



A Venturi Aerator

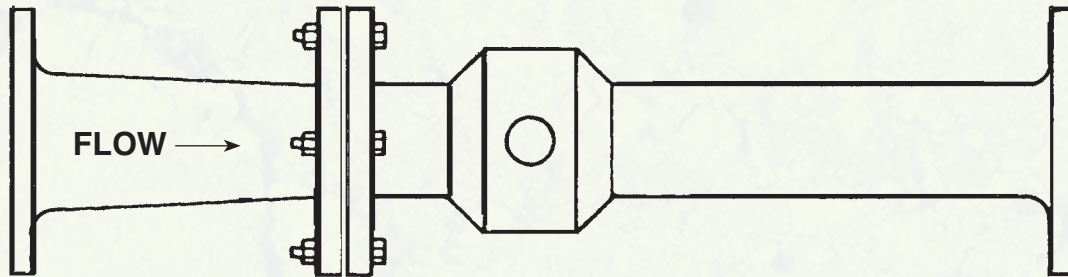
SALES & RENTALS



Areas of Use:

Lift Stations • Preaeration Systems • Aeration Basins • Effluent Aeration Cells
FOG Flotation Units • Aerobic Sludge Digesters • Lagoons • Replace Diffused Air

Air Jammer® Aerator



Capabilities:

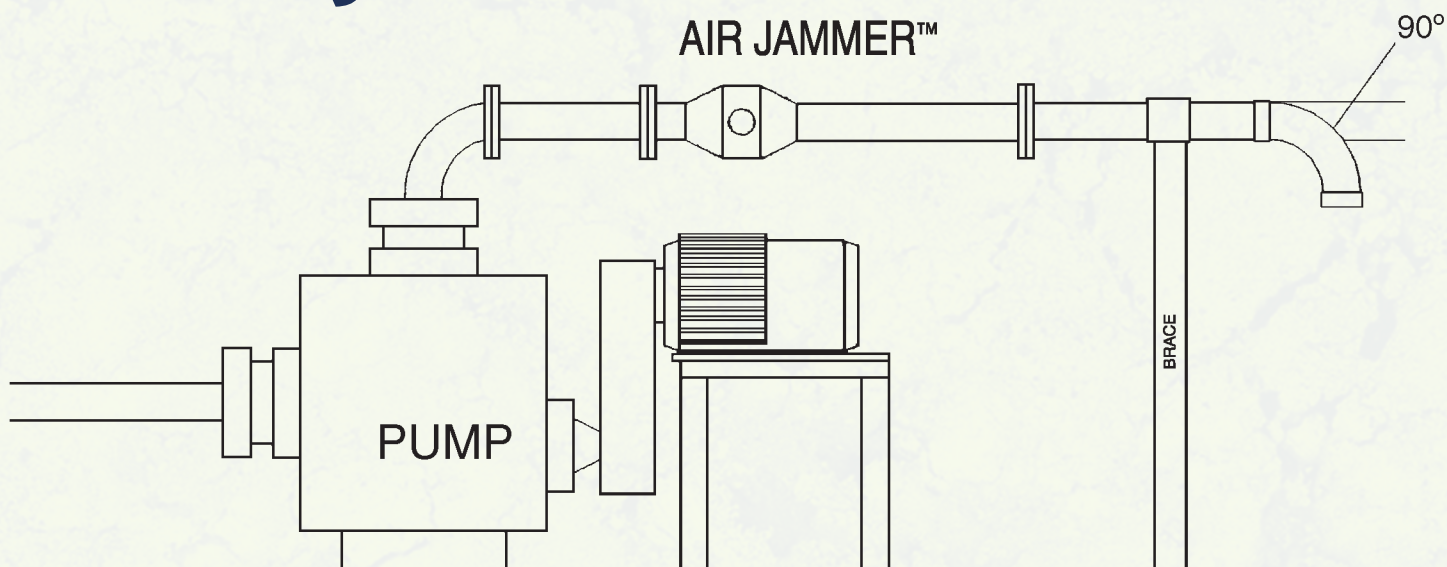
- Shears Solids
- Degasses Solids
- Precipitates Solids
- Floats Grease
- Adds Oxygen
- Controls Odor
- Controls Corrosion
- Reduces Chemical Use

Characteristics:

- Rugged Construction
- Non-Clogging
- Expandable by Multiple Units
- No Moving Parts
- Self Cleaning
- Low Maintenance
- Land Based
- Retrofits Existing Systems

The Air Jammer® aerator is a unique device for injecting atmospheric oxygen into wastewater. The Air Jammer® utilizes micron-size bubble diffusion along with hydraulic shear within a pressurized aeration chamber to produce a well mixed, highly oxygenated and conditioned liquid. Wastewater, the primary target, is pumped through the Air Jammer's® high velocity nozzle at a hydraulic pressure of 20 psi. The resulting implosion and dramatic expansion thereafter shears the waste stream's organic solids to macroscopic size and releases the embedded grease and gas bubbles trapped within the solids. The waste stream is then thoroughly mixed under pressure with aspirated air utilizing micron-size bubbles to produce an exceptional oxygen transfer to the liquid, resulting in a dramatically improved environment for biological activity and thus a more rapid degradation of wastewater contaminants.

Air Jammer® Aerator



Air Jammer® Operating Data

MODEL NO.	PUMP REQUIREMENTS							AVAILABLE POUNDS O ₂ PER HOUR
	SIZE	GPM	PSI	TOTAL HEAD	BHP	MOTOR SIZE	AIR SCFM	
M-2	2"	125	20	60'	3.8	5 HP	43.0	45
M-3	3"	250	20	60'	8.1	10 HP	85.90	90
M-4	4"	500	20	60'	14.6	15 HP	161.5	170
M-6	6"	1100	20	60'	28.7	30 HP	325.5	342

Oxygen transfer rates as a percentage of these numbers will vary depending upon altitude, temperature and the amount of oxygen in the liquid being treated.

* Flow rates other than these noted will work, but will change other operating parameters.

Air Jammer® Dimensions

Model No.	Size	Length	Weight
M-2	2"	21.75"	10#
M-3	3"	34"	30#
M-4	4"	43.5"	50#
M-6	6"	52"	100#

The Air Jammer® is virtually maintenance free and extremely durable. It has no moving parts and is constructed from an aluminum alloy with specific portions made from PVC and polyurethane.

How circulation increases oxygen transfer:

- 1) Oxygen depletion normally occurs at the bottom of the water. By deep circulating and bringing the oxygen depleted water from the bottom to the surface, the normal oxygen transfer can take place. If the circulation pattern is deep enough, the oxygen-rich water is drawn back down to the bottom where it is most needed.
- 2) EPA manuals for waste pond operation show that through pond circulation the oxygen producing zone can be drawn down from a typical 6 - 18 inches to about 4 feet, thereby increasing direct oxygen production by over 2.5 times.
- 3) Typical surface scum and algae matting stops wave action and blocks photosynthesis. Circulation reduces surface encrustation and matting, thereby increasing oxygen transfer.

Air Jammer® systems have several advantages over other aeration systems:

- 1) The Air Jammer® has an excellent oxygen transfer to water/wastewater. As water is pumped through the Air Jammer unit, at specified rates and pressure, a vacuum is created at the air induction ports on each side of the unit. The vacuum created is equal to approximately twice the atmospheric pressure that water and people are subjected to, 28 PSI. This pressure forces the atmospheric oxygen into the water. Once this occurs the oxygen can only be removed from the water by biological uptake from the waste stream or boiling of the water. As wastewater is pumped through the unit, organics that are in the waste stream are sheared into macroscopic size and thoroughly mixed with the oxygenated water. This shearing of organics into smaller particles allows bacteria to digest them easier.
- 2) The oxygen transfer stated above for Air Jammer® units is equal to:

Model M-2	15 pounds per hour
Model M-3	27 pounds per hour
Model M-4	50 pounds per hour
Model M-6	101 pounds per hour
- 3) The Air Jammer® system is a land-based system allowing ease of installation and increased safety for maintenance requirements.
- 4) The Air Jammer® system pulling water or wastewater from the bottom or near bottom of a lagoon or tank gives mixing from bottom to top and circulation in clockwise or counter-clockwise direction. This mixing and stirring greatly improves operation of any system and will stop temperature inversions and the odor problems caused by the changing of the seasons. The Air Jammer® will not create odors.
- 5) The Air Jammer® will place more oxygen in the water for less electrical cost than any aeration system available today.



Comparison of Oxygen Transfer Capabilities by Aerator Types

Transfer Rate Lbs. O ₂ /Hp/HR	
Venturi Air Jammer	2.7 - 3.1
Surface low-speed*	1.2 - 2.4
Surface low-speed w/draft tube*	1.2 - 2.1
Surface high-speed*	1.2 - 2.0
Surface downdraft turbine*	1.0 - 2.0
Submerged turbine w/sparger*	1.2 - 1.8
Submerged impeller (stirrer)*	1.2 - 1.8
Surface brush and blade*	0.8 - 1.8

*Wastewater Engineering: Treatment, Disposal and Reuse, 3rd Edition.
Metcalf & Eddy, Inc. McGraw-Hill, NY, NY 1991

Surface aerators beat atmospheric oxygen into water that already has oxygen in it. Venturi aeration is configured to bring the most anoxic (oxygen-deficient) water into the venturi. This is where the venturi can achieve higher transfer rates of dissolved oxygen because there is less resistance at the air/liquid interface. Most aerators use the buoyancy transfer model for dissolved oxygen. The venturi (Air Jammer) uses the kinetic oxygen transfer model where in the liquid is converted into macro-droplets of water and is imploded with 2.2 volumes (twice the atmospheric pressure) of ambient air to one equivalent volume of liquid. Transfer takes place predominantly within the “mixing and oxidizing” zone of the Air Jammer.

Manufactured By:

The Environmental Company, Inc.

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