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Special Ultraviolet(UV) Water Treatment Systems Provide Continuous, Cost-Effective Breakdown of Chloramines At Multi-Pool Facility

Enhance Facility Appeal While Reducing Costs For Chloramine Control

Kalispell, Montana --- Use of special ultraviolet(UV) water treatment systems for lap, spa, and therapy pools at The Summit here has resulted in continuous and effective breakdown of chloramine contamination that is necessary for the facility to meet its dual mission of promoting both health and fitness. While significantly enhancing the facility's appeal and effectiveness, the devices have also dramatically cut costs for chloramine control.

"We won't operate unless the water is healthy, and the UV systems have proven to be the avenue to get there for all three facilities," said Dr. Brad Roy, FACSM, The Summit's director. "Previously, water conditions were often requiring us to drain and refill daily---sometimes twice daily---and then reheat, add new treatment chemicals, and wait for required measurements. Since we installed the UV, we haven't had to do those things at anywhere near the previous level, plus our customers no longer have the inconvenience of the frequent downtime."

The maker of the UV systems, Aquionics Inc. of Erlanger, KY, provides a special photolytic chamber surface, which it says promotes formation of hydroxyl radicals that enhance the breakdown of chloramines. The company was introduced to Dr. Roy by Abel Engineering, a Kalispell pool design firm.

"I had studied the technology thoroughly, and when I heard about The Summit's difficulties, I thought it might be a good fit for them," said Tom Abel, P.E., the firm's principal. "In addition to being familiar with the widespread successful use of UV for various water treatment applications, I knew the Aquionics UV system was specially designed to solve problems previously associated with efforts to treat pool water."

Dr. Roy, whose Ph.D. is in exercise physiology, describes The Summit as a 117,000 sq. ft. wellness center, completely integrated with Kalispell Regional Medical Center's programs in cardiac and pulmonary rehabilitation, physical therapy, occupational therapy, speech therapy, occupational health, workplace wellness, and community health education, while also providing a standard fitness center.

"We have over 7,000 members, which represents about 10% of the population of the valley," he stated. "My concern was providing the healthiest environment possible for all our pool facilities."

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The UV system for the 75', 130,000-gal. lap pool treats water at a typical rate of 480 gal./min., and reaches as high as 550 gal./min. during optimum filtration. In the therapy pool, the typical rate is 180 gal./min., while the spa pool is treated at about 140 gal./min. Abel said the UV installations were easily handled by a plumber and electrician, requiring only "cutting into a pipe, putting the device in-line in its proper place, mounting an electrical control panel on the wall, and wiring it in."

Trina Stivers, the facility's aquatic director, is enthusiastic about both operational and marketing benefits that have been realized.

"Our chloramine level had been out of control in the lap pool, ranging from 0.5 ppm to 3.0 ppm, and we could never reach break point," she recalled. "Instructors and customers were having respiratory problems, and also were complaining about the water's taste and smell, and having their swimsuits wearing out within a month of purchase."

"And there were frequent breakdowns of the pool ventilation system caused by visible corrosion. The pool heater also broke down from overwork, because we had to dump 6 to 12 inches of the pool nightly as well as several gallons per hour during the day. We then added fresh water, heated it, and added chemicals continually to remain within the state guidelines of chloramine 0.5 ppm max. and total chlorine 1.0 to 2.0 ppm."

"After installing the UV system, we noticed immediate favorable changes in water taste and smell, and over a period of three months, we saw a drastic change in the chloramine level---so much that we bought more precise test equipment to be sure. The level now ranges from 0.0 to 0.3 ppm, with an average of 0.17 ppm."

"Customers report they are no longer having respiratory problems, or leaving with hair and skin that is dry and smelling of chlorine. And they say their swim suits are lasting as long as a year, without fading or losing elasticity. Our excellent water quality has been featured in pool program advertising, and the advertising has steadily increased attendance."

"We decreased fresh water intake to just a few gallons per hour during the day---about 10% of what it used to be---and we're not dumping water at night at all anymore. We are no longer using the extra quantities of pool chemicals, and we stopped having problems with the pool heaters and the ventilation system, as well as the corrosion of ceiling pipes and water running down walls that had begun to occur as a result of loss of the ventilator's dehumidifying function."

Stivers estimated previous costs of \$3000-4000 for each of a series of incidents involving breakdown of her pool heating system or ventilation system, which required deployment of extra manpower and chemicals, as well as changes in normal operating procedures. In addition to no longer suffering these costs, she feels undetermined savings have also been realized in the facility's water and sewage bills. She reports subsequent installation of UV systems for the smaller therapy and spa pools have also been very successful.

Larry Leimkuehler, The Summit's maintenance facilities supervisor, estimated the UV systems had cut routine, ongoing chemical costs by 10-15%.

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“We’ve gotten way below the state regulations without using as much chemical input, in pools that have very heavy user loads,” he said. “We’re now testing for chloramine and total chlorine with an ORP automatic reader, and manually using DPD 1A & 1B and DPD 3, and use a phenol red indicator to easily keep pH at 7.5.”

Stivers said the lap pool load is about 1000-2000 people per day, with the spa pool and therapy pool each seeing about 300-1000 users per day. The therapy pool is maintained at a temperature in the low 90’s, while the other pools are maintained at about 83°. Air temperature ranges from 80-85°.

ORP(Oxidation Reduction Potential) is a measure of the total reactivity of chemicals in the water. DPD(N,N-Dethyl-P-Phenylenediamine) is an organic colorimetric indicator used for the determination of chlorine, bromine, ozone, and other reactive oxidizers.

Tom Abel explains that the offensive chlorine odor reported by pool users, as well as the other related problems reported at heavily used indoor facilities like The Summit, is the result of the formation of trichloramine in the water, which occurs as a result of the interaction between chlorine added as a disinfectant and urea added by bathers through sweat or urine. The compound typically settles over the water in a gaseous layer 1-2” thick, where it readily encounters swimmers.

“It can be very hard to get rid of,” he noted, “usually requiring shutdown, or excessive dosing of chlorine to reach breakpoint. And as chlorine is taken up in the formation of chloramines, most of its disinfectant properties are lost. Applying UV not only provides for continuous breakdown of chloramines back into chlorine and nitrogen, eliminating the need for shutdowns or breakpoint chlorination, but also adds its own germicidal affect.”

Aquionics explains that ultraviolet light in the wavelength range of 200-300 nm is known to be lethal to microorganisms by disrupting their reproductive mechanism. In addition to the special chamber lining, it says its UV systems feature a high-intensity ultraviolet lamp that is 20 times stronger than standard UV lamps, as well as an automatic cleaning mechanism to keep oxides and dead bacteria from accumulating and inhibiting its function.

The company adds its systems are fully automated, and require a minimum of maintenance throughout the year. If continually run, lamps are said to require replacement annually, with staff capable of performing the task in fifteen minutes, with pumps remaining on. Its UV systems are readily integrated into an existing operation, with extensive performance data available for record-keeping and/or sending to a remote location for continuous monitoring.

For further information, contact Aquionics Inc., 21 Kenton Lands Road, P.O. Box 18395, Erlanger, Kentucky 41018, Tel. (800) 925-0440, Fax (606) 341-0350, sales@aquionics.com, www.aquionics.com.

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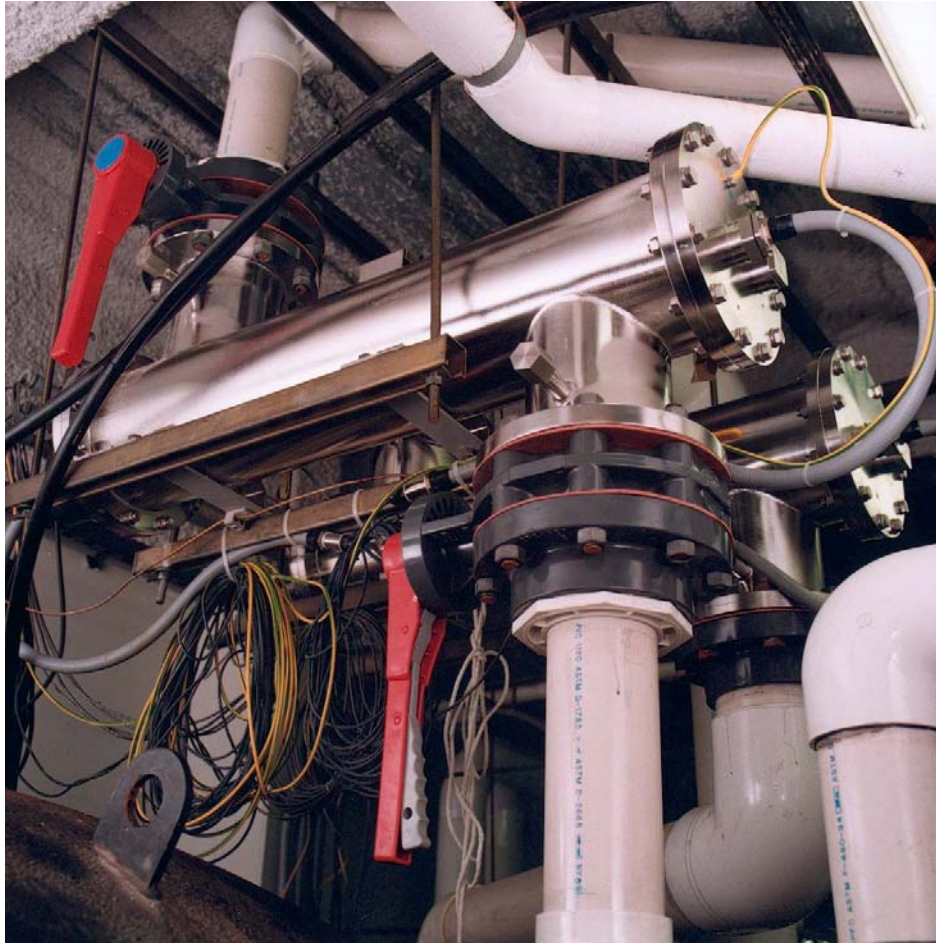


Photo #1:

Special ultraviolet water treatment systems for lap pool and therapy pool at The Summit in Kalispell, MT were deployed in adjacent installations to suit space convenience. Unit for lap pool typically treats water at 480 gal./min., reaching as high as 550 gal./min. during optimum filtration. Unit for therapy pool typically treats at 180 gal./min.



Photo #2:

Successful experience with installation of special ultraviolet(UV) water treatment systems for lap and therapy pools at The Summit in Kalispell, MT led to installation of third system for facility's spa pool. Unit there treats water at about 140 gal./min. All installations were easily handled by a plumber and electrician.



Photo #3:

Each of three special ultraviolet(UV) pool water treatment systems at The Summit in Kalispell, MT features its own control panel, with extensive performance data available for record keeping and/or sending to a remote location for continuous monitoring. Testing of pool water at The Summit for chloramine and total chlorine is performed with an ORP (Oxidation Reduction Potential) automatic reader, and manually through DPD (N,N-Dethyl -P-Phenylenediamine) 1A & 1B and DPD 3.