Application Data Sheet
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Ozone Measurement In Potable Water

BENEFITS

- Direct Ozone Measurement
- Reduce technician workload
- Improve environmental compliance

BACKGROUND

Ozone is a powerful oxidizing agent that can be used to destroy the organic compounds that affect the taste and odor of potable water. Environmental concerns have led to increased use of ozone because, unlike chlorine, it does not form hazardous by-products.

Ozone is a powerful oxidant. Its effectiveness is measured by the amount of residual ozone remaining after disinfection. The presence of a small residual implies that all organic compounds have already been sterilized. Ozone use also increases the dissolved oxygen content of the stream that converts sulfides, sulfites, and nitrites to sulfates and nitrates leaving an insoluble easily removed surface scum.

PROCESS

Ozone gas is produced by electrical discharge in air. The gas is injected into a contact chamber via diffusers to distribute the gas evenly and speed the disinfection process along. The ozone concentration in the contact chamber, where reaction is still occurring, can therefore be much higher than in the final effluent. Some ozone generator manufacturers recommend monitoring ozone concentration in the contact chamber to meet disinfection requirements (i.e. exposure to .4 ppm of ozone for 4 minutes). Aside from the capital cost of the ozone generator itself, the main cost of an ozone system is the electricity used.

Measuring residual ozone concentration can lower energy costs **and** verify continuous disinfection of the treated water. Figure 1 describes the process of ozone measurement in potable water.

INSTRUMENTATION

The Rosemount Analytical Model 1056 Ozone analyzer and the Model 499A OZ Ozone Amperometric sensor can be used to monitor ozone residual in the contact chamber or in the treated water. The Model 499AOZ sensor is covered with a gas permeable membrane specific for ozone that eliminates interference from chlorine, bromine, peroxide, or their by-products. The amperometric sensor develops a current that is directly proportional to the ozone residual. A minimum velocity of 1 ft/sec flowing past the sensor is required for accurate measurement. A Pt 100 RTD is embedded in the sensor for temperature compensation.

The Model 1056 converts the current and temperature signals to an ozone residual concentration.The analyzers produce a programmable 4-20 mA output that can be used directly for control of the ozone generator. As an alternative, the Model Xmt-A can be used if a two wire installation is preferred. The Xmt-A comes with choice of Digital protocols: 4-20mA with superimposed HART® or FOUNDATION® Fieldbus.

INSTRUMENTATION

Model 1056 Dual Input Analyzer

- Easy to use menu structure.
- Large display.
- Single or dual ozone measurements.
- NEMA 4X (IP65) Rated enclosure.

Model 499A OZ Dissolved Ozone Sensor

- Direct Ozone Measurement.
- Chemically resistant Polysulfine body withstands higher ozone concentrations.
- Easy to maintain sensor requires no special tooling.

Model Xmt-A Transmitter

- Choice of HART or Foundation Fieldbus Digital communications.
- NEMA 4X (IP65) Rated enclosure.
- Easy to use menu structure.

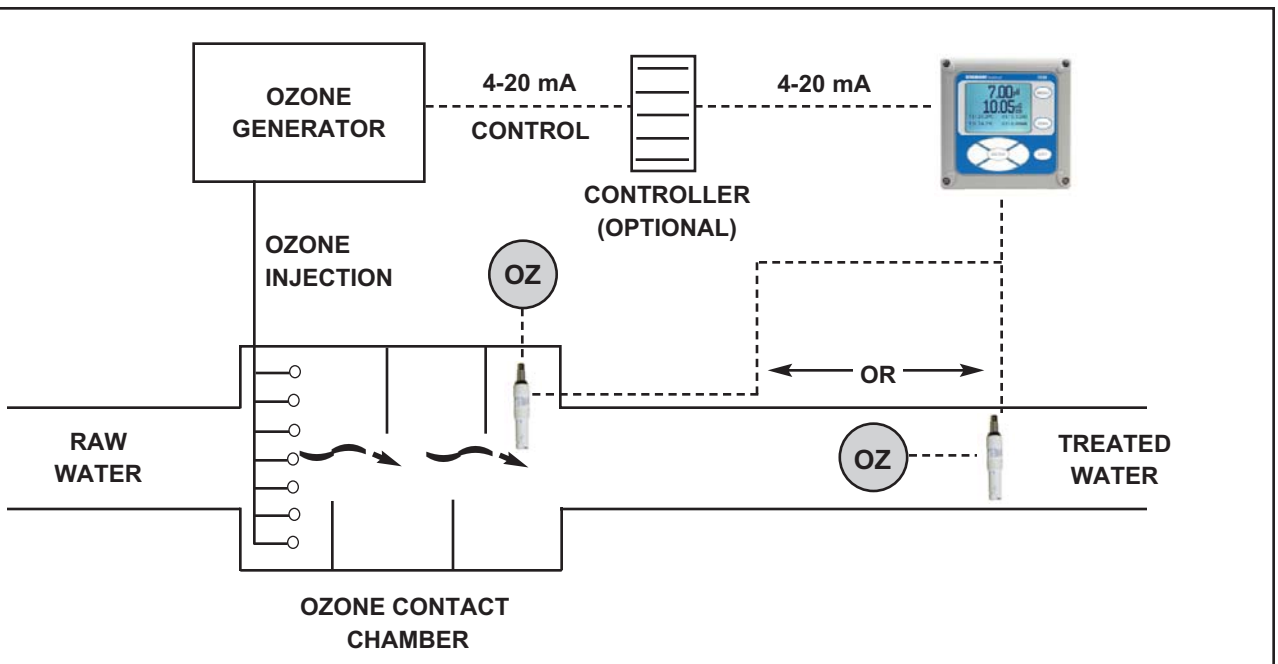

FIGURE 1. Ozone Measurement in Potable Water

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