

TERAtion UJV(E)-)

- More effective Than manual cleaning with chemicals
- 5-20 minutes TREATMENT TIME
- Disinfection radius:1-5 m
- 2 hours battery
- Environmental protection
- No chemical residue

TERAtron UVG-1 Specification

- Hybrid Disinfection Technology[™] / UVC & Air filter, Disinfection in the shortest time. 1.
- High intensity UVC, Disinfects directly and indirectly on surfaces and airborne. No 2. damage to plastic and furniture.
- **Orbit Disinfection**[™], 360 degrees targeted radius. 3.
- **30X Reflectors**[™] Reflectors UVC light spectrum result in 30% increased effectiveness. 4.
- (HAPD) High Air Pollution Detector[™] Air purifier (Air filter pm 2.5) / 5.
- 5-20 minutes treatment time. 6.
- Temperature and humidity display. 7.
- Built-in 15-second delay allows operator time to safely leave the area (light alert 1 time/1 8. sec)
- **TERA Emergency Active Sensor**[™] (Motion Sensor) 9.
- 10. Intelligent software (application)
- **11. TERA Intelligent Pad Controls**[™] A wireless controller by Tablet.
- **12. TERA Accurate Sensor**[™] 360 degree Room Scanner.
- 13. Ozone free germicidal lamp
- 14. Real time linkage of usage information to Tablet.
- 15. Energy saving and environmental protection.
- 16. Easy to operate Seamless integration into daily cleaning routines.

TERAtion UICE - 1 System

UVC Germicidal Lamp maximizes next sterilization capabilities with advanced pollution filter system.

TERA Intelligent Pad Controls™

(Smart controller)

Intelligent software, Applications for TERAtron UVG-1 system controller, and data storage access.

TERA Accurate Sensor™ (Room Scanner)

Room scan software with a laser measure. Inform the room scale, temperature, humidity and air quality,

High Air Pollution Detector[™] (HAPD[™])

Eliminating PM2.5 to maximize UVC sterilization capabilities.

already built into TERA Intelligent Pad Controls™

TERA Emergency Active Sensor™

(Motion Sensor)

Smart Sensor detector, For moving object and

emergency shutdown.

TERAtron Pro-Spectrum test card™

UVC irradiation certification by color tap test.

High Air Pollution Detector™ (HAPD™)

To get the best purification results, we've upgraded to highly effective filters that remove 99.97% of particulate matter of size 0.3µm or larger, creating a room full of clean, pure air so that you can breathe easy.

E coli test

ตารางคำนวณผลการทดลอง

Escherichia coli

time (s) Distance (m)	Dose 90% (Sec.)	Min	Sec	Dose 99% (Sec.)	Min	Sec	lrradiance: E (uW/cm2)	Ecoli Test 1 (Min.)	Ecoli Test 5(Min.)	Ecoli Test 10(Min.)	Ecoli Test 15(Min.)	Ecoli Test 30(Min.)	Ecoli Test 60(Min.)
1.00	8.15	0.00	8.15	17.93	0.00	17.93	368.00						•
2.00	22.39	0.00	22.39	49.25	0.00	49.25	134.00						\bullet
3.00	50.00	0.00	50.00	110.00	1.00	50.00	60.00						\bullet
4.00	78.95	1.00	18.95	173.68	2.00	53.68	38.00						\bullet
5.00	250.00	4.00	10.00	550.00	9.00	10.00	12.00						

Energy Dosage of Ultraviolet radiation (UV dose) in µWs/cm2 needed for kill factor

E coli 90%3000E coli 99%6600ระดับความสูง จาก พื้น ถึง เชื้อทดสอบ 75 cmRoom Tempurature 25 °CHumidity 47%

Source : Energy Dosage of Ultraviolet radiation (UV dose) in µWs/cm2 needed for kill factor

The list of viruses was compiled according to a corresponding list published by the Robert Koch Institute in cooperation with the German Association for the Control of Virus Diseases and the German Society for Hygiene and Microbiology (RKI, DVV, DGHM 2004), according to the U.S. Departments of Health and Human Services (CDC 2004) and Büchen-Osmond 2003a, b). The predicted values for UVC sensitivity were adopted from Lytle & Sagripanti (2005).

SARS Coronavirus test

ตารางคำนวณผลการทดลอง SARS Coronavirus

time (s) Distance (m)	Dose 90% (Sec.)	Min	Sec	lrradiance: E (uW/cm2)	Test 1 (Min.)	Test 5(Min.)	Test 10(Min.)	Test 15(Min.)	Test 30(Min.)	Test 60(Min.)
1.00	2.99	0.00	2.99	368.00						
2.00	8.21	0.00	8.21	134.00				\bullet		
3.00	18.33	0.00	18.33	60.00						
4.00	28.95	0.00	28.95	38.00						
5.00	91.67	1.00	31.67	12.00						

Energy Dosage of Ultraviolet radiation (UV dose) in µWs/cm2 needed for kill factor SARS coronavirus 1100

ระดับความสูง จาก พื้น ถึง เชื้อทดสอบ 75 cm Room Tempurature 25 °C Humidity 47%

Source : Energy Dosage of Ultraviolet radiation (UV dose) in µWs/cm2 needed for kill factor

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EASY TO USE,

ESTERAtech Pzent

HOM

HOK

เครื่องฆ่าเชื้ออัจฉริยะด้วยพลังงานแสง UVC ยับยั้งการระบาดเชื้อ Covid-19 และเชื้อโรคอื่นๆ

- ฆ่าเชื้อได้ 360 องศา ทั้งในอากาศและพื้นผิว ได้ถึง 99%

- ทำลายเชื้อโรคอย่างมีประสิทธิภาพฆ่าถึงระดับสลาย พันธุกรรม DNA และ RNA
- ไม่มีขั้นตอนยุ่งยากในการเตรียมพื้นที่

TERAtron

- ใช้เวลาเพียง 5-20 นาที ในการฆ่าเชื้อ (ขึ้นอยู่กับขนาดพื้นที่)
- ปราศจากสารเคมีตกค้าง ทำให้สามารถกลับมาใช้งานพื้นที่ได้ทันที หลังฉายพลังงานแสง
- มีปริมาณแสงเข้มข้นทำให้เชื้อโรคตายในระยะเวลาอันสั้น
- มีระบบกรองอากาศ ที่กรองได้แม้ฝุ่น PM 2.5
- มีระบบซอฟแวร์อัจฉริยะ สามารถคำนวณหาพื้นที่ห้องได้ 360 องศา วัดอุณหภูมิและความชื้นภายในห้อง พร้อมบันทึกข้อมูลการทำงาน
- ตัวเครื่องสามารถควบคุมระยะไกล ด้วยรีโมทอัจฉริยะ
- ประหยัดพลังงาน และ ปกป้องสิ่งแวดล้อม
- ใช้งานง่ายสามารถทำงานร่วมกับการทำความสะอาดอื่นได้

Danger Label: Hazardous Voltage / Ultraviolet Radiation (70-0036)

SAFETY WARNINGS

- · All personnel should be alerted to the potential hazards indicated by the product safety labeling on this unit.
- The following conventions are used to indicate and classify precautions in this manual and on product safety labeling. Failure to
 observe precautions could result in injury to people or damage to property.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Danger indicates an **IMMINENTLY** hazardous situation, which, if not avoided, **WILL** result in death or serious injury.

ACAUTION

Caution indicates a **POTENTIALLY** hazardous situation, which, if not avoided, **MAY** result in minor or moderate injury.

This symbol is used to identify an **ELECTRICAL SHOCK** or **ELECTROCUTION** hazard.

This symbol is used to identify the need to wear approved ultraviolet blocking eyewear.

This symbol is used to identify the need to wear protective gloves.

CAUTION

COULD result in death or serious injury. Caution used without the safety alert symbol indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

This symbol is used to identify an ULTRAVIOLET LIGHT hazard.

This symbol is used to identify the need to wear approved ultraviolet blocking face shield.

Warning indicates a POTENTIALLY

hazardous situation, which, if not avoided,

This symbol is used to identify components which must not be disposed of in trash

Safety concerns

Short-wave UV light is harmful to humans. In addition to causing <u>sunburn</u> and (over time) <u>skin cancer</u>, this light can produce extremely painful inflammation of the <u>cornea</u> of the eye, which may lead to temporary or permanent <u>vision impairment</u>. It can also damage the <u>retina</u> of the eye. For this reason, the light produced by a germicidal lamp must be carefully shielded against direct viewing, with consideration of reflections and dispersed light. A February 2017 risk analysis of UV-C lights concluded that ultraviolet light from these lamps can cause skin and eye problems.

Ozone production

For most purposes, ozone production would be a detrimental side effect of lamp operation. To prevent this, most germicidal lamps are treated to absorb the 185 nm mercury emission line (which is the longest wavelength of mercury light which will ionize oxygen). In some cases (such as water sanitization), ozone production is precisely the point. This requires specialized lamps which do not have the surface treatment.

L'TZRAtech

TUV T8 - Guaranteed

TUV T8

TUV T8 lamps are double-ended UVC (germicidal) lamps used in professional water and air disinfection units. TUV T8 lamps offer almost constant UV output over their complete lifetime, for maximum security of disinfection and high system efficacy. Moreover, they have a long and reliable lifetime, which allows maintenance to be planned for in advance.

Benefits

- Security of effective disinfection over the useful lifetime of the lamp ۲
- Maintenance can be planned in advance, virtually eliminating the need for ۲ expensive spot replacement of prematurely failed lamps
- High system efficacy because it is not required to over-design the • purification
 - system to maintain effectiveness of disinfection
- Good environmental choice because of lowest amount of mercury

Features

- Short-wave UV radiation with a peak at 253.7 nm (UVC) for disinfection purposes
- Protective inside coating ensures constant UV output over the complete lifetime • of
 - the lamp
- Long lifetime of 18.000 hours (based on operation on a Philips electronic driver) \bullet
- High reliability with the lowest percentage of lamps that fail prematurely in the • market (90% of all lamps still operate on full output and quality after 15,000 hrs if operated on a Philips electronic driver)
- Special lamp glass filters out the 185 nm ozone-forming radiation
- High Output versions available for optimum UVC output per lamp length, allowing
 - for reduction of system size
- Warning sign on lamp indicates that the lamp radiates UVC

2020, February 14 - data subject to change

LTERAtech www.lighting.philips.com

Technology reaches all

Thank you.

Reference

Content

https://ultraviolet.com/what-is-germicidal-ultraviolet/

https://www.sciencenews.org/article/coronavirus-disease-outbreak-severity-symptoms

https://www.handydryers.co.uk/customer-service/blog/coronavirus-killed-with-uvc-light.html

https://en.wikipedia.org/wiki/Ultraviolet#Subtypes

https://www.abc.net.au/news/science/2020-03-20/how-long-does-coronavirus-last-on-surfaces/12074330

https://www.nea.gov.sg/our-services/public-cleanliness/environmental-cleaning-guidelines/guidelines-for-environmental-cleaning-and-disinfection

http://www.news12.com/story/41895765/uvc-far

https://www.safetysign.com/products/4967/caution-ultraviolet-light-sign?s=st1zsk15dyzgphvqzbp150

https://en.wikipedia.org/wiki/Ultraviolet_germicidal_irradiation

https://en.wikipedia.org/wiki/Germicidal_lamp

Don't spray

https://www.lesswrong.com/posts/L8KGSDchPpNo48PCM/ubiquitous-far-ultraviolet-light-could-control-the-spread-of www.steril-aire.com.au https://www.gov.uk/government/topical-events/ebola-virus-government-response https://www.dkhthailand.com/14679126/laboratory https://metro.co.uk/2020/03/05/buses-blasted-uv-light-rid-coronavirus-12352400/?ito=cbshare https://www.channelnewsasia.com/news/asia/coronavirus-china-uv-light-disinfect-buses-lifts-banknotes-12535916 https://en.wikipedia.org/wiki/Germicidal_lamp

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