Central Drinking Water Systems

- Kill bacteria and organisms
- Remove suspended solids
- Remove lead and chemicals
- Improve taste, color, and odor
- Provide cold & clean water

Drinking water purification & refrigeration systems engineered for the ultimate protection of your most important assets
• Structurally rugged welded steel frame with powder finished aluminum easy-access enclosure panels. Stainless steel panels are optional.
• Large capacity, insulated stainless steel reservoir and stainless steel close-coupled circulating pumps. Redundant components available.
• Refrigeration can be external or self-contained using water cooled, air cooled, or split system designs. R-22 and other refrigerants available.
• Standard analog controls includes capacity and common refrigeration controls, safeties and water system gauges.
• Water side controls include automatic air vent and pressure relief valve.
• Custom designs to meet any thermal and flow capacity.
• UV, particulate and Reverse Osmosis systems available.

UV Disinfection Systems
• Particulate and Sediment
• Phosphate Feed Systems
• Activated Carbon Cartridges
• Lead Removal Systems
• Lime-Scale Removal
• Corrosion Prevention

Ultraviolet Disinfection Basics

In use for over 50 years, UV Light continues to be an effective method eliminating many organisms from drinking and source water. UV light penetrates the organism’s cell wall and cytoplasmic membrane to alter the DNA structure, making reproduction impossible.

Different organisms require different dosages of UV to be effective. The table below shows the average UV Dose (mJ/cm²) required:

<table>
<thead>
<tr>
<th>Organism</th>
<th>UV Dose (mJ/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryptosporidium parvum</td>
<td>4.9</td>
</tr>
<tr>
<td>Giardia lamblia cysts</td>
<td>5.0</td>
</tr>
<tr>
<td>Vibrio cholerae</td>
<td>1.4</td>
</tr>
<tr>
<td>Shigella dysenteriae</td>
<td>1.2</td>
</tr>
<tr>
<td>Escherichia coli O157:H7</td>
<td>2.8</td>
</tr>
<tr>
<td>Salmonella enteritidis</td>
<td>7.0</td>
</tr>
<tr>
<td>Legionella pneumophila</td>
<td>5.1</td>
</tr>
<tr>
<td>Hepatitis A virus</td>
<td>11</td>
</tr>
<tr>
<td>Coxsackie B5 virus</td>
<td>14</td>
</tr>
</tbody>
</table>

Advantages of UV Treatment

• No toxic byproducts
• Works across range of temp and pH.
• Requires little maintenance
• Eliminates handling chemicals
• No danger of over-dosing
• Requires low contact time
• Removes some organic compounds
• Can improve taste

Application Requirements

UV radiation is not suitable for water with high levels of suspended solids, turbidity or soluble organic matter.

WHEN THE PENTAGON AND WHITE HOUSE SELECTED THEIR DRINKING WATER SYSTEMS, THEY SPECIFIED ARCTICCHILL!

Water Chilling
Cooling for drinking water can be accomplished by refrigeration (see front cover) or by heat transfer. System shown has double-wall plate and frame heat exchanger to use existing utility chilled water.

Sturdy Contraction and Corrosion Free

Standard design features corrosion free mill-finished white aluminum panels with epoxy coated structural steel welded frame. System shown has 304 Stainless Steel enclosure panels.

UV Monitoring

Ultraviolet light is emitted from a cylindrical quartz tube available in various diameters and intensities housed in a stainless steel chamber. Useful life ranges from 10,000 to as much as 17,000 hours depending on the type of tube. UV intensity is monitored using a panel mounted meter. Operators have easy access to lamps and sensors for periodic replacement and calibration.
Low-Cost Skids to Complete Systems

Pre-engineered, skid mounted drinking water systems that can be equipped with activated carbon and pre-filters for simplified, single connection-point service.

- Rugged welded steel frame
- Stainless steel filter housing
- Easy access for service
- Low installed cost
- Effective for 10-15 gpm

Choose From Several Treatment Methods

Systems can include several types of filtering and water treatment methods within one system. Common requirements are for pre-filters, Ultraviolet treatment, activated carbon, phosphate feed and lead removal. Filters can be installed within the cabinet as shown or out-board (see the cover) to facilitate easy-access cartridge replacements. Photographed before final insulation, all systems have 100% non-ferrous liquid path and fully insulated with closed-cell insulation.

Central Reservoir

Large insulated stainless steel reservoir stores purified water. System is designed to continuously recirculate chilled water to point-of-use drinking fountains. System shown has 450 gallon reservoir capacity.

Water Circulation

Accomplished with mounted pumping systems. Shown is a dual stainless-steel pump system in an automatic lead/lag control.

Ease of Service

Facilitated by easy-access panels, analog or PLC controls with user-interface, and various gauges for pressure, temperature or flow.

Drinking Water Pathogens and Contaminants

Pathogens

Microbes that include bacteria, viruses, protozoa and other organisms that are known to cause disease.

Coliforms

A group of closely related bacteria that live in water. Total coliform count is an indicator of fecal matter contamination.

Cryptosporidium

A single-celled protozoa that causes disease when ingested. Severity of disease can range from mild stomach upset to life-threatening.

Giardia Lamblia

Another single-celled microbe known to cause Giardiasis, a gastrointestinal disease that results in diarrhea, fatigue and cramps.

Protozoas

Microscopic, usually single-celled microbes. Relatively much larger than other microbes, Protozoas often eat bacteria. Many are parasitic in humans.

Disinfection Byproducts

Are formed when disinfectants used used in water treatment react with bromide or organic matter. Byproducts such as Trihalomethanes, haloacetic acid, bromate and chlorite are examples.

Turbidity

The cloudy appearance of water caused by the presence of tiny particles. High levels of turbidity may interfere with proper water treatment and monitoring.

Lead

In children, exposure to lead can result in delays in physical and mental development, along with deficits in attention span and learning abilities. In adults, it can cause increases in blood pressure and kidney disease. Lead enters tap water through corrosion of plumbing materials. The most common problem is with brass or chrome-plated brass faucets and fixtures which can leach significant amounts of lead into the water, especially hot water.
**Genuine ArctiChill UV Lamps and Filter Media**

**Indium Amalgam UV Lamp** - Provides up to three times the output of standard low pressure lamps, allowing systems to be designed with lower cost components such as ballasts and sleeves. UV systems include electronic ballast designed to support the use of IA Lamps. Unique design provides greater water temperature range of effectiveness including chilled drinking water.

**Granulated Carbon Cartridges and Bags** - Carbon filters, using granular activated carbon (GAC) or a carbon block are effective at removing a variety of organic contaminants and chlorine; are slightly effective removing a few dangerous heavy metals, but have no capacity at all to remove dissolved mineral salts or nitrates. ArctiChill provides carbon treatment as filter cartridges as well as in bag form for larger housings. ArctiChill provides customized housings to retain carbon materials and make service easy.

**Phosphate Crystal Cartridges** - Contains food-grade haxametaphosphate which dissolves slowly in water to prevent scale and rust buildup. All materials are FDA grade. Highly effective at treating scale, corrosion, and iron problems at various flow rates and concentrations. Equipped in ArctiChill Phosphate Feed Systems, all water passes through the crystal bed. Intended for applications below 100°F as the rate of use will increase with warm water. Water being treated should have no more than 15 GPG hardness and a pH range of 6.5 to 9.0.

**Lead Removal Cartridges** - ArctiChill lead removal cartridges employ specially formulated ceramic lead removal media plus pulverized activated carbon to reduce lead concentrations up to 99% with very short contact time. The material works well in hard water and in the presence of iron and manganese. Performance is relatively unaffected by pH.

**Particulate Filter Cartridges** - Pleated polypropylene filters remove solids down to 5 microns in size and are effective as general purpose final or pre-filter cartridges. Pre-filtering is recommended to protect downstream RO and carbon filters. ArctiChill water treatment skids use this cartridge design within a stainless steel housing for applications from 10-15 gpm.

**Acid Neutralizing Cartridges** - Calcium and magnesium media is dissolved upon contact with acidic water, raising the pH of the water and increasing the alkalinity. This eliminates the effects of corrosive water chemistry. Calcium carbonate media corrects pH only enough to reach a non-corrosive equilibrium. Magnesium oxide is more reactive, and is used where pH correction is substantial or high flow rates are required. Both media types can be blended. Magnesium oxide can neutralize up to five times as much acidity than calcium carbonate media.