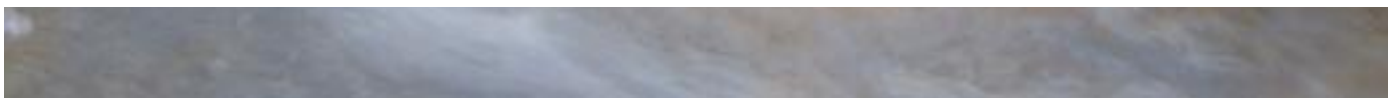




# Aquarius<sup>®</sup>: Pre-engineered conventional water treatment

Water Technologies

**SIEMENS**





*This 4.75 MGD Aquarius® plant is located on the Isle of Wight off the coast of England.*

## The keys to Aquarius® systems

The Aquarius family of modular and pre-engineered treatment systems combines the conventional treatment steps of flocculation, sedimentation and filtration. The family includes the modular Aquarius® system and the smaller, factory-assembled Water Boy® unit. Aquarius® products are among the most compact and efficient water treatment systems ever designed. Three Microfloc technologies – tube settlers, the Mixed Media filter and the Aquaritol® III process controller – combine with chemical feeders, influent flow control, flocculation, process valves and an automatic backwash controller to provide a complete and compact treatment system.

### Complete, Self-contained Treatment

Aquarius® and Water Boy® plants deliver complete, high-performance water treatment, with no shortcuts. Standardized design and manufacturing procedures reduce cost and size without sacrificing superior treatment process efficiency and quality. The plants can treat water from nearly any source to clarity levels of 0.1 turbidity units and correspondingly low levels of

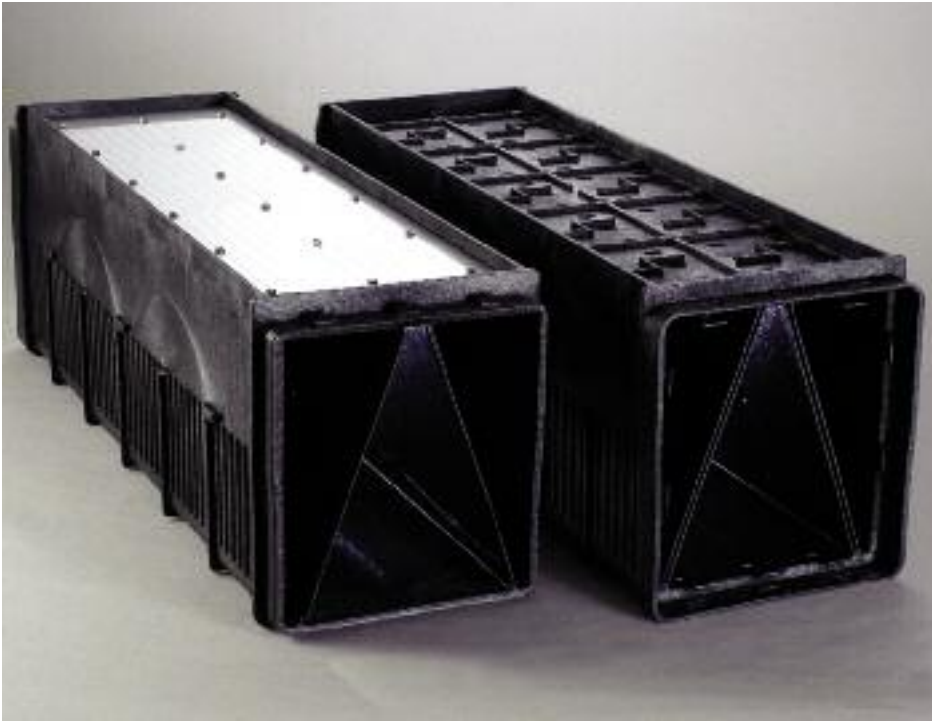
color, iron and manganese. Capacities range from 10 gpm to several million gallons per day.

The smaller Water Boy® unit, is available in capacities of 10, 20, 60 and 100 gpm. It is ideally suited for small communities, low-flow industrial applications, resorts and recreation sites.

### Simple Operation

The modular Aquarius® and Water Boy® units are uncomplicated plants with excellent performance characteristics. They are designed for constant rate operation, greater reliability and simplification of process controls.

All working parts are easily accessible. Flocculator mechanisms with adjustable blades are mounted in the tanks. Sludge is automatically withdrawn during each backwash without the use of scrapers, and backwash is initiated on headloss, time or manually using a PLC. Coagulant dosages for Aquarius® units are changed automatically using the Aquaritol® III chemical control system. Both systems are reliable and simple.



MULTIBLOCK® underdrain and Laser Shield™ retainer



Mixed Media as placed (left) and after backwash.

### Tube Clarification: More Efficient Solids Separation

Another Microfloc® products development is the concept of settling tubes. Tube settlers greatly increase the effective clarifier settling area and reduce the distance a particle must fall to strike a settling surface from several feet to 2 inches.

All Aquarius® treatment plants include 7½° tubes, which put into practice the theory of shallow depth sedimentation and provide more efficient settleable solids removal. Solids accumulated during operation are flushed from the tubes during each filter backwash.

### Mixed Media Filtration: High Performance Filtration Technology

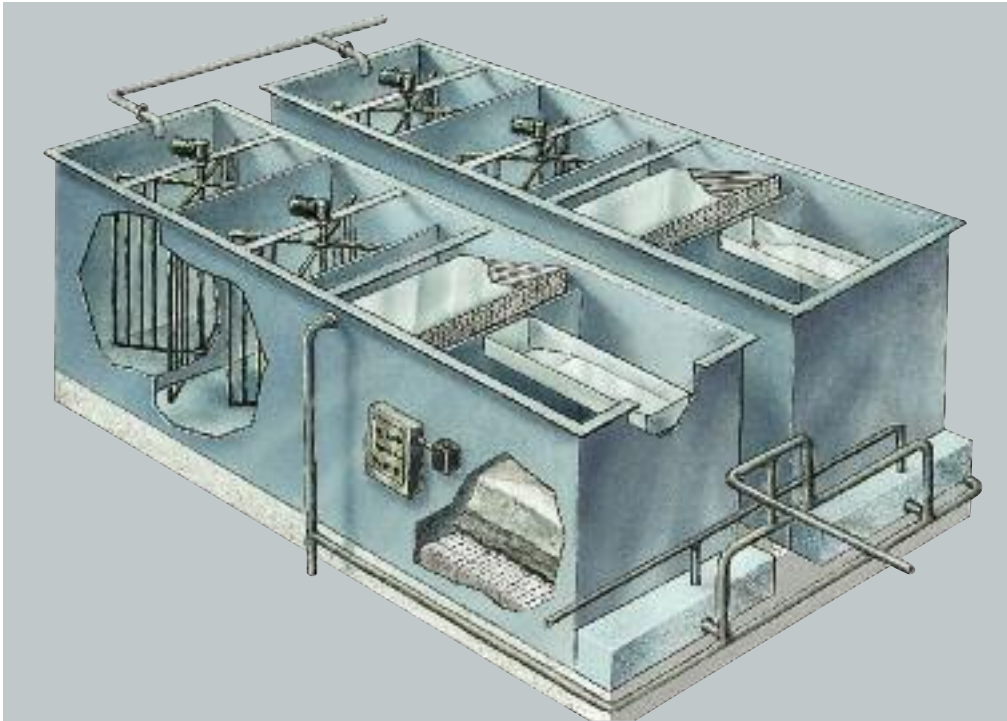
Mixed Media filters are a significant advancement in high-rate, high-performance filtration technology. Three or more granular materials of differing size and specific gravity produce a filter that is coarse near the top of the bed and has a progressively finer pore and grain size toward the bottom.

Solids removal is spread throughout the Mixed Media filter depth, allowing long, high-rate runs and producing a measurably better effluent quality. The bottom layer of fine media creates superior quality and breakthrough resistance.

All Microfloc® water and wastewater filter systems utilize Mixed Media. Additionally, most existing filters can be converted to Mixed Media to increase plant capacity without increasing plant size.

### MULTIBLOCK® Underdrain

The MULTIBLOCK® underdrain is a dual lateral design to ensure uniform collection of finished water and even backwash water and air distribution. The Laser Shield™ media retainer directly supports the Mixed Media without requiring gravel support. All components in contact with the water are constructed of corrosion-resistant materials. Once installed, the entire bottom of the filter is protected from corrosion by the securing grout.



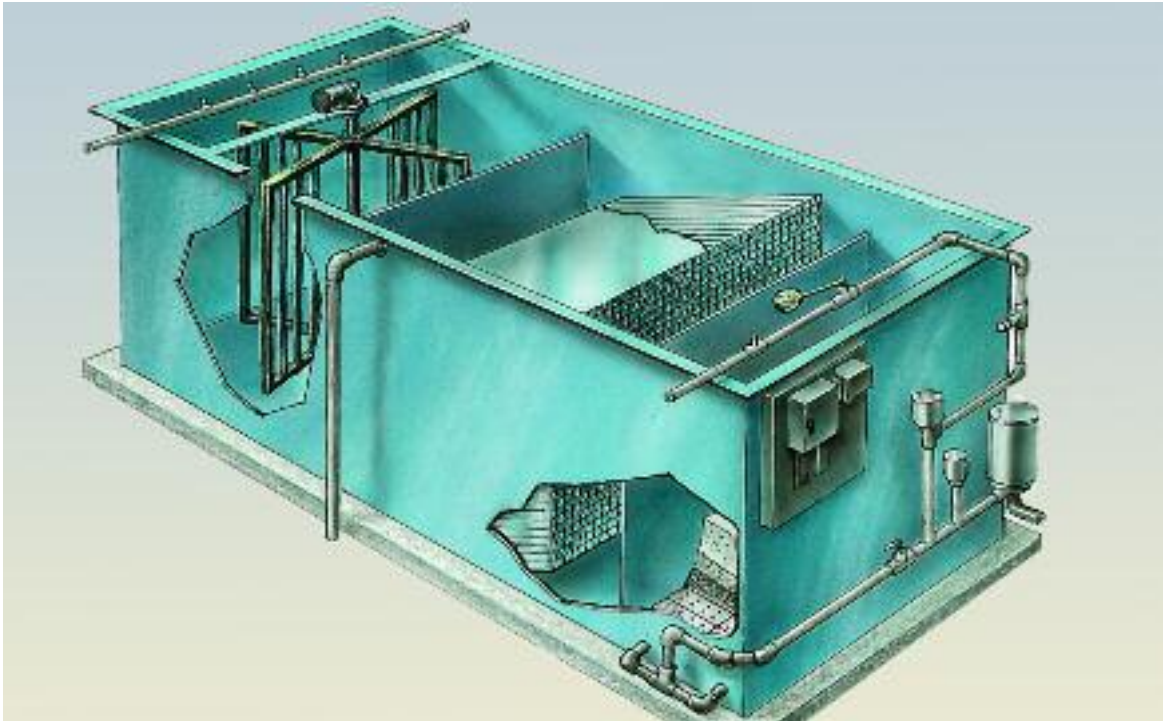
## Aquarius® System

The modular Aquarius® water treatment system treats surface or ground water with coagulation, two-stage flocculation, 7½° tube settler clarification and Mixed Media filtration. Because the Aquarius® design offers more tube volume than the Water Boy® unit and more flocculation time than our Trident® system, the Aquarius® system can handle higher raw water turbidity and color. Standard flow range is 350 to 1400 gpm per two tank system.

### Advantages of Aquarius® include:

- Modular construction
- Effective removal of turbidity, color, iron, manganese and arsenic
- Two complete process trains to permit uninterrupted water service, even when one unit is being backwashed
- Automated operation
- Excellent for high turbidity waters

	MODEL	AQ-70B	AQ-112B	AQ-150B	AQ-300B
Nominal Flow	GPM	350	520	700	1400
Dimensions (Per Tank)	Length	23 ft.10 in.	26 ft. 7 in.	29 ft. 3 in.	39 ft. 11 in.
	Width	6 ft.9 in.	8 ft. 4 in.	9 ft. 9 in.	11 ft. 11 in.
	Height	8 ft.1 in.	8 ft.1 in.	8 ft.1 in.	10 ft.1 in.



## Water Boy® System

The Water Boy® unit provides coagulation, flocculation, 7½° tube settler clarification and Mixed Media filtration in a single, compact tank unit. Standard flow range is 10 gpm to 100 gpm. Multiple units can be used for larger flows.

### Advantages of Water Boy® units include:

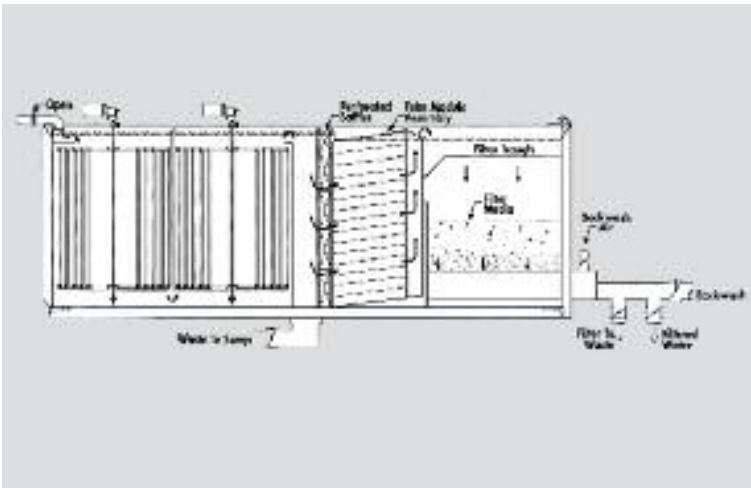
- Units up to 100 gpm shipped completely assembled (except chemical feeds)
- Low installation costs
- Automated operation
- Hydraulically designed to operate at 35% above design
- Suitable for industrial pretreatment, wastewater reclamation and arsenic removal, as well as potable water applications

	MODEL	14	27	82	133
Nominal Flow	GPM	10	20	60	100
Shipping Dimensions	Length	7ft.0 in.	5ft. 10in.	8ft. 9in.	16ft. 0in.
	Width	4ft.0in.	4ft. 8in..	7ft. 7in.	7ft. 6in.
	Height	5ft.0in.	6ft.10in.	7ft.6in.	7ft.6in.

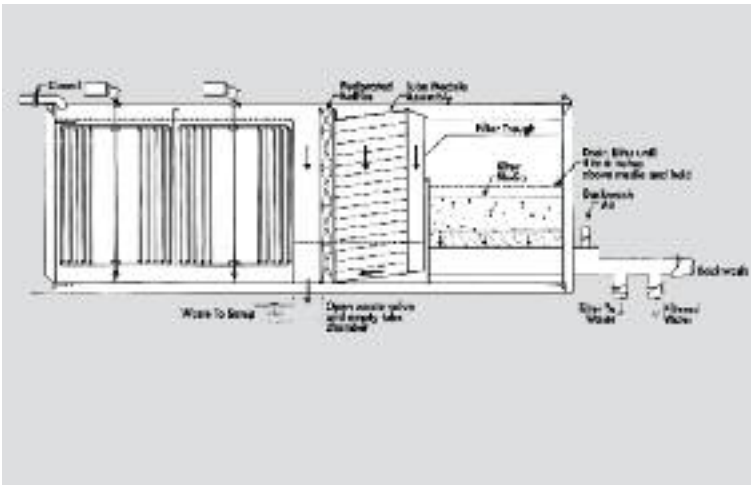
# Equipment Details

## Modular Aquarius® systems

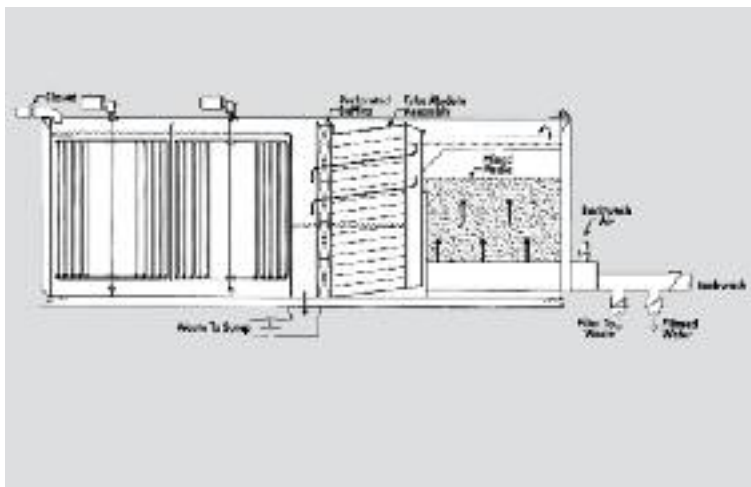
The modular Aquarius® systems are furnished in rectangular, open-top steel tanks, suitably lined for potable water service. Each Aquarius® unit consists of two complete process trains to permit uninterrupted water service, even when one module is being backwashed. Aquarius® units are supplied with chemical pumps to feed coagulant and polymer. Each process train includes two-stage flocculators with adjustable blades. The settling compartment is equipped with horizontal tube settlers and flow distribution baffles. The filter compartment includes MULTIBLOCK® underdrains, Mixed Media, air wash and level controls. A double bulkhead between the filter and settler eliminates the possibility of unfiltered water reaching the plant outlet. Wafer-type, pneumatically operated butterfly valves are standard. Other valve types are available on special request. The backwash controller with integral Aquaritrol® III controller are usually tank-mounted, but can be remote. Backwash air scour blower is provided by Siemens



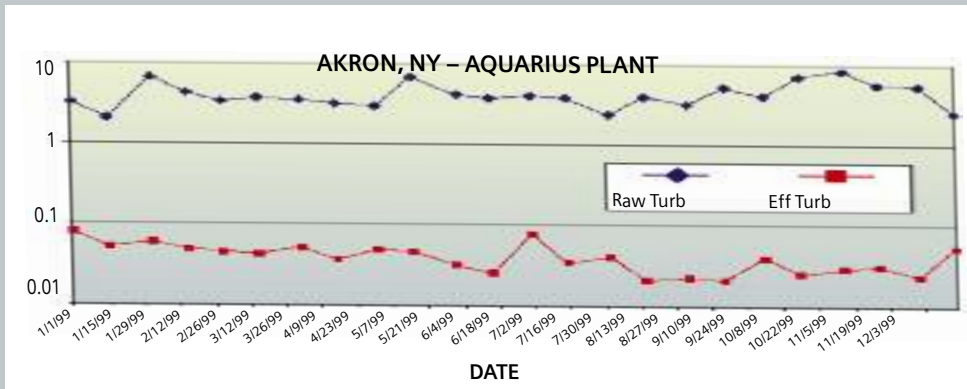
Operation (Filter Mode)



Drain Down



Filter Backwash



## Aquaritol® III Process Controller

The Aquarius® system utilizes the Aquaritol® III process controller for automatic coagulation control. This control system automatically modulates chemical feed to respond quickly to variations in effluent turbidity, raw water characteristics and flow rate to maintain efficient setpoint turbidity. The accuracy of the Aquaritol® III system takes the guesswork out of treating water and helps provide consistent, high-quality treatment while minimizing chemical costs.

### Akron, New York, Case History

The Akron Water Treatment Plant has been running since 1927. The Akron WTP has approximately 1300 service connections. All the water that the plant supplies is from a reservoir, located on a hill, and flows down by gravity from the reservoir through the filtration plant out into the distribution center via 15 miles of pipeline.

The plant was originally built using rapid sand filters and in 1975 it was replaced by two Aquarius® modular treatment units. In 1989, the units were given a new coat of paint and mixed media in filter beds. During the maintenance, they continued to operate, producing

450,000 gpd by running one unit while the other unit was rehabilitated. The water plant is currently operating at approximately 600,000 gpd. For the time that the plant has operated the Aquarius® system, they have met and continue to meet today's stringent drinking water standards.

The Akron Water Treatment Plant has achieved all of their quality objectives with the Aquarius® units, including turbidity of <0.1 NTU. During the worst storms the plant was able to handle turbidity spikes easily by increasing the dosage of chemicals. The plant is very pleased with the performance of the Aquarius® unit. "We look forward to continued trouble free operation with these units."

### Installations

More than 300 Aquarius® and Water Boy® unit installations worldwide attest to the flexibility and effectiveness of the system in municipal and industrial applications. They are at work providing water for communities, parks, resorts and various industries. Water Boy® units can also be used for construction water and water research.

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