

CLEAN³ BIO-DECONTAMINATION Generator with H₂O₂ Vapor

CLEAN³
MODULAR SYSTEMS



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GENERATOR 4, COMPACT 22

CLEAN³ BIO-DECONTAMINATION Generators with H₂O₂ vapor (*hydrogen peroxide*) are designed for the bio-decontamination of sterile areas and cleanrooms. Our H₂O₂ generators feature an innovative process which utilizes the building's HVAC System to distribute the H₂O₂ vapor inside the area to be treated. ***The typical bio-decontamination cycle consists of the following phases:***

- Conditioning of the area by the HVAC system (*humidification and temperature control*)
- Injection of H₂O₂ vapor to reach the desired concentration for a fast bio-decontamination (*typically above 400 ppm*)
- Maintenance of the concentration for the time required to decontaminate the area (*approximately 30 minutes*)
- Aeration of the area by the HVAC system. This eliminates the H₂O₂ vapor and restores the area to its initial condition.
- The bio-decontamination process can be performed by setting the building HVAC system in either closed-loop configuration or open-loop configuration.

ADVANTAGES

H₂O₂ demonstrates broad-spectrum efficacy against viruses, bacteria, yeasts, and bacterial spores. Hydrogen peroxide is generally viewed as an environmentally safe alternative to chlorine-based bleaches, as it degrades to form oxygen and water and is recognized as being a safe antimicrobial agent by the U.S. Food and Drug Administration (FDA) "Sec. 184.1366 Hydrogen peroxide".

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AWS BIO-PHARMA TECHNOLOGIES

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- **Distribution by the HVAC system**
 - Sterilization of ducts and AHU
 - No need for auxiliary fans inside the area
- **Bio-decontamination of large areas**
 - Maximum vapor production of 44 kg/h
 - Up to 600 m³ with one generator
 - Larger volumes combining more generators
- **Totally innocuous by-products (oxygen and water)**
- **Fully controlled and repeatable process**
 - Measurement of H₂O₂ concentration with appropriate sensors
 - Chemical indicators to verify H₂O₂ vapor distribution
 - Biological indicators to prove cycle effectiveness
- **Flexible and adaptable to various applications**
 - Wide range of generators with different vapor production capacity
- **Possibility of integrating multiple sensors for concentration, relative humidity and temperature monitoring during the process.**
- **Quick process**
 - Cycle duration of about two hours (excluding the heating phase)

Hydrogen peroxide breaks down quickly when exposed to light, so it is necessary to maintain the validated levels for the prescribed time period.

NOTE: Hydrogen-peroxide vapor is potentially hazardous. According to U.S. NIOSH, the immediately dangerous to life and health (IDLH) limit is only 75 ppm. The U.S. Occupational Safety and Health Administration (OSHA) has established a permissible exposure limit of 1.0 ppm calculated as an 8-hour time-weighted average (29 CFR 1910.1000) so it is very important to ensure the area being treated is well ventilated upon completion of the cycle.



MODEL	MAX H ₂ O ₂ VAPOR PRODUCTION (kg/h)	AIRFLOW (mc/h)	AIR PRESSURE (mm w.c)	ELECTRIC POWER (kW)	SIZE WIDTH X HEIGHT X DEPTH (m)	WEIGHT (kg)
5 COMPACT 44	44	160	260	50.4	1.4 x 1.93 x 0.58	363
5 COMPACT 32	32	120	240	36.1	1.4 x 1.93 x 0.58	294
4 COMPACT 22	22	120	240	21.7	1 x 1.93 x 0.5	262
4 COMPACT 16	16	100	240	20.5	1 x 1.93 x 0.5	246
4 COMPACT 10	10	80	240	11.8	1 x 1.93 x 0.5	236
3 COMPACT 7.2	7.2	220	380	16.8	0.8 x 1.3 x 0.5	184
2 COMPACT 3.6	3.6	180	450	14.8	0.7 x 1.1 x 0.45	88

All CLEAN³ Modular Systems and equipment are designed and manufactured and in accordance with cGMP regulations and CFR21/PART11 compliance.



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