

IET Ozone Systems

System Features:

Mechanical:	3' PVC Sch 80 influent and effluent lines 550 Gallons Holding Capacity Transfer Pump – 275 gpm @60 psig 7 ½ HP 230 3 phase
Power Requirements:	230, 3 phase, 65 amps Draw – 30 amps w/o transfer pump running 50 amps average w transfer pump running 65 amp max draw

“In-Tank” method of mass transfer for blending Ozone into the influent water,
Pressure activated transfer pump so as to respond to the call from the infiltration system
Regulation of Ozone dosage precisely by using ORP based Modulated Output
Operational and safety parameters are monitored and controlled via an integrated PLC
Ambient Ozone Monitoring System linked to the PLC
Peroxide addition capability

Control System

Modulated Output continuously assures that sufficient, but not excessive Ozone is being transferred into the water. Modulated Output is superior to a “full-on/full-off” approach, which “saw-teeths” the ORP plot. The end result is a managed and controlled level of oxidation potential stored in the water to be reinjected.

The control loop consists of: An ORP sensor, a “PID” control device (inherent in the 650-hz medium frequency power supply) a variable output voltage frequency converter. The 650 Medium Frequency Power Supply output voltage is varied in (inverse) proportion to the measured real-time ORP (milli-volt) value to achieve and maintain a desired Oxidation/reduction potential (ORP) “setpoint”.

Process

When the Medium Frequency Power Supply receives and “enable” signal (all safety and operational conditions having been satisfied) the unit will commence producing Ozone which flows to the mixer head in the storage tank. The ozone is dissolved into the water in the storage tank. The ORP rises as the ozone demand of the water is met. When the ozone demand of the water is satisfied, an ozone residual is then established and maintained by continuously adding ozone to the water. The Ozone gas flow to the head remains constant, but the concentration of ozone in the gas is varied in proportion to the ORP (milli-volt) value.

Injection System

Rotating Propeller/Eductor with crown-dispersion is superior to direct injection or direct diffusion. Diffusion methods require a water column of between 13-20 feet, otherwise up to 90% of the ozone is lost. The propeller/eductor is superior to typical helix style propellers.

Safety

- 1) Ambient Ozone Monitors interlocked with the PLC and the ozone generator,
- 2) Ozone mixing tank is under “negative pressure” allowing venting of freeboard gases to an appropriate area.
- 3) Interlocks on doors, cooling water flow, oxygen flow, reaction vessel temperature, reaction vessel oxygen pressure, etc.
- 4) All contact surfaces are stainless steel, ceramic, Teflon or Viton

Oxygen Feed System: Each unit is fed by two AirSep Model AS-12 oxygen generators. Take ambient air and make 90%+ pure oxygen for feed to the Ozone system.

Unit Pictures:



Figure 1: Units



Figure 2: Ozone Generator Portion



Figure 3: Top View



Figure 4: Propeller Mixer in Tank



Figure 5: PLC and Monitoring System



Figure 6: Systems and Controls on Skids