Ozonation Pilot Plant

- Automatic pressure and temperature compensation allows direct entry of ozone dosage in mg/L in manual mode
- Maintains dissolved ozone concentration setpoint in auto mode
- Automatic calculation of ozone transfer efficiency and applied dosage
- Integrated oxygen generation system
- Automatic calculation of ozone transfer efficiency and applied dosage
- Ambient ozone concentration transmitter for ozone leak detection and automatic shutdown
- Feed pump with automatic flow control
- Chemical feed systems configurable for flow-pacing, closed-loop PID, or trim control
- Chemical feed pump configurable as a composite sampler
- Twenty-five equally-spaced sampling ports in contactor for decay analysis
- Influent piping weir eliminates need for feed tank
- All equipment integrated onto one skid for plug-and-play operation
- Designed for automatic un-manned operation
- Monitored and controlled remotely via wireless cellular connection
- Data logging to formatted text file for importing into spreadsheet and charting applications
- Historical and real-time trending visualization tool
- Alarm notification via email or text messaging
- IoT network of sensors provides exceptional diagnostic information
All information presented in this data sheet is for configuration code Z11-1PC-1GC-2OS-1TM-2DO-0PH-2CF. See ordering section for other configurations.

### Specifications

<table>
<thead>
<tr>
<th></th>
<th>Flow Rate</th>
<th></th>
<th>Contact Volume</th>
<th></th>
<th>Maximum Ozone Delivery</th>
<th>Ozone Concentration</th>
<th>Chemical Feed Systems</th>
<th>Chemical Feed Rate</th>
<th>Chemical Tank Volume</th>
<th>Operating Dimensions</th>
<th>Operating Weight</th>
<th>Electrical Supply</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Maximum Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2...10 gpm</td>
<td></td>
<td>130 gallon</td>
<td></td>
<td>80 (mg/L)(gpm)</td>
<td>8...13 %W</td>
<td>2</td>
<td>0.02...16.5 mL/min</td>
<td>4 gallon</td>
<td>90 X 48 X 74.5 inch</td>
<td>2286 X 1219 X 1892 mm</td>
<td>2800 lbs</td>
<td>Single Phase</td>
<td>120 / 240 V</td>
<td>60 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>303 (mg/L)(L/min)</td>
<td></td>
<td></td>
<td>0.02...16.5 mL/min</td>
<td></td>
<td></td>
<td></td>
<td>Single Phase</td>
<td>230 V</td>
<td>50 Hz</td>
<td>8.6 A</td>
</tr>
</tbody>
</table>

### Operation

#### Simple

Operation of ozone water treatment systems can be complex but our automatic control system makes it simple. In manual mode the dosage is entered directly in mg/L, eliminating the need for complex pressure, temperature, and concentration calculations. In auto mode the controller will vary the dosage to maintain a dissolved ozone concentration setpoint. The resulting transfer efficiency is calculated and displayed on the operator interface.

#### Safe

Most people can smell an ozone leak before it reaches a dangerous level, but the automatic control system includes an ambient ozone concentration analyzer that is used to shut down the ozone generator if a leak is detected. If the module is installed in an Intuitech Pilot Enclosure the automatic control system will run the ventilation system at maximum capacity until the ozone concentration is reduced to a safe level.

#### Reliable

The ozone gas system consists of an oxygen generation panel and an ozone generation panel. The oxygen generation panel includes a compressor, heat exchanger, particle filter, air dryer, and oxygen concentrator. The ozone generation panel consists of an ozone generator, particle filters, ozone concentration analyzer with automatic zeroing, and a pressure and temperature compensated mass flow controller. Both panels are monitored with an extensive network of diagnostic sensors including temperature, pressure, humidity, and oxygen concentration. This information is used for predictive maintenance to ensure reliability.
1. Fine Bubble Diffuser
2. Contactor
3. Ozone Destruct Unit
4. Contactor Sample Pump
5. Dissolved Ozone Transmitter
6. Ambient Ozone Transmitter
7. Chemical Feed System 1
8. Chemical Feed System 2
9. Status Beacon
10. Inlet, 1½" MPT
11. Outlet, 2" MPT
12. Drain Waste, 2" MPT
20. Oxygen Panel
21. Ozone Panel
22. Operator Interface
23. Folding Shelf
24. Control Panel
25. Air Conditioner
26. Power Transformer
27. Feed Pump

Dimensions: inch [mm]
**Data Logging**

The following parameters are automatically collected and stored for analysis. The collection is performed at a user-specified frequency from once per second to once per twelve hours. The values are time and data stamped and simultaneously written to a formatted text file on a removable flash drive and to a backup file on the internal solid state drive. These files can be transferred by removing the flash drive or using file transfer protocol over a remote connection.

<table>
<thead>
<tr>
<th>Contactor Water Flow</th>
<th>Ambient Ozone Concentration</th>
<th>Air Dryer Inlet Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contactor Dissolved Ozone Concentration</td>
<td>Oxygen Concentrator Inlet Pressure</td>
<td>Chemical 1 Dosage</td>
</tr>
<tr>
<td>Contactor Off-Gas Ozone Concentration</td>
<td>Oxygen Concentrator Inlet Dewpoint</td>
<td>Chemical 1 Flow</td>
</tr>
<tr>
<td>Diffuser Ozone Flow</td>
<td>Ozone Generator Inlet Oxygen Concentration</td>
<td>Chemical 1 Tank Level</td>
</tr>
<tr>
<td>Diffuser Ozone Flow</td>
<td>Ozone Generator Pre-filter Inlet Pressure</td>
<td>Chemical 2 Dosage</td>
</tr>
<tr>
<td>Air Compressor Inlet Pressure</td>
<td>Ozone Generator Pre-filter Outlet Pressure</td>
<td>Chemical 2 Flow</td>
</tr>
<tr>
<td>Air Compressor Outlet Pressure</td>
<td>Ozone Generator Post-filter Inlet Pressure</td>
<td>Chemical 2 Tank Level</td>
</tr>
<tr>
<td>Air Compressor Outlet Temperature</td>
<td>Ozone Generator Post-filter Outlet Pressure</td>
<td>System Diagnostic Data</td>
</tr>
</tbody>
</table>

**Remote Operation**

The pilot module is designed for fully automatic un-manned operation and can be monitored and controlled remotely. A wireless cellular router is installed in the control panel. This device can provide remote access to the pilot module in locations where adequate cellular data service is available. The router can be configured for the Verizon or AT&T networks depending on which network has the best service at the installed location. Data service is included during the warranty period. Data service beyond the warranty period can be purchased from Intuitech in one year blocks. Any task normally performed using the operator interface can also be performed remotely using a laptop computer, tablet, or smartphone. The operator interface can also be configured to send alarm notifications via email or text messaging.

**Warranty**

Equipment manufactured by Intuitech is warranted to be free from defects in material and workmanship for a period of one year from the date of manufacture. In the event of any defect in material or workmanship, Intuitech will repair and/or replace, at its option, part or parts, which are proven to have been defective, provided the Buyer provides written notice of the defect during the warranty period. The Buyer shall notify Intuitech of the preferred location of repair. If the defective equipment is returned to Intuitech’s manufacturing facility, the Buyer is liable for all costs associated with removal, shipping and re-installation of the equipment. The Buyer must obtain authorization from Intuitech prior to return of the equipment. If the defective equipment is repaired at the Buyer’s site, the Buyer is liable for travel costs, including, but not limited to, airfare, auto rental, hotel, meal per diem and transit time to and from the site charged at a rate of $125 per hour. The Buyer must provide a purchase order for the amount of the estimated charges before travel arrangements will be made. If the defect has resulted from improper storage, installation, operation or maintenance of the equipment, Intuitech reserves the right to reject the warranty claim. Intuitech makes no warranty, express or implied, other than the foregoing express warranties.

**Ordering**

Our standard Ozonation Pilot Module can be configured as shown below. It can also be customized to meet specific requirements for an additional cost. Please contact Intuitech for more information.

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Z___-__PC-__GC-__OS-__TM-__DO-__PH-__CF-___
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Options:
- RPS (reusable packaging system)
- UPS (uninterruptible DC power supply)
- SIU (SI units)
- EIP (Ethernet/IP SCADA connection)
- SAI (spare analog input module)

Number of Chemical Feed Systems: 0, 1, 2, 3
Number of pH Transmitters: 0, 1, 2, 3, 4
Number of Dissolved Ozone Transmitters: 1, 2, 3, 4
Transfer Method: 1 (Fine Bubble Diffuser), 2 (Side Stream), 3 (Both)
Oxygen Source: 0 (None), 1 (Dual CG Cylinders), 2 (Oxygen Generator)
Ozone Generator Capacity: 1 (20 g/h)
Feed Pump Capacity: 1 (2.0...12.2 gpm)
Contactor Pump Capacity: 1 (6 feet high, 130 gallons), 2 (15 feet high, 130 gallons)
Number of Trains: 1, 2