Preface

Dear users, first of all, thanks for your trust and using KN-4003 series UV radiation treatment system manufactured by our company.

Please read this manual and attached documentations carefully before your first installation and using this system.

To improve capability and reliability of equipment, we will continuously upgrade our product (including hardware and software). We will announce you immediately if any amendments are made. Thanks in advance if you correct it after finding any mistake or oversight.

Version：V3.0

Important Notice

If you have any 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 at the first time.

Use correctly can extend the life of equipment, also make fully usability of equipment by farthest.

Abnormal operation may do harm to equipment or personal safety. Our company is irresponsible for abnormal condition, hazards to equipment or personal injury caused by operations that are absolutely prohibited as specified in this document. Disclaims any responsibility for safety, reliability or performance of this equipment by not observing the instructions!

Any faults arising from such non-observance will invalidate the warranty!

Please carefully read the instructions in the "safety requirements", "Note" and the special warnings "⚠" part of the content.

If you want to get more accurate information and perfect service, please log in www.kerneluvb.com.

Content

Chapter I safety requirements and precautions

(Please read before using equipment in this section!)

1.over exposure will hurt the eyes and skin, in serious cases may even lead to diseases such as cataracts or skin cancer, patients and operators in the use of equipment must wear special goggles, male patients, especially testicular genital area should be fully covered.

2.Before treatment, patients should be aware of the test values of MPD (minimal phototoxic dose) or MED (minimal erythema dose).

3.During treatment, the operator should be monitored carefully and take notes.

4. If lumps, pain, or pigmented spots appear continually on the skin after irradiation, the dermatologist should be invited to take appropriate measures.

5. Please turn off the power to extend the lamp life when the equipment is not in use.

1.1 Safety Requirements

- Accord with IEC60601-1 safety requirements.
- When you use the equipment for treatment, please strictly confirm the indications, contraindications and possible adverse reactions.
- Patient and operator will not cause injury if a sudden power failure occurs. Please turn off the power switch and restart.
- Electromagnetic field may interfere with the normal operation of equipment. Therefore, make sure the neighboring external devices comply with EMC requirements. X-ray equipment or magnetic resonance device may be a source of interference, because they can produce high-intensity electromagnetic radiation. At the same time, pay attention away from mobile phones or other communications equipment.

1.2 Notes

- Instrument is used for clinical care, only by trained medical personnel in the specified usage situations. No authorized personnel, or untrained personnel not to monitor any operation
- Prohibit to put it in anesthetic inflammable and explosive environment, in case of fire or explosion.
- Prohibit to open the Instrument shell without authorization,

or may have get an electric shock risk. To Instrument maintenance or upgrade must be after the company training or authorized service personnel.

- If supply voltage fluctuation is too large, it should be with an accuracy of 2% of the AC regulator;
- In order to prevent electrical shock occurrence and reduce equipment failure, equipment can not be watered. If there is a water inflow by accident, please stop using it immediately. The equipment should be overhauled by professional and technician before reuse.
- Before using the device, please inspect the power cable, power switch and light tubes for any defects. Do not use if any defects are found. If any defects are found, please contact kenrelmed immediately for replacement. (this should be a second bulleted point) This device is for personal use only, the owner should not allow use by other individuals without prior Doctor approval.
- For the equipment with time controller, operator must confirm the correct time first, then power on the lamp.
- Treatment dose should be adjusted depending on the degree of the reaction of the patients by the attending physician.
- 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.

- Decrease or increase radiation dosage according to patient's erythema raising or reducing.
- In order to ensure the equipment running safety, please use the replacement parts, accessories provided or designated by the Kernel.
- After 30 minutes of continuous working, the lamp must be turned off for 10 minutes.
- **Accessories and equipment handling**

Packing materials should be handled based on the local waste disposal rules, and prevent children from touching.

Equipment life is five years. After the end of life, equipment together with its accessories should be handled according to relevant laws and regulations. Any doubts, please contact our company or agency.

- **Manual**

Users must comply with the listed user instructions to ensure the safe use of this equipment. However, medical practice experience can not be replaced by the instructions.

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

CHAPTER II SUMMARY

UV phototherapy was originated from 20s of 21 century. With development of science & technology, the technology of artificial light source has been developed swiftly. And UVA, UVB methods became the most effective way in treating many kinds of dermatosis in European and American countries.

In recent years, dermatosis patients become more and more, but traditional medication is not accepted by patients for shortcoming such as long treatment period, great side effective, easy relapse and so on. To reduce patients' pain, we researched and developed KN-4000 series UV radiation treatment system which is very effective for vitligo, psoriasis, pityriasis rose and so on.

2.1 Functional Overview

Intended Application

- UVA： For the use of pityriasis, eczema, dermatitis, psoriasis, vitiligo, lichen planus, pustular palm stumble clinical treatment.
- UVB： For the use of pityriasis, eczema, dermatitis, psoriasis, vitiligo, lichen planus, herpes zoster clinical treatment.

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 in 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 abnormity.

Specification

- Use Philips special UV lamp as light source, with best stability and long life；
- Small size, light weight, patients can take with themselves；
- hand-held operation；
- Reasonable price, use simply, patients can bring and cure at

home.

- Unique comb design, can take the treatment of scalp;
- Additional reflectors designed to improve the radiation efficiency;
- Unique anti-jamming technology to ensure that the equipment in strong magnetic field may be a normal work;
- Blue LCD display, coupled with microcomputer timer function, ensure the accuracy of treatment time.

2.2 Composition

KN-4003A/KN-4003B are consist of irradiation device, lamp, control circuit, as shown on figure 2-1,2-3.

Figure 2-1 KN-4003A/KN-4003B

KN-4003AL/KN4003BL are consist of irradiation device, lamp, control circuit, as shown on figure 2-2,2-3.

Figure 2-2 KN-4003AL/KN-4003BL

Figure 2-3 Product inner Effect Figureture

2.3 External mark declaration

	Attention! Please read attached catalogue
	Pay attention to ultraviolet (uv) radiation protection
	Need to wear goggles
ON	Power on
OFF	Power off
	Refer to user's manual
	Recycling symbol mark
	Ⅱ class device

2.4 Parameters

Type

- Safety Classification: Ⅱ
- continuous duty
- Common equipment（Anti-drip into the liquid）
- Can not be used in flammable anesthetic gas mixed with air or oxygen or Nzo

Main Tech parameters

Table 2-1 Product model comparison

Parameter / Model	Lamp Qty		Spectrum scope (nm)		Display mode
	UVA	UVB	UVA	UVB	
KN-4003A	1	--	350～400	--	--
KN-4003B	--	1	--	311～312	--
KN-4003AL	1	--	350～400	--	LCD
KN-4003BL	--	1	--	311～312	LCD

- **Working voltage:** AC 230V±10%，50Hz±2%
- **Power rating:** 50VA
- **Fuse protector:** T0.5AL/250V
- **Working Condition:**

  Temp: 5～40

RH: ≤85%

Atmospheric pressure: 700hPa～1060hPa

- **Structure**: handheld
- **Work distance**：3cm
- **Effective Radiant area**：48cm^2±2%
- **Lamp housing temperature**：<60℃
- **Radiant intensity**：

Quantity type (mw/cm²) / Wave band type	KN-4003A KN-4003AL	KN-4003B KN-4003BL
UVA	1～50	--
UVB	--	0.3～20

- **Radiation time:**
  a) UVA setting scope 0～30min；testing accuracy<±1%。
  b) UVB setting scope 0～30min；testing accuracy<±1%。
  c) Setting accuracy：1s。

CHAPTER III PRODUCT CONFIGURATION AND WORKING THEORY

3.1 Checking before installation

- Take out the equipment from the box, place it in safe, stable location.
- Check the accessories according to the packing list.

3.2 Power supply connection

Figure 3-1

As shown in the picture, A-end connects ballast, B-end Connect the power plug to AC power outlet. (note: Differentiate to some extent of B-end plug according to the sales area requirement)

Notice: ——Before connecting the power supply, make sure the

supplied voltage is the same as the equipment requirement.

—— Equipment must be inserted to a power outlet which is used for it only, can not be shared with other equipments. It is better to apply regulated power supply in unstable power voltage.

—— Equipment can not be put in shaking place.

—— Must assure normal working environment requirement and power of this device. Otherwise you won't meet instrument claims to technical specifications, and may lead to the damage of equipment and unanticipated consequences.

3.3 Installation of lamp comb

Inlay the four buckles into the grooves of the lamp housing as Figure 3-2, push the comb toward right till end of the grooves. Then install the comb firmly.

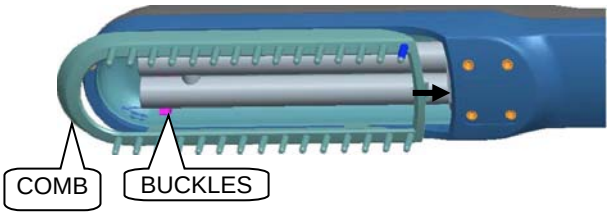


Figure 3-2

CHAPTER IV OPERATION

4.1 Preparation before treatment

4.1.1 Preparation for treatment

Dermatologist: make treatment plans according to the patient and determine treatment site, initial dose, treatment and interval.

Patient: ——Clean treatment part and remove all the cosmetics.

—— expose treatment part and protect health skin with cloth or other methods.

—— place some consistent grease if necessary.

—— wear UV protective goggles 

——If using the PUVA therapy, should be in accordance with the provisions in the lesion skin daub photosensitive drug before treatment, the treatment should be started after 15 ~ 20 minutes.

NOTICE: The first diagnosed patients should take test skin minimum phototoxic dose (MPD) and minimal erythema dose (MED) according to the UV radiation type. 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 UV rays, so make the biological dose (MPD or MED) as the unit of UV treatment. The biological dose: The time from light first radiates on the skin till visible erythema can be see (identified by naked eyes). Test result is better to be observed in 24 hours after irradiation. Test value will be helpful to choose the right treatment dose in the initial therapy. For more details please see Appendix C.

4.1.2 treatment illustration

Summarize: UV phototherapy is a high effective therapy which require the dermatologist have a certain degree of phototherapy knowledge and experience, prohibit taking treatment process as a process of learning. Treatment should be performed under the guidance of a doctor, doctor should implement tracking to monitor on a regular basis.

UV protective goggles: Ensure patient wear UV protective goggles before treatment. Irrelevant personnel should br avoid, during the treatment process.

Basic info: Information of appendix B can not be applied to every patient, should be selected according to patient circumstances.

Individual reaction: Radiation dosage must be adjusted on basis of individual's response. Before every new treatment, cutireaction must be checked and adjusted according to last treatment.

Dose: UVB therapy: initial dose is usually 50% ~ 75% of MED, 3 to 5 times per week; PUVA therapy: initial dose is usually inferior phototoxic dose, 2 to 4 times per week. In the successive treatment, whether to increase the radiation dose and increase rate or not depends on treatment frequency and treatment response. In principle, after irradiation of the increased dose, visible erythema should appear. When combine UVB or PUVA therapy with other therapies, such as vitamin A acid, calcipotriol, dose and frequency should be adjusted. Generally, light sensitivity of leg , feet, palm and elbow skin is lower than other parts of the body, so the dose could be increased accordingly during irradiation. Don’t stop treatment until complete remission or no further improvement. Facial skin is more sensitive to UV radiation than other parts of the body, when necessary, cover it or use an anti- light agent.

Solar Dermatitis: After treatment, if the patient showed a larger area of solar dermatitis, please verify whether the patient received excessive solar radiation, whether taking an enhanced photosensitive drugs, whether to stop using the past have been using contains a certain enhanced

photosensitivity of sun block aromatic cosmetics, shower gel, or Tea.

Pre-treatment protection: it is proposed to make some skin oil which can help UV permeate to corneum. In this way, permeation to corneum will be enhanced and therapeutic effect will be better.

NOTICE: Do not use too much skin oil! Too much skin oil will left oil layer which will influence or weaken therapeutic effect.

After-treatment care: UV radiation treatment can cause dry skin, After treatment, put some moisturizing cream in the treatment skin and avoid overexposure to the sun. When using PUVA therapy, after treatment, flush all coated drug skin and put anti-light agent. PUVA may cause skin burns in 72 hours after treatment, so avoid daily continuous treatment.

Adverse reactions: adverse reactions after phototherapy are almost the same reaction as overexposure to the sun, including erythema, edema, occasional blisters. Once there is adverse reaction, adjust dose or stop treatment, and some measures can be taken to the extent of phototoxic reactions, such as: topical non-steroidal anti-inflammatory drugs or corticosteroids. Long-term, repeated phototherapy after irradiation may cause skin pigmentation, dry skin, decreased elasticity, actinic keratosis, lentigines and

so on. So in the beginning of treatment and during the treatment, doctors and patients should observe skin condition and timely adjust treatment course.

4.2 Software operation (applicable to KN-4003A/KN-4003B)

Attention! Before use, please take out the protection foam in front of the tube.

Operator: wear UV protective goggles,

Power on test: turn on the equipment, check if every part is all right

NOTE: After startup instrument will be issued "di" of a sound, verify the buzzer work is normal or not. If not normal please contact with manufacturer or local dealers.

Usage of comb: The scalp, hair can be separated by the comb, so that can be expose under the lamp to be irradiated.

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

Patient: Expose treatment part to the UV lamp in the distance of 3cm, as Figure 4-1,If start, it record the time, and the end time is calculated;

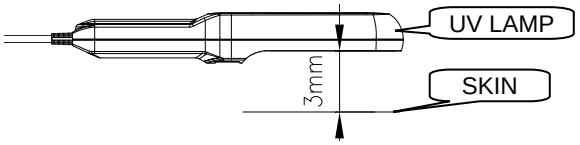


Figure 4-1

After treatment: When radiation treatment is finished, turn off the power switch.

4.3 Software operation (applicable to KN-4003AL/KN-4003BL)

Attention! Before use, please take out the protection foam in front of the tube.

Operator: wear UV protective goggles,

Power on test: turn on the equipment, check if every part is all right

NOTE: After startup instrument will be issued "di" of a sound, verify the buzzer work is normal or not. If not normal please contact with manufacturer or local dealers.

Usage of comb: The scalp, hair can be separated by the comb, so that can be expose under the lamp to be irradiated.

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

Patient: Expose treatment part to the UV lamp in the distance of 3cm, as Figure 4-1；

Start timer: press "▶" to start timing;

After treatment: When radiation treatment is finished, lamp will turn off automatically.

Shutdown method: turn off the power switch, disconnect the power cord.

 **operation panel**

Figure 4-2

【Notes】The following direction buttons (< > ∧ ∨) indicates the corresponding keyboard of Figure 4.2

Main Interface

Boot display

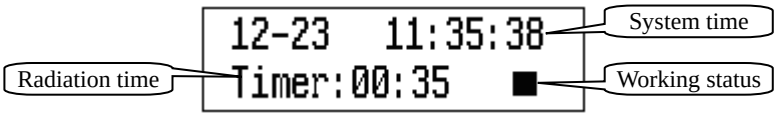


Figure 4-3

System time, radiation setting time and working status is displayed when starting equipment.

Working status: ▶ running ▮▮ pause ■ stop

system time setting

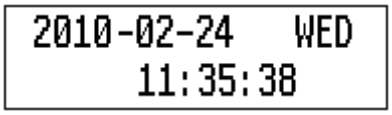


Figure 4-4

Press ∧ Key into the system time setting interface, as Figure

4-4. Press OK key to enter the edit mode. Editor-box has a blue box flashing and press ∧,∨ key to amend it, press <, > key to Left shift. Press OK to confirm, Exit setup interface to return the boot interface.

Irradiation time setting interface

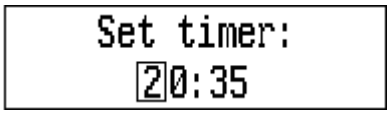


Figure 4-5

Press ∨ to time setting mode as Figure 4-5, default first space is a editable blue box. Press ∧,∨ to amend figure, press <, > to shift to other editing place. Press OK to confirm and exiting editing mode to boot interface.

running, pause, stop

- **running ▶**

After irradiation time is setted press ▶ to run the equipment, then lamp will be turned on, the working status indicates "▶", irradiation time starts the countdown. In the last 10 seconds of countdown, there will be alarm reminder.

- **pause ▮▮**

Press ■ to pause treatment, lamp will be turned off and countdown will pause while work status indicates is "▮▮". If ▶ is

pressed, lamp will be turned on to continue treatment and countdown will go on.

- **stop ■**

When countdown is finished, equipment will automatically shut down the lamp and end treatment while working status indicates "■".

In the pause mode, if press ■ again, treatment will be finished and countdown is cleared.

Saving setup

In stop mode, if the last irradiation time is needed, press the ▶ button, and the last setup time will be displayed on the "Timer". Press the ▶ button again to enter into the start state and press ▽ key to enter into the timer setup interface.

Shutdown and reboot, the system will automatically display last setup irradiation time.

NOTE: Shall confirm the preset treatment time is correct and treatment, such as incorrect should be reset.

CHAPTER V MAINTENACE&MAINTAIN

In order to ensure equipment's normal use, extend the equipment life, should notice Maintenance & Maintain.

5.1 Maintenance of equipment and accessories

In order to ensure normal and safe work, every 6 months, please make a preventative checkup and maintenance for the equipment and its accessories (including the performance inspection and safety inspection), to ensure the medical operator and patients are safe and meet the required clinical use accuracy.

1. Note the local voltage fluctuations, Beyond the permitted range, the regulator equipment should be applied.
2. The housing of the equipment should not be arbitrarily opened without permission, in order to avoid unexpected failure to affect the normal use.
3. Accessories of the equipment should be handled carefully and put down gently, do not throw, hit, pull, wipe with corrosive chemicals.
4. Do not touch the lamp and reflector by hand in order to avoid fingerprints and reduce the radiation effects.
5. Do not leave the lamp holder long-time unused, to prevent the metal contact point from dust and oxidation , which leads to lamp poor contact.

6. Equipment and accessories should be inspected at the hospital in accordance with the provisions of calibration cycle, when the calibration cycle ends, please contact the manufacturer. Recommend that users inspect equipment and accessories in their daily use in order to receive appropriate treatment.
7. Equipment and accessories service life expires, please deal with it in accordance with the related electronic products waste handling requirements.

5.2 Equipment cleaning

Warning: Cut off the AC power. before cleaning equipment.

1. The most commonly used hospital cleaning fluid and non-corrosive detergents can be used to clean the equipment, but note that many of them need to be diluted before use, please follow the detergent manufacturer's instructions to use.
2. Avoid the using ethanol-based, amino-or acetone-based cleaning agents.
3. Lamp housing, screen, lamp should be kept free of dust pollution, soft lint-free cloth or sponge with the cleaning agent can be used to wipe.

Notice: Be careful that not to pour the liquid on the equipment.

4. Abrasive materials such as steel brush and polishing agent are

prohibitted to use.

5. Please use distilled water or deionized water to wash, then dry it in 40 ℃ to 80 ℃ air for at least one hour when the plug is occasional wet.
6. Cotton swabs with some alcohol can be used to wipe if the metal contacts of the lamp holder and lamp are oxygenated
7. Lint-free cloth or cotton wool with some alcohol can be used to wipe if the reflector is taint with fingerprints or other blot.

5.3 Storage

Equipment should be wiped clean and covered with dust cover if it's unused for a long time. The storage environment should be kept dry and ventilated.

5.4 Transport and storage

Transport: Equipment should be avoided from rain and snow. It is prohibited to transport under the circumstance of corrosive substances and gases mixed.

Storage: The completely packed products should be stored in warehouse of dry and ventilated, non-corrosive substances, no strong magnetic field.

Transport and storage environmental conditions:

Ambient temperature: -40 ~ 55 ℃

Atmospheric pressure: 500 ~ 1060hpa

Relative humidity: ≤ 95%

5.5 Lamp Replacement

UVA, UVB lamps were produced by Philips, the power is 9W.

The normal life of UV lamp is 1000 hours (this data is provided by the manufacturer), but with the increase of the service time, frequently turn on and off, or high temperature will lead to reduce the lamp intensity and shorten the lamp life, when the lamp flickers or does not work, please change a new lamp in time. Meanwhile, to ensure the effectiveness of treatment, it is recommended to change new lamps when the service time is up to 350 hours or an obvious intensity reduction (less than 50% of the original intensity),to keep a better therapeutic effect.

Notice:

- **The replaced lamp must be the same model to ensure the normal work of the equipment.**
- **Lamps are fragile items, please handle with care and note the intensity should be moderate during assembling and disassembling.**
- **The waste lamps should be handled in accordance with special waste related provisions.**

Warning: Please cut off the power before replacing the lamps.

1) Slide the comb to the left to separate it from groove to remove.

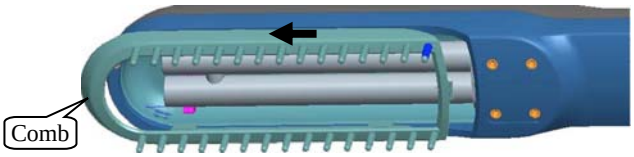


Figure.5-1

2) Remove the fixed light buckle fastening screws, remove the lamp buckle.

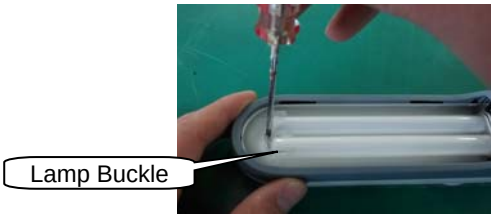


Figure.5-2

3) Slide the lamp to the left to separate it from the lamp holder, hold the end of the lamp, uplift and pull it out gently.

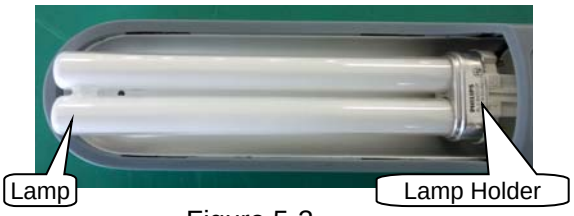


Figure.5-3

4) Aiming the lamp at the lamp holder, push the lamp into the holder. The two positioning holes aligned lamp shell lamp

buckle and fixing holes and fasten with screws. Mounted lights comb.

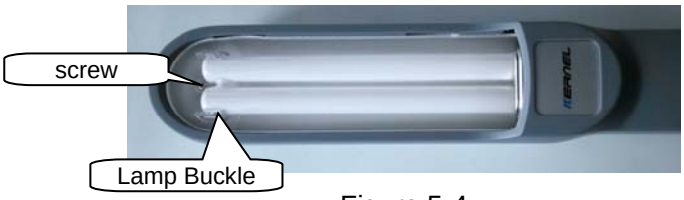


Figure.5-4

Chapter VI Common fault analysis and elimination

Instrument common failure analysis and elimination method see table 6-1 content. If you can't tell or resolve instrument malfunction, please do not hesitate to contact my company after-sales service center.

Table 6-1 fault analysis and ruled out

NO.	fault phenomenon	probable cause	exclusion methods
1	Tube is not bright	Loose tube	Reinstall tube
		Tube and socket contact point appear black oxide layer	Scrape off the metal oxide
		Fluorescent tubes, fuse or transformer broken	Notice manufacturer or local agent
2	All tubes are not bright	Power supply voltage is too low	Check voltage, if the voltage is too low, stop using
3	Turn on the power switch, display window no display	Power supply system is breakdown	Check the power line connection is loose, the fuse is damaged
		control circuit breakdown	Notice manufacturer or local agent
4	After startup did not start lamp light	control circuit breakdown	Notice manufacturer or local agent
5	The countdown does not work properly	Control circuit fault	Notice manufacturer or local agent

Chapter VII AFTER-SALES SERVICE

1. Our company will not provide free service for the failures caused by the following reasons, such as
   a. Self-disassembling and change the structure of the equipment.
   b. Falling or dropping during using and moving.
   c. Lack of rational maintenance or fail to reach the use environmental requirements.
   d. Wrong operations which are not subject to the manual.
   e. Equipment and accessories damage caused by artificial reason.
   f. Self-repair by user without kernel's approval.
   g. Equipment damage caused by local voltage fluctuation.
   h. Damages caused by fire disaster, earthquake or other natural disaster.

2. Please directly contact KERNEL's service center by telephone, telex, letter or fax in case of need of maintenance service. Information transmission interrupt may happen if connect with other staff or departments, thus it delays our maintenance and your normal use.

3. The company's schematics, component lists and other technical information can be provided to authorized technician if necessary.

Contact information:

Company Name: Xuzhou Kernel Medical Equipment Co., Ltd.
Company Address: Kernel Mansion, Economic Development District, Xuzhou City, Jiangsu Province, China
Zip Code: 221004
Tel：+86(516)87732209
Fax: +86(516)87732210
Web: www.kernelmed.com www.kerneluvb.com
Email: sales1@kernelmed.com

EC REP **EU representative:**

Company Name: Wellkang Ltd t/a Wellkang Tech Consulting
Company Address: Suite B, 29 Harley Street LONDON W1G 9QR England, United Kingdom
Tel：+44(20) 30869438, 32876300
Fax: +44(20)76811874
Web: www.CE-marking.com www.CE-marking.eu www.CEmarking.org
Email: AuthRep@CE-marking.eu

Appendix A radiation intensity

The radiation intensity will be recorded in Table A-1.

Table A-1 irradiation intensity settings

Wave band type	Radiation Intensity（mW/cm²）
UVA	
UVB	

Attention: After a period of the usage of lamp, the value of exposure intensity will attenuate correspondingly and should be adjusted in time according to the condition (For example, every usage of 100 hours or less time, when the intensity attenuate obviously, after the replacement of lamp, or other any may cause the change of the exposure intensity value) of the usage of lamp, and should be acquired after measurement by special tools. If it's unable to determine the accuracy of the exposure intensity value, please contact the distributor or manufacturer to help you determine.

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

Skin Type	The Initial Dose （J/cm²）	Increasing Dose （J/cm²）	Maximum Dose （J/cm²）
I	0.5	0.5	8
II	1.0	0.5	8
III	1.5	0.5	8
IV	2.0	1.0	12
V	2.5	1.0	12
VI	3.0	1.0	12

- UVA treatment: only UVA Radiation Treatment.

Table B-3 UVA Dose

Skin Type	The Initial Dose （J/cm²）	Increasing Dose （J/cm²）	Maximum Dose （J/cm²）
I	2	1	10
II	2	1	10
III	4	1	20
IV	4	1	20
V	6	1	35
VI	6	1	35

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

Table B-4 Narrow band UVB Dose

Skin Type	The Initial Dose (J/cm²)	Increasing Dose (J/cm²)	Maximum Dose (J/cm²)
I	0.2	0.05	2
II	0.2	0.05	2
III	0.3	0.10	3
IV	0.3	0.10	3
V	0.4	0.15	5
VI	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.

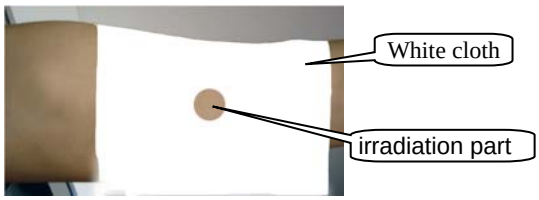
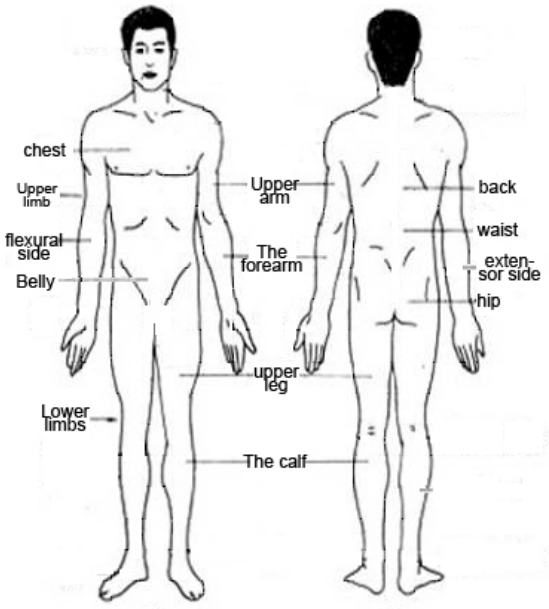


Figure C-1

5. Required for the test of five different phototherapy 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.)



FigureC-2 every part mame of the body

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

Dose (J/cm²) Skin Type Sequence	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	Ⅵ
1	2	3	5	7.5	9	12
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
5	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/cm²) / Skin Type / Sequence	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	Ⅵ
1	2.5	3.6	6	9	11	14.5
2	2	2.88	4.8	7.2	8.8	11.6
3	1.5	2.16	3.6	5.4	6.6	8.7
4	1	1.44	2.4	3.6	4.4	5.8
5	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/cm²) / Skin Type / Sequence	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	Ⅵ
1	0.4	0.65	0.9	1.2	1.5	1.6
2	0.32	0.52	0.72	0.96	1.2	1.28
3	0.24	0.39	0.54	0.72	0.9	0.96
4	0.16	0.26	0.36	0.48	0.6	0.64
5	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/cm²) / Skin Type / Sequence	Ⅰ	Ⅱ	Ⅲ	Ⅳ	Ⅴ	Ⅵ
1	0.5	0.8	1.4	1.8	2.3	2.5
2	0.4	0.64	1.12	1.44	1.84	2
3	0.3	0.48	0.84	1.08	1.38	1.5
4	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 1.2J/cm^2, The second is 0.96J/cm^2, the third is 0.72J/cm^2, the fourth is 0.48J/cm^2, the fifth is 0.24J/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 0.72J/cm^2, so the patient's MED is 0.72J/cm^2.

Figure. C-3

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

Suggestion: use KERNEL's 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 look up the radiation time directly from Appendix D.Common dosage/intensity/time calculation value are in below table.first line is radiation intensity ，unit is mW/cm²；the first column is radiation dosage，unit is J/cm²；the value in the table are“radiation time”，unit are“Min.：Sec.”：

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓									
Radiation Dosage →	01.00	01.20	01.40	01.60	01.80	02.00	02.20	02.40	02.60	…
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	00:19	…
0.06	01:00	00:50	00:43	00:38	00:33	00:30	00:27	00:25	00:23	…
0.07	01:10	00:58	00:50	00:44	00:39	00:35	00:32	00:29	00:27	…
0.08	01:20	01:07	00:57	00:50	00:44	00:40	00:36	00:33	00:31	…
0.09	01:30	01:15	01:04	00:56	00:50	00:45	00:41	00:38	00:35	…
…	…	…	…	…	…	…	…	…	…	…

Radiation Dosage

Radiation Intensity

Radiation time

Example： If the radiation intensity is 5.0mW/cm² (the actual value please see table A-1 of appendix A)，and need radiation 2.5J/cm²，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（mW/cm²）↓									
Radiation Dosage (J/cm²) →	04.00	04.20	04.40	04.60	04.80	05.00	05.20	05.40	05.60	...
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	...
2.30	09:35	09:08	08:43	08:20	07:59	07:40	07:22	07:06	06:51	...
2.40	10:00	09:31	09:05	08:42	08:20	08:00	07:42	07:24	07:09	...
2.50	10:25	09:55	09:28	09:03	08:41	08:20	08:01	07:43	07:26	...
2.60	10:50	10:19	09:51	09:25	09:02	08:40	08:20	08:01	07:44	...
2.70	11:15	10:43	10:14	09:47	09:23	09:00	08:39	08:20	08:02	...
2.80	11:40	11:07	10:36	10:09	09:43	09:20	08:58	08:39	08:20	...
…	…	…	…	…	…	…	…	…	…	…

Method 2：Formula method

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

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

example： If the lamp intensity is 4.0mW/cm^2（the actual value please see table A-1 of appendix A），and need the phototherapy dosage 6.0J/cm^2，we can calculate as followed ：

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

That means it needs 25min .

Appendix：

Table D-1 General Parameter List 1 (Radiation Intensity 1.0～3.8mW/ cm²)

Table D-2 General Parameter List 2 (Radiation Intensity 4.0～6.8mW/ cm²)

Table D-3 General Parameter List 3 (Radiation Intensity 7.0～9.8mW/ cm²)

Table D-4 General Parameter List 4 (Radiation Intensity 10.0～12.8mW/ cm²)

Table D-5 General Parameter List 5 (Radiation Intensity 13.0～15.8mW/ cm²)

Table D-1 General Parameter List 1 (Radiation Intensity 1.0～3.8mW/ cm²)

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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**
0.04	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
0.05	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
0.06	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
0.07	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
0.08	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
0.09	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
0.10	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
0.12	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
0.14	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
0.16	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
0.18	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
0.20	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
0.30	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
0.40	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
0.50	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
0.60	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
0.70	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
0.80	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
0.90	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
1.00	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
1.10	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
1.20	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
1.30	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
1.40	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
1.50	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
1.60	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
1.70	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
1.80	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
1.90	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
2.00	**33:20**	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

Radiation Dosage（J/cm²）↑

continued table D-1：

Radiation time (Min:Sec)↘		Radiation Intensity（mW/cm²）↓														
		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/cm²）→	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/ cm²)

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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/cm²）↑ 0.04	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
0.05	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
0.06	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
0.07	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
0.08	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
0.09	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
0.10	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
0.12	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
0.14	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
0.16	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
0.18	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
0.20	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
0.30	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
0.40	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
0.50	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
0.60	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
0.70	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
0.80	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
0.90	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
1.00	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
1.10	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
1.20	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
1.30	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
1.40	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
1.50	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
1.60	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
1.70	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
1.80	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
1.90	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
2.00	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/cm²）↓														
		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/cm²）→	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/ cm²)

Radiation time (Min:Sec)↘		Radiation Intensity（mW/cm²）↓													
		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/cm²）↑	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	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	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	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	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	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	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	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	00:12
	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	00:14
	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	00:16
	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	00:18
	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	00:20
	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	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	00:41
	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	00:51
	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	01:01
	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	01:11
	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	01:22
	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	01:32
	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	01:42
	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	01:52
	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	02:02
	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	02:13
	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	02:23
	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	02:33
	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	02:43
	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	02:53
	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	03:04
	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	03:14
	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	03:24

continued table D-3：

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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**
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

Radiation Dosage（J/cm²）→

Table D-4 General Parameter List 4 (Radiation Intensity 10.0～12.8mW/ cm²)

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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**
0.04	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
0.05	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
0.06	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	00:05
0.07	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	00:05
0.08	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
0.09	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
0.10	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
0.12	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
0.14	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
0.16	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
0.18	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
0.20	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
0.30	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
0.40	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
0.50	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
0.60	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
0.70	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
0.80	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
0.90	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
1.00	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
1.10	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
1.20	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
1.30	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
1.40	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
1.50	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
1.60	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
1.70	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
1.80	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
1.90	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
2.00	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

Radiation Dosage（J/cm²）↑

continued table D-4：

Radiation time (Min:Sec)↘		Radiation Intensity（mW/cm²）↓														
		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/cm²）→	**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/ cm²)

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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
0.04	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
0.05	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	00:03
0.06	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
0.07	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
0.08	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	00:05
0.09	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
0.10	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
0.12	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
0.14	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
0.16	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
0.18	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
0.20	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
0.30	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
0.40	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
0.50	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
0.60	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
0.70	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
0.80	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
0.90	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
1.00	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
1.10	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
1.20	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
1.30	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
1.40	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
1.50	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
1.60	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
1.70	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
1.80	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
1.90	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
2.00	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

Radiation Dosage（J/cm²）↑

continued table D-5:

Radiation time (Min:Sec)↘	Radiation Intensity（mW/cm²）↓														
	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**
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

Radiation Dosage（J/cm²）→

Appendix E Patients Record

No.：_____ Name：_____ Age：_____

Date	Prescription dose （J/cm²）	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.

Appendix F Declaration of the EUT

Guidance and manufacturer´s declaration – electromagnetic emission –for all EQUIPMENT AND SYSTEMS

Row

1	**Guidance and manufacturer´s declaration – electromagnetic emission**		
2	The KN-4000 series UV Radiation Treatment System is intended for use in the electromagnetic environment specified below. The customer or the user of KN-4000 UV Radiation Treatment System should assure that it is used in such an environment.		
3	**Emissions test**	**Compliance**	**Electromagnetic environment - guidance**
4	RF emissions EN 55011	Group 1	The KN-4000 series UV Radiation Treatment System uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
5	RF emissions EN 55011	Class B	The KN-4000 series UV Radiation Treatment System is suitable for use in all establishments, including domestic establishments and those directlyconnected to the public low-voltage power supplynetwork that supplies buildings used for domestic purposes.
6	Harmonic emissions EN 61000-3-2	Class A	
7	Voltage fluctuations /flicker emissions EN 61000-3-3	Complies	

Guidance and manufacturer's declaration – electromagnetic immunity –for all EQUIPMENT and SYSTEMS

Guidance and manufacturer´s declaration – electromagnetic immunity			
The KN-4000 series UV Radiation Treatment System is intended for use in the electromagnetic environment specified below. The customer or the user of The KN-4000 series UV Radiation Treatment System should assure that it is used in such an environment.			
Immunity test	**EN 60601 test level**	**Compliance level**	**Electromagnetic environment-guidance**
Electrostatic discharge (ESD) EN 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrostatic transient / burst EN 61000-4-4	±2kV for power supply lines ±1kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge EN 61000-4-5	±1 kV differential mode ±2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.

continued table：

Immunity test	EN 60601 test level	Compliance level	Electromagnetic environment-guidance
Voltage dips, short interruptions and voltage variations on power supply input lines EN 61000-4-11	< 5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (>95 % dip in U_T) for 5 sec	< 5 % U_T (>95 % dip in U_T) for 0.5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles < 5 % U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of The KN-4000 series UV Radiation Treatment System requires continued operation during power mains interruptions, it is recommended that The KN-4000 series UV Radiation Treatment System be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field EN 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a. c. mains voltage prior to application of the test level.			

Guidance and manufacturer´s declaration – electromagnetic immunity –for EQUIPMENT and SYSTEM that are not LIFE-SUPPORTING

Guidance and manufacturer´s declaration – electromagnetic immunity			
The KN-4000 series UV Radiation Treatment System is intended for use in the electromagnetic environment specified below. The customer or the user of The KN-4000 series UV Radiation Treatment System should assure that it is used in such an environment.			
Immunity test	**EN 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of The KN-4000 series UV Radiation Treatment System, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF EN 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	$d = [\frac{3.5}{V_1}]\sqrt{P}$
Radiated RF EN 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = [\frac{3.5}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 800 MHz to 2.5 GHz

continued table：

Immunity test	EN 60601 test level	Compliance level	Electromagnetic environment - guidance
			where *p* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in metres (m).[b] Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic is affected by absorption and reflection from structures, objects and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which The KN-4000 series UV Radiation Treatment System is used exceeds the applicable RF compliance level above, The KN-4000 series UV Radiation Treatment System should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating The KN-4000 series UV Radiation Treatment System. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3V/m.			

Recommended separation distances between portable and mobile RF communications equipment and the EQUIPMENT or SYSTEM - for EQUIPMENT and SYSTEMS that are not LIFE-SUPPORTING

Recommended separation distances between portable and mobile RF communications equipment and The KN-4000 series UV Radiation Treatment System			
The KN-4000 series UV Radiation Treatment System is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of The KN-4000 series UV Radiation Treatment System can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and The KN-4000 series UV Radiation Treatment System as recommended below, according to the maximum output power of the communications equipment			
Rated maximum output of transmitter **W**	**Separation distance according to frequency of transmitter** **m**		
	150 kHz to 80 MHz $d = [\frac{3.5}{V_1}]\sqrt{P}$	80 MHz to 800 MHz $d = [\frac{3.5}{E_1}]\sqrt{P}$	800 MHz to 2.5 GHz $d = [\frac{7}{E_1}]\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above the recommended separation distance d in metres (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Packing List

No.	Name	Quantity	Unit
1	Mainframe	1	Set
2	Comb	1	PCS
3	Goggle（optional）	1	Pair
4	User’s manual	1	PCS
5	Certificate	1	PCS