

Tighter Controls Promote Chlorine Dioxide Savings

Chemical dosing for disinfection in the drinking water treatment process can be an expensive and tedious task. Many municipalities struggle to keep down the cost of chemicals, power, and maintenance while devoting an extensive amount of labor to making hourly checks.

However, there is an alternative that is both effective and economical.

For drinking water treatment operations that could benefit from superior efficiency, accuracy, control, and safety, the JCS Industries Model 4180 Chlorine Dioxide Generator provides a significant advantage over other technologies. The 4180 contains a vacuum injector with an inline flow meter that safely introduces and accurately measures chlorine dioxide going into the source water stream while allowing for continuous monitoring and automatic adjustment.

It is available as a two- or three-precursor model — either of which can be remotely monitored and controlled from a user's SCADA — and is currently in use by plants of every size across the country.

Key Differences In Technology

The two-precursor version of the 4180 uses dual reversing servo motors coupled with v-notch valves to regulate the chemical feed rate, as well as an electronic flow sensor for the sodium chlorite and a calibrated borosilicate glass rotameter for chlorine gas. The three-precursor version



uses triple reversing servo motors coupled with v-notch valves to regulate the chemical feed rate, as well as an electronic flow sensor for the sodium chlorite, sodium hypochlorite, and hydrochloric acid. Both versions generate a more than 95 percent chlorine dioxide solution.

The 4180 is essentially a plug-and-play machine that is available as a freestanding or mounted unit. It can be adapted to automatically adjust based on plant flow, pH from an analyzer, or a compound loop control.

Other equipment typically relies on a rotameter tube instead of inline flow

meters. While this isn't an issue with gas, it can cause problems with liquids. Since there is no feedback from the rotameter to the controller, it is difficult to accurately know how much liquid is being fed as water quality managers only know the volume at the start. As soon as they walk away, variances can arise and go undetected. This also forces water plant personnel to return hourly to perform manual checks.

The 4180 automatically tells how much chemical is being fed and can be monitored from SCADA.

Rotameter-based chlorine dioxide feeders

are also subject to air binding, when air bubbles are released by sodium chlorite and sodium hypochlorite, as well as scaling or debris in the chemical supply. Any of these can impede measurement performance. By comparison, if the 4180 detects an air bind or trash in the system it will open to full flow to attempt to pass the obstruction, then return to normal flow.

A Solid Business Case For The 4180

While features are important, it's critical to analyze the overall lifecycle costs for the 4180 versus competing equipment when looking for a new or replacement chemical feeder.

Rotameter-based chemical feeders only offer an accuracy rate of about +/- 4.0 percent, whereas the 4180 offers +/- 0.25 percent. With tighter control of chemical usage, the 4180 saves money by avoiding overfeeding. Competing models also cost more for annual maintenance because of their design (each unit uses two rotameter

tubes and two valve assemblies, whereas the 4180 contains just one gas rotameter and no maintenance to the flow meter is necessary). Additionally, the 4180 uses significantly less power — at 110 volts and 20 amps, maximum — than other models that rely on three-phase power.

The ability to redirect labor for other uses is another benefit. Competing systems require hourly checks to ensure that the settings hold, as well as manual changes to make any desired adjustments. The 4180 can be checked or adjusted from SCADA. Although it is still recommended to perform several manual checks per day, the 4180 offers more trust for water quality managers.

However, the largest cost savings usually comes from the sales structure offered by JCS Industries.

Many equipment vendors use lease agreements that provide the chlorine

dioxide feeders for “free,” but they contain an expensive service contract and require customers to purchase chemicals from them at a significantly higher price than market rates. With the 4180, municipalities have one capital expenditure, the equipment purchase, and are encouraged to go to the market to find the best prices on chemicals. A service contract is optional.

A municipality with a 10 MGD water treatment plant, for example, purchased two 4180s and cut its price for sodium chlorite from \$1.35 per pound to 55 cents per pound. This generated a \$75,000 savings in the first year, which was enough to pay for both machines.

When ease of operation, accuracy, safety factors, and overall costs are considered, the 4180 presents a solid investment for equipping new and upgraded facilities or simply to replace less effective technology. ■