



SPARTOX™ Optional Equipment

System Layout

The SPARTOX system can come packaged in three basic configurations in sizes up to 120 g/h: on board oxygen concentrator with compressor, on board oxygen concentrator with external compressor or no oxygen concentrator (existing oxygen source available). In sizes larger than 120 g/h, only the latter two options are available. Spartan can provide an external compressor if an existing compressed air utility is not available. External compressed air requirements are for clean dry plant air with a pressure of at least 90 psi for the required flow rate.

Systems with SS skids have a control panel mounted in a powder coated mild steel enclosure with vents. The ozone units are mounted in the control panel, and because they are air cooled, the panels must be vented. This is the same for the oxygen concentrators. If the operating environment is not appropriate for this arrangement alternative enclosures are available up to and including air conditioned NEMA4X in stainless steel. Contact Spartan for additional information and recommendations.

For systems with oxygen concentrators using off skid compressed air sources, the oxygen concentrator can be shipped as a separate skid to allow better fit for the equipment in tight spaces.

Ozone Injection System

The SPARTOX system employs venturi type injection system with booster pump. The SPARTOX **Data Sheet** provides the standard pump designed for the on board ozone injection system. These pumps were designed to provide a flow to create the typical gas to liquid ratios for ozone dissolving. Since each application is different, these standard configurations may not be optimal for every case. Spartan can provide alternative pumps/injection systems configured to a particular application. Contact Spartan for additional information and recommendations.

Control Options

The standard SPARTOX system comes with automatic controls managed by an on board PLC. Our standard PLC is a ProFace PLC/HMI using a 6" monochrome screen with Ethernet communication capability. Spartan can also configured the SPARTOX with various Allen Bradley PLC/HMI combinations.

We also offer two options without PLC control:

OEM: A terminal strip is provided so that the OEM can use an existing PLC to control the SPARTOX unit.

Manual: Operator controls all settings. Ambient ozone monitor is interlocked with ozone generator directly to shut down the system. A passive back flow protection system is employed eliminating the venturi pressure transmitter and solenoid shut off valve (see P&ID on product cut sheet).



Instrumentation Options

Spartan offers various instrumentation packages for the SPARTOX system:

Ambient Ozone Monitor: *An ambient ozone monitor is standard for all SPARTOX systems.* The standard unit provides a digital read out of ambient ozone concentration with optional 4-20 mA output of ozone concentration value. The instrument has a relay integrated with the PLC to shut down the ozone generator in event ambient ozone levels exceed 0.1 ppm.

Dissolved Ozone/ORP: Spartan offers instruments for measurement and automatic control of dissolved ozone and oxidation/reduction potential (ORP) in water. The ozone generator output can be automatically maintained to achieve a targeted level of dissolved ozone or ORP in the treated water. Dissolved ozone or ORP monitors used have built in PID controllers. These are matched with ozone generators that are fitted with power output control circuits that respond to 4-20 mA signals from the PID controllers. The PID controllers are then able to increase or decrease ozone output to achieve a targeted residual ozone or ORP level. The monitors are typically mounted on the skid, but can alternatively be located at another point in the process and the signal wired back to the SPARTOX control panel

High Concentration Ozone Gas Monitors: Spartan can also provide high concentration monitors to follow the actual concentration of ozone gas from the ozone generator. If combined with the appropriate flow measuring devices, the combination can provide an accurate real time measurement of the amount of ozone produced in grams per hour or any equivalent units of measure.

Mass Flow Meter or Mass Flow Controller: The SPARTOX system can be configured with mass flow meter or controller versus the standard rotometer. These can be integrated with the PLC.

Data Logging

The SPARTOX PLC can be configured for data logging of instrument and operating information with download to a flash drive.

Communication and Monitoring

The standard SPARTOX system provides simple digital/analog inputs and outputs for integration into a larger control system. This would include permissive state for operation, positive acknowledgement of ozone production, fault condition and remote analog control of ozone generator power. Optional Ethernet communication is available.

The SPARTOX system can also be integrated with remote monitoring via analog telephone line or cellular network.



On Skid Degassing

Because most of the gas injected into the water is oxygen the overall treatment process normally requires a location where the liquid can be degassed. Often a tank within the treatment process can be used for this purpose. In some cases, removing the gas on the SPARTOX skid is required. SPARTAN can supply an integrated degassing system on the SPARTOX skid which removes non dissolved gas under pressure.

Ozone Destruction for Vent Gas

Whether the undissolved gases are removed on the skid or downstream of the SPARTOX system, they will contain a small amount of unreacted ozone. In some situations, the destruction of the ozone in the vent gas is required. If so, Spartan can provide a "catalytic" gas phase ozone destruct system compatible with the production and gas flow of the SPARTOX system.

UV Ozone Destruct of Dissolved Ozone in the Treated Water

In some applications ozone in the water can affect downstream processes or sensitive equipment. An example of such an application is where the ozone is applied prior to a membrane filtration system where the membranes may be damaged by elevated ozone levels. Where removal of the ozone from the treated water is required before use, Spartan can supply a UV systems for removing residual ozone from the liquid phase. Spartan can add a UV ozone removal system to the SPARTOX skid or as a separate piece of equipment if the treatment stage is remote to the SPARTOX skid.