

MAGNETI MARELLI

Ozone Generator M-MX4000

Operating Manual

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**Read this Operating Manual thoroughly before attempting to use this machine.
Pay particular attention to Section "SAFETY WARNING".**

SAFETY WARNING HEALTH HAZARDS

The **M-MX4000** ozone generator is intended for COMMERCIAL AND INDUSTRIAL USE. The machine operates on single-phase AC voltage of $U_n = 230\text{ V}$ at 50 Hz.

This machine generates ozone. Ozone is one of the most effective known disinfectants. Ozone displays bactericidal action at a concentration of $13\text{ }\mu\text{g}/\text{dm}^3$. The bactericidal action of ozone is about 50 times better and 3000 faster than of chlorine. Ozone is an irritant gas which damages biological membranes by free radical reactions with the membrane components. Once in living cells, ozone may inhibit the action of cellular enzymes and arrest intracellular respiration. The first symptoms of ozone irritation (observable already at $0.2\text{ }\mu\text{g}/\text{dm}^3$) include: coughing, sore throat, drowsiness and headache. Ozone's half-life is (practically) short: 30 minutes; hence its primary concentration falls to approx. 6% in two hours. Ventilate all rooms after ozonation and wear respirators with charcoal filters if you need to remain in areas of exposure during ozonation. The ozone concentration at 0.1 ppm is harmless to humans up to a maximum of 8 hours of exposure. The ozone concentration at 10 ppm is hazardous already after a few minutes of exposure. Ozone generators may output 0.5 ppm maximum (and the higher the concentration the faster the decay is). Operating several high-performance ozone generators in a small and relatively gas-tight room may increase the output concentration. This will result in a toxic and deadly atmosphere. Hence professional operation of ozone generators demands professional operators. Current laws and regulations do not necessitate any training in operation of ozone generating equipment. However, due to safety considerations, every person who wants to use ozone generators in a professional way should ask our company for training or read and understand relevant reference literature. Note that our company training is not obligatory. Always keep your exposure in rooms being ozonated to several minutes only. The ozone concentration in professional use ranges from 0.01 to 3 ppm. When this concentration is achieved in a room being processed, its ozonation begins. The following ozone disinfection time is 30 minutes. This time spread results from the varied reaction of pathogens to ozone. The differences in concentration and processing time may also vary between the ozonation objectives. You can find more information in very extensive literature on this topic. The following statements are only a very broad introduction to ozonation which is due to the wide averaging, high simplification, and conversion of the dynamic state to a static one. **The concentration threshold at which ozone disinfection and deacariation (dust mite and allergen control) begin is 1 g of ozone per 10 m³ of the processed room.** The **M-MX4000** generator outputs 3-4 grams of ozone per hour, which means that the machine can kill fungi in 30-35 m³ within 30 minutes. Ozonation kills all allergens. Ozonation of refrigerators or home freezers is recommended. In the seasons for mushroom, fruit and vegetables, these products should be ozonated, which significantly improves their shelf life – even before freezing. This destroys bacteria and fungi on their skin. It is recommended to ozonate potatoes or onion before stowing them. The processing requires mesh bags and a tight room. Air ozonation is recommended for cottages when they are still vacant. Ozonation is often used to process clothing after prolonged storage. Ozonation is a standard sanitation process for shoes, athletic clothing, fitness equipment, saunas or gyms. It is also highly recommended to ozonate all animals rooms and shelters (e.g. kennels, pens, transport boxes for dogs and cats, bird cages or dovecotes).

1. Permissible Exposure Limits:

PELs in USA, Great Britain and other parts of Europe:

- 8 hour TWA daily / 5 days a week: 0.1 ppm
- 15 minutes (short-term exposure): 0.3 ppm

The **M-MX4000** generator can output up to 4000 milligrams of ozone per hour. The ozone concentration generated by the **M-MX4000** can quickly exceed the 15-minute PEL (0.3 ppm).

2. Ozone toxicity:

Irrespective of PEL values, there is a risk of respiratory inflammation. It has been proven that ozone contributes to asthmatic attacks. No person with a history of asthmatic episodes should enter rooms which have been recently been saturated with ozone until all remaining ozone is

completely dispersed and the room well ventilated with fresh air.

Ozone has a specific pungent smell, which makes it easily detectable even at concentration levels much below the 15-minute PEL. Most people can smell ozone at a concentration approx. 1/10 of the 15-minute PEL. A very pungent smell of ozone in the air usually means that the concentration exceeds the 15-minute PEL.

WARNING

- **Do not allow any person with impaired smell to operate this generator.**
- **Leave clearance around the machine before turning it on.**
- **Do not check that the generator produces ozone by directly sniffing at the generator outlet.**
- **Short-term inhalation of ozone at high concentration or long-term inhalation of ozone at low concentration may result in adverse physiological effects. DO NOT smell the ozone directly at the machine's output.**

GENERAL SAFETY WARNINGS:

- ⚠ This machine is not water-proof and may only be used indoors. Protect the machine from water. Damage by flooding is not covered by the warranty.
- ⚠ DO NOT open the machine's enclosure or attempt unauthorised repairs. The M-MX4000 ozone generator works at an extremely high voltage which may result in physical injury. Do not touch the machine when it is working and open.
- ⚠ Do not use the machine at high relative humidity (> 80%).
- ⚠ The recommended minimum room size for water processing is 30 m³, which will prevent a very pungent smell of ozone.
- ⚠ Keep out of reach of children.
- ⚠ Unplug the machine from the power outlet when not in use.
- ⚠ DO NOT use this machine where explosive gases or materials are present.
- ⚠ DO NOT touch this machine with wet or moist hands.
- ⚠ Avoid frequent use of this machine in areas where metals or synthetic materials (e.g. plastics) are kept.
- ⚠ Use ozone-resistant hoses only. Use of incompatible materials may result in inadvertent ozone leakage into the surroundings.
- ⚠ DO NOT lubricate the tips of air hoses with mineral oils or organic fats.

- ⚠ DO NOT place the working machine on carpets, etc.

IMPORTANT WARNING

Magnetti Marelli shall not be liable for any damage to persons or property caused by this product, or any damage which may arise from handling this product by the user or other persons. The user is liable for proper installation, operation and storage of this product.

PRODUCT CONTENTS

1. Ozone generator
2. 100 cm long hoses
3. Ozone Generator Operating Manual

FIRST STEPS BEFORE USE

1. Before making any connections, make sure that all hoses are clear of dust and other contaminants.
2. Insert the end of this line into the air inlet on the ozone generator.

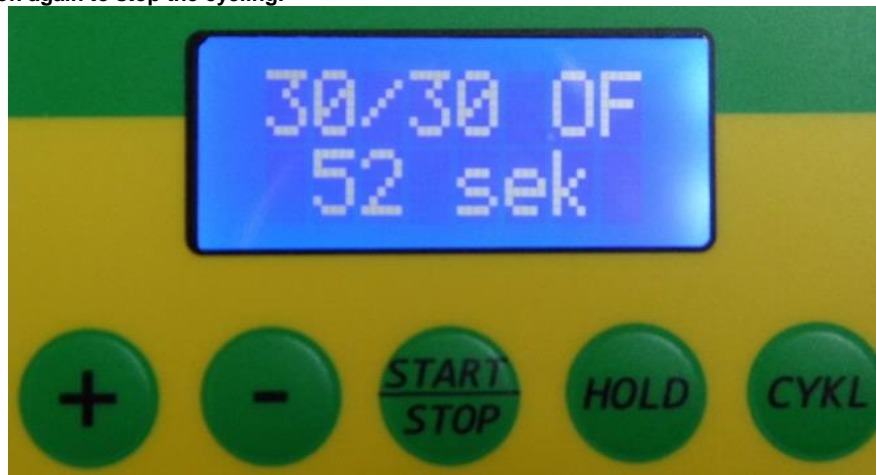
INSTRUCTIONS FOR USE

- 1) Set the I/O switch to "I".
- 2) Set the operating time with the + and - buttons, then press the Start/Stop button. The machine begins ozonating and it will stop after the set time expires or when Start/Stop is pressed again.



3) Cycle operation

can be started by pressing the cykl button. The machine will ozonate for 30 minutes and stop for 30 minutes alternately, and this cycle will repeat itself at least 4 times. Press the cykl button again to stop the cycling.



4) Continuous operation

Start the ozone generator by pressing the Start/Stop button first and immediately press the Hold button, which will leave the machine running without interruption. Press the Hold button again to stop the machine.



Caution:

1. To ozonate water or other liquids, connect one end of the 1.0 m long hose to the ozone output socket and the other end to a diffuser block.
2. To ozonate air, do not connect any hoses or diffuser blocks.
3. Plug the power cable into a mains outlet.

Caution: The power outlet ratings must match the nameplate data of the machine. See the nameplate on the machine. THE POWER OUTLET MUST HAVE A PE (PROTECTIVE EARTH) CONTACT.

GUIDELINES FOR OZONE THERAPY APPLICATION

When using the generator to ozonate liquids, place the machine at least 20 cm above the liquid level to prevent the medium from flowing into the generator. When using the generator to ozonate air, do not connect any hoses or diffuser blocks.

WARNING: Place the machine base at least 20 cm above the surface of the liquid to be ozonated.

MAINTENANCE

If the **M-MX4000** is used sporadically, keep it in a dry place in a plastic bag for protection against dust. If you decide to operate the machine with the automatic ozone distribution system, regularly inspect it to make sure that the system works properly and efficiently:

- Check all lines and connections for damage and leaks.

TECHNICAL SPECIFICATIONS AND OPERATING CONDITIONS

Model: **M-MX4000**

Ozone generator output: 3000-4000 mg/h

Internal pump output: 10-15 l/min

Programmable time counter: 1-60 min

Pump pressure output: 17 kPa

Operating conditions: use inside well-ventilated rooms without any corrosive gases in the ambient air

Ambient pressure: 100±4 kPa

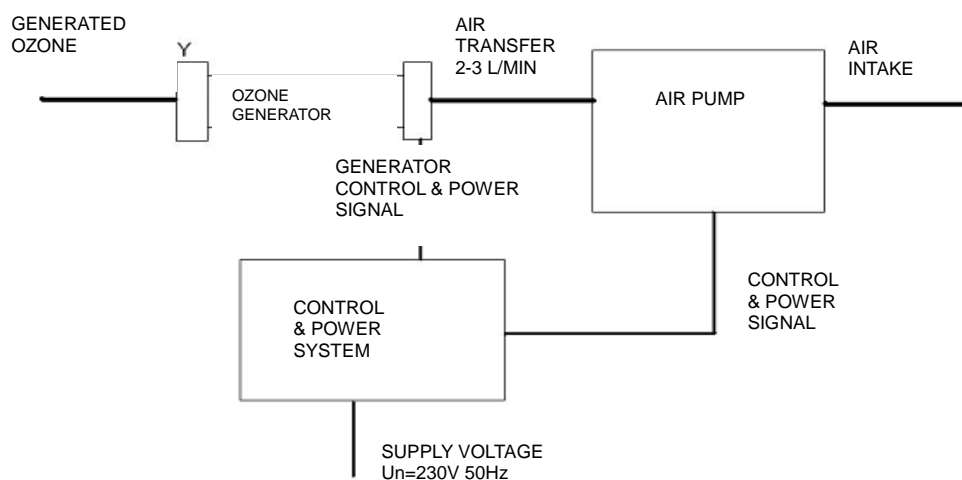
Ambient temperature range: 5-40°C

Relative ambient humidity: ≤ 80%

Ozone generation process: coronary discharge

Output line diameter: 8 mm

Power supply: AC, 220-240 V 50 Hz



MACHINE DESIGN This machine generates ozone (O₃).

Warranty & after sales service

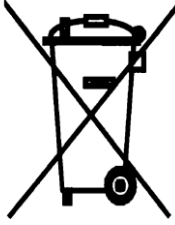
See the warranty rights in the enclosed Warranty Sheet.

IMPORTER/DISTRIBUTOR DECLARATION

The importer/distributor hereby declares that the following product: Ozone generator, type **M-MX4000**, meets the requirements of the following directives:

- ⌘ DIRECTIVE 2006/95/EC OF THE EU PARLIAMENT AND OF THE COUNCIL
- ⌘ DIRECTIVE 2004/108/EC OF THE EU PARLIAMENT AND OF THE COUNCIL
- ⌘ and the relevant harmonised standards

as proven by applicable EC Certificates and test reports.

<p>Disposition on use of electrical and electronic equipment in the EU member states</p> <p>This symbol on the product, its packaging and/or operating instructions indicates that the product must not be disposed of with household waste. It must be returned to an authorised waste electrical and electronic equipment collection point, operated under a recycling scheme that follows the Polish Act of 29 July 2005 on Waste Electrical and Electronic Equipment (<i>Polish Journal of Laws, Year 2005, no. 180 items 1494 and 1495</i>). Compliance with these guidelines can help avoid potentially negative environmental and human health due to improper landfilling of processing of waste electrical and electronic equipment (WEEE).</p> <p>If possible to do so, remove all batteries from this equipment and return them to relevant waste collection points as required by current laws. Compliance with these waste materials and equipment recycling guidelines helps conserving natural resources.</p>	
<p>Disposal</p> <p>If the machine is to be disposed, follow the applicable laws!</p>	

Ozone generator periodic inspections

Only licensed electricians may carry out the following inspections.

1. Visual inspection

Verify the following:

- Outer enclosure and hand grip parts are undamaged.
- The power cord plug is undamaged (i.e. not cracked or charred, and without deformed contacts).
- The power cable is protected against ripping out of the plug or the machine and its insulation is undamaged.
- the electrical lines and connections in the ozone generator are good.

2. Protective earth line check

Verify the following:

- The PE wire is firmly and properly connected.
- The length of the power cable live and return wire allows them to be strained before straining the PE wire when the cable leaves the cable relief hook.

3. Measurements

- Measure the insulation resistance with the machine and its power cable cold. Test with a continuous voltage of 500 V (from a 500 V megohmmeter). The insulation resistance values shall not be less than:
2 MΩ for Protection Class I and III equipment;
7 MΩ for Protection Class II equipment.
- The maximum permissible resistance of the PE wire is 0.1 Ω.
- The measurement results are positive when:

$R_p \leq R_w$ and $R_{PE} \leq R_{PR}$, with:

R_p - measured insulation resistance

R_w - maximum permissible insulation resistance

R_{pe} - maximum permissible wire resistance

R_{rr-w} - maximum permissible PE wire resistance

Ozone generator testing intervals:

Cat. I: 6 months (infrequent operation per month)

Cat. II: 4 months (frequent operation, 1 to 3 times a day)

Cat. III: 2 months (continuous operation on several work shifts)

Categories defined in PN-88/E-08400/10: Handheld electrical power tools: Inspection tests during the operating life.

Note: Reduce the given testing intervals by half if the ozone generator is operated at elevated risk of mechanical damage, in damp rooms, extreme conditions, etc.

The Test Report shall specify the machine data:

Ozone generator model:

Manufacturer:

Type:

P [kW]

U [V]

Insulation class:

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