PACKING LIST

No.	Item	Quantity
1	Phototherapy device	1
2	Comb attachment	1
3	Goggle	1
4	User manual	1
5	Certificate	1

USER MANUAL

KN-4003 SERIES

Table of Contents

APPENDIX E – PATIENT REPORT

No.: _____ Name: _____ Age: _____

Date	Dose (J/cm²)	Exposure time (min : sec)	Treatment site	Skin Reactions & Comments	Cumulative Exposure Time (Hours : Min)

The patient report helps physicians and patients to keep track of the treatment course and provides guidance for the next treatment. This patient report is just one example and can therefore be adapted to individual needs. This page is intended as a copy template and should therefore not be completed.

continued **Table D-5**

Exposure time (Min:Sec)↘	Irradiance (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

Dose (J/cm²) →

Preface

Thank you for purchasing a KN-4003 Series UV phototherapy device. This user manual has been provided to ensure that you understand and can safely use this UV phototherapy device.

This user manual describes the device in detail and shows you how to operate and maintain it. The appendices in this manual also show you how to effectively and safely determine the exposure time for UV treatment with this device.

Please read this manual and the accompanying documentation carefully before using the device for the first time.

For more information on our products and services, please visit www.kerneluvb.com

Version：V2.0
Publish Data：May. 26, 2015

Table D-5 (13.0 – 15.8 mW/cm²)

Exposure time (Min:Sec)↘		Irradiance（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
Dose（J/cm²）→	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

continued **Table D-4**

Exposure time (Min:Sec)↘		Irradiance（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
Dose（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

1 SAFETY REQUIREMENTS & PRECAUTIONS

- Patients and operators must wear ultraviolet blocking goggles during treatment to avoid eye injury.
- MPD (minimal phototoxic dose) or MED (minimal erythema dose) shall be determined prior to starting the UV phototherapy.
- The treatment process shall be monitored and recorded by operator.
- Any adverse events, such as pain or changes in the skin, should be evaluated by a dermatologist.
- Please turn off the power when the device is not being use.

1.1 Warnings

- Read the user manual carefully before using the device.
- To avoid electric shock the device must never be directly exposed to flowing or splashing liquid or water. Also, be careful when cleaning with a damp cloth to ensure that no liquid enters the device. If water gets into the device, please stop using it immediately, and contact KERNEL or a local distributor or service center.
- Wear UV protective goggles during use to avoid eye injury. Serious burns may be caused if the recommended dosage is exceeded.
- Use only under the guidance of a licensed physician. Do not use over skin eruptions unless directed by physician.
- To prevent erythemas, ensure that all exposed skin, that is not to be treated, (face, neck, ears, forehead, etc.) is adequately covered with a sun block rated SPF 15 or higher. Not all sun blocks are the same. Follow all sunscreen manufacturers' instructions for proper application and use.
- All individuals in view of the device must wear eye protection during radiation times.
- To avoid dangerous UV exposure to others, do not treat with bystanders in the same room.
- The exposure time tables contain general parameters and are intended only as a guideline. Your physician should determine and issue your treatment plan.
- It is important to carefully determine the proper exposure time. Over-exposure will produce erythemas and discomfort. Under-exposure will result in reduced therapeutic benefit while at the same time building resistance to future treatments. Always follow your physician's instructions.

Table D-4 (10.0 – 12.8 mW/cm²)

Exposure time (Min:Sec)↘		Irradiance (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
Dose (J/cm²) ↓	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

continued **Table D-3**

Exposure time (Min:Sec)↘		Irradiance (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
Dose (J/cm²) →	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

- Do not operate the device with the exposure surface blocked. This may cause overheating and can damage the device.
- Always inspect the device housing, timer, power supply cord, and goggles prior to use to ensure they are in correct working operating condition. Do not use the device if it appears to be damaged or altered in any way.
- Please store the device in a location where children can not access it.
- If any adverse reactions occur during treatment, contact your physician immediately.
- Never use the device in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide or where flammable substances such as alcohol, fuel or similar substances are used.
- This device should not be used by patients with a previous history of skin cancer.
- The treatment of genital lesions require caution and directions by your physician.

1.2 Precautions

- Only use replaceable parts and accessories provided or designated by your distributor or KERNEL.
- Turning off the device incorrectly may cause damage to the device.
- Power failure may cause an interruption of the exposure time during operation. If such a situation occurs, please closely observe the device's condition. If the device does not work within 60 seconds automatically after power failure, please restart the device.

- Disposal of packing materials and the device shall comply with local regulations.
- Please use the device away from electromagnetic fields, such as X-ray and MRI equipment. This interference may disrupt the normal operation of the device.

1.3 Contraindications

- Xeroderma pigmentosum.
- Photosensitivity disorders (including lupus, porphyria, etc.)
- Basal cell nevus syndrome.
- Photosensitizing medications with an action spectrum within the wavelengths applied by the device.

2 GENERAL INFORMATION

2.1 Intended Use

The UV phototherapy device models KN-4003AL/KN-4003BL and KN-4003A/KN-4003B, deliver ultraviolet (UV) light to affected skin. The device should be used under the guidance of your physician, and it is effective for the treatment of psoriasis, vitiligo, and atopic dermatitis (eczema) on all skin types (I - VI). In conjunction with the MPD/MED Tester attachment KN-4000M the devices are also suitable for the determination of the minimal phototoxic dose, respectively the minimal erythema dose.

Table D-3 (7.0 – 9.8 mW/cm²)

Exposure time (Min:Sec)↘	Irradiance (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
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

Dose (J/cm²) ↓

continued **Table D-2**

Exposure time (Min:Sec)↘		Irradiance (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
Dose (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

2.2 Device Description

The device model KN-4003AL/KN-4003BL consists of a device housing with integrated UV lamp, LCD display and keys, as shown in figures 2-1, 2-3.

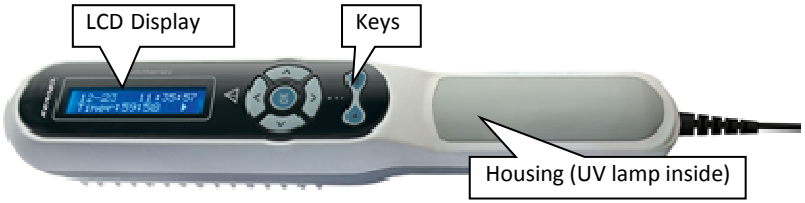


Figure 2-1, models KN-4003AL/KN-4003BL

The device model KN-4003A/KN-4003B consists of a device housing with integrated UV lamp, as shown in figures 2-2, 2-3.

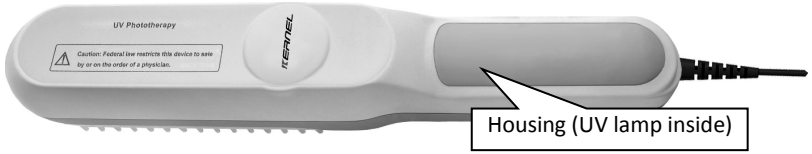


Figure 2-2, models KN-4002A/KN-4003B

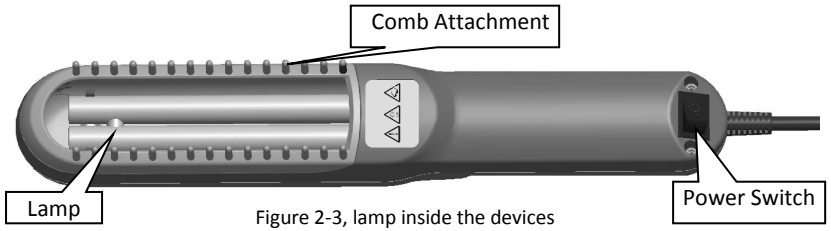


Figure 2-3, lamp inside the devices

2.3 Symbols & Definitions

	**ATTENTION!** Sections marked with this symbol must be read with special attention
	**CAUTION! ULTRAVIOLET RADIATION**
	**PROTECTIVE EYEWEAR MUST BE WORN**
ON	**POWER ON**
OFF	**POWER OFF**
	**REFER TO USER MANUAL**
	**CLASS II EQUIPMENT**
	**MANUFACTURER**
	**DATE OF MANUFACTURE**
SN	**SERIAL NUMBER**
EC REP	**EUROPEAN AUTHORISED REPRESENTATIVE**
	**DO NOT DISPOSE OF ELECTRICAL APPLIANCES AS UNSORTED MUNICIPAL WASTE**

Table D-2 (4.0 – 6.8 mW/cm²)

Exposure time (Min:Sec)↘		Irradiance（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
Dose（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-1**

Exposure time (Min:Sec)↘		Irradiance（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
Dose（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

2.4 Technical Data

Table 2-1 Product model comparison

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

Power supply:	AC 230V ± 10%, 50 Hz ± 2%
Power consumption:	50 VA
Fuse in device:	T0.5AL/250V
Operating conditions:	Temperature 5 to 40°C; RH ≤85%; Atmospheric pressure 700 to 1060hPa
Electrical appliance class:	Class II Equipment
Device type:	Hand-held
Recommended exposure distance:	3 cm
Exposure time setting:	0 to 30 min.; accuracy <±1%
	Resolution 1s
Irradiation area:	48 cm² ±2%
Lamp housing temperature:	< 60°C

Radiation intensity (irradiance):

Irradiance (mw/cm²) / Spectrum \ Model	KN-4003AL KN-4003A	KN-4003BL KN-4003B
UVA	5.5-18.2	---
UVB	---	3.2-7.2

Note: Due to manufacturing tolerances of the UV lamps, the irradiance of individual devices may vary. The irradiance, expressed in milliwatts per square centimeter, also decreases with time due to the aging of the lamp. To ensure the effectiveness of the treatment the irradiance must be within the range given in the above table. Depending on the decrease in irradiance, longer exposure times may also become necessary, according to the recommendations of the physician. The original irradiance of your device was measured at the factory. The corresponding measured value can be found in Appendix 1, Table A-1.

3 HANDLING

3.1 First steps

- Remove the device from the packaging!
- Check the device for damage. Do not use a damaged unit, but immediately inform our customer service department!
- Check the delivery contents for completeness according to the packing list on the last page.

Table D-1 (1.0 – 3.8 mW/cm²)

Dose (J/cm²) ↓ \ Exposure time (Min:Sec) →	Irradiance (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

Method 2: Calculation of the exposure time

In addition to using the reference tables, it is of course also possible to calculate the required exposure time.

Formula 1: Dose in J/cm²

If a dose is given in J/cm² the exposure time must be calculated according to this formula:

$$\frac{\text{Dose [J/cm²] x 1000}}{\text{Irradiance [mW/cm²] of device}} = \text{Exposure time in seconds}$$

Formula 2: Dose in mJ/cm²

If a dose is given in mJ/cm² the exposure time must be calculated according to this formula:

$$\frac{\text{Dose [mJ/cm²]}}{\text{Irradiance [mW/cm²] of device}} = \text{Exposure time in seconds}$$

Example:

If the irradiance of the device (see Appendix A) is 4.0mW/cm², and the desired dose is 6.0J/cm², then the calculation will look as follows:

$$\frac{\text{6.0 J/cm² x 1000}}{\text{4.0 mW/cm²}} = \text{1500 seconds (25 minutes)}$$

In this example the exposure time is 1500 seconds
(1500 seconds ÷ 60 = 25 minutes).
If a dose is given in mJ/cm², do not multiply the dose with 1000 as in the above example.

3.2 Power Supply Connection

- Connect plug marked with A into the ballast as shown in Figure 3-1. Then plug the power plug B into a suitable outlet. The device may only be operated with the power supply voltage specified in this manual.
- Depending on the requirements of the sales area, the type of the power plug B may be different from the one shown in Figure 3-1.
- The device must be connected to a power outlet that is only used for this device and can not be shared with other devices.
- The device may not be used in an environment where it may be exposed to vibrations.
- The device may only be operated in accordance to the operating conditions specified in this manual. An operation outside the specified operating conditions may result in malfunction, unpredictable effects and damage to the equipment.

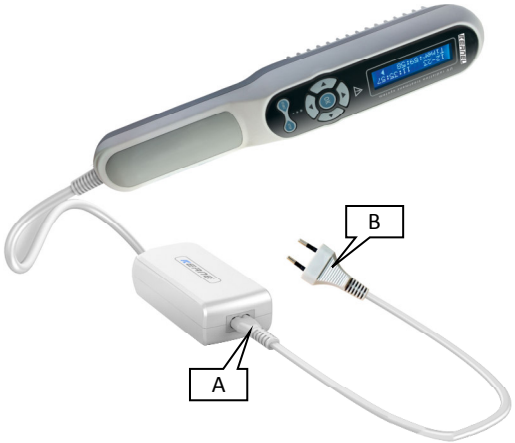


Figure 3-1

3.3 Attaching the Comb Attachment

Place the four tabs of the comb attachment into the grooves of the device housing and carefully slide the comb attachment in the direction of the arrow until it clicks into place, as shown in Figure 3-2.

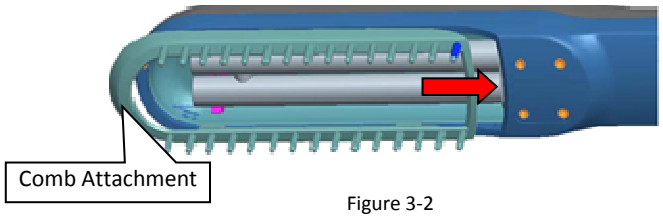


Figure 3-2

4 OPERATION

4.1 Treatment Preparation

The following pages describe the operation of the device. However, a treatment may only be carried out after the user manual has been completely read and understood.

Physician: Establish treatment plans including: treatment site, skin type, initial dose, treatment intervals and number of treatments.

Patient: Read and understand the user manual. Clean the treatment site and remove all cosmetics. Cover skin areas that do not need to be treated with cloth or sunscreen. Put goggles on and carry out the treatment.

APPENDIX D – DOSE & EXPOSURE TIME

Method 1: Exposure time reference table

The required exposure time can be looked up directly in Tables D-1 to D-5.

The table columns contain irradiances from 1.00 mW/cm² to 15.80mW/cm², and the table rows contain doses from 0.04J/cm² to 5.00J/cm².

To select the required exposure time, first find the table column with the irradiance that matches the irradiance of your device. Then, select the line with the desired dose.

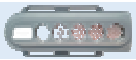
The table cell where the selected table column and table row meet contains the required exposure time in minutes and seconds.

In the below example an irradiance of 5.00 mW/cm² was selected (blue table column), and a dose of 2.50 J/cm² (yellow table row). The table cell where the table column and table row meet is marked in green and contains the required exposure time for this example.

Exposure time (Min:Sec)↘	Irradiance（mW/cm²）↓									
	04.00	**04.20**	**04.40**	**04.60**	**04.80**	**05.00**	**05.20**	**05.40**	**05.60**	**...**
Dose（J/cm²）→ **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	...
...	...	...	...	...	...	...	...	...	...	...

MPD/MED Tester – Delivery Contents

If the KN-4003 series device was ordered in conjunction with the MPD/MED Tester KN-4000M, following items are additionally included in the delivery contents.

Item	Image	Qty
Test attachment		1 PCS

The minimal phototoxic dose (MPD), respectively minimal erythema dose (MED) should be determined for each patient before the first UV phototherapy. Further information on MPD/MED determination can be found in Appendix C of this user manual.

- UV phototherapy must be prescribed by an approved physician.
- Patients and anyone in view of the device must wear tightly fitting UV blocking goggles.

4.2 KN-4003A / KN-4003B Operation

- Already before the treatment starts, the operator and anyone in view of the device must wear tightly fitting UV protective goggles.
- The device is equipped with comb teeth, which help to maintain the correct exposure distance of 3 cm (see Figure 4-1) when you place the device on the skin area to be treated.

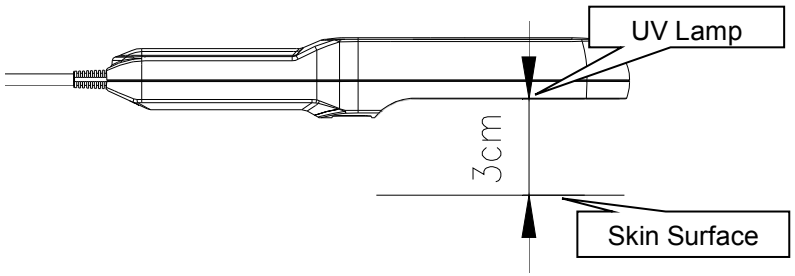


Figure 4-1

- As treatment parameter, usually a dose in joules per square centimeter (J/cm²) is given. The exposure time required for the application of the desired dose can be calculated in conjunction with the irradiance (see Appendix A) according to the following formula:

Dose [J/cm² x 1000] ÷ Irradiance [mW/cm²] = Exposure time in seconds

- Alternatively, you can look up the required exposure time in Appendix D in the Tables D-1 to D-5.
- For the start of the treatment, turn the power switch to the ON position.
- After the required exposure time has elapsed, the device must be switched off.

4.3 KN-4003AL / KN-4003BL Operation

- As treatment parameter, usually a dose in joules per square centimeter (J/cm²) is given. The exposure time required for the application of the desired dose can be calculated in conjunction with the irradiance (see Appendix A) according to the following formula:

Dose [J/cm² x 1000] ÷ Irradiance [mW/cm²] = Exposure time in seconds

- Alternatively, you can look up the required exposure time in Appendix D in the Tables D-1 to D-5.
- Turn on the device by turning the power switch to the ON position.
- Set the required exposure time using the built-in electronic timer and start the treatment. A detailed description of the timer functions is provided in the following section.
- When the required exposure time has elapsed, the timer automatically turns off the lamp. After that, turn off the device with the power switch.

During this time, exposure to natural or artificial UV light must be avoided.

8. Due to the graduated light transmittance of the five test apertures also five different doses will be applied, according to Table C-2.

Table C-2 Dose Graduation

Aperture No.	1	2	3	4	5
Percentage of selected dose	100%	80%	60%	40%	20%

9. After a successful MPD/MED test, the test area should look like the example shown in Figure C-5. Of the five different doses, the dose of test aperture 4 provoked just a slight erythema (circled in red). Therefore, this dose represents the minimal phototoxic dose, respectively the minimal erythema dose.

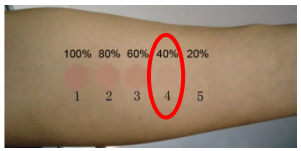


Figure C-5

10. If severe erythema or blisters occur, topical corticosteroids should be used.

5. Select the appropriate dose according to skin type from Table C-1.

Table C-1 Recommended MPD/MED Doses

Skin Type		I	II	III	IV	V	VI
Maximum recommended test dose (J/cm²)	UVA	2	3	5	7.5	9	12
		*2.5	*3.6	*6	*9	*11	*14.5
	UVB	0.4	0.65	0.9	1.2	1.5	1.6
		*0.5	*0.8	*1.4	*1.8	*2.3	*2.5

Note: The forearm and the outside of the upper arm are usually less sensitive to UV light. Therefore, these areas require a slightly higher dose which is marked with an asterisk* in the table.

6. The MPD/MED attachment will affect the irradiance of your KN-4003 series device. To take this into account, the irradiance given in Appendix A Table A-1 must be multiplied with the correction factor 0.6. Therefore, the exposure time for a MPD/MED test must be calculated according to the following formula:

$$\frac{\text{Dose [J/cm}^2 \text{ x 1000]}}{\text{Irradiance [mW/cm}^2\text{] x 0.6}} = \text{Exposure time in seconds}$$

Alternatively, you can look up the required exposure time in Appendix D in the Tables D-1 to D-5, but make sure you use the corrected irradiance (irradiance x 0.6) for this purpose.

7. Since an erythema doesn't appear immediately after exposure, the test area should be marked with a ballpen, for example. After a MED test it will take about 24 hours until the erythema can be assessed, whereas for a MPD test this will take 72-96 hours (for orally administered PUVA), respectively 96-120 hours (for bath-PUVA).

4.3.1 Timer Settings

Plug in the device and turn it on. Hold the device horizontally, as shown in Figure 4-2, so you can read the display.

Figure 4-2

Default display

After the device is switched on, the display shows the system time and date, the set exposure time and a symbol for the respective operating status, as shown in Figure 4-3.
Following symbols are used to indicate the operating status: ▶ started **II** paused ■ stopped

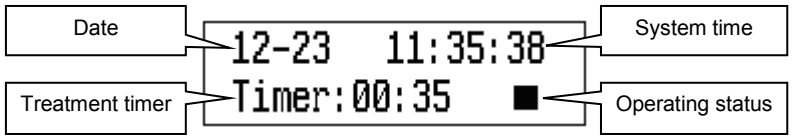


Figure 4-3

System date and time setting

Press the **^** key to enter the time and date setting mode, as shown in Figure 4-4, then press **OK**. The respective editable entry (year, month, weekday, hour or minute) is highlighted in blue. Use the **<** and **>** keys to select the desired entry (move left or right). Use the **^** and **˅** keys to change the corresponding entry. Press **OK** to confirm your settings and to leave the setting mode.
Note: The time can only be set in 24-hour format.

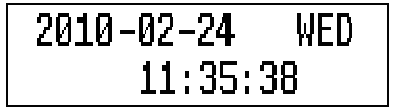


Figure 4-4

Exposure time setting

Press the ˅ key to enter the exposure time setting mode, as shown in Figure 4-5.
The respective editable entry (minutes or seconds) is highlighted in blue. Use the **<** and **>** keys to select the desired entry (move left or right). Use the **^** and **˅** keys to change the corresponding entry. Press **OK** to confirm your settings and to leave the setting mode.

Figure 4-5

Start, pause and stop of the exposure time

If this is your practice run, you must point the lamp away from your eyes and skin before starting the practice session. No one else should be in the same room during this time.

Before you start a treatment, familiarize yourself with the arrangement of the Start ▶, Pause **II** and Stop ■ buttons.

Start ▶

After the desired exposure time is set put your goggles on, and press the Start ▶ button. The lamp will turn on, the exposure time countdown starts and the display shows the symbol ▶ to indicate that the treatment was started. Make sure that the comb is positioned directly on the skin area to be treated. During the last ten seconds of the countdown the device will beep every second to let you know that the treatment is almost over.

2. Test Procedure

An MPD or MED test may only be carried out by such persons who can ensure a proper handling, due to their profession or their knowledge and practical experience. For an optimal operating temperature respectively light output, it is recommended to switch on the light source for about two minutes before use on the patient. Users and patients must wear tightly fitting UV protective goggles throughout the test procedure. With regards to possible contraindications, please read section 2.1 of this user manual.

1. Determine the patient's skin type according to Table B-1 in Appendix B.
2. Choose a suitable skin area for the test. Suitable test areas include the inside of the forearm, abdomen, lower back, buttocks, thighs, and other lesion-free skin areas that are not normally exposed to natural sunlight and are therefore less pigmented. The test area should not have been treated with UV phototherapy within the last three weeks.
3. Before the test, the according area of the skin should be thoroughly cleaned with medical grade alcohol.
4. Place the test attachment directly on the desired skin area and fix it with the Velcro straps as needed, as shown in the examples in Figure C-4. Make sure that the side marked with the numbers 1-5 is facing the patient's skin.

Figure C-4

2. Place the four tabs of the test attachment into the grooves of the lamp housing and carefully slide the test attachment in the direction of the arrow until it clicks into place, as shown in Figure C-2.

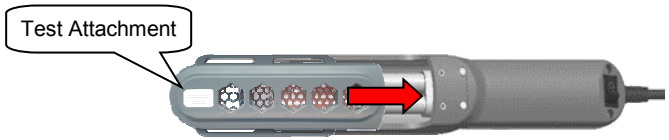


Figure C-2

3. If you want to fix the device on the test area, please attach the optionally available Velcro straps to the slots of the test attachment as shown in Figure C-3. Depending on the area of use, Velcro strips of different lengths are available.

Figure C-3

Pause II

If you want to interrupt the treatment, press the Pause **II** button. This will turn off the lamp and the countdown of the exposure time stops. A paused treatment is indicated by this **II** symbol on the display. Pressing the Start ▶ button will turn the lamp back on and the countdown of the exposure time will continue. If the Stop ■ button is pressed during a paused treatment, the treatment is stopped and the exposure time is reset to zero.

Stop ■

When the timer reaches zero, the treatment is finished and the lamp turns off automatically. The corresponding operating status is indicated by the Stop ■ symbol on the display.

After treatment

The timer automatically saves the last set exposure time. When the treatment is finished, turn off the device.

5 DETERMINATION OF THE EXPOSURE TIME

5.1 Definitions

mW/cm²	Milliwatts per square centimeter. This is the intensity of the light emitted by the lamp of the device, commonly referred to as irradiance. The irradiance of the device was already measured in the factory at a distance of 3 cm (comb teeth) and the corresponding measured value was entered in table A-1.
mJ/cm² or **J/cm²**	Millijoules per square centimeter, respectively Joules per square centimeter. This is the unit that is used for the UV dose. 1000 mJ/cm² = 1 J/cm²

The exposure time is the time during which the skin is treated with UV light. For the first treatments, a shorter exposure time is usually chosen. This so-called initial exposure time helps to see how the skin reacts to the UV light without immediately leading to a severe erythema.

If your physician provided a treatment plan with dose information, please read section 5.2.

If your physician provided a treatment plan without dose information, please read section 5.3.

5.2 UV Dose Information Provided by Physician

If your physician provided you with a treatment plan with doses expressed in J/cm², you may calculate the exposure time by using the first formula in Appendix D. You may also use tables D1-D5 to select the required exposure time. You will also need the actual irradiance of the device, which you can find in Table A-1 of this manual.

Review the treatment plan carefully as some physicians provide the dose in mJ/cm². In this case, you must use the second formula in Appendix D.

After you have determined the required exposure time, please make a note of it. However, this is not the exposure time you will start the treatment with. To find out in a safe way how the skin actually reacts to UV light, the initial exposure time must be shorter than the previously determined exposure time. More information on the initial exposure time can be found in Appendix B.

APPENDIX C – MPD / MED DETERMINATION

For the determination of the minimal phototoxic dose or the minimal erythema dose KERNEL offers the KN-4000M MPD/MED Tester. This small and handy accessory can be easily attached to the devices of the KN-4003 series. The KN-4000M test attachment can be used with the models KN-4003A or KN-4003AL to determine the minimal phototoxic dose, or in conjunction with the models KN-4003B or KN-4003BL to determine the minimal erythema dose. The attachment has five apertures with different light transmittances, which enable the application of five different doses with only one exposure. For convenient use, the scope of delivery of the test attachment includes Velcro straps with which the device can be securely fixed to the skin area to be tested.

1. Handling of the Test Attachment

1. Carefully slide the comb attachment to the left and lift it out of the grooves in the housing to remove it, as shown in Figure C-1.

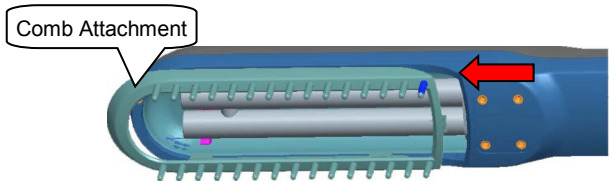


Figure C-1

UVB Narrowband treatment

Table B-4 UVB Narrowband Dose

Skin Type	Initial Dose (J/cm²)	Dose Increase (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

Note:

- Even though the determination of the dose by skin type is relatively simple, this method is not as accurate as an MPD or MED test.
- Certain drugs may affect the photosensitivity of the skin, which is usually not taken into account in a mere determination by skin type.
- It is also important to consider the patient's reaction to sunlight for the determination of the treatment dose. In patients of the same skin type, a lower dose should be chosen for those who only tan slowly.

5.3 UV Dose Information NOT Provided by Physician

Your physician may not have provided you with a treatment plan, but instead provided information about your skin type. In this case, please read Appendix B to determine the required exposure time.

6 MAINTENANCE

6.1 Cleaning

Cleaning of the Device

1. Disconnect the device from the power supply before cleaning.
2. The lamp should never come into direct contact with anything, but if a cleaning is required, use a soft cloth with 70% isopropyl alcohol to gently clean the surface of lamp.

Cleaning of Accessories

1. Soak the goggles and lamp comb in 70% isopropyl alcohol for 5 minutes, then rinse thoroughly with water.
2. Dry the goggles and comb before reusing.

Caution:

Do not clean the lamp with paper!
Do not apply liquid cleaner directly to any surface of the device or the lamp as this can damage the electrical components.
If used for more than one patient, all patient-contacting parts of this device must be disinfected using a hospital-grade high-level disinfectant.

6.2 Transport and Storage

Transport: During transport, the device must not be exposed to rain, snow or corrosive substances and gases. After each transport, check the device for damage. Do not operate a damaged unit, but immediately inform our customer service department!
Transport and storage conditions must be adhered to.

2. Dose Recommendations

The Tables B-2 to B-4 provide dose recommendations for different types of treatments and are meant as a reference for healthcare professionals only. The actual dose must always be chosen individually according to the actual requirements of the patient.

PUVA treatment (UVA + photosensitizer)

Table B-2 PUVA Dose

Skin Type	Initial Dose (J/cm²)	Dose Increase (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

Table B-3 UVA Dose

Skin Type	Initial Dose (J/cm²)	Dose Increase (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

APPENDIX B – UV PHOTOTHERAPY DOSE REFERENCE TABLE

1. Skin Type

Before you start a therapy your physician must determine your skin type and prepare a treatment schedule. The following table shows a general classification of skin types in terms of sensitivity to sunlight.

Table B-1

Skin Type	Genetic Disposition	Characteristics
I	White; very fair, red or blonde hair; blue eyes, freckles	Always burns, never tans
II	White; fair; red or blonde hair; blue, hazel or green eyes	Usually burns, tans with difficulty
III	Cream white; fair with any eye or hair colour	Sometimes mild burn, gradually tans
IV	Brown; typical Mediterranean Caucasian skin	Rarely burns, tans with ease
V	Dark brown; mid-eastern skin types	Very rarely burns, tans easily
VI	Black	Never burns, tans very easily

Storage: The product must be stored in its original packaging in a dry, ventilated warehouse and must not be exposed to corrosive substances or strong magnetic fields.

Environmental conditions for transport & storage

(these values apply in the appropriate packaging for a period of 10 weeks)

Ambient temperature: -40 °C to +55 °C

Humidity: ≤ 95%

Atmospheric pressure: 500 hPa to 1060 hPa

6.3 Lamp Replacement

The 9W UVA and UVB lamps used are manufactured by Philips and have a service life of 1000 operating hours according to the manufacturer. After the designated service life, the lamps will continue to emit visible light and low levels of UV light for hundreds of hours. To ensure effective treatments, lamps should be replaced and properly disposed of after approximately 350 hours of use, or if the irradiance is less than 50% of the initial irradiance.

Lamp Specifications:

	Manufacturer	***Lamp Type***	***Lamp Spec.***
UVA	LightTech	LTC9W/G23	9W
UVB	Philips	PL-S 9W/01/2P	9W

Caution:

- Please ensure that the replacement lamp is designated or provided by your distributor.
- Lamps are fragile and must therefore be handled with care, especially when you are installing and removing a lamp.

Warning:

- Always disconnect the device from the power supply before replacing a lamp.
- The lamp contains mercury, which can be harmful if it comes in direct contact with the skin or if disposed improperly. Consult your local and federal authorities for information on the proper disposal.

Follow the below lamp replacement instructions or contact your distributor for lamp replacement.

1. Carefully slide the comb attachment to the left and lift it out of the grooves in the housing to remove it, as shown in Figure 5-1.

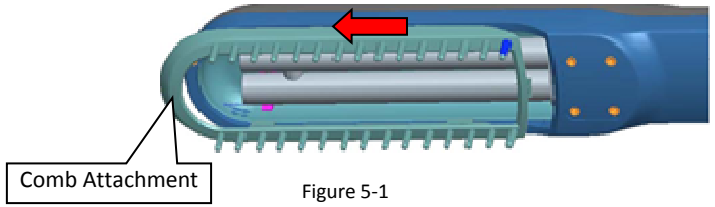


Figure 5-1

2. Unscrew the lamp clip and remove it.

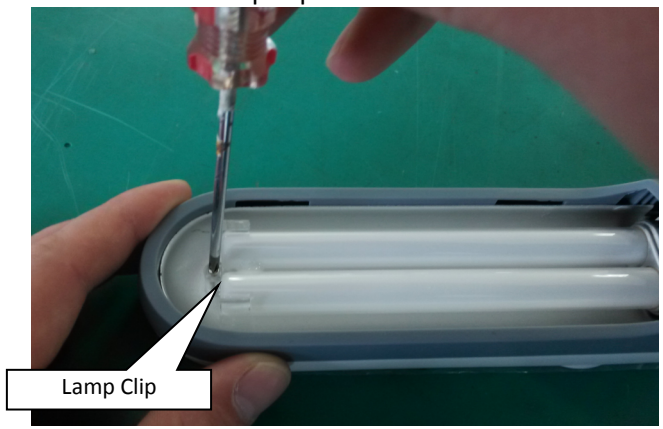


Figure 5-2

APPENDIX A – IRRADIANCE OF THE DEVICE

The irradiance of your device was measured at the factory and measured value is noted in Table A-1 below. This value will be used with the tables in this manual, to determine the required exposure times.

Table A-1

Spectrum	Irradiance (mW/cm²)
UVA	
UVB	

Attention: The irradiance of the UV tube decreases with time due to aging. Therefore, it may be necessary to increase the exposure time to compensate for the loss of irradiance. If, on the other hand, a new UV tube with a higher irradiance has been installed, it may be necessary to shorten the exposure time accordingly. The only way to check the irradiance is to take a measurement with a calibrated UV radiometer. Please contact KERNEL or an authorized sales partner in this regard.

EC REP EU Representative:

Company Name: Wellkang Ltd t/a Wellkang Tech Consulting
Company Address: Suite B, 29 Harley Street, LONDON W1G 9QR, United Kingdom
Phone: +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

Authorized Sales Partner:

MEDlight GmbH
Werrestr. 94
32049 Herford
Germany
Phone: +49 (5221) 99429-0
Fax: +49 (5221) 99429-40
Web: www.medlight.eu
Email: info@medlight.eu
WEEE-Reg.-Number: DE 11726256

3. Pull the lamp out of the lamp holder to the left as shown in Figure 5-3 and gently lift the end of the lamp to remove it from the housing.

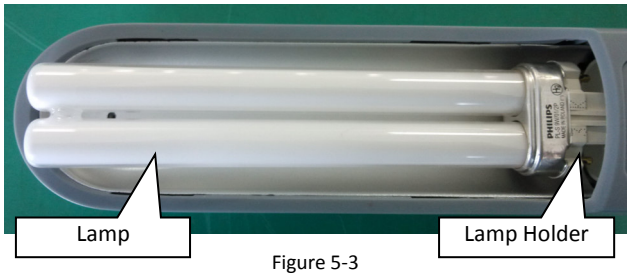


Figure 5-3

4. Insert the new lamp into the lamp holder until it clicks into place. Now screw the lamp clip back on to hold the lamp in place, then slide the comb attachment back on.

6.4 Troubleshooting

In the event that a technical problem occurs with the device, the below table 7-1 gives you an overview of possible causes as well as suggestions for resolving them.

Table 6-1

No.	Fault	Possible Cause	Possible Solution
1	UV tube does not work or is not bright	Loose UV tube	Reinstall the UV tube
		Electrical contacts of UV tube or lamp holder appear black (oxide layer)	Scrape off the oxide layer
		UV tube, fuse or transformer of the device defective	Contact the manufacturer or an authorized dealer

		Supply voltage too low	Check the supply voltage! If it is too low, do not use the device.
2	The display remains dark after switching on the device	Failure of the power supply	Check fuses and wiring of the power supply.
		Device defective	Contact the manufacturer or an authorized dealer
3	The display works, but the UV tube does not turn on	Device defective	Contact the manufacturer or an authorized dealer
4	The timer countdown does not work properly	Device defective	Contact the manufacturer or an authorized dealer

6.5 After-Sales Service

1. KERNEL will not offer free services for any unit which has been used, repaired or altered outside the factory in any way so as to affect the design, or which has been subject to misuse negligence or accident, or operated in any way other than in accordance with this user manual. In these cases KERNEL will not accept any liability for any consequential damages, even if KERNEL has been informed about the possibility of such damages. Prerequisite is the normal use and the compliance with the required maintenance in the designated intervals.
2. Please contact the KERNEL Service Center directly by telephone, fax or email, if you require a maintenance.

3. Circuit diagrams, service manuals etc. are available upon request for authorized service technicians.

6.6 Disposal Note

The European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), requires that old household electrical appliances must not be disposed of in the normal unsorted municipal waste stream. Old appliances must be collected separately in order to optimise the recovery and recycling of the materials they contain and reduce the impact on human health and the environment. The crossed out wheelie bin symbol on the device reminds you of your obligation, that when you dispose of the device it must be separately collected. Consumers should contact their local authority or retailer for information concerning the correct disposal of their old appliance.

6.7 Contact Details

Company Name: Xuzhou Kernel Medical Equipment Co., Ltd.
Company Address: Kernel Mansion, Economic Development District, Xuzhou City, Jiangsu Province, China
Zip Code: 221004
Phone: +86 (516) 877322-09
Fax: +86 (516) 877322-10
Web: www.kernelmed.com www.kerneluvb.com
Email: sales1@kernelmed.com