

## The Phoenix MB72 250nm UVC exposure cabinet.

### Operating Manual



UVC light in adequate concentrations is proven to kill many bacteria and viruses and has been used for many years as a form of laboratory and hospital room sterilisation. The Phoenix MB72 is a 72 watt (72 watt input power – 20 watt radiated UVC) dual source reflective chamber UVC exposure unit built specifically to accept microphones, communication equipment, cameras, and hand held devices that are to be rapidly transferred from person to person.

For UVC to kill the following organisms the following doses are required.

Microorganism	90% disinfection mW/cm <sup>2</sup> /sec	99.9% disinfection mW/cm <sup>2</sup> /sec
Bacterium coli (in air)	0.7	2.1
Legionella pneumophila	0.92	2.76
Dysentery bacilli	2.2	6.6
Baccillus tuberculi	10	30
Infectus Hepatitis	5.8	17.4
Influenza	3.4	10.2
Covid 19	6.6	10-20

*(Source Meyer GMBH/ Philips lighting / iuva.org)*

The Phoenix MB72 has an average calculated UVC exposure cycle radiation exposure figure of in excess of 200mw/cm<sup>2</sup>, as a consequence, in most cases just a few seconds in the unit would (in ideal exposure cases) kill most known viruses.



To allow for shaded areas and shadows we have increased the baseline optional exposure rate to 10 times above that figure, or many more times for organisms such as influenza. This guarantees that where light levels may be less than 10 times lower than the average there is still effective exposure.

The light sources used in the Phoenix MB72 are often used in moving air ventilation systems or flowing water treatment systems where they are capable of sterilising air or water as it passes.

The Phoenix MB72 is designed primarily to ensure the safety of staff and crew operating AV and communications equipment, it is not a medical or laboratory sterilisation system. Laboratory sterilisation systems must be used in a controlled manner by skilled operators in a fully sterile environment in order to achieve a medical grade result that can be certified to be totally effective. The Phoenix MB72 is designed to be used in commercial / industrial settings where laboratory equipment would not correctly function, neither in regards of reliability or suitability. Equally, where laboratory grade equipment would have user variable exposure times to be set by skilled operatives relative to requirements, the Phoenix MB72 has a factory set single button exposure cycle, set to over expose most organisms in order to compensate for poor loading discipline. Additional exposure times required by the user to satisfy the users own risk assessment are available as a factory order.

In order for the Phoenix MB72 to be safe and effective the user must follow the manufacturers instructions from start to end.

There are various internal support systems available, including a special-order custom support system for specific items the customer may require. The two standard factory options are a 16-position plate for standard XLR connection microphones, or an aluminium utility frame for clip-on devices or hanging devices such as lapel microphones or headsets. The frame also includes a 4-bar grid to sit items such as hand-held radio mics or broadcast cameras.

**It is critically important that every user should carry out their own procedural risk assessment** of all procedures, and when necessary seek expert advice if unsure. DO NOT in any circumstance, assume that a measure that you have seen others doing, or assume is safe because it is simple, or common knowledge, will be in any way effective. For example, simply wiping equipment with a “sterile wipe” will not in any way effectively sterilise the item, this is worse than doing nothing as it misleads others into behaving as the equipment is safe when it is not. A sterile wipe is called that because it is sterile, not because it sterilises anything. DO NOT assume anything, research what you intend to do before acting.



## Procedure.

- 1 Everything in a used performance space, after the performance, must be immediately considered a Biohazard, treat the space as though everyone performing was infected and you did not know. As Covid19 transmitters can be asymptomatic it cannot be assumed that no visible symptoms means that a person is safe.
- 2 Wear adequate PPE, but do not restrict vision, movement, or ability to freely operate.
- 3 Change PPE frequently between “dirty” and “clean” tasks.
- 4 When people wear devices, they must bring their own device to the designated recovery station themselves. To minimise potential cross contamination no devices must be passed from person to person unless unavoidable. This includes not only microphones, but crew worn communication equipment and handheld equipment such as camcorders. Operators should deliver their own equipment. If not possible then operators should leave their equipment where it was used for collection by staff decontaminating it. Equipment must NEVER be taken to an intermediate position.
- 5 The recovery station must have a method of receiving the equipment and placing it for UVC exposure that does not allow the equipment to cross contaminate any clean equipment or other surfaces. Large equipment that requires preparation for UVC exposure should be placed on a “quarantine surface” such as a metal or plastic-coated table which is disinfected with an effective aqueous detergent/bleach solution immediately after each use.
- 6 The size and capacity of the reception station must be adequate to receive all equipment in a controlled manner and must NEVER risk being overloaded by sudden arrivals of a lot of equipment. The operator must make a full assessment of how the station will work in full operating conditions. Any loss of inventory control is a potential severe contamination threat.
- 7 All potentially contaminated equipment must be placed in a clearly labelled area, access to that area must be controlled.
- 8 When using the XLR mic board the following sequence of events must be followed.
  - a) Wash your hands thoroughly, frequently.
  - b) Open the MB72 door with clean PPE. (gloves and masks)
  - c) Remove the mic board and take to stage (Do not close the MB72 door).
  - d) Place the mic board in a suitable position easily accessed by the operator.
  - e) Assess which mics require treatment, normally within 2m forward of a singer or wind instrument. (but do the assessment yourself to be sure). You probably don't need to do the guitar amp or kick mics (for example).
  - f) Remove mics from the stands using correct PPE (Gloves and masks).
  - g) Place the mics on the XLR posts provided. Space for maximum exposure to the light.
  - h) When all mics are collected, return the mic board directly to inside the MB72.
  - i) Remove the contaminated gloves correctly, dispose of them, and close the MB72 door. (with new gloves if required) – *Learn how to remove gloves correctly.*
  - j) With clean hands (or new gloves) press the “START” button.
  - k) When the “COMPETE” light is illuminated take the required number of zip-lock bags and place over the microphones, release the microphones from the XLR, remove from the unit, and close the zip-lock bag, indicating that the microphone is now processed.



- l) Only remove the microphone from the bag when placing it back into use on the stand.
  - m) If you wish to re-use the zip-lock bag you may process it in the unit if it is adequately transparent. (do not put a big stack of them in there)
  - n) Periodically (or when you believe it may be contaminated) wipe down the outer surfaces of the MB72 with an aqueous detergent bleach solution.
  - o) You must ASSUME YOU ARE CONTAMINATED AT ALL TIMES and act accordingly.
- 9 When using the multi-purpose frame take care attaching equipment to ensure that parts are not hidden from the UVC light, do not overload the frame. (interior of belt pack clips are unlikely to be a great concern).
- 10 Equipment that has been processed should be placed in a clean environment and adequately labelled. Use a separate table for clean and contaminated equipment.
- 11 Ideally clean equipment should be bagged to protect it from further contamination until the user receives it.
- 12 As the only exposure within the MB72 is light, it is not required to switch off any equipment that goes in there, working IT equipment will have no issue with exposure. It is however, out of caution, recommended to cover optical equipment with lens caps and/or UV filters.
- 13 The interior of the MB72 is self-cleaning, but it won't harm it to run a cycle with the unit empty after use just to be sure everything is nice and clear of contamination.
- 14 You should have a robust procedure for treating microphone stands and clips. These items can be surface decontaminated effectively with strong industrial detergent bleach solutions. Mic clips can be submerged in a mild bleach solution, stands can be wiped down with a strong solution (do not dry).
- 15 For crew protection, you should assume that all equipment in spitting distance of a vocal performer is contaminated. Wear correct PPE when handling it. It would not be reasonable to clean floor monitors between artists, but they should be handled assuming they are contaminated, and wiped down before removal at the end of the show. Equally cables.
- 16 You should have a robust effective policy of how to keep all staff and guests safe in a production environment, The Phoenix MB72 is only a small part of this process, without a comprehensive policy the effectiveness of any process is limited.



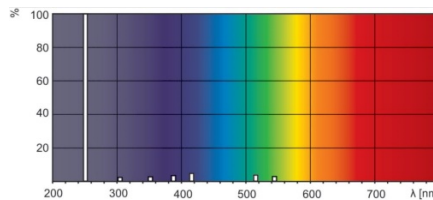
## WARNINGS.

- 1 Plastics and decorative finishes will exhibit accelerated ageing. If an item is especially precious, consider not using it in such an environment. Most plastics used in microphones and professional equipment will not see severe damage for many years with short term exposure, but some are extremely sensitive to UV light. Consult the manufacturer if you are especially concerned.
- 2 Do not use in wet environments
- 3 Do not EVER transport with the accessory tray inside (Except for the touring version where the tray must be in the locked position).
- 4 Transport only in a flight case or shipping crate, do not transport outside of the place of use without protection.
- 5 Always place on a level stable surface
- 6 Not for domestic / public use.
- 7 Heavy item, take care when lifting.
- 8 Do not allow to fall / do not drop
- 9 Take great care to avoid hitting the lamps with items being inserted.
- 10 Lamps contain mercury, if a lamp is broken ventilate the area well, do not breathe fumes. Take care when clearing up glass, it is sharp.
- 11 Do not use if the door switch has become damaged
- 12 Do not use if the red plastic window is damaged or broken
- 13 NEVER try to bypass the door switch or try to use with anything bigger than the internal volume.
- 14 Always disinfect the exterior after periods of use.
- 15 Never put live creatures inside
- 16 Do not stack heavy items on top
- 17 This unit emits no UVC light, all light is internally contained, if any damage causes UVC to escape take the unit out of service immediately and contact your dealer for repair.
- 18 Do not transport with any foreign objects inside.
- 19 Do not use for medical use. Do not use to sterilise items for insertion into the human body, either surgically or inserted into any bodily orifice.
- 20 Do not place “dirty” objects inside the unit, if an object is covered in dirt carefully clean the object first. UVC will not penetrate dirt.
- 21 Some plastics react badly to UVC light over time. It is recommended to assess whether or not your equipment is suitable for short duration UVC exposure before use. Most decorative finishes will be subject to accelerated ageing, but in most cases the effects are minor, some foams, sponges, and day-glow finishes will degrade quickly.
- 22 Newell Acoustic Engineering offers no certainty that this unit will sterilise items inserted into it. Each item has its own properties that may or may not be suitable for this style of UVC exposure, there may be hidden surfaces or cavities that light may not penetrate. If you require guaranteed sterilisation you should subject the MB72 and your specific item for laboratory testing, that test however will only be valid for that item in that position in the machine.
- 23 All internal parts in the exposure chamber are classed “service items” and are subject to wear and tear, replace periodically as required or when worn by exposure to UVC light.

**Technical Specifications.**

Dimensions.	63cm x 63cm x 73cm
Voltage	220V
Light source	2 x 36W TUV Low pressure gas UVC 250nm
Microcontroller	ATMEGA 8 bit Arduino platform – Code, open source.
Ballast	Electronic instant start
Cabinet material	18mm Baltic Birch Plywood
Safety mechanisms	Door, hard kill switch, positionally accurate.
Exposure cycle	Standard exposure 4 minutes, User option alternatives.
Item support	Optional standard cassettes, or custom support systems.
User control	Single button start, manual door operation.
Indicators	Door Closed, Running, Cycle complete.
UV radiated power per cycle	200mW / CM <sup>2</sup> or higher
Weight	45 - 50Kg

UV Spectrum



Lamp life	9000h - 270,000 2 min cycles. (73 years 10 cycles per day)
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## EU Declaration of conformity.

- 1 Phoenix MB72 Mk1
- 2 J Newell Acoustic Engineering (unipessoal) Lda Rua Do Funchalinho Viv Viarinho 2825-048 Caparica Portugal
- 3 This declaration of conformity is issued under the sole responsibility of the manufacturer.
- 4 Phoenix MB72 UVC light box
- 5 The object of the declaration described above is in conformity with the relevant Union harmonisation legislation

### RoHS Directive 2011/65/EU

The EC RoHS Recast Directive 2011/65/EU restricts the use of the hazardous substances listed below in electrical equipment

The maximum concentration values of the restricted substances by weight are:

Lead	0.1%
Mercury	0.1%
Hexavalent Chromium	0.1%
Polybrominated Biphenyls	0.1%
Polybrominated Diphenyl Ethers	0.1%
Cadmium	0.1%

Based on information provided by its suppliers J Newell Acoustic Engineering Unipessoal Lda designates the product listed below as: **RoHS Compliant**

### Directive 2014/30/EU / EMC

PART B, Module C: internal production control.

### Directive 2014/35/EU / LVD

MODULE A, Internal production control.

### Signed for and on behalf of

J Newell Acoustic Engineering (Unipessoal) Lda  
Caparica. June 2020.



## Certificate of UVC exposure dose.

Each Phoenix MB 72 is calibrated by measurement with reference to our certified exposure map.

The exposure map measured with a calibrated UV-C exposure meter at pre-defined points in the chamber is as follows.

Unit under test MB72T Serial no 3913 - Date of test 28/09/20 – Location NAE Workshops.

Calibration point	method	point measure	cycle dose
1	reflected	0.92	220.8
2	reflected	1.2	288
3	reflected	1.7	408
4	reflected	0.88	211.2
5	reflected	0.88	211.2
6	reflected	0.82	196.8
7	reflected	1.2	288
8	reflected	0.84	201.6
9	reflected	0.82	196.8
10	reflected	1.2	288
11	reflected	3.2	768
12	reflected	4.9	1176
13	reflected	1.1	264
14	reflected	1.5	360
15	reflected	0.96	230.4
16	reflected	2.6	624
17	reflected	1.5	360
18	reflected	1.1	264
19	reflected	1.12	268.8
20	direct	5.17	1240.8
21	reflected	1.62	388.8
22	reflected	0.85	204
23	reflected	1.06	254.4
24	reflected	1.12	268.8
25	reflected	2.45	588
26	direct	8.35	2004
27	reflected	2.1	504

It is hereby certified that the minimum dose measured over the programmed cycle is 196.8 mW/cm<sup>2</sup> from wall reflected UV-C light.

Direct exposure is measured to be between 2.5mW/cm<sup>2</sup> and 8.5mW/cm<sup>2</sup>

Measurement device Sentry ST512, S/N 3897, Factory calibration certificate available on request.

Measurement method multi-point chamber mesh grid, sensor facing reflectors.

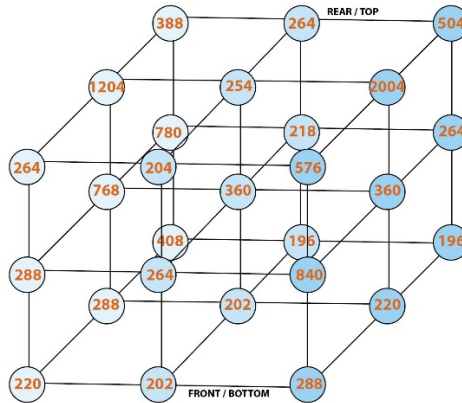
Measurement frequency calibration point 253nm





**PHOENIX MB72**  
Standard UV-c measured surface exposure rate per cycle

**Mesh model of exposure chamber**  
Measurements in mW/cm<sup>2</sup>



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It is certified that the chamber of the Phoenix MB72 exceeds these published figures for surface decontamination.

NOTE: Presence of items in the chamber will affect the measured dosage, if in doubt measure with items present to confirm.

**Signed for and on behalf of**

J Newell Acoustic Engineering (Unipessoal) Lda  
Caparica. September 2020.