



## What is OZONE & Ozone Treatment?

Ozone is an extremely versatile and effective disinfecting and oxidising agent, which has applications in many industries. With the ever increasing awareness of environmental pollution and chemicals which adversely effect the environment, alternative, more acceptable oxidants are being sought.

Ozone is the most powerful, natural sanitising agent of water which is commercially available and has the advantages of acting 3 000 times faster than chlorine, leaving no chemical residue and has no by-products. In addition ozone is also used to control the taste, colour and odour of water.

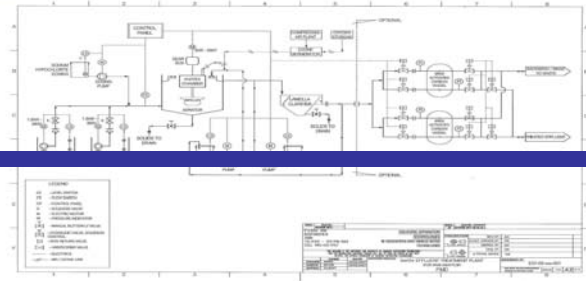
Ozone has many great advantages over alternative methods of water treatment.

### OZONE:

- Is the most powerful water sanitizer available for domestic and commercial use.
- Is up to 3000 times faster acting than chlorine, yet leaves no chemical residues in the water. The only by-product from the sterilising process is Oxygen.
- Rapidly kills bacteria, coliforms, viruses. If correctly applied, Ozone is also effective against Giardia and Cryptosporidium cysts.
- Is effective for the removal process of iron, manganese, organically-bound heavy metals, cyanides, (some), phenols and some other organics
- Does not require the water to be clear to be totally effective.
- Can eliminate the use of sanitising chemicals in your water supplies
- Is a completely natural products that is produced on-site from electricity and air
- Running costs are very low (about the cost of a 100 watt light for the ozone generator)
- It is tasteless, odourless and pH neutral.

The opportunities for the use of Ozone and its benefits are becoming more widespread and acknowledged. Ozone treatment is used in:

- Water Purification
- Odour Control
- Air Purification
- Drinking Water Treatment
- Wastewater Treatments
- Cooling Tower Water Treatment
- Agricultural
- Aquariums
- Health/Medical services
- Food Industries
- Chemical Industries
- Bottled Water Treatment
- Well Water Treatment
- Swimming Pools/Spas
- Water Vending Machines
- Reverse Osmosis Permeate Water



## Influent & Effluent Solutions

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- Closed Loop Carwashes
- Disinfectant in Laundry Wash Cycle

## Ozone Uses

### Water Treatment:

For many years chlorine has been effective in water purification, but some bacteria are becoming resistant to it. Internationally, Ozone is fast becoming the chemical choice to replace chlorine in drinking water treatment. This latest technology in water purification is being introduced into this country as an alternative to chemical treatment.

The use of ozone in water purification and wastewater is growing rapidly.

### Drinking Water Treatment:

Chemfree Aqua ozone technology is mainly used in the potable water sector to achieve the following aims:

- Disinfection i.e. to kill microorganisms (Giradia lamblia / virus inactivation / elimination of cryptosporidia)
- Elimination of odours (deodorization)
- Elimination of humic substances (decolouration)
- Taste enhancement
- Oxidation of iron and manganese
- Breakdown of pesticides

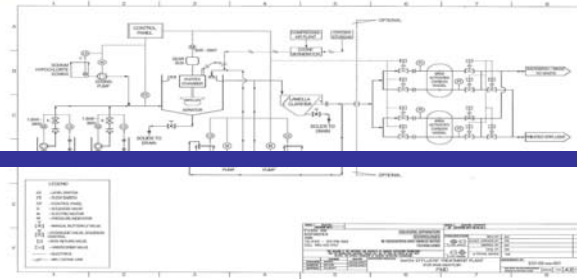
The advantages of using ozone rather than chlorine are:

- No production of Haloforms
- Very low ozone masses are needed, i.e. investment and operating costs are low
- No secondary products
- pH-insensitivity
- Support and partial replacement of flocculants

Advanced water treatment technology with ozone will solve many bacteria, virus and other contamination problems without chlorine disinfection as the world becomes more environmentally conscious of "Green" technology. Various sized ozone generators and their related accessories are specified by our specialists so you can do the job right the first time!

### Food Industries:

The benefits of using Ozone can readily be seen in its use, as water plays such an important role in the health and growth of all living things, whether it is cows or cucumbers, fowls or flowers.



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By improving the quality of water with Ozone treatment, many problems resulting from poor water quality can be eliminated. Removal of unpleasant tastes and smells can result in substantial increase in water consumption by dairy cattle, together with a measurable increase in milk production. Disinfection of water supplies can remove bacteria from rinse water with the result that milking equipment remains free of infection, with less chance of milk contamination.

The importance of good water quality in the poultry industry has been recognised by MAF regulations that require water supplies to the birds to be of the same standard as human potable water supplies. Installations completed in New Zealand have shown an immediate increase in drinking water consumption by birds once Ozone treatment of the water commenced.

Ozone is being used extensively overseas for treating makeup water and run-off water, rinse water from pesticide sprayers, and for sterilising soil and greenhouse equipment. Ozone kills all water-borne soil fungi while leaving a very beneficial residual of dissolved oxygen. This means that Ozone can provide superior pathogen remediation and significantly increase plant yield without the need to store and handle dangerous chemicals.

### Swimming Pools:

Ozone treatment of swimming pool water has been used for many years and has proven to be able to provide a water quality that is simply not achievable with traditional swimming pool cleaners. Ozone treatment of swimming pool water is widely accepted as the ultimate choice and is successfully used in many large aquatic facilities including the Olympics 2000 Sydney International Aquatic Centre.

Now the same technology is available for small and medium sized commercial pools, at an affordable price, by installing the OzTreat slipstream ozone package.

BUT OZONE CAN TAKE CARE OF IT!

REMEMBER

OZONE kills bacteria, viruses, spores, and mold and does it fast. Ozone pierces the cell wall of bacteria and viruses killing them 3000 times faster than chlorine.

Ozone was used to treat the water in the swimming pool that the AIDS infected blood of Greg Louganis contaminated. No one else contracted AIDS from that incident.

## OZONE ADVANTAGES

OZONE is produced on site-no storage or transport of dangerous chemicals

OZONE kills all bacteria, viruses, fungi and parasites

OZONE prevents calcium carbonate scaling and removes existing

OZONE not used up slowly decomposes to oxygen up to the saturation point of oxygen in water this gives sparkling clean pool water

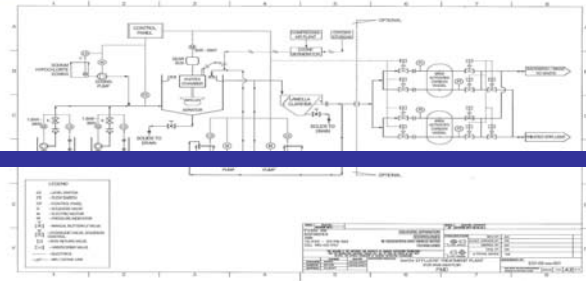
OZONE use in the water does not cause discharge liabilities

OZONE is not affected by pH of water, nor does it affect the pH of water

OZONE causes increased flocculation of organic wastes, thus increasing the effectiveness of the sand filtration system of your pool.

ARE YOU SURE IT WON'T NEED CHLORINE EVER?

YES, we are sure except sometimes for shock treatment in cold climates at the beginning of the season. We use bromides instead of chlorine for residual disinfection and algae destruction. The bromine reacts with algae and turns to bromide. The bromide recombines with the ozone to reform bromine. This starts the cycle over again. Bromide is added in the beginning and additional bromide is needed only as water leaves the pool by splashing or on a swimmer's body as he/she exits.



## Influent & Effluent Solutions

### The Ozone System

The system consists of three main components.

- Ozone Generator
- Water Pump
- Venturi

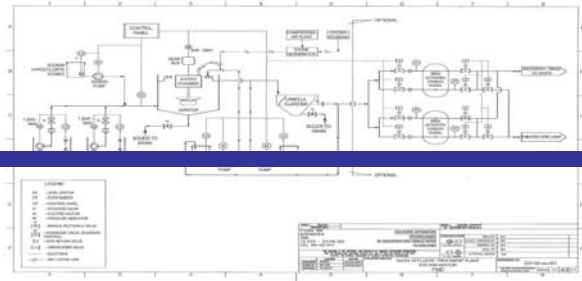
### The Water Purification Process.

The Ozone System works in the following manner:

- Source water enters the pump and is forced through the Venturi under pressure.
- The Venturi creates suction on the Ozone inlet port.
- This suction draws Ozone from the Ozone Generator along the 6mm Ozone tubing into the Venturi.
- Ozone is vigorously mixed into the water stream.
- Ozonated water exits the system.

In order for the system to function 3 ingredients are required:

- Electricity - 220 Volts.
- Water.
- Air. (Air is drawn into the Ozone Generator through the nozzle located on the front of the unit. This should be connected to an air filter or air dryer. Alternatively this fitting can be connected to an Oxygen source. This will substantially increase the Ozone output of the generator (up to 5 times more Ozone)) With Oxygen the recommended flowrate is 3 to 10 litres/minute O<sub>2</sub>. If no Oxygen flowmeter is available, set the flow to very gentle, about the same as blowing gently through a straw. The needle on the regulator will only just rise above zero. At this rate a standard 14Kg Oxygen bottle will last about 24 hours. We also now produce Oxygen concentrators which dry normal air as well as increasing the Oxygen content. These serve to replace Oxygen bottles and can run 24 hours a day, everyday.
- Another way of enhancing the Ozone production is to connect a fish tank type air pump to the Air inlet. These pump are available at hardware stores and pet shops. Go for the biggest one and connect it to the unit with clear plastic tubing. This will give 50% or so more Ozone than if the unit is run on a vacuum.



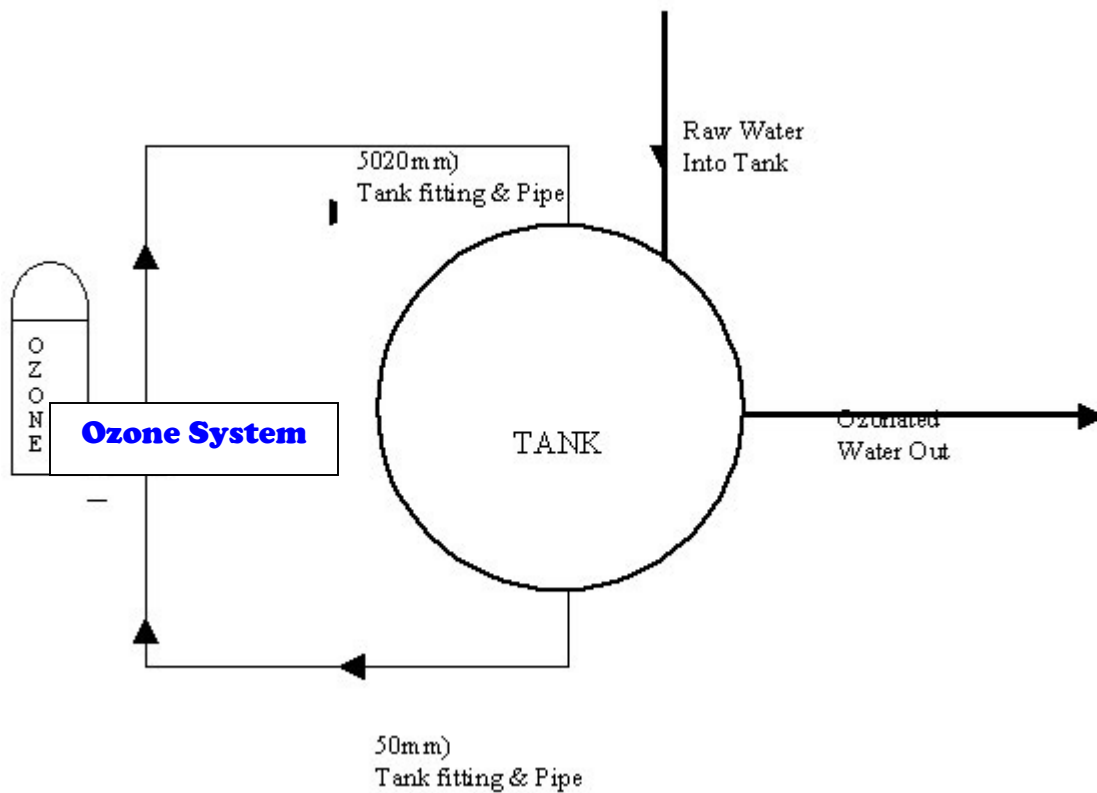
## Influent & Effluent Solutions

### Installation

There are 2 recommended ways of installing the Ozone System:

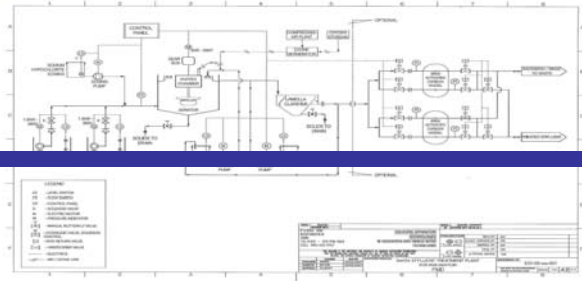
1. To circulate water in a tank or reservoir.
2. To treat water in a main flow line.

### Tank or Reservoir Installation



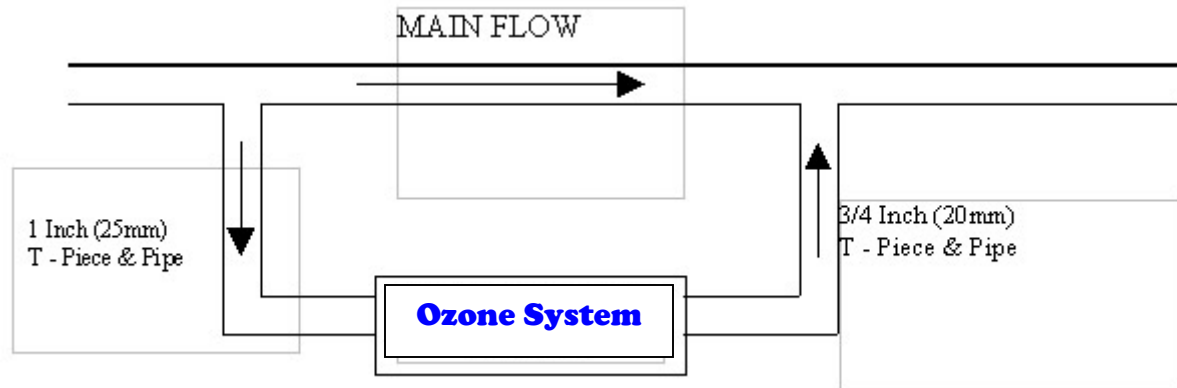
This is in many ways the preferred and most efficient installation. Ozone can be mixed into the tank 24 hours a day ensuring a high level of Ozone/Water contacting and disinfection.

It is recommended that the Ozone system be switched on permanently.



## Main Flow Line Installation

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This installation is to be used in situations where water is not re-circulated. Operation of the Ozone System will be limited to times when there is sufficient water flow.

### Installation Without a Pump.

In some cases the Ozone system can be used without a pump. This is if the venturi can be installed into a pressurized water line. In this case proceed as follows.

- Connect the venturi either directly into the line or on a by-pass. If on a by-pass make sure that there is a control valve in the main line in-between the T-pieces that lead to the venturi. Thus by closing the valve, water can be diverted from the main line into the venturi. NOTE. The water must flow in the direction of the Arrow on the venturi.
- Connect the venturi to the Ozone generator. The venturi has 1 port on one side. Following the direction of the arrow they are: Ozone inlet.

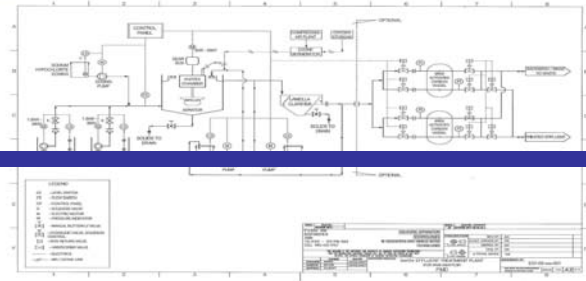
### Ozone Operating Procedure

Always follow the steps below **In Order.**

#### **Startup**

##### **Step Action**

- 1 Ensure that the Ozone switch is OFF and the Ozone Control Valve Closed
- 2 Switch ON Pump (Press Black button on Pump Controller)
- 3 Wait 5 to 10 Seconds (Venturi will suck any moisture from the Ozone Generator)
- 4 Fully Open the Ozone Control Valve on the Venturi.
- 5 Wait 5 to 10 Seconds (Venturi will suck any moisture from the Ozone Generator)
- 6 Switch Ozone Generator ON



## Influent & Effluent Solutions

### Shutdown

#### Step Action

- 1 Switch Ozone Generator OFF
- 2 Close Ozone Control Valve
- 3 Switch OFF Pump (Press Red button on Pump Controller)

### Maintenance

The Air intake fitting on the front of the Ozone Generator should be connected to an air filter or dryer..

Please check this filter periodically for blockages. To check for suction switch the system on and place a finger against the air inlet. If there is a vacuum then all is running properly.

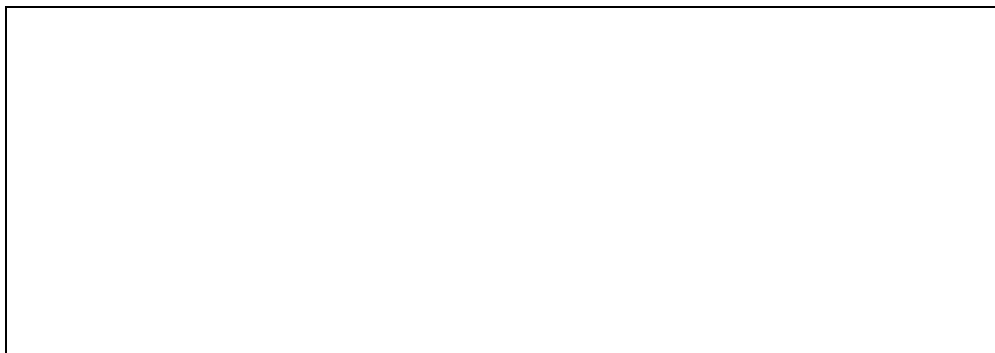
### Checking for Ozone

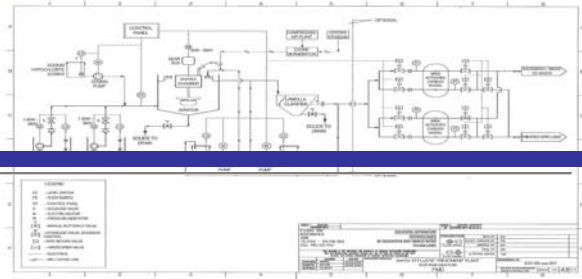
The Front panel features an Ozone indicator Light. With the Ozone Generator On this will glow. This indicates that the transformer is functioning properly. If this light is on and there are bubbles in the water then the system will be producing Ozone.

To further check for ozone, switch the system on. Disconnect the 6mm ozone tubing from the Venturi. Place the end against your ear. If you hear a buzzing sound coming down the tube then the ozone generator is working. Alternatively suck on the pipe. Ozone has a distinctive taste/smell.

If the Ozone indicator light does not come on (NB. It will only come on if the pump is running) then check the fuse. This is located under the plug assembly of the unit.

If changing the fuse does not work then contact us [www.nimbuswater.co.za](http://www.nimbuswater.co.za) .





## Influent & Effluent Solutions

### Industrial

- 1 gm - 200 gm/hour Ozone Production
- High Concentration
- Aircooled
- Multi Port Option
- Poly Carbonate or Stainless Steel Enclosures

### Systems

- Highly effective means of dissolving ozone into water
- Up to 99% mass Transfer
- Air Cooled
- IP 65 Cabinet
- Short Circuit Proof
- Thermal Safety

