

# OPERATING MANUAL



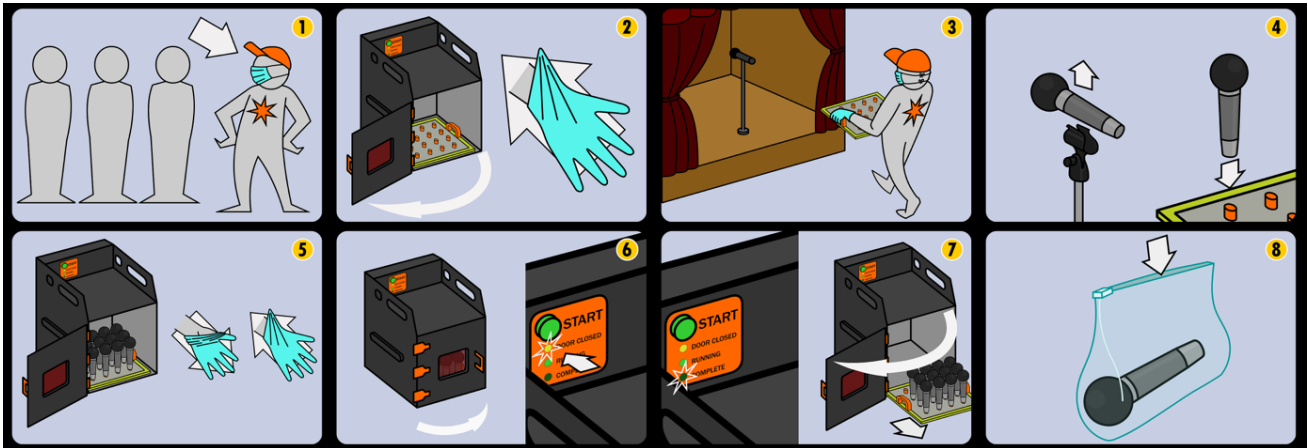
## PHOENIX-MB72 UVC Decontamination chamber



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## QUICK GUIDE



1. Select a single MB72 operator from the staff
2. Sanitize your hands or wear gloves / take the tray and leave the door fully open
3. Take the tray to working area
4. Insert subject items on tray
5. Return the tray to the MB72 and remove contaminated gloves before touching anything else
6. Close the door, wait for the "CLOSE DOOR" LED to lit, press start
7. After 2 minutes exposure the "COMPLETE" LED lights, the objects can now be removed with clean hands
8. Processed items can now be returned to use or placed in sealed bag to ensure they remain clean

## INTRODUCTION

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 accommodate communication equipment, cameras, and hand-held devices or any working equipment 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/cm2/sec	99.9% disinfection mW/cm2/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
SARS-CoV-2	6.6	10-20

The Phoenix MB72 has an average calculated UVC radiation exposure figure of in excess of 10mw/cm2, (closer to 20mw/cm2) as a consequence, in most cases just 2 or 3 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 40 times above that figure, or more than 100 times for organisms such as influenza. This guarantees that where light levels may be less than 100 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 electronic 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.

## OPERATIONAL PROCEDURE

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 headsets. The frame also includes a 4-bar grid to sit items such as computer keyboards, mice or TV remotes.

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.

1. Everything in a used work space, after being used, must be immediately considered a Biohazard, treat the space as though everyone who used a given subject item was infected and you did not know. As Covid19 transmitters can be asymptomatic it cannot be assumed that no visible symptoms mean 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. People should deliver their own equipment. If not possible then they 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 items and placing it for UVC exposure that does not allow the objects 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 items. 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 multi-purpose tray, 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 multi-purpose tray and take it to the work position or designated recovery station (Do not close the MB72 door).

## OPERATIONAL PROCEDURE

- d) Place the multi-purpose tray in a suitable position easily accessed by the operator.
  - e) Assess which items require treatment.
  - f) Remove items from their position using correct PPE (Gloves and masks).
  - g) Place the items on the multi-purpose tray, by sitting or hanging them. Space for maximum exposure to the light.
  - h) When all items are collected, return the multi-purpose tray 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 them over the items, remove them from the unit, and close the zip-lock bag, indicating that the object is now processed.
  - l) Only remove the item from the bag when placing it back into use.
  - m) If you wish to re-use the zip-lockbag 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 tray take care attaching equipment to ensure that parts are not hidden from the UVC light, do not overload the tray.
10. Objects that have 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 oversized objects. These items can be surface decontaminated effectively with strong industrial detergent bleach solutions.
15. For operator protection, you should assume that all objects in spitting distance of the user is contaminated. Wear correct PPE when handling it.
16. You should have a robust effective policy of how to keep all staff and people safe in a workplace environment, The Phoenix MB72 is only a small part of this process, without a comprehensive policy the effectiveness of any process is limited.

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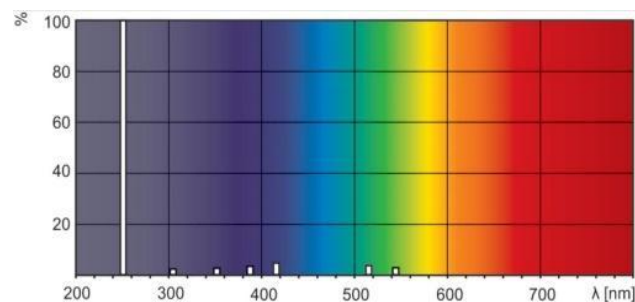
### WARNINGS

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 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.

## TECHNICAL SPECIFICATIONS

External dimensions	63cm x 63cm x 73cm (MB72 Standard) 70cm x 70cm x 114cm (MB72T Touring)
Inner dimensions	50cm x 50cm x 50cm
Weight	48 Kg (MB72 Standard) 90 Kg (MB72T Touring)
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 2 minutes, User option alternatives
Item support	Optional standard trays, or custom support systems
User control	Single button start, manual door operation
Indicators	Door Closed, Running, Cycle complete
UV radiated power	200mW / CM <sup>2</sup> or higher

UV Spectrum



Lamp life 9000h - 270,000 2 min cycles. (73 years 10 cycles per day)

## CE CERTIFICATION



### 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.

A handwritten signature in blue ink, appearing to be 'J Newell', is written over a light blue grid background.

J Newell. MIOA. MinstSCE



## CERTIFICATE of UVC exposure

### 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>

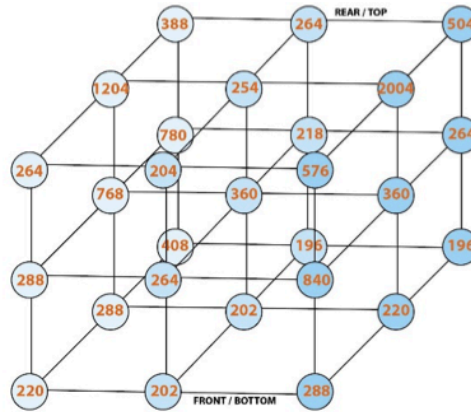
Measurement device Sentry ST512, S/N 3897, Factory calibration certificate available on request.  
Measurement method multi-point chamber mesh grid, sensor facing reflectors.

Measurement frequency calibration point 253nm

**CERTIFICATE of UVC exposure dose**

**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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Infectus Hepatitis	5.8	17.4
Influenza	3.4	10.2
Covid 19	6.6	10-20

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.

## Notes