



"Quality Service for Quality Equipment"

Commissioning Services

Features

Commissioning Service:

- Extends Warranty
- Assures maximum performance and reliability of your ozone equipment
- Complete site and installation evaluation
- Tune your ozone contact skid to your unique application
- Provide training on startup and shutdown procedures
- Provide training on preventative maintenance
- Provide training on troubleshooting
- Recommended list of spare parts to prevent unscheduled down time
- Available worldwide*
- All service and training is normally completed in one day[†]

*Some restrictions apply.

[†]Not including travel time

Field service technician may decline to startup the equipment if it is improperly installed / integrated or conditions are unsafe. Pre-requisites for Commissioning are the responsibility of the customer. Travel expenses are billed to the customer; schedule Commissioning Service in advance to reduce travel expenses.



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Commissioning Check List

- ✓ Confirm proper electrical and plumbing connections to the ozone generator
- ✓ Pressure test ozone generator
- ✓ Test injector suction capacity
- ✓ Test back pressure of O₃ delivery line, diffuser stones, & contact tank
- ✓ Water pressure (if applicable) is regulated to 20-30 psig
- ✓ Confirm that the ozone generator / system is properly installed
- ✓ Confirm that environmental conditions are within stated requirements
- ✓ Confirm that feed gas quality meets stated requirements
- ✓ Onboard oxygen supply – filtered to .01 micron, hydrocarbons < .08ppm, 38°F dew point.
- ✓ External oxygen supply – Coalescing/particulate filtration inherent in oxygen supply; additional filtration not required
- ✓ External air supply – filtered to .01 micron, hydrocarbons < .08ppm, -60°F dew point.
- ✓ Confirm that electrical is within stated requirements
- ✓ Voltage
- ✓ Circuit breaker or fuse protection
- ✓ Confirm that all tubing, tanks, or other materials connected to the ozone generator is stainless, Teflon or other ozone resistant material
- ✓ Fill off-gas water trap / drain assembly with 50mL of water
- ✓ Confirm that the pressure regulator (if equipped) is appropriately set
- ✓ Confirm that water backflow protection is installed (check valve / ball valve / anti-siphon loop / water trap with drain)
- ✓ Confirm that ozone destruct devices are properly installed and operational (if applicable)
- ✓ Confirm that the ozone skid auxiliary drain is properly connected to the plant drain
- ✓ Confirm that ozone leak detection devices are properly installed and operational (if applicable)
- ✓ Prepare dissolved ozone analyzer membrane if necessary
- ✓ Zero dissolved ozone analyzer
- ✓ Confirm that dissolved ozone analyzers are properly installed, calibrated, and operational (if applicable)
- ✓ Confirm ozone concentrations with gas phase and aqueous phase analyzers (gas phase not applicable during initial commissioning; see Production Control Document [PCD] for factory gas phase test results). Note: aqueous phase ozone detection is not conducted on wastewater operations or where ORP detection is used.
- ✓ Record PID values for customer file



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Preventative Maintenance Training Items

- ✓ Inspect filter elements. Replace if necessary*
- ✓ Inspect and clean ozone reactor cell exterior and heat transfer surfaces
- ✓ Inspect and clean ozone reactor cell cooling fan
- ✓ Inspect and clean fan intake screen
- ✓ Inspect and clean power supply cooling fan
- ✓ Inspect open power supply circuit board for hot spots
- ✓ Clean power supply heat transfer surfaces
- ✓ Verify controller voltage output and calibrate if required
- ✓ Measure main incoming AC voltage
- ✓ Verify proper control range (manual control)
- ✓ Verify proper control range and auto-tune function of optional PID equipment*
- ✓ Basic process evaluation. Start/stop cycle. Injector suction cycle
- ✓ Inspect ozone system for water leaks
- ✓ Clean cabinet fan screen
- ✓ Measure ozone output (grams per hour)
- ✓ Measure injector suction capacity
- ✓ Clean water-traps and/or auto-drains
- ✓ Measure oxygen concentration percentage (if equipped with onboard oxygen concentrator)
- ✓ Inspect ozone monitors (if equipped). Replace membranes and electrolyte*. Zero and calibrate*
- ✓ Inspect primary and secondary injection check valve (if equipped)
- ✓ Inspect all wire termination points for hot spots
- ✓ Clean machine interior and exterior surfaces
- ✓ Inspect equipment with ozone leak detector
- ✓ Inspect pump for proper operation*
- ✓ Replace power supply cooling fan, as required – MTBF is 20,000 hours
- ✓ Replace ozone reactor cell cooling fan, as required – MTBF is 20,000 hours
- ✓ Inspect solenoid valve for complete closure (if equipped)
- ✓ Inspect wire harness routing & security; confirm away from high voltage
- ✓ Replace filter elements*
- ✓ Evaluate ozone destruct performance (if equipped)
- ✓ Rebuild compressor (internal compressors only) – MTBF is 15,000 hours
- ✓ Measure compressor pressure and flow rate (internal compressors only)*
- ✓ Replace Injector check valves (primary and secondary)
- ✓ Inspect Isolation Valve

****Excludes equipment not supplied by Pacific Ozone***



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Pre-requisites for Commissioning

- ✓ The ozone equipment is properly integrated using industry standard techniques for ozone; a process control engineer that understands the entirety of the customer's process AND ozone fundamentals AND ozone equipment operation has certified that the installation and integration is correct and meets the customer objectives.
- ✓ The ozone equipment is properly mounted/installed using hardware that is rated for the weight load of the equipment
- ✓ Any cabinet penetrations required to facilitate utility (gas, water, electricity) connections have been made; appropriate conduit fittings and conduit are securely attached. All metal shavings have been vacuumed or otherwise removed from the cabinet.
- ✓ All electrical connections to the equipment are complete, meet the manufacturer's specification(s), and meet any necessary local requirements.
- ✓ All signal and control wiring for the ozone equipment, control panel and instruments are complete and tested to be operational.
- ✓ All piping, whether for gas or liquid, and connections for mass transfer, contacting and other plumbing equipment is complete, flushed, clean and tested to be operational.
- ✓ All ozone safety equipment, ozone destruct chamber(s) are installed and tested to be operational.
- ✓ Pacific Ozone may elect to inspect or request demonstration of equipment to ensure proper operational conditions and safety systems meet installation requirements.
- ✓ Verify - Ozone detection sensors exist at the installation
- ✓ Verify - Water pressure and flow meets ozone equipment specifications
- ✓ Verify - Feed Gas preparation meets the ozone equipment specification
- ✓ Verify - All necessary safety precautions for the operators and visitors to isolate and protect them from electrical and other hazards
- ✓ Verify all spare parts, accessories or other devices required for successful start-up by the Field Service Engineer are correct and on site.
- ✓ Customer has informed the Field Service Engineer in writing of any unassembled parts (if any) that are required to be added to the equipment at the time of start-up or a later time excluding any modification that may be requested after the completion of the contracted commissioning. Drawings must be furnished by the customer in these cases.
- ✓ All other equipment and utilities, including air and water supply, are available, connected, operational and ready for production runs or simulated production runs