	16:40	15:52	15:09	14:30	13:53	13:20	12:49	12:21	11:54	11:30	11:07	10:45	10:25	10:06	09:48
4.10	17:05	16:16	15:32	14:51	14:14	13:40	13:08	12:39	12:12	11:47	11:23	11:01	10:41	10:21	10:03	
4.20	17:30	16:40	15:55	15:13	14:35	14:00	13:28	12:58	12:30	12:04	11:40	11:17	10:56	10:36	10:18	
4.30	17:55	17:04	16:17	15:35	14:56	14:20	13:47	13:16	12:48	12:21	11:57	11:34	11:12	10:52	10:32	
4.40	18:20	17:28	16:40	15:57	15:17	14:40	14:06	13:35	13:06	12:39	12:13	11:50	11:28	11:07	10:47	
4.50	18:45	17:51	17:03	16:18	15:38	15:00	14:25	13:53	13:24	12:56	12:30	12:06	11:43	11:22	11:02	
4.60	19:10	18:15	17:25	16:40	15:58	15:20	14:45	14:12	13:41	13:13	12:47	12:22	11:59	11:37	11:16	
4.70	19:35	18:39	17:48	17:02	16:19	15:40	15:04	14:30	13:59	13:30	13:03	12:38	12:14	11:52	11:31	
4.80	20:00	19:03	18:11	17:23	16:40	16:00	15:23	14:49	14:17	13:48	13:20	12:54	12:30	12:07	11:46	
4.90	20:25	19:27	18:34	17:45	17:01	16:20	15:42	15:07	14:35	14:05	13:37	13:10	12:46	12:22	12:01	
5.00	20:50	19:50	18:56	18:07	17:22	16:40	16:02	15:26	14:53	14:22	13:53	13:26	13:01	12:38	12:15	

Table D-3 General Parameter List 3 (Radiation Intensity 7.0~9.8mW/cm<sup>2</sup>)

Radiation time (Min:Sec)↘	Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
	07.00	07.20	07.40	07.60	07.80	08.00	08.20	08.40	08.60	08.80	09.00	09.20	09.40	09.60	09.80
Radiation Dosage (J/cm <sup>2</sup> ) ↓	0.04	00:06	00:06	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:04	00:04	00:04	00:04
	0.05	00:07	00:07	00:07	00:07	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:05	00:05	00:05
	0.06	00:09	00:08	00:08	00:08	00:08	00:08	00:07	00:07	00:07	00:07	00:07	00:07	00:06	00:06
	0.07	00:10	00:10	00:09	00:09	00:09	00:09	00:09	00:08	00:08	00:08	00:08	00:08	00:07	00:07
	0.08	00:11	00:11	00:11	00:11	00:10	00:10	00:10	00:10	00:09	00:09	00:09	00:09	00:09	00:08
	0.09	00:13	00:13	00:12	00:12	00:12	00:11	00:11	00:11	00:10	00:10	00:10	00:10	00:10	00:09
	0.10	00:14	00:14	00:14	00:13	00:13	00:13	00:12	00:12	00:12	00:11	00:11	00:11	00:11	00:10
	0.12	00:17	00:17	00:16	00:16	00:15	00:15	00:15	00:14	00:14	00:14	00:13	00:13	00:13	00:13
	0.14	00:20	00:19	00:19	00:18	00:18	00:18	00:17	00:17	00:16	00:16	00:16	00:15	00:15	00:15
	0.16	00:23	00:22	00:22	00:21	00:21	00:20	00:20	00:19	00:19	00:18	00:18	00:17	00:17	00:17
	0.18	00:26	00:25	00:24	00:24	00:23	00:23	00:22	00:21	00:21	00:20	00:20	00:20	00:19	00:19
	0.20	00:29	00:28	00:27	00:26	00:26	00:25	00:24	00:24	00:23	00:23	00:22	00:22	00:21	00:21
	0.30	00:43	00:42	00:41	00:39	00:38	00:38	00:37	00:36	00:35	00:34	00:33	00:33	00:32	00:31
	0.40	00:57	00:56	00:54	00:53	00:51	00:50	00:49	00:48	00:47	00:45	00:44	00:43	00:43	00:42
	0.50	01:11	01:09	01:08	01:06	01:04	01:03	01:01	00:60	00:58	00:57	00:56	00:54	00:53	00:52
	0.60	01:26	01:23	01:21	01:19	01:17	01:15	01:13	01:11	01:10	01:08	01:07	01:05	01:04	01:03
	0.70	01:40	01:37	01:35	01:32	01:30	01:28	01:25	01:23	01:21	01:20	01:18	01:16	01:14	01:13
	0.80	01:54	01:51	01:48	01:45	01:43	01:40	01:38	01:35	01:33	01:31	01:29	01:27	01:25	01:23
	0.90	02:09	02:05	02:02	01:58	01:55	01:53	01:50	01:47	01:45	01:42	01:40	01:38	01:36	01:34
	1.00	02:23	02:19	02:15	02:12	02:08	02:05	02:02	01:59	01:56	01:54	01:51	01:49	01:46	01:44
1.10	02:37	02:33	02:29	02:25	02:21	02:18	02:14	02:11	02:08	02:05	02:02	01:60	01:57	01:55	
1.20	02:51	02:47	02:42	02:38	02:34	02:30	02:26	02:23	02:20	02:16	02:13	02:10	02:08	02:05	
1.30	03:06	03:01	02:56	02:51	02:47	02:43	02:39	02:35	02:31	02:28	02:24	02:21	02:18	02:15	
1.40	03:20	03:14	03:09	03:04	02:59	02:55	02:51	02:47	02:43	02:39	02:36	02:32	02:29	02:26	
1.50	03:34	03:28	03:23	03:17	03:12	03:08	03:03	02:59	02:54	02:50	02:47	02:43	02:40	02:36	
1.60	03:49	03:42	03:36	03:31	03:25	03:20	03:15	03:10	03:06	03:02	02:58	02:54	02:50	02:47	
1.70	04:03	03:56	03:50	03:44	03:38	03:33	03:27	03:22	03:18	03:13	03:09	03:05	03:01	02:57	
1.80	04:17	04:10	04:03	03:57	03:51	03:45	03:40	03:34	03:29	03:25	03:20	03:16	03:11	03:08	
1.90	04:31	04:24	04:17	04:10	04:04	03:58	03:52	03:46	03:41	03:36	03:31	03:27	03:22	03:18	
2.00	04:46	04:38	04:30	04:23	04:16	04:10	04:04	03:58	03:53	03:47	03:42	03:37	03:33	03:28	



continued table D-3:

Radiation time (Min:Sec) ↘		Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
		07.00	07.20	07.40	07.60	07.80	08.00	08.20	08.40	08.60	08.80	09.00	09.20	09.40	09.60	09.80
Radiation Dosage (J/cm <sup>2</sup> ) ↓	2.10	05:00	04:52	04:44	04:36	04:29	04:23	04:16	04:10	04:04	03:59	03:53	03:48	03:43	03:39	03:34
	2.20	05:14	05:06	04:57	04:49	04:42	04:35	04:28	04:22	04:16	04:10	04:04	03:59	03:54	03:49	03:44
	2.30	05:29	05:19	05:11	05:03	04:55	04:48	04:40	04:34	04:27	04:21	04:16	04:10	04:05	03:60	03:55
	2.40	05:43	05:33	05:24	05:16	05:08	05:00	04:53	04:46	04:39	04:33	04:27	04:21	04:15	04:10	04:05
	2.50	05:57	05:47	05:38	05:29	05:21	05:13	05:05	04:58	04:51	04:44	04:38	04:32	04:26	04:20	04:15
	2.60	06:11	06:01	05:51	05:42	05:33	05:25	05:17	05:10	05:02	04:55	04:49	04:43	04:37	04:31	04:25
	2.70	06:26	06:15	06:05	05:55	05:46	05:38	05:29	05:21	05:14	05:07	05:00	04:53	04:47	04:41	04:36
	2.80	06:40	06:29	06:18	06:08	05:59	05:50	05:41	05:33	05:26	05:18	05:11	05:04	04:58	04:52	04:46
	2.90	06:54	06:43	06:32	06:22	06:12	06:03	05:54	05:45	05:37	05:30	05:22	05:15	05:09	05:02	04:56
	3.00	07:09	06:57	06:45	06:35	06:25	06:15	06:06	05:57	05:49	05:41	05:33	05:26	05:19	05:13	05:06
	3.10	07:23	07:11	06:59	06:48	06:37	06:28	06:18	06:09	06:00	05:52	05:44	05:37	05:30	05:23	05:16
	3.20	07:37	07:24	07:12	07:01	06:50	06:40	06:30	06:21	06:12	06:04	05:56	05:48	05:40	05:33	05:27
	3.30	07:51	07:38	07:26	07:14	07:03	06:53	06:42	06:33	06:24	06:15	06:07	05:59	05:51	05:44	05:37
	3.40	08:06	07:52	07:39	07:27	07:16	07:05	06:55	06:45	06:35	06:26	06:18	06:10	06:02	05:54	05:47
	3.50	08:20	08:06	07:53	07:41	07:29	07:18	07:07	06:57	06:47	06:38	06:29	06:20	06:12	06:05	05:57
	3.60	08:34	08:20	08:06	07:54	07:42	07:30	07:19	07:09	06:59	06:49	06:40	06:31	06:23	06:15	06:07
	3.70	08:49	08:34	08:20	08:07	07:54	07:43	07:31	07:20	07:10	07:00	06:51	06:42	06:34	06:25	06:18
	3.80	09:03	08:48	08:34	08:20	08:07	07:55	07:43	07:32	07:22	07:12	07:02	06:53	06:44	06:36	06:28
	3.90	09:17	09:02	08:47	08:33	08:20	08:08	07:56	07:44	07:33	07:23	07:13	07:04	06:55	06:46	06:38
	4.00	09:31	09:16	09:01	08:46	08:33	08:20	08:08	07:56	07:45	07:35	07:24	07:15	07:06	06:57	06:48
4.10	09:46	09:29	09:14	08:59	08:46	08:33	08:20	08:08	07:57	07:46	07:36	07:26	07:16	07:07	06:58	
4.20	10:00	09:43	09:28	09:13	08:58	08:45	08:32	08:20	08:08	07:57	07:47	07:37	07:27	07:18	07:09	
4.30	10:14	09:57	09:41	09:26	09:11	08:58	08:44	08:32	08:20	08:09	07:58	07:47	07:37	07:28	07:19	
4.40	10:29	10:11	09:55	09:39	09:24	09:10	08:57	08:44	08:32	08:20	08:09	07:58	07:48	07:38	07:29	
4.50	10:43	10:25	10:08	09:52	09:37	09:23	09:09	08:56	08:43	08:31	08:20	08:09	07:59	07:49	07:39	
4.60	10:57	10:39	10:22	10:05	09:50	09:35	09:21	09:08	08:55	08:43	08:31	08:20	08:09	07:59	07:49	
4.70	11:11	10:53	10:35	10:18	10:03	09:48	09:33	09:20	09:07	08:54	08:42	08:31	08:20	08:10	07:60	
4.80	11:26	11:07	10:49	10:32	10:15	10:00	09:45	09:31	09:18	09:05	08:53	08:42	08:31	08:20	08:10	
4.90	11:40	11:21	11:02	10:45	10:28	10:13	09:58	09:43	09:30	09:17	09:04	08:53	08:41	08:30	08:20	
5.00	11:54	11:34	11:16	10:58	10:41	10:25	10:10	09:55	09:41	09:28	09:16	09:03	08:52	08:41	08:30	

Table D-4 General Parameter List 4 (Radiation Intensity 10.0~12.8mW/cm<sup>2</sup>)

Radiation time (Min:Sec) ↘	Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
	10.00	10.20	10.40	10.60	10.80	11.00	11.20	11.40	11.60	11.80	12.00	12.20	12.40	12.60	12.80
<b>0.04</b>	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:03	00:03	00:03	00:03	00:03	00:03	00:03
<b>0.05</b>	00:05	00:05	00:05	00:05	00:05	00:05	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04
<b>0.06</b>	00:06	00:06	00:06	00:06	00:06	00:06	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05
<b>0.07</b>	00:07	00:07	00:07	00:07	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:05
<b>0.08</b>	00:08	00:08	00:08	00:08	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:06	00:06	00:06
<b>0.09</b>	00:09	00:09	00:09	00:08	00:08	00:08	00:08	00:08	00:08	00:08	00:08	00:07	00:07	00:07	00:07
<b>0.10</b>	00:10	00:10	00:10	00:09	00:09	00:09	00:09	00:09	00:09	00:08	00:08	00:08	00:08	00:08	00:08
<b>0.12</b>	00:12	00:12	00:12	00:11	00:11	00:11	00:11	00:11	00:10	00:10	00:10	00:10	00:10	00:10	00:09
<b>0.14</b>	00:14	00:14	00:13	00:13	00:13	00:13	00:13	00:12	00:12	00:12	00:12	00:11	00:11	00:11	00:11
<b>0.16</b>	00:16	00:16	00:15	00:15	00:15	00:15	00:14	00:14	00:14	00:14	00:13	00:13	00:13	00:13	00:13
<b>0.18</b>	00:18	00:18	00:17	00:17	00:17	00:16	00:16	00:16	00:16	00:15	00:15	00:15	00:15	00:14	00:14
<b>0.20</b>	00:20	00:20	00:19	00:19	00:19	00:18	00:18	00:18	00:17	00:17	00:17	00:16	00:16	00:16	00:16
<b>0.30</b>	00:30	00:29	00:29	00:28	00:28	00:27	00:27	00:26	00:26	00:25	00:25	00:25	00:24	00:24	00:23
<b>0.40</b>	00:40	00:39	00:38	00:38	00:37	00:36	00:36	00:35	00:34	00:34	00:33	00:33	00:32	00:32	00:31
<b>0.50</b>	00:50	00:49	00:48	00:47	00:46	00:45	00:45	00:44	00:43	00:42	00:42	00:41	00:40	00:40	00:39
<b>0.60</b>	01:00	00:59	00:58	00:57	00:56	00:55	00:54	00:53	00:52	00:51	00:50	00:49	00:48	00:48	00:47
<b>0.70</b>	01:10	01:09	01:07	01:06	01:05	01:04	01:03	01:01	01:00	00:59	00:58	00:57	00:56	00:56	00:55
<b>0.80</b>	01:20	01:18	01:17	01:15	01:14	01:13	01:11	01:10	01:09	01:08	01:07	01:06	01:05	01:03	01:03
<b>0.90</b>	01:30	01:28	01:27	01:25	01:23	01:22	01:20	01:19	01:18	01:16	01:15	01:14	01:13	01:11	01:10
<b>1.00</b>	01:40	01:38	01:36	01:34	01:33	01:31	01:29	01:28	01:26	01:25	01:23	01:22	01:21	01:19	01:18
<b>1.10</b>	01:50	01:48	01:46	01:44	01:42	01:40	01:38	01:36	01:35	01:33	01:32	01:30	01:29	01:27	01:26
<b>1.20</b>	02:00	01:58	01:55	01:53	01:51	01:49	01:47	01:45	01:43	01:42	01:40	01:38	01:37	01:35	01:34
<b>1.30</b>	02:10	02:07	02:05	02:03	02:00	01:58	01:56	01:54	01:52	01:50	01:48	01:47	01:45	01:43	01:42
<b>1.40</b>	02:20	02:17	02:15	02:12	02:10	02:07	02:05	02:03	02:01	01:59	01:57	01:55	01:53	01:51	01:49
<b>1.50</b>	02:30	02:27	02:24	02:22	02:19	02:16	02:14	02:12	02:09	02:07	02:05	02:03	02:01	01:59	01:57
<b>1.60</b>	02:40	02:37	02:34	02:31	02:28	02:25	02:23	02:20	02:18	02:16	02:13	02:11	02:09	02:07	02:05
<b>1.70</b>	02:50	02:47	02:43	02:40	02:37	02:35	02:32	02:29	02:27	02:24	02:22	02:19	02:17	02:15	02:13
<b>1.80</b>	03:00	02:56	02:53	02:50	02:47	02:44	02:41	02:38	02:35	02:33	02:30	02:28	02:25	02:23	02:21
<b>1.90</b>	03:10	03:06	03:03	02:59	02:56	02:53	02:50	02:47	02:44	02:41	02:38	02:36	02:33	02:31	02:28
<b>2.00</b>	03:20	03:16	03:12	03:09	03:05	03:02	02:59	02:55	02:52	02:49	02:47	02:44	02:41	02:39	02:36

continued table D-4:

Radiation time (Min:Sec) ↘		Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
		10.00	10.20	10.40	10.60	10.80	11.00	11.20	11.40	11.60	11.80	12.00	12.20	12.40	12.60	12.80
Radiation Dosage (J/cm <sup>2</sup> ) ↓	2.10	03:30	03:26	03:22	03:18	03:14	03:11	03:08	03:04	03:01	02:58	02:55	02:52	02:49	02:47	02:44
	2.20	03:40	03:36	03:32	03:28	03:24	03:20	03:16	03:13	03:10	03:06	03:03	03:00	02:57	02:55	02:52
	2.30	03:50	03:45	03:41	03:37	03:33	03:29	03:25	03:22	03:18	03:15	03:12	03:09	03:05	03:03	02:60
	2.40	04:00	03:55	03:51	03:46	03:42	03:38	03:34	03:31	03:27	03:23	03:20	03:17	03:14	03:10	03:08
	2.50	04:10	04:05	04:00	03:56	03:51	03:47	03:43	03:39	03:36	03:32	03:28	03:25	03:22	03:18	03:15
	2.60	04:20	04:15	04:10	04:05	04:01	03:56	03:52	03:48	03:44	03:40	03:37	03:33	03:30	03:26	03:23
	2.70	04:30	04:25	04:20	04:15	04:10	04:05	04:01	03:57	03:53	03:49	03:45	03:41	03:38	03:34	03:31
	2.80	04:40	04:35	04:29	04:24	04:19	04:15	04:10	04:06	04:01	03:57	03:53	03:50	03:46	03:42	03:39
	2.90	04:50	04:44	04:39	04:34	04:29	04:24	04:19	04:14	04:10	04:06	04:02	03:58	03:54	03:50	03:47
	3.00	05:00	04:54	04:48	04:43	04:38	04:33	04:28	04:23	04:19	04:14	04:10	04:06	04:02	03:58	03:54
	3.10	05:10	05:04	04:58	04:52	04:47	04:42	04:37	04:32	04:27	04:23	04:18	04:14	04:10	04:06	04:02
	3.20	05:20	05:14	05:08	05:02	04:56	04:51	04:46	04:41	04:36	04:31	04:27	04:22	04:18	04:14	04:10
	3.30	05:30	05:24	05:17	05:11	05:06	05:00	04:55	04:49	04:44	04:40	04:35	04:30	04:26	04:22	04:18
	3.40	05:40	05:33	05:27	05:21	05:15	05:09	05:04	04:58	04:53	04:48	04:43	04:39	04:34	04:30	04:26
	3.50	05:50	05:43	05:37	05:30	05:24	05:18	05:13	05:07	05:02	04:57	04:52	04:47	04:42	04:38	04:33
	3.60	06:00	05:53	05:46	05:40	05:33	05:27	05:21	05:16	05:10	05:05	05:00	04:55	04:50	04:46	04:41
	3.70	06:10	06:03	05:56	05:49	05:43	05:36	05:30	05:25	05:19	05:14	05:08	05:03	04:58	04:54	04:49
	3.80	06:20	06:13	06:05	05:58	05:52	05:45	05:39	05:33	05:28	05:22	05:17	05:11	05:06	05:02	04:57
	3.90	06:30	06:22	06:15	06:08	06:01	05:55	05:48	05:42	05:36	05:31	05:25	05:20	05:15	05:10	05:05
	4.00	06:40	06:32	06:25	06:17	06:10	06:04	05:57	05:51	05:45	05:39	05:33	05:28	05:23	05:17	05:13
4.10	06:50	06:42	06:34	06:27	06:20	06:13	06:06	05:60	05:53	05:47	05:42	05:36	05:31	05:25	05:20	
4.20	07:00	06:52	06:44	06:36	06:29	06:22	06:15	06:08	06:02	05:56	05:50	05:44	05:39	05:33	05:28	
4.30	07:10	07:02	06:53	06:46	06:38	06:31	06:24	06:17	06:11	06:04	05:58	05:52	05:47	05:41	05:36	
4.40	07:20	07:11	07:03	06:55	06:47	06:40	06:33	06:26	06:19	06:13	06:07	06:01	05:55	05:49	05:44	
4.50	07:30	07:21	07:13	07:05	06:57	06:49	06:42	06:35	06:28	06:21	06:15	06:09	06:03	05:57	05:52	
4.60	07:40	07:31	07:22	07:14	07:06	06:58	06:51	06:44	06:37	06:30	06:23	06:17	06:11	06:05	05:59	
4.70	07:50	07:41	07:32	07:23	07:15	07:07	06:60	06:52	06:45	06:38	06:32	06:25	06:19	06:13	06:07	
4.80	08:00	07:51	07:42	07:33	07:24	07:16	07:09	07:01	06:54	06:47	06:40	06:33	06:27	06:21	06:15	
4.90	08:10	08:00	07:51	07:42	07:34	07:25	07:18	07:10	07:02	06:55	06:48	06:42	06:35	06:29	06:23	
5.00	08:20	08:10	08:01	07:52	07:43	07:35	07:26	07:19	07:11	07:04	06:57	06:50	06:43	06:37	06:31	

**Table D-5 General Parameter List 5** (Radiation Intensity 13.0~15.8mW/cm<sup>2</sup>)

Radiation time (Min:Sec) ↘	Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
	13.00	13.20	13.40	13.60	13.80	14.00	14.20	14.40	14.60	14.80	15.00	15.20	15.40	15.60	15.80
<b>0.04</b>	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03	00:03
<b>0.05</b>	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:03	00:03	00:03	00:03	00:03	00:03	00:03
<b>0.06</b>	00:05	00:05	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04	00:04
<b>0.07</b>	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:05	00:04	00:04
<b>0.08</b>	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:05	00:05	00:05	00:05	00:05	00:05
<b>0.09</b>	00:07	00:07	00:07	00:07	00:07	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06	00:06
<b>0.10</b>	00:08	00:08	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:07	00:06	00:06	00:06
<b>0.12</b>	00:09	00:09	00:09	00:09	00:09	00:09	00:08	00:08	00:08	00:08	00:08	00:08	00:08	00:08	00:08
<b>0.14</b>	00:11	00:11	00:10	00:10	00:10	00:10	00:10	00:10	00:10	00:09	00:09	00:09	00:09	00:09	00:09
<b>0.16</b>	00:12	00:12	00:12	00:12	00:12	00:11	00:11	00:11	00:11	00:11	00:11	00:11	00:10	00:10	00:10
<b>0.18</b>	00:14	00:14	00:13	00:13	00:13	00:13	00:13	00:13	00:12	00:12	00:12	00:12	00:12	00:12	00:11
<b>0.20</b>	00:15	00:15	00:15	00:15	00:14	00:14	00:14	00:14	00:14	00:14	00:13	00:13	00:13	00:13	00:13
<b>0.30</b>	00:23	00:23	00:22	00:22	00:22	00:21	00:21	00:21	00:21	00:20	00:20	00:20	00:19	00:19	00:19
<b>0.40</b>	00:31	00:30	00:30	00:29	00:29	00:29	00:28	00:28	00:27	00:27	00:27	00:26	00:26	00:26	00:25
<b>0.50</b>	00:38	00:38	00:37	00:37	00:36	00:36	00:35	00:35	00:34	00:34	00:33	00:33	00:32	00:32	00:32
<b>0.60</b>	00:46	00:45	00:45	00:44	00:43	00:43	00:42	00:42	00:41	00:41	00:40	00:39	00:39	00:38	00:38
<b>0.70</b>	00:54	00:53	00:52	00:51	00:51	00:50	00:49	00:49	00:48	00:47	00:47	00:46	00:45	00:45	00:44
<b>0.80</b>	01:02	01:01	00:60	00:59	00:58	00:57	00:56	00:56	00:55	00:54	00:53	00:53	00:52	00:51	00:51
<b>0.90</b>	01:09	01:08	01:07	01:06	01:05	01:04	01:03	01:03	01:02	01:01	01:00	00:59	00:58	00:58	00:57
<b>1.00</b>	01:17	01:16	01:15	01:14	01:12	01:11	01:10	01:09	01:08	01:08	01:07	01:06	01:05	01:04	01:03
<b>1.10</b>	01:25	01:23	01:22	01:21	01:20	01:19	01:17	01:16	01:15	01:14	01:13	01:12	01:11	01:11	01:10
<b>1.20</b>	01:32	01:31	01:30	01:28	01:27	01:26	01:25	01:23	01:22	01:21	01:20	01:19	01:18	01:17	01:16
<b>1.30</b>	01:40	01:38	01:37	01:36	01:34	01:33	01:32	01:30	01:29	01:28	01:27	01:26	01:24	01:23	01:22
<b>1.40</b>	01:48	01:46	01:44	01:43	01:41	01:40	01:39	01:37	01:36	01:35	01:33	01:32	01:31	01:30	01:29
<b>1.50</b>	01:55	01:54	01:52	01:50	01:49	01:47	01:46	01:44	01:43	01:41	01:40	01:39	01:37	01:36	01:35
<b>1.60</b>	02:03	02:01	01:59	01:58	01:56	01:54	01:53	01:51	01:50	01:48	01:47	01:45	01:44	01:43	01:41
<b>1.70</b>	02:11	02:09	02:07	02:05	02:03	02:01	01:60	01:58	01:56	01:55	01:53	01:52	01:50	01:49	01:48
<b>1.80</b>	02:18	02:16	02:14	02:12	02:10	02:09	02:07	02:05	02:03	02:02	02:00	01:58	01:57	01:55	01:54
<b>1.90</b>	02:26	02:24	02:22	02:20	02:18	02:16	02:14	02:12	02:10	02:08	02:07	02:05	02:03	02:02	02:00
<b>2.00</b>	02:34	02:32	02:29	02:27	02:25	02:23	02:21	02:19	02:17	02:15	02:13	02:12	02:10	02:08	02:07


continued table D-5:

Radiation time (Min:Sec) ↘		Radiation Intensity (mW/cm <sup>2</sup> ) ↓														
		13.00	13.20	13.40	13.60	13.80	14.00	14.20	14.40	14.60	14.80	15.00	15.20	15.40	15.60	15.80
Radiation Dosage (J/cm <sup>2</sup> ) ↓	2.10	02:42	02:39	02:37	02:34	02:32	02:30	02:28	02:26	02:24	02:22	02:20	02:18	02:16	02:15	02:13
	2.20	02:49	02:47	02:44	02:42	02:39	02:37	02:35	02:33	02:31	02:29	02:27	02:25	02:23	02:21	02:19
	2.30	02:57	02:54	02:52	02:49	02:47	02:44	02:42	02:40	02:38	02:35	02:33	02:31	02:29	02:27	02:26
	2.40	03:05	03:02	02:59	02:56	02:54	02:51	02:49	02:47	02:44	02:42	02:40	02:38	02:36	02:34	02:32
	2.50	03:12	03:09	03:07	03:04	03:01	02:59	02:56	02:54	02:51	02:49	02:47	02:44	02:42	02:40	02:38
	2.60	03:20	03:17	03:14	03:11	03:08	03:06	03:03	03:01	02:58	02:56	02:53	02:51	02:49	02:47	02:45
	2.70	03:28	03:25	03:21	03:19	03:16	03:13	03:10	03:08	03:05	03:02	03:00	02:58	02:55	02:53	02:51
	2.80	03:35	03:32	03:29	03:26	03:23	03:20	03:17	03:14	03:12	03:09	03:07	03:04	03:02	02:59	02:57
	2.90	03:43	03:40	03:36	03:33	03:30	03:27	03:24	03:21	03:19	03:16	03:13	03:11	03:08	03:06	03:04
	3.00	03:51	03:47	03:44	03:41	03:37	03:34	03:31	03:28	03:25	03:23	03:20	03:17	03:15	03:12	03:10
	3.10	03:58	03:55	03:51	03:48	03:45	03:41	03:38	03:35	03:32	03:29	03:27	03:24	03:21	03:19	03:16
	3.20	04:06	04:02	03:59	03:55	03:52	03:49	03:45	03:42	03:39	03:36	03:33	03:31	03:28	03:25	03:23
	3.30	04:14	04:10	04:06	04:03	03:59	03:56	03:52	03:49	03:46	03:43	03:40	03:37	03:34	03:32	03:29
	3.40	04:22	04:18	04:14	04:10	04:06	04:03	03:59	03:56	03:53	03:50	03:47	03:44	03:41	03:38	03:35
	3.50	04:29	04:25	04:21	04:17	04:14	04:10	04:06	04:03	03:60	03:56	03:53	03:50	03:47	03:44	03:42
	3.60	04:37	04:33	04:29	04:25	04:21	04:17	04:14	04:10	04:07	04:03	04:00	03:57	03:54	03:51	03:48
	3.70	04:45	04:40	04:36	04:32	04:28	04:24	04:21	04:17	04:13	04:10	04:07	04:03	04:00	03:57	03:54
	3.80	04:52	04:48	04:44	04:39	04:35	04:31	04:28	04:24	04:20	04:17	04:13	04:10	04:07	04:04	04:01
	3.90	05:00	04:55	04:51	04:47	04:43	04:39	04:35	04:31	04:27	04:24	04:20	04:17	04:13	04:10	04:07
	4.00	05:08	05:03	04:59	04:54	04:50	04:46	04:42	04:38	04:34	04:30	04:27	04:23	04:20	04:16	04:13
4.10	05:15	05:11	05:06	05:01	04:57	04:53	04:49	04:45	04:41	04:37	04:33	04:30	04:26	04:23	04:19	
4.20	05:23	05:18	05:13	05:09	05:04	05:00	04:56	04:52	04:48	04:44	04:40	04:36	04:33	04:29	04:26	
4.30	05:31	05:26	05:21	05:16	05:12	05:07	05:03	04:59	04:55	04:51	04:47	04:43	04:39	04:36	04:32	
4.40	05:38	05:33	05:28	05:24	05:19	05:14	05:10	05:06	05:01	04:57	04:53	04:49	04:46	04:42	04:38	
4.50	05:46	05:41	05:36	05:31	05:26	05:21	05:17	05:13	05:08	05:04	05:00	04:56	04:52	04:48	04:45	
4.60	05:54	05:48	05:43	05:38	05:33	05:29	05:24	05:19	05:15	05:11	05:07	05:03	04:59	04:55	04:51	
4.70	06:02	05:56	05:51	05:46	05:41	05:36	05:31	05:26	05:22	05:18	05:13	05:09	05:05	05:01	04:57	
4.80	06:09	06:04	05:58	05:53	05:48	05:43	05:38	05:33	05:29	05:24	05:20	05:16	05:12	05:08	05:04	
4.90	06:17	06:11	06:06	06:00	05:55	05:50	05:45	05:40	05:36	05:31	05:27	05:22	05:18	05:14	05:10	
5.00	06:25	06:19	06:13	06:08	06:02	05:57	05:52	05:47	05:42	05:38	05:33	05:29	05:25	05:21	05:16	

## Appendix E Patients Record

No.: \_\_\_\_\_ Name: \_\_\_\_\_ Age: \_\_\_\_\_

Date	Prescription dose (J/cm <sup>2</sup> )	Radiation time (minutes / seconds)	doctor comments	Irradiation site	Skin eaction	Examination dates	Cumulative exposure time (time / min)	Reviews

 Record the log will help patients to help doctors keep abreast of the patient attending the course of treatment, to provide reference for the next treatment. Given in Appendix E of the log sheet samples for reference only, the user can be modified according to the actual usage.