

Ozone Skid

Carollo Engineers' standard ozone skid may be operated independently, or may be easily integrated with other skids to evaluate the impact of ozonation on other treatment processes. This type of skid is generally used to evaluate intermediate ozonation. The rugged metal outer frame of the skid is polymer coated to provide a durable finish and prevent corrosion. The three ozone columns can be easily disassembled and crated for transport.

The ozone contact columns provide a theoretical contact time of 10 minutes at a flow rate of 6 gpm. The skids come fully equipped for complete ozone evaluations, including the following components:

- ▼ Air compressors to provide feed gas.
- ▼ Complete air preparation, including drying and filtration.
- ▼ Ozone generation equipment.
- ▼ Ozone contacting.
- ▼ Ozone quenching.
- ▼ Off-gas ozone destruction.
- ▼ Instrumentation and control.

Ozone Generation

The on-board, water-cooled PCI WEDECO GLS-3 provides up to 3 lbs/day ozone generation capacity. This generator allows a full range of ozone dosages

(i.e., 0.2 to 20 mg/L) so that various applications may be examined.

Carollo's ozonation skid provides the following benefits:

- ▼ Mimics full-scale hydraulics, ozone demand, and by-product formation.
- ▼ Offers capacity for a wide range of ozone dosages.
- ▼ Includes full instrumentation
- ▼ Quenches ozone residuals using on-board UV reactor.

Ozone Contacting

The three ozone contactors are 8 inches in diameter and 8 feet in height. Carollo has specifically designed the columns to match full-scale ozone contactor hydraulics with a T10 to T ratio in the range of 0.6 to

0.7. Matching full-scale hydraulics is important for developing proper design criteria for ozone system sizing, and to accurately determine ozone demand and by-product formation, such as bromate or assimilable organic carbon. Fine bubble diffusers,

common in full-scale design practice, provide ozone transfer within the columns. Multiple sample ports allow detailed analysis of ozone residual, ozone decay kinetics, and disinfection by-product formation.

Instrumentation

The gas feed flow rate, the ozone concentration in the gas, and the water flow rate through the system are continuously monitored. The transferred ozone dose can be calculated directly by Carollo's data acquisition and control (DAC) system or using an on-board programmable logic controller (PLC). Ozone residual is monitored at the effluent of the second ozone contactor, although multiple ports are available to monitor residuals at other locations.

Ozone Quenching

The skid includes a low-pressure UV reactor (Wedeco-Ideal Horizons) for quenching ozone in order to avoid carry-over of ozone residuals to downstream processes.



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Design Criteria		
	Value	Additional Information
Design Flow	6 gpm	
Hydraulic Detention	10 min	
Ozone Contactors		
Type	-	8-inch-diameter, 8-foot height, columns operated in series
Number	3	
Ozone Transfer	-	Fine bubble diffuser
Hydraulic Condition (CSTRs in series)	6 to 8	
Ozone Generation		
Type	-	PCI Wedeco, model GLS-3
Number	1	
Capacity	3 lb/day	
Ozone Dose Range	0.2 to 20 mg/L	
Ozone Quenching		
Type	-	Wedeco-Ideal Horizons, CI series (low-pressure UV light)
Number	1	

Technical Specifications	
Skid Weight	1,500 lbs
Skid Dimensions (L x W x H)	93 in x 40 in x 156 in
Electrical Requirements	208 VAC, 3 Phase, 30 A (WYE connection) Optional transformer requires 480 V, 3 Phase (Delta connection)
Influent, Effluent, Overflow Connections	1-inch Cam Lock
Typical Rental Fee	\$4,000 per month