PENTAIR

2015

AQUATIC ECO-SYSTEMS™

COMMERCIAL CATALOG

English • Español • Português

GLOBAL SOLUTIONS FOR THE FUTURE OF AQUACULTURE

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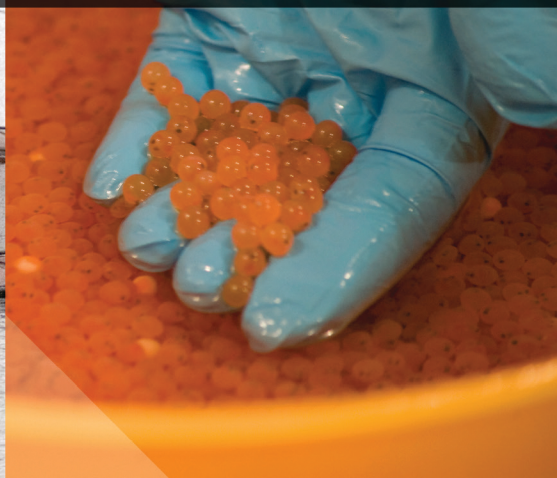

English Version

Versión en español

Portuguese Version

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IMPORTANT

Though we have tried to make this catalog as comprehensive and factual as possible, errors occasionally occur. Additionally, prices, specifications and packaging may have changed since the date of publication. Pentair Aquatic Eco-Systems reserves the right to substitute equivalent items and make other changes without notice.

IMPORTANTE

A pesar de que hemos intentado hacer este catálogo lo más exhaustivo y objetivo posible, de vez en cuando se producen errores. Además, los precios, las especificaciones y el embalaje pueden haber cambiado desde la fecha de publicación. Pentair Aquatic Eco-Systems se reserva el derecho de sustituir artículos equivalentes y de realizar otros cambios sin previo aviso.

IMPORTANTE

Embora tenhamos tentado fazer este catálogo o mais abrangente e factual possível, eventualmente podem ocorrer erros. Além disso, os preços, especificações e embalagem podem ter modificado desde a data de publicação. A Pentair Aquatic Eco-Systems reserva-se o direito de substituir itens equivalentes e fazer outras alterações sem aviso prévio.

SYMBOL LEGEND

AES Number
AES will help you estimate aerator sizing (see Tech Talk 84 on page 60).

Fresh Water or Salt Water
Indicates products that are compatible with fresh water or salt water.

Restricted
In certain states, herbicides and algaecides are restricted. Products with this symbol cannot be sold into the states of California, Connecticut, Iowa, Maine, Michigan, Nebraska, Montana, New Hampshire, New York, Vermont or Washington.

LEYENDA DEL SÍMBOLO

Número de AES
AES lo ayudará a calcular el tamaño del aireado (consulte el índice de datos técnicos 84 en la página 60).

Agua dulce o agua salada
Indica productos que son compatibles con agua dulce o salada.

Restringido
En algunos estados, los herbicidas y los algicidas están restringidos. Productos con este símbolo no se pueden vender en los estados de California, Connecticut, Iowa, Maine, Michigan, Nebraska, Montana, New Hampshire, Nueva York, Vermont y Washington.

LEGENDA SÍMBOLO

Número AES
A AES irá ajudá-lo a estimar a dimensão do aerador (veja a Tech Talk 84 na página 60).

Água doce ou salgada
Indica os produtos que são compatíveis com água doce ou salgada.

Restrição
Em alguns estados, os herbicidas e algicidas são restritas. Os produtos com este símbolo não podem ser vendidos para os estados da Califórnia, Connecticut, Iowa, Maine, Michigan, Nebraska, Montana, New Hampshire, Nova York, Vermont ou Washington.

Cover photos: courtesy of Marine Harvest Canada

As a unified company for over two years now, we have expanded rapidly worldwide and accomplished a tremendous amount after blending Aquatic Eco-Systems, Point Four and Pentair's aquaculture division in 2012. During this past year, we've added Emperor Aquatics, Inc. (EAI) products to our portfolio. These products deliver high quality UV disinfection and water filtering solutions to a variety of applications. Emperor Aquatic's products are a perfect complement to our existing commercial sanitization products. PAES has also acquired the product offerings of HE Group, Inc. (HGI), a leader in fiberglass design and manufacturing, specializing in aquaculture and water treatment systems. The technology and fiberglass design capability from HGI will enhance our solutions capability in a broad range of Aquaculture applications. In December 2014, we welcomed the addition of PR Aqua Supplies, Ltd., now a Pentair Aquatic Eco-Systems division. For the past 25 years, PR Aqua has been pioneers in the aquaculture industry and water treatment leaders, providing diverse design, engineering and manufacturing expertise to their clients. PR Aqua complements our abilities in integrated water treatment and fish handling solutions, including the evolving technology of Recirculating Aquaculture Systems.

At Pentair Aquatic Eco-Systems, it is important to us that our daily work reflects Pentair's values. These values are centered in a 'Customer First' approach. We work hard each day to continuously improve in everything we do. Our goal is to always exceed your expectations. If your expectations are not met, we want to know about it. We have recently incorporated a Customer Feedback Form function into our web site; you can find it at the bottom of every web page or at this link: Pentairaes.com/customer-service/customer-feedback-form. We would like to hear your objections, suggestions, or praise, and we appreciate those who take the time to share that information with us.

Just as 'Customer First' is important to us, we want our customers to 'Think Pentair First!' Whatever your product or service needs, for Commercial Aquaculture, Aquaponics, Laboratory Animal Housing, Lake and Pond Management, Aquatic Life Support or workshops and training, we urge you to think of us first. Be assured that we will always work to keep you as a valued customer. While working hard to please our customers, we do our absolute best to make this catalog as comprehensive as possible. We also deliver our wide-range of new products in specific categories to create a more user-friendly resource.

Our work and dedication to the aquaculture industry has helped to ensure a more stable, sustainable food source for the growing global population. We have and will continue to develop innovative solutions to complex challenges that our customers are facing; enabling their operations to increase yields and profits by improving efficiencies in key input costs such as water, energy as well as labor. Our teams of industry experts have taught hundreds of students in our Aquaponics Technology and Design Workshop as well as our Recirculating Aquaculture Systems training courses held in our on-site training center; at industry events from Dubai to Nicaragua and everywhere in between. We are excited to share that we have broken ground on a state-of-the-art research and development facility at our Florida location. The PAESWATER facility will be 12,000 square feet and will be accessible to our aquaculture industry visitors to learn and observe new technology under development in early 2015.

This past year, we've completed our largest commercial aquaculture projects in the history of Pentair Aquatic Eco-Systems, as well as consulting and providing equipment to some of the most significant aquaculture projects in the world. With these achievements, we are better prepared than ever to meet your complete aquatic needs. Our field service and sales teams have circled the globe, many times over, providing insight, expertise and critical services to customers in dozens of countries. Our global reach has grown substantially with now 19 operating locations worldwide, filled with experienced professionals, all focused on providing excellent service to our customers as we continue to push technology forward.

There have been many changes over the years, but our commitment to ensuring your success and satisfaction has always been our top priority. Speaking of change, we are excited to bring you our new website, PentairAES.com; launched in March of 2014. Our new website offers a complete e-commerce experience, interactive features for our products and solutions, an enhanced information resource portal, and expert advice and technical content. Of course, we continue to offer the same expert advice via our customer contact center at +1 407-886-3939 or toll free 877-347-4788.

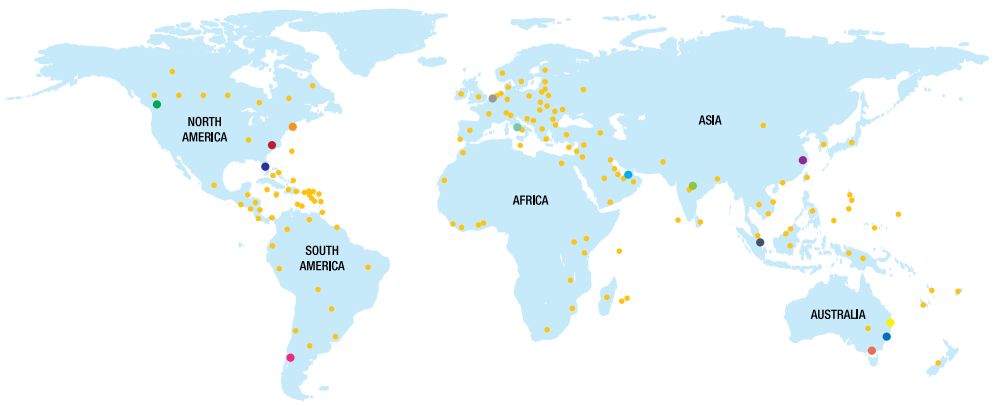
The aquaculture and aquaponics industries are quickly evolving, and Pentair Aquatic Eco-Systems is ready to be your partner in success as we head toward a bright future together. We appreciate your loyalty, and we look forward to continuing to serve you.

Sincerely,

Bob Miller
Vice President
Pentair Aquatic Eco-Systems, Inc.

WORLDWIDE SALES AND SERVICE

Pentair Aquatic Eco-Systems, Inc., has served over 150 countries worldwide. Now with additional corporate offices in North America, Chile and China, our global sales and service support increases immensely. This includes multi-language catalogs and international customer service representatives, which will bring you a better customer experience.



- Corporate offices in Sanford, NC
- Operations and sales office in Apopka, FL
- Operations and sales office in Beverly, MA
- Operations and sales office in Vancouver, Canada
- Operations and sales office in Puerto Montt, Chile
- Operations and sales office in Suzhou City, China
- Operations and sales office in Brisbane, Australia
- Sales office in Dubai, United Arab Emirates
- Sales office in Dandenong South, Australia
- Sales office in Milperra, Australia
- Sales office in U.P, India
- Sales office in Herentals, Belgium
- Sales office in Singapore
- Sales office in Rome, Italy
- Customers served worldwide

COMMERCIAL AQUACULTURE

GLOBAL SOLUTIONS FOR THE FUTURE OF AQUACULTURE

With depleting food stocks unable to keep up with rising demand, the commercial aquaculture industry is ready to explode. The potential for commercial aquaculture is enormous, but the industry is also highly complex. The need for advanced equipment, high-level support and precise engineering has never been greater, and the many economic and ecological challenges of fish production must be solved.

Which is why we're here. Our mission is to offer symbiotic biological and engineering solutions to support any aquaculture need. For you, this means everything from designing a complete facility to engineering solutions for existing production systems. Our commercial aquaculture team can also help you with equipment upgrades, troubleshooting and technical support. With Pentair Aquatic Eco-Systems as your partner, the future has arrived.

TAP INTO SERIOUS POTENTIAL

2011 was a momentous year for the evolution of the human diet, when world farmed fish production topped beef production for the first time in recorded history. Fish and shellfish farming—also known as aquaculture—increased its lead in 2012, with output reaching a record 66 million tons, compared with 63 million tons of beef. And 2013 became the first year that people consume more farmed fish than those caught in the wild.

Pentair Aquatic Eco-Systems is ideally and strategically placed, has extensive in-house experience and expertise with proven products and the know-how that allows our team to help you to design, install and maintain the world-class systems you need to be successful in today's aquaculture industry.

Our mission is to help growers navigate this dynamic industry with innovative, high-quality aquaculture products, and the skills and knowledge that build a strong business and meet your expectations for growth and profit.

YOUR SINGLE-SOURCE SOLUTION

Pentair Aquatic Eco-Systems is your single source for complete system design, equipment supply and advice. We can enhance your ability to produce the premium quality products you need to thrive in expanding and increasingly competitive local, regional and global markets. Our complete line of innovative and energy-efficient products are engineered to maximize the performance of your aquatic systems, maintain water quality parameters, minimize investments in feed, energy and oxygen and reduce stress within your systems.

MORE WAYS TO HELP YOU

As your business evolves and grows, we're ready to help you gain and maintain momentum. You'll have access to our teams of in-house experts—including designers, engineers, aquaculturists, biologists and technicians—each dedicated to your business' growth and long-term sustainability.

With Pentair Aquatic Eco-Systems, you'll have a partner who understands and knows your business and industry. We anticipate challenges before they arise and offer extraordinary solutions that no one else can match. Our extensive and unmatched product offering is what separates us from the competition and has established Pentair Aquatic Eco-Systems as the global leader in all aspects of commercial aquaculture.

A LEADER NEVER STANDS STILL

With 35 years of aquaculture leadership, Pentair Aquatic Eco-Systems has the knowledge and experience to help you succeed. We've leveraged our expertise to become pioneers of technological innovation and develop the infrastructure necessary to support your aquaculture business globally. From concept design through harvest, we're with you every step of the way—no matter the size of your business or species produced.

STABILITY AND INNOVATION YOU CAN COUNT ON

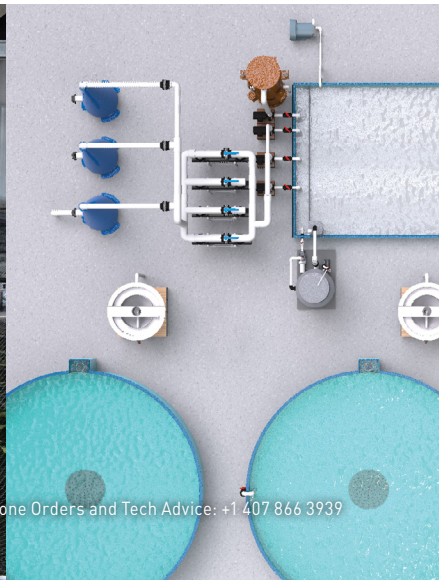
Pentair is the global leader in the design, manufacture and distribution of equipment, technology and engineered solutions for the aquaculture industry. Our global reach ensures that innovative products will remain at the forefront of aquatic research technology for years to come.

Proud Manufacturer Of:

Point Four™, Arias™ Filter, Eco-Trap/Flow, Sparus™ Pump

Proud Distributor Of:

Sweetwater® Blower and Pumps, ProLine™ Algae Food



TASTE OF BC AQUAFARMS

LAND-BASED STEELHEAD MODEL FARM: PROJECT BACKGROUND

Taste of BC Aquafarms in Nanaimo, British Columbia, Canada is a venture that was spawned through the Freshwater Aquaculture Action Plan of the Interprovincial Partnership for Sustainable Freshwater Aquaculture Development (IPSFAD). This Action Plan was intended to focus applied research and commercialization efforts on those issues that could best enhance productivity and profitability within the freshwater aquaculture sector in Canada. A key finding of the Action Plan noted that Canada needed to establish one or more freshwater aquaculture farms to serve as models for the environmentally and economically viable expansion of freshwater aquaculture.

PROJECT DESCRIPTION

The Taste of BC Aquafarms Model Farm was designed to produce 100 mT annually of Steelhead Trout using recirculating aquaculture and circular culture tank technologies. Upon completion, the facility will support an economically viable business, will provide training and research opportunities, and will be a model for farm diversification and growth of freshwater aquaculture in Canada. Project proponents and contributors include Taste of BC Aquafarms (owner), PR Aqua Supplies Ltd., Vancouver Island University, IPSFAD, Tides Canada, Freshwater Institute, and many others. The facility was designed in 2012 and was commissioned in 2013.

PROJECT FEATURES

The innovative treatment system provided by PR Aqua for this farm is a significant advancement. The design applies proven unit process technologies, such as PR Aqua Rotofilter™ Microscreen Drum Filters and high-efficiency Fluidized Sand Bioreactors (FSBs). An innovative approach has been used to integrate these technologies, resulting in a recirculating aquaculture system (RAS) that offers significant improvements in water quality, energy consumption, and operability. This innovative design is anticipated to reduce system energy use by 25 percent over traditional FSB-based RAS systems.

Growout module recirculation pumps

Culture tank system

THE BENEFITS OF PR AQUA'S RAS DESIGN INCLUDE:

- Biofilter and culture system flows are separated, which allows flow rates and pumping head to be matched to the requirements of the individual processes. This reduces operating head and cost.
- By treating both the biofilter and the culture flows with aeration, significant reduction in dissolved carbon dioxide concentrations are possible, which results in improved fish health and performance.
- The treatment system is combined into a large concrete vessel, which reduces the total footprint and provides easier access.
- The treatment system is low profile, which allows for improved accessibility and operability, as well as decreased building volume, which translates into less energy for heating and air handling.
- The low head oxygenation technology used at this facility allows for the use of low-cost, low-pressure generated oxygen without the risk of elevating total dissolved gases.

RESULTS

ANNUAL PRODUCTION	100 mT
SPECIES	Steelhead Trout
TARGET FISH SIZE	2 kg
COHORT FREQUENCY	8 weeks
GROWOUT MODULE TANK VOLUME	652 m^3
GROWOUT MODULE TANK VOLUME	50 m^3
BUILDING FOOTPRINT	1300 m^3 (14,000 ft^2)
WATER CONSUMPTION	135 lpm maximum
POWER CONSUMPTION	4.03 kWh/kg fish produced

SERVICES PROVIDED

PR Aqua has provided the following services: bio-programming, system planning and engineering design, aquaculture equipment supply of both custom and standard products, construction review, commissioning, and operational training.

This facility demonstrates PR Aqua's recent experience with development of land-based growout systems for salmonid culture, and PR Aqua's constant pursuit of improved RAS efficiency through process innovation.

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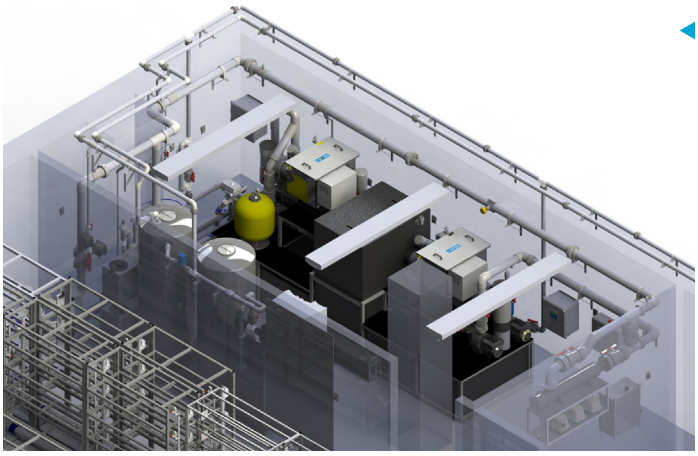


MULTI-RACK FACILITY DESIGN

The Multi-Rack system is configured to your specifications, with as many racks as your research needs. We have been designing large-scale aquatic research facilities since 1997 and continue to lead the industry in quality of equipment and service. Couple our industry pioneering rack designs with our new cutting-edge filtration packages you will benefit from a robust, user-friendly system for many years to come.

- Z-Hab, X-Hab and G-Hab system are all available for multi-rack facility design
- Heavy-duty, powder coated 316L stainless steel construction provides corrosion resistance, durability and ease of maintenance.
- State-of-the-art Aquatic Habitats Filtration Packages

CALL FOR MORE INFORMATION AND PRICING.

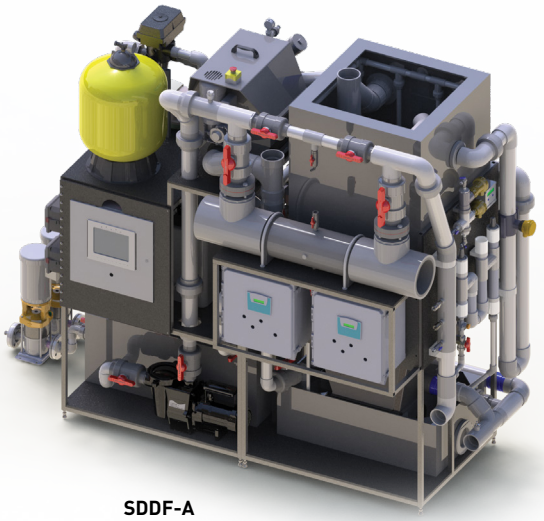
AQUATIC HABITATS FILTRATION PACKAGES

Pentair introduces its next generation filtration packages, innovative solutions designed to address the needs of the modern day aquatic lab. We have married our intimate knowledge of aquatic husbandry and state-of-the-art technology to deliver robust, flexible, user-friendly systems capable of providing the model environment for aquatic research.

Optimal water quality is maintained using an oversized 5-stage filtration process featuring the most cutting edge technology on the market. Which includes Sparus™ Pumps with Constant Flow Technology™, rotary micro-screen drum filters and a programmable logic controller (PLC) customized to your specific system requirements. The modular design is flexible enough to be ramped up or down for situations like multi-phase projects or coupled with additional packages for lab expansions.

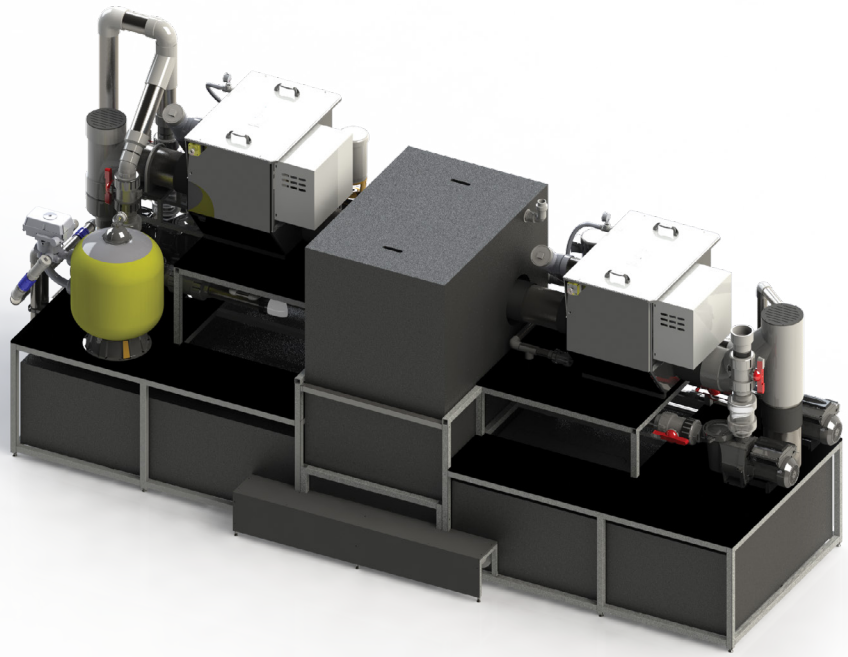
Low cost of ownership and labor savings provided by zero consumable filtration and minimal maintenance requirements. Say good-bye to changing filter pads and cartridges! Each PLC is equipped with SMS or email alarm capabilities and remote access via the web. All of this contained within a small footprint configured for easy access to all the system components.

- Automated Monitoring and Control
  - Water Quality
  - Drum Filter Backwash
  - Carbon Filter Backwash
- Zero Consumables
- Minimal Maintenance (6 month service intervals)



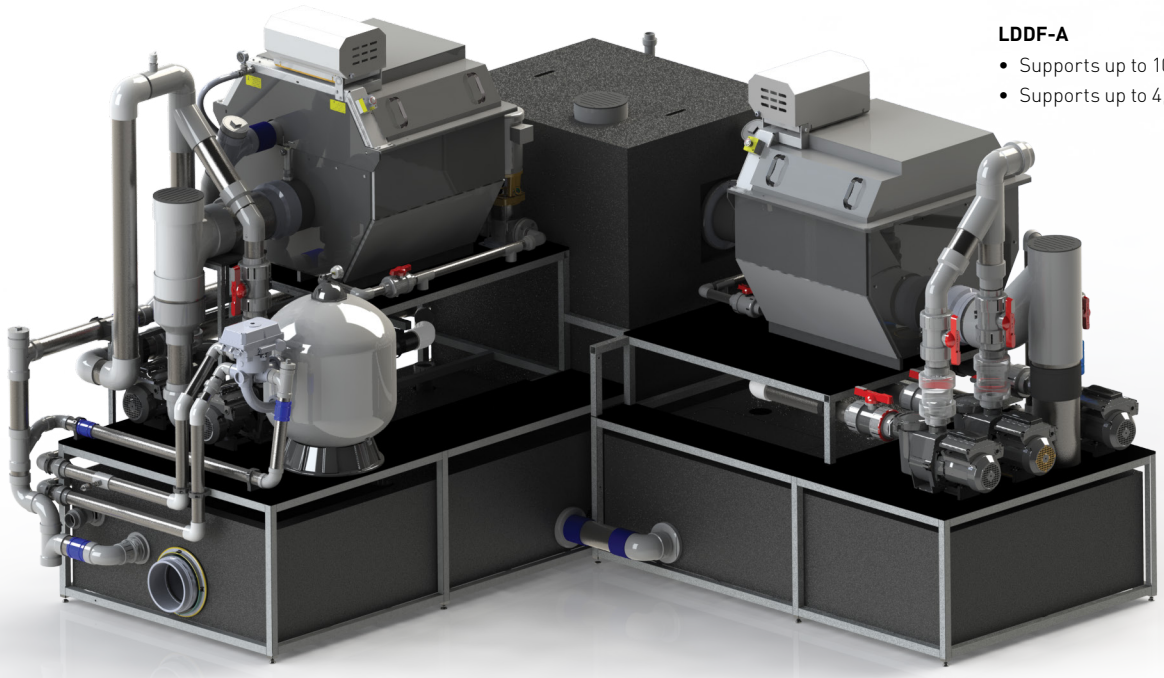
SDDF-A

- Supports up to 35,000 zebrafish
- Supports up to 1,440 *Xenopus laevis*



MDDF-A

- Supports up to 72,000 zebrafish
- Supports up to 2,880 *Xenopus laevis*



LDDF-A

- Supports up to 100,000 zebrafish
- Supports up to 4,000 *Xenopus laevis*

FEATURES

SPARUS™ PUMP WITH CONSTANT FLOW TECHNOLOGY™

Quiet, Energy Efficient and Smart

- Sparus Pumps with Constant Flow Technology(CFT) manage water circulation quietly and efficiently. The integrated Variable Frequency Drive automatically calculates and self-adjusts the speed of the motor to deliver the programmed flow rate
- Each Sparus with CFT pump features a digital communication port that allows for monitoring/control by PLC systems
- By utilizing the unique feature set of the Sparus with CFT and by monitoring pressure, the PLC system controller adjusts the speed of the pump to maintain a constant pressure. The result is consistent flow is maintained to aquaria when the flow to other racks of aquaria is shut off. Eliminates unexpected sharp increases in flow and provides consistent flow to aquaria as flow elsewhere on the system is adjusted.

MECHANICAL FILTRATION

Zero Consumables

- High-quality, self-cleaning rotary drum filter(s) provide highly efficient solids removal without the need for consumables. Say good-bye to replacing filter pads, cartridges or bags.

BIOLOGICAL FILTRATION

Self-Cleaning

- Moving bed bioreactors use a continuous flow action achieved by aeration and high density polyethylene biofilm carrier elements. The continuous flow action makes the media self-cleaning!

CHEMICAL FILTRATION

Polishing

- Activated carbon captures smaller suspended solids and adsorbs dissolved solids and other contaminants that may make their way into the system, ensuring optimal water quality and transmission of UV light

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

UV DISINFECTION

Eliminate Pathogens

- NSF UV Sterilizer outfitted with over temperature, lamp out, and UV intensity alarming capabilities are sized to provide a minimum UV dose of 110 mJ/cm², EOU. UV Lamp service interval of 12,000 hrs. Choose between stainless steel or heavy-wall UV-resistant polymer vessel.

AERATION AND DEGASSING

Optimize Dissolved Oxygen Levels

- Quiet linear piston pumps supply air through Sweetwater diffusers to strip CO_2 and maintain dissolved oxygen levels of the supply water to aquaria at optimal.

TEMPERATURE CONTROL

Maintain Consistent Water Temperature for Animals

- Heater (Standard)- Submersible titanium heaters and automatic controller maintain system water temperature at set point + - 1°C (Ambient +5°C)
- Chiller (Optional)- Multiple options including chillers, heat exchangers and heat pumps are available for a variety of applications

WATER QUALITY CONTROL

Automated Monitoring and Dosing

- Conductivity and pH levels are continuously monitored by precise high-grade sensors. Buffer and salt solutions are automatically dosed using peristaltic pumps to maintain steady-state pH and conductivity
- PLC system controller automatically opens a solenoid valve to bleed off a user programmable percentage of system water per day to keep nitrates at non-stressful levels. System water is automatically replaced with virgin make-up water

PROGRAMMABLE LOGIC CONTROLLER

Versatile and Dependable

- Pentair PLCs operate with reliability, precision and responsiveness. Examples of water quality and system parameters you can control or monitor include dissolved oxygen, system temperature, pH conductivity, level, supply line pressure, carbon filter vessel pressure, total dissolved gas pressure (TGP) and pump speed. Each model has an easy-to-read touchscreen interface that will tell your system status at a glance. If an alarm condition is detected, the device will text or email multiple cellphones to alert staff—helping prevent catastrophic failures and loss of animals.

CULTURE TANK SYSTEMS

For over 25 years, PR Aqua has pioneered innovative solutions for aquaculture production. We offer expertise in aquaculture engineering and manufacturing. From conservation hatcheries to commercial operations, PR Aqua works with you to develop an integrated life support system tailored to your species and goals.

Integrated tank systems improve fish health and reduce costs. Existing flow-through systems can gradually convert to partial reuse by adding tanks. And partial reuse and recirculating systems can improve production by using tanks engineered by people who understand fish.

IMPROVE FISH HEALTH

- Maintain uniform water quality: Circular tanks achieve proper water circulation, which prevents lowoxygen regions from developing. Higher oxygen levels can be maintained, which improves fish health, growth rates, and feed conversion ratios. Unlike raceways, high fish densities can be safely maintained.
- Raise fit fish: Circular tanks provide a range of rotational velocities across the radius of the tank. With a variety of swim speeds, hatchery fish have better stamina and survivability. In addition, proper tank hydraulics evenly distribute feed and fish.
- Minimize pathogens: Unlike concrete, PR Aqua's proprietary fiber-reinforced plastic (FRP) laminate does not harbor pathogens. The smooth, fish-friendly surface eliminates fin and scale damage, which can increase susceptibility to infection. Additionally, morts and solids move quickly to the drains, which helps maintain optimal water quality.

LOWER EXPENSES

- Reduce labor requirements: PR Aqua's self-cleaning tank design effectively removes both feed and waste. You'll eliminate tedious vacuuming and brushing.
- Decrease water consumption: Aquaculture facilities with water shortages or poor source water quality find that tanks can reduce water usage by 50 percent or more.
- Condense facility footprint: Circular tanks allow you to raise more fish in less water than traditional raceway systems.

Ten-foot diameter tanks at the William Jack Hernandez Sport Fish Hatchery, Anchorage, AK.

EXCEED PRODUCTION GOALS WITH INTEGRATED TANK SYSTEMS

CULTURE TANKS

PR Aqua's fiberglass tanks come in sizes ranging from small research tanks to 48-foot diameter culture tanks. These tanks can be used in a variety of aquaculture settings. PR Aqua's FRP laminate provides years of worry-free use. Tank features include:

- UV-resistant gel coat availabe in standard and customer colors
- Fish-friendly joints and surfaces
- Above- and below-grade installation options
- Ability to modify tanks into header tanks, reservoirs, or fish transport tanks
- Easy, on-site installation with no secondary fiberglass work required

COMBI TANKS

A PR Aqua Combi Tank is a complete "hatchery system" for starting salmonoid development. The Combi Tank is designed for hatching eggs, first feeding fry, and rearing larger fry. You can grow up to 25,000 fry in 3.8 liters (1 gallon) before moving to larger rearing tanks. The tanks hydrodynamics simplify cleaning procedures.

Photo lid covered tanks protect fish from predators and allow photo period manipulation.

Thirty-foot diameter tank system with radial flow settler that removes large solids.

TANK SYSTEM COMPONENTS

All PR Aqua tanks can be configured to meet your needs. For a complete, operable system, PR Aqua provides the following options: side drains, spray bars, screens, stand pipes, bottom drains, stands and skirts, and predator/shade covers. Please contact us for details and for assistance in configuring your tank system.

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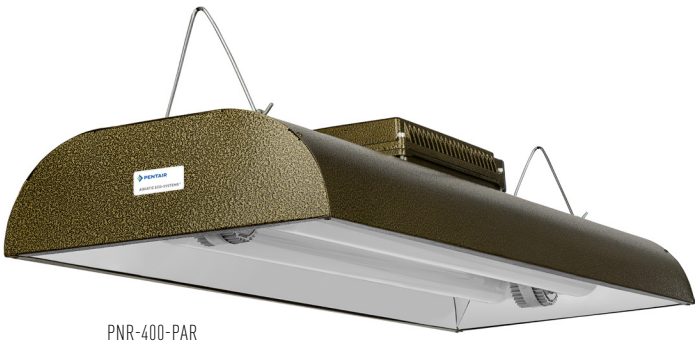


PNR-400-PAR

PNR-400-PON

PNR-400-PAR-PON

INDUCTION GROW LIGHTS

Energy saving, full spectrum lighting ideal for aquaponics!

Introducing Pentair Aquatic Eco-Systems' new line of induction grow lights. Induction lighting is an emerging technology that is replacing metal halide and high pressure sodium lighting in aquaponics. Induction lighting offers many benefits to crop production including a broad spectrum, greater canopy penetration and lower operating temperatures.

- Consumes up to 70% less power than traditional HID lamps
- One lamp from vegetative thru flowering reduces plant stress
- PAR rated spectrums: 90% UV – 95% Carotenoid – 80% R/FR/IR
- 98% specular reflectance for greater canopy penetration
- Low operating temperatures reduce cooling costs
- Longer lamp life (100,000 hour rated)
- 10 year lamp and driver warranty

40W PONTOON ACCESSORY

Designed to work as an enhancement accessory to the induction lamps' broad spectrum phosphor blend. They are a low wattage addition to our induction lamps' spectrums and should be considered when the gardener is seeking optimized quality, yield and reduced time to harvest.

- Flowering enhancement accessory
- Comes fully assembled No Tools Required for Easy Installation
- 5 Year Warranty

LIGHTING CONVERSION REFERENCE
PNR-100-PAR (100W) REPLACES 200W METAL HALIDE OR HP SODIUM LIGHTS
PNR-200-PAR (200W) REPLACES 400W METAL HALIDE OR HP SODIUM LIGHTS
PNR-400-PAR (420W) REPLACES 1,000W METAL HALIDE OR 750W HP SODIUM LIGHTS

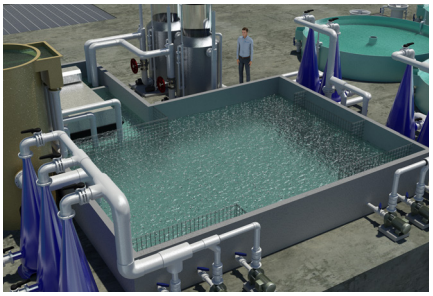
Grow Lights

MODEL		VOLTS	HZ	WATTS	COVERAGE AREA L	COVERAGE AREA W	DIMENSIONS L	DIMENSIONS W	DIMENSIONS H	SHIP WT (LBS)
PNR-100-PAR	100W GROW LIGHT	120-277	50/60	100	24"	24"	19"	14½"	6¾"	8
PNR-200-PAR	200W GROW LIGHT	120-277	50/60	200	36"	36"	26½"	14½"	6¾"	11
PNR-400-PAR	420W GROW LIGHT	120-277	50/60	420	48"	48"	41"	14½"	6¾"	15
PNR-400-PON	40W PONTOON ACCESSORY	120-277	50/60	40	—	—	40"	20"	5½"	4

Combo Light Kit

MODEL		VOLTS	HZ	WATTS	COVERAGE AREA L	COVERAGE AREA W	DIMENSIONS L	DIMENSIONS W	DIMENSIONS H	SHIP WT (LBS)
PNR-400-PAR-PON	420W LIGHT & 40W PONTOON	120-277	50/60	420+40	48"	48"	41"	20"	6¾"	19

RECIRCULATING AQUACULTURE SYSTEMS (RAS) TECHNOLOGY WORKSHOP



Dr. Losordo has earned a Bachelor degree in Biology and a Masters degree and Ph.D. in Agricultural Engineering. Involved in aquaculture for 40 years, Dr. Losordo has extensive experience in the research, development, design, and implementation of recirculating aquaculture systems worldwide. Past president of both the World Aquaculture Society and the Aquacultural Engineering Society.

Dr. Thomas M. Losordo

TOPICS THAT WILL BE COVERED DURING THIS 2½-DAY WORKSHOP:

- An introduction to recirculating systems
- Critical considerations before designing recirculating systems
- Component options for use in recirculating production systems
- Developing an appropriate design for your aquaculture application
- The management of recirculating systems
- Waste management issues
- Economic considerations in creating, evaluating and operating recirculating systems

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

AQUAPONICS TECHNOLOGY AND DESIGN WORKSHOP

TOPICS THAT WILL BE COVERED DURING THIS 4½-DAY WORKSHOP:

- UVI aquaponic system & UVI-based system at PAES
- Fish production
- Marketing and economics
- Plant production
- Hands-on instruction
- Green Sky Growers rooftop greenhouse tour
- "Behind the Seeds Tour" at The Land at Epcot®

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

"Teaching at the aquaponics course sponsored by Pentair Aquatic Eco-Systems (PAES) was a real treat for me because PAES employees have an incredible depth of experience and knowledge that they share with their students as they guide them through all phases of constructing and operating an aquaponic system to establish a successful hobby or business."

Dr. James Rakocy, "Father of Aquaponics"

SWEETWATER® REGENERATIVE BLOWERS AQUACULTURE DUTY

The Pentair Aquatic Eco-Systems Sweetwater® regenerative blowers reach higher pressures, operate in more corrosive environments and operate at lower noise levels than industry standard commercial blowers. They are inexpensive to operate, and the air they deliver is oil-free. They are extremely energy-efficient and quiet.

Sweetwater® blowers are simple. And simplicity means reliability. They have only one moving part: a dynamically balanced impeller that is attached directly to the motor shaft. The rotating impeller doesn't touch a thing, so there's no wear, no vibration, no seals and no lubrication. Just wash the inlet air filters as needed and replace the motor bearings after three years of continuous operation.

All Sweetwater® blowers come with internal mufflers and low- restriction, washable inlet filters as standard equipment. Outlet flex hoses, which simplify installation, are also standard equipment.

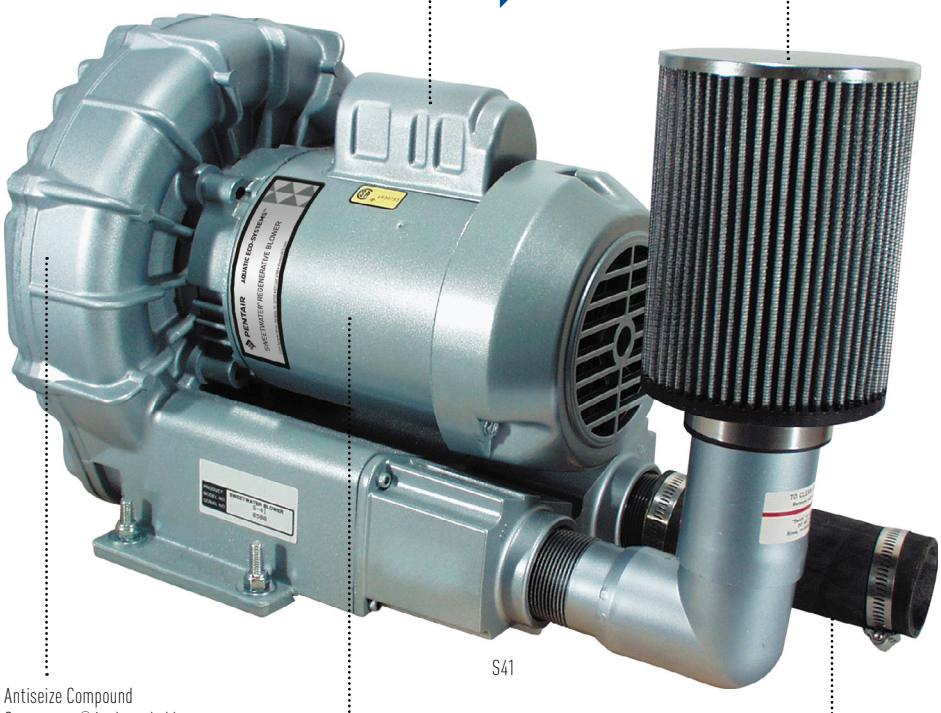
The Sweetwater® blower's electric motor is a high-efficiency type motor that will run cool and handle a wide range of power variations so often found in rural locations. All models will operate on both 50 and 60 cycle (Hz) power except **S631** and **S651**, which are 60 Hz only. 60-Hz curves shown (pressure and volume at 50 Hz will be about 30% less).

Automatic thermal overload protection is standard (except **S631**). Should a power brownout occur and trip the motor, the Sweetwater® blower will restart automatically after cooling. Motors are completely enclosed and fan cooled for the highest reliability in a humid aquaculture environment. Each blower is assembled with antiseize compound, performance tested prior to shipment and guaranteed for three years! All are UL-listed, CSA-certified and CE-compliant.

High altitude will affect blower performance. Deduct 4% of volume and pressure for every 1,000' (300 m) above sea level. The 3,450-rpm motors used on these regenerative blowers require about ten seconds to reach full speed. Use starting watts to size generators and use full load amps to size breakers.

Automatic Thermal Overload Protection*
Should a power brownout occur and trip the motor, the Sweetwater® blower will automatically restart after cooling (*except **S631**).

Air Filter
Low-restriction inlet, washable filter that removes particulates to 50 microns included in price.

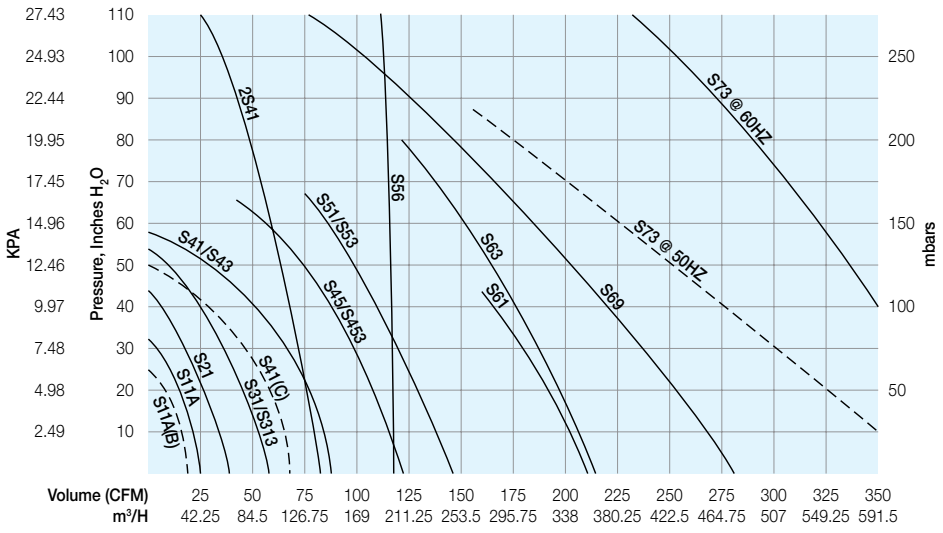


S41

Antiseize Compound
Sweetwater® is the only blower we know of that is assembled with antiseize compound to ensure easy disassembly when it becomes necessary years down the road.

High-Efficiency Premium Motor
Runs cool, is completely enclosed and fan cooled for the utmost reliability in humid environments. Universal 50/60 Hz, UL-, CSA- and CE-compliant.

Flexible outlet hose
simplifies installation.



3-Phase Equipment:

We highly recommend using protective devices with all 3-phase equipment. Motor starters, phase monitors and phase protectors are not included in the sale and should be sourced locally. Failure to install protective devices will void most warranties. We also recommend that a certified electrician perform the installation.

Combination starters are not included with Sweetwater® blowers, but are strongly recommended. NEC and local electrical codes prevail.

PENTAIR

SWEETWATER® REGENERATIVE BLOWERS AQUACULTURE DUTY

3-YEAR WARRANTY

Blower Specifications (at Sea Level, 68°F, 60 Hz)

MODEL	CFM FREE AIR @ INCHES WATER 20"	30"	40"	50"	MAX DUTY	HP	PHASE	NO. FILTERS	RUNNING WATTS INPUT @ INCHES WATER	MAX STARTING WATTS	VOLTAGE	RATED FULL LOAD AMPS	HEIGHT W/O FILTER	WIDTH	OUTLET HOSE PIPE SIZE	WEIGHT (LBS)
S11A [1,2]	13	3	—	—	34"	⅛	1	1	198/20"	900	115/230	2.0/115	10"	8"	1"	23
S21 [1,2]	27	19	7	—	43"	⅓	1	1	377/30"	1,800	115/230	3.8/115	10"	9"	1"	28
S31 [1,2]	34	28	21	16	56"	½	1	1	471/30"	2,000	115/230	5.6/115	10"	10"	1½"	36
S313 [1]	34	28	21	16	56"	½	3	1	410/30"	4,000	230/460	2.0/230	10"	10"	1½"	36
S41 [1,2]	70	65	53	36	58"	1	1	1	971/40"	4,000	115/230	9.8/115	12"	12"	1½"	50
S43 [2]	70	65	53	36	58"	1	3	1	860/40"	5,000	230/460	3.2/230	12"	12"	1½"	50
S45 [2]	110	100	90	80	65"	1½	1	2	1,430/40"	9,000	115/230	10.4/230	14"	15"	2"	77
S453-AQ [2]	110	100	90	80	65"	1½	3	2	1,500/40"	12,000	230/460	4.9/230	14"	15"	2"	85
S51 [1,2]	135	120	110	100	65"	2½	1	2	1,760/40"	14,000	115/230	11.9/230	14"	15"	2"	87
S53-AQ [2]	135	120	110	100	65"	2½	3	2	1,750/40"	17,000	230/460	6.9/230	14"	15"	2"	100
S61-AQ [3]	190	180	165	—	45"	2½	1	2	2,600/40"	14,000	115/230	11.8/230	16"	17"	3"	100
S63 [3]	190	180	165	160	80"	3½	3	2	3,260/60"	28,000	230/460	8.8/230	16"	17"	3"	115
S631 [3,4]	190	180	165	160	75"	3½	1	2	3,400/60"	21,000	230	19.0/230	16"	17"	3"	115
S651 [3]	190	180	165	160	100"	5	1	2	3,710/80"	29,000	230	22.3/230	16"	17"	3"	150
S653 [3]	190	180	165	160	110"	5	3	2	3,520/80"	36,000	230/460	12.0/230	16"	17"	3"	150
S56 [3]	120	120	118	117	280"	6	3	2	4,000/150"	38,000	230/460	18.2/230	19"	22"	3"	215
S69 [3]	250	245	230	210	110"	5½	3	2	4,190/60"	48,000	230/460	18.2/230	22"	22"	3"	250
S73 [3]	390	375	350	330	125"	10	3	4	7,640/80"	75,000	230/460	25.0/230	24"	22"	3"	245
S15	650	640	630	610	125"	15	3	1	11,000/80"	70,000	230/460	50/230	23"	21"	3"	452
S18P	720	710	690	650	105"	18	3	2	12,000/80"	90,000	230/460	52/230	20"	28"	4"	438
S18S	410	405	400	395	200"	18	3	1	12,000/80"	90,000	230/460	52/230	22"	28"	4"	431
S30P	1,275	1,230	1,200	1,190	125"	30	3	2	20,000/80"	140,000	230/460	98/230	23"	32"	5"	630
S30S	650	640	630	625	225"	30	3	1	20,000/80"	140,000	230/460	98/230	23"	33"	5"	606

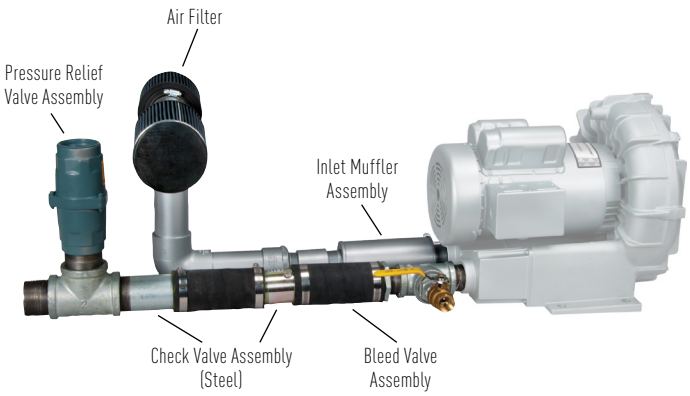
[1] Standard with 115V or 230V 8' power cord (230V models are also rated for 208V). Add "**230**" to part number for **230V**.
[2] S453 and smaller ship Ground. [3] S51 and larger ship via motor freight only. [4] No thermal overload protection.

CHECK VALVE ASSEMBLIES

For Multiple Blower Assemblies

Inlet check valves can be plastic, but outlet check valves are subject to high temperatures requiring steel.

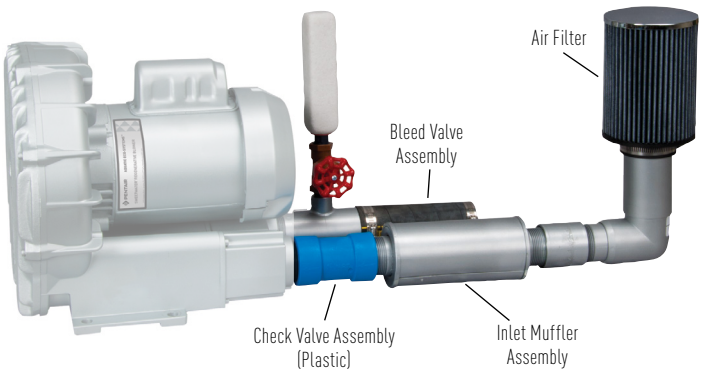
MODEL	TYPE	FITS BLOWER MODEL
BCVA1	INLET (PLASTIC)	S11, S21
BCVA2	INLET (PLASTIC)	S31
BCVA3	INLET (PLASTIC)	S41
BCVA4	INLET/OUTLET (STEEL)	S5 SERIES
BCVA5	INLET/OUTLET (STEEL)	S6 SERIES
BCVA6	INLET/OUTLET (STEEL)	S7 SERIES



EXTERNAL INLET MUFFLER ASSEMBLIES

For Blower Inlet

MODEL	INLET/OUTLET (NPT)	FITS BLOWER MODEL
BM20	1"	S11, S21
BM30	1¼"	S31, S313
BM40-2	1½"	S41, S43, S45, S453-AQ, S51, S53-AQ, SD4, SD5
BM60-2	2"	S61-AQ, S63, S631, S651, S56, S69, SD6
BM70-2	3"	S15, S18P, S18S, S73



AIR FILTERS

If you're not getting the air you need out of your blower, perhaps a dirty air filter is keeping air from getting into the blower. Keep a spare on hand, change out as needed, then wash and dry the dirty one when you have time. Both filters have 2⅜" I.D.

MODEL	SIZE	FITS BLOWER MODEL
BF4	4"	**S11**, **S21**
BF6	6"	**S31** AND LARGER

Note: 2 or more BF6 filters required for S45 and larger blowers.

BLEED VALVE ASSEMBLIES

Regenerative blowers are quieter, run cooler and use less power when excess air is vented or "bled off." Weighs 3 lbs.

MODEL	FITS BLOWER MODEL
BV1	**S11**, **S21** WITH **ALR15** SILENCER
BV2	**S31** WITH **ALR15** SILENCER
BV3	**S41** WITH **ALR15** SILENCER
BV4	**S45** AND **S51**
BV5	**S6** SERIES

PRESSURE RELIEF VALVE ASSEMBLY

Designed for low-pressure blowers, these valves will automatically protect blowers from over-pressurization by discharging air to the outside. The valve assembly is easy to install and calibrate. Pressure relief valves can be noisy when dumping air, so add a muffler assembly if you plan to use it as a normally open bleed valve. Both sides are FNTP. One-year warranty.

MODEL	SIZE	FITS BLOWER MODEL
PRV20	2"	**S45**, **S453**, **S51**, **S553**, **SD5**
PRV30	3"	**S61**, **S63**, **S631**, **S651**, **S653**, **S56**, **S69**, **S73**, **S15**, **SD6**, **SD69**

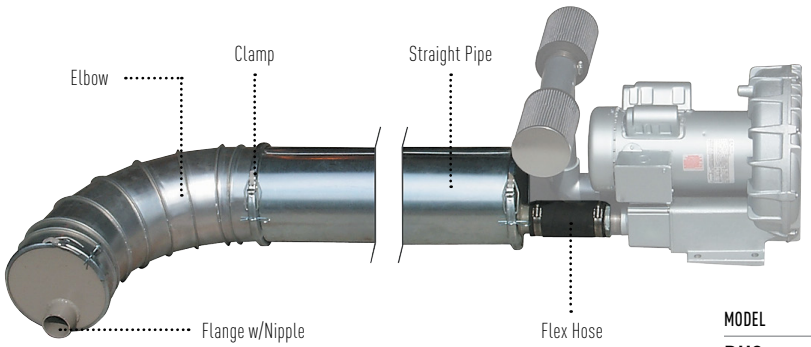
ECONOMICAL REGENERATIVE BLOWERS

The Pentair Aquatic Eco-Systems Whitewater® blowers are a very good value for aquariums, pet stores, bait systems and seafood holding systems. They are smaller, lighter and quieter than most blowers and very energy-efficient. They feature a "cupped" impeller for reduced noise. The specially designed motor is low in power consumption and excellent in performance. Blowers are 115V/60 Hz and include a 6' power cord. One-year warranty. Pricing includes filter, filter connections and a flexible outlet.

All Whitewater® blowers include:

- Inlet filter
- Filter connections
- Flexible outlet
- Power cord

MODEL	CFM @ INCHES WATER 10"	20"	30"	40"	50"	AQUARIUM OUTLETS @ 10" DEPTH	MAX DUTY	NOISE, DB	RUNNING WATTS	OUTLET HOSE FOR PIPE SIZE	SHIP WT (LBS)
WW10	4	2	—	—	—	40	25"	48	170	¾"	15
WW18	8	3	—	—	—	60	28"	48	190	¾"	16
WW29	15	8	2	—	—	100	35"	52	260	¾"	18
WW39	25	15	6	—	—	300	40"	54	330	¾"	19
WW60	33	21	13	3.5	—	460	43"	60	410	1"	21
WW80	55	43	31	20	6	860	56"	64	687	1¼"	23



HEAT DISSIPATING PIPE

When air is compressed it gives off heat. This heat of compression, plus the heat from friction, can make a blower's outlet air temperature high enough to fry an egg. When the inlet air is 100°F and the blower pressure is just 55" H_2O (2 psi), the resulting 150°F discharge air can soften plastic PVC pipe.

This 8" diameter thin wall galvanized steel pipe can be used to cool the compressed air before it reaches the plastic pipe. Rated to 4 psi (110"). Each clamp includes one gasket. Flex hoses are listed by pipe size and include clamps. Seal connections with silicone to prevent air leaks. Made in USA.

MODEL		SHIP WT
DH8	STRAIGHT PIPE, 58"	13
DH45	ELBOW, 45°	3
DH90	ELBOW, 90°	6
DH19	CLAMP W/GASKET, 190°F	1
DH20	CLAMP W/GASKET, 1,100°F	1
PFG1	FLANGE WITH 11/2" NIPPLE	2
PFG2	FLANGE WITH 2" NIPPLE	3
PFG3	FLANGE WITH 3" NIPPLE	4
FH1	FLEX HOSE, 11/2" X 8"	1
FH2	FLEX HOSE, 2" X 8"	1
FH3	FLEX HOSE, 3" X 8"	1
FH4	FLEX HOSE, 4" X 12"	1
FH5	FLEX HOSE, 5" X 16"	1

PENTAIR

HIGH EFFICIENCY REGENERATIVE BLOWERS

AQUACULTURE DUTY

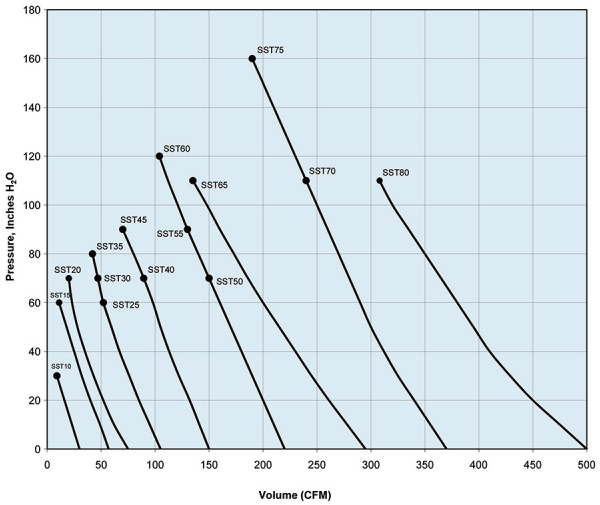
Get more performance per hp!

The Pentair Aquatic Eco-Systems Sweetwater® Series 2 regenerative blowers operate at a higher efficiency than traditional regenerative blowers. The cool-running outboard bearing design allows these units to achieve higher differential pressures, provide more cfm per horsepower and extend service life. The rugged die-cast aluminum build is lightweight, compact and extremely quiet. Easy-to-install, close-coupled design means you can quickly add them to your system. And their internal silencers, washable inlet filter and outlet flex hose further simplify installation. Oilless and virtually maintenance-free. CE- and UL-listed TEFC motors operate at both 50 and 60 Hz. Three-year warranty. **SST45** and larger ship motor freight.

SST10

3-YEAR WARRANTY

MODEL	CFM FREE AIR @ INCHES WATER 20"	30"	40"	50"	MAX DUTY	HP	PHASE	VOLTAGE	RATED FULL LOAD AMPS	HEIGHT W/O FILTERS	WIDTH	OUTLET HOSE SIZE	SHIP WT (LBS)
SST10	16	9	—	—	32"	.3	1	115/230	2.6/1.3	8.4"	7.8"	1"	13
SST15	40	33	26	20	56"	.6	1	115/230	6.0/3.0	9.8"	9.6"	1.25"	22
SST20	50	43	35	28	64"	.67	3	230/460	2.6/1.5	9.8"	9.6"	1.25"	23
SST25	85	76	67	60	64"	1.3	3	230/460	4.0/2.3	11.9"	11.3"	1.5"	33
SST30	85	76	67	60	76"	1.75	1	115/230	14.0/7.0	11.9"	11.3"	1.5"	35
SST35	85	76	67	60	88"	2	3	230/460	5.5/3.2	11.9"	11.3"	1.5"	35
SST40	132	122	112	105	72"	2.35	1	230	12.0	11.9"	11.3"	1.5"	35
SST45	132	122	112	105	84"	2.75	3	230/460	7.5/4.4	13.3"	13.1"	2"	46
SST50	200	190	180	170	76"	3.4	3	230/460	9.0/5.3	16.6"	15"	2"	64
SST55	200	190	180	170	92"	4.6	3	230/460	12.0/6.5	16.6"	15"	2"	75
SST60	200	190	180	170	124"	6.2	3	230/460	15.2/8.5	16.6"	15"	2"	93
SST65	260	245	230	215	112"	6.2	3	230/460	15.2/8.5	16.6"	15"	2"	95
SST70	340	327	312	300	112"	8.4	3	230/460	20.0/11.2	20.1"	17.6"	2.5"	143
SST75	340	327	312	300	161"	11.5	3	230/460	27.5/15.0	20.1"	17.6"	2.5"	150
SST80	450	430	410	395	104"	11.5	3	230/460	27.5/15.0	20.1"	17.6"	2.5"	160



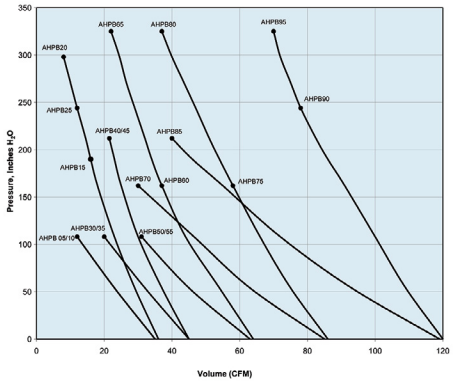
AHPB05

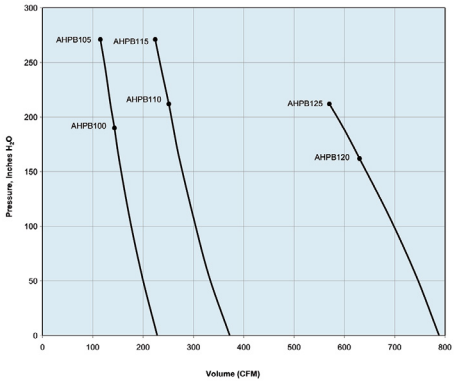
HIGH-PRESSURE REGENERATIVE BLOWERS

The ideal replacement for rotary lobe blowers and dry rotary vane vacuum pumps. While delivering comparable (or better) air pressure, these high-pressure blowers do not require the maintenance typically associated with traditional types of blowers and vacuum pumps.

The cool-running outboard bearing design allows these units to achieve higher differential pressures and extend service life. The rugged die-cast aluminum build is lightweight, compact and super quiet. Easy-to-install, close-coupled design means you can quickly add them to your system. And their internal silencers, washable inlet filter and outlet flex hose further simplify installation. Virtually maintenance-free. Fin-cooled TEFC motors operate at 50 and 60 Hz. Three-year warranty.

3-YEAR WARRANTY





3-Phase Motor Testing

A common mistake in the field is to wire a 3-phase motor and "bump" it to test the rotation. (Keep in mind, only certified electricians should be installing electrical equipment!). A phase tester should always be used to test the rotation. When a motor is "bumped" and the rotation is incorrect, the impeller can—and will—spin off. When the impeller spins off, it will not only break the impeller but also damage the volute. This can be a costly mistake.

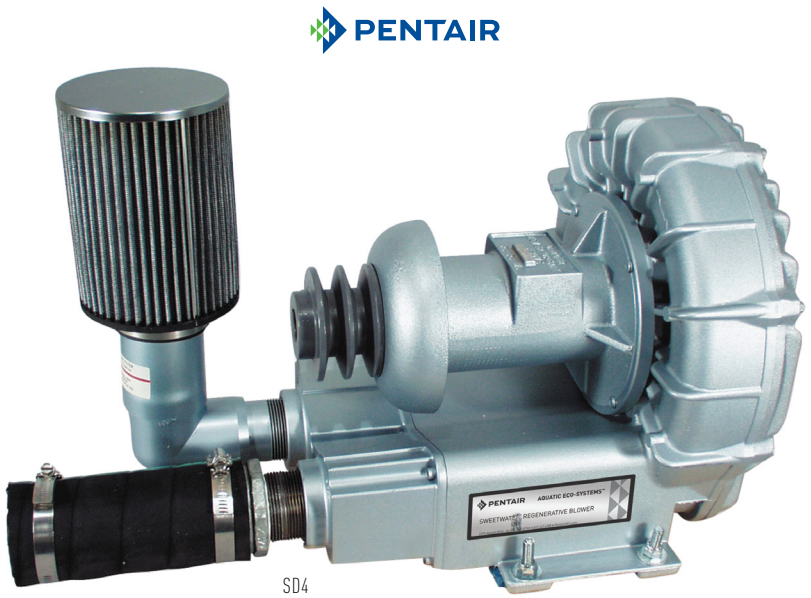
MODEL	CFM FREE AIR @ INCHES WATER* 54"	108"	162"	190"	212"	244"	271"	298"	325"	MAX DUTY	HP	PHASE	VOLTAGE	RATED FULL LOAD AMPS	HEIGHT W/O FILTERS	WIDTH	OUTLET HOSE SIZE	SHIP WT (LBS)
AHPB05	23	12	—	—	—	—	—	—	—	128"	1.1	3	230/460	3.8/2.2	12.5"	11.6"	1.25"	35
AHPB15	28	20	17	15	—	—	—	—	—	193"	1.25	3	230/460	4.0/2.3	12.8"	11.6"	1.25"	53
AHPB20	28	20	17	15	13	11	9	7	—	298"	2.75	3	230/460	7.5/4.4	12.8"	11.6"	1.25"	62
AHPB25	28	20	17	15	13	11	—	—	—	265"	2.35	1	230	10.3	12.8"	11.6"	1.25"	66
AHPB30	32	20	—	—	—	—	—	—	—	145"	1.25	3	230/460	4.0/2.3	13.4"	12.3"	1.25"	37
AHPB35	32	20	—	—	—	—	—	—	—	157"	1.47	1	115/230	18.0/9.0	13.4"	12.3"	1.25"	40
AHPB40	37	30	25	21	20	—	—	—	—	241"	2.75	3	230/460	7.5/4.4	13.6"	12.3"	1.25"	66
AHPB50	41	30	—	—	—	—	—	—	—	149"	2	3	230/460	5.5/3.2	14.8"	13.6"	1.25"	51
AHPB60	52	42	35	—	—	—	—	—	—	165"	2.75	3	230/460	7.5/4.4	14.9"	13.6"	1.25"	73
AHPB65	52	42	35	32	30	28	25	23	20	341"	5.1	3	230/460	13.5/7.8	14.9"	13.6"	1.25"	86
AHPB70	63	48	30	—	—	—	—	—	—	193"	3.4	3	230/460	9.0/5.3	15.6"	14.4"	1.25"	64
AHPB75	72	65	56	—	—	—	—	—	—	181"	3.4	3	230/460	9.0/5.3	15.7"	14.4"	1.25"	88
AHPB80	72	65	56	52	49	46	42	38	35	325"	6.2	3	230/460	16.5/9.5	15.7"	14.4"	1.25"	112
AHPB85	90	72	55	46	40	—	—	—	—	213"	5.1	3	230/460	13.5/7.8	17.9"	16.4"	1.25"	77
AHPB90	110	90	80	76	72	68	—	—	—	260"	6.2	3	230/460	16.3/9.5	17.9"	16.4"	1.25"	129
AHPB95	110	90	80	76	72	68	65	60	55	337"	8.8	3	230/460	22.5/12.6	17.9"	16.4"	1.25"	143
AHPB100	195	170	150	142	—	—	—	—	—	201"	8.4	3	230/460	20.0/11.2	16.3"	25.1"	2"	154
AHPB105	195	170	150	142	135	123	110	—	—	265"	11.5	3	230/460	27.5/15.0	16.3"	25.1"	2"	170
AHPB110	320	290	260	250	240	—	—	—	—	241"	16.8	3	230/460	50.2/29.0	20.1"	31.4"	2.5"	316
AHPB115	320	290	260	250	240	225	210	—	—	301"	23.2	3	230/460	60.0/34.5	20.1"	31.4"	2.5"	341
AHPB120	730	680	610	—	—	—	—	—	—	173"	31	3	230/460	72.0/42.0	24.6"	42.4"	4"	455
AHPB125	730	680	610	580	550	—	—	—	—	217"	39	3	230/460	90.0/52.0	24.6"	42.4"	4"	500

*For complete CFM Air @ Inches Water specs see PentairAES.com.

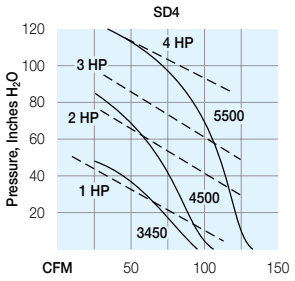
SWEETWATER® REMOTE-DRIVE REGENERATIVE BLOWERS

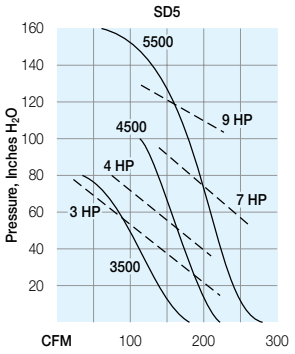
The Pentair Aquatic Eco-Systems Sweetwater remote-drive regenerative blowers are as reliable as Sweetwater motor-mounted electric blowers, and they offer the added benefits of variable performance and nonelectric drives. They are designed to be bolted to a base and driven by belts.

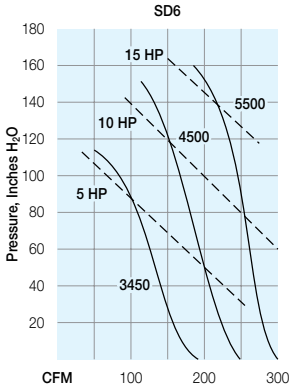
The power source can be an electric motor, gasoline engine, diesel engine or even hydro power. They are perfect for use in electrical emergencies or anywhere electric power is not available. Remote-drive blowers allow the user to vary performance by simply changing the engine speed or the pulley size. Ask a Pentair AES technician to calculate the pulley size for your application. Inlet air filters, flexible outlet hoses and double groove blower pulleys (sheaves) are included. Rotation is clockwise as you face the blower shaft. One-year warranty. Made in USA.

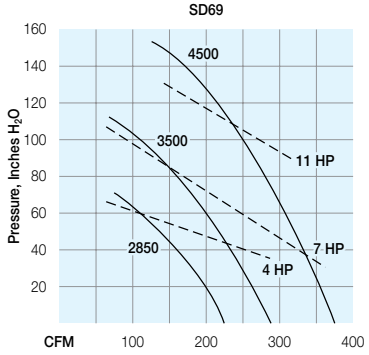


SD4



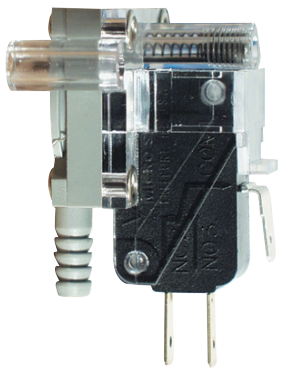






MODEL		PULLEY DIA.**	NO. OF FILTERS	OUTLET HOSE FOR PIPE SIZE	SHIP WT (LBS)
SD4	BELT-DRIVE BLOWER	2.4"	1	1½"	30
SD5	BELT-DRIVE BLOWER	3.0"	2	2"	40
SD6*	BELT-DRIVE BLOWER	4.0"	3	3"	80
SD69*	BELT-DRIVE BLOWER	4.0"	3	3"	155
BF6	REPL. INLET FILTER				

*Ships motor freight. **Pulley diameters are pitch diameters using "A" section belts. Shaft diameter is ⅞" (.875") on all models.



PRESSURE SWITCH

A low-cost method of starting backup equipment or tripping an alarm. Airwater line hose barb is ⅛". Can be used for either normally open or normally closed. Will carry up to 3 amps at 115V. Moistureproof. Preset to switch on/off at 30" H_2O, but is adjustable from 27" to 33" H_2O. 2" L x 1½" H.

MODEL
B601

PW11

PADDLE WHEEL AERATORS, FOR AQUACULTURE & WASTE WATER

FW SW

Excellent oxygen transfer and circulation.

Asian-made paddle wheels have become the most popular, even in North America, because of their low cost.

But be careful, they are not all the same. Gear reducers, motors, bearings, paddles and seals are all problematic components. The availability of repair parts, warranty replacements and efficiency ratings must be considered over low price!

We offer only high-quality, Taiwanese-made paddle wheels featuring high-efficiency TEFC motors and the high-quality gear reducer to ensure a long service life. The entire unit, including gear reducer and motor, has a one-year warranty. The frame, drive shafts and hardware are 304 stainless steel—all compatible with salt water. The SAE is approximately 4.1 on all models. Power cable not included.

Other features include fiber-reinforced nylon paddles (8 blade) and one-piece, molded, polyethylene floats.

We will be happy to provide quotations for larger quantities shipped directly to you from the factory. 50-Hz models are available in quantity by special order.

Note: Warranty requires the gear oil be changed after the first 3 months. Use SAE 90 oil.

Ship motor freight only.

3-Phase Equipment:

We highly recommend using protective devices with all 3-phase equipment. Motor starters, phase monitors and phase protectors are not included in the sale and should be sourced locally. Failure to install protective devices will void most warranties. We also recommend that a certified electrician perform the installation.

MODEL		AES	PHASE	RUNNING AMPS	SHIP WT (LBS)
PW11-AQ	1 HP, 115/230V, 60 HZ	1,450	1	8.0	400
PW21	2 HP, 230V, 60 HZ	2,900	1	13.0	430
PW23	2 HP, 230/460V, 60 HZ	2,900	3	6/3	430
PW333	3 HP, 230/460V, 60 HZ	4,350	3	9/4.5	460
PW11M	REPLACEMENT MOTOR, 1 HP		1		132
PW21M	REPLACEMENT MOTOR, 2 HP		1		143
PW23M	REPLACEMENT MOTOR, 2 HP		3		143
PW33M	REPLACEMENT MOTOR, 3 HP		3		152
PW11G	REPLACEMENT GEAR BOX, 1 & 2 HP				47
PW33G	REPLACEMENT GEAR BOX, 3 HP				53
PW23-5	PILLOW BLOCK (FITS ALL)				
PW23-3	MOTOR COVER (FITS ALL)				
PW11-5	PADDLE WHEEL (FITS ALL)				
PW23-8	FLOAT (FITS ALL)				

SWEETWATER® AIR DIFFUSERS ✓ DESIGNED HERE

As close to perfect as diffusers get!

Pentair Aquatic Eco-Systems Sweetwater diffusers are the highest-quality ceramic-type air diffusers on the market today. They're machined from a solid block of glass-bonded silica. Because dust and dirt particles up to 30 microns in size will pass right through these diffusers, there's no need for expensive air filters. And with an air resistance of less than .25 psi, Sweetwater glass-bonded diffusers are compatible with economical low-pressure blowers.

They produce a uniform medium/fine bubble and are very resistant to clogging. And when cleaning does become necessary because of a buildup of calcium precipitate or bacteria, an acid bath restores them to like-new performance.

Note that water pH in excess of 9.0 will shorten the diffuser life. Self-weighting when used with typical tubing lengths.

Beware of imitations.

Sweetwater diffusers are the original 2,000°F glass-bonded silica diffusers introduced by us in 1984. You may come across other diffusers that copy our sizes, descriptions and even our photos, but it takes more than flattering imitation to compete with the best. Look for the name and the two-year warranty. Made in USA.

AES This is the lbs of fish supported.

PENTAIR

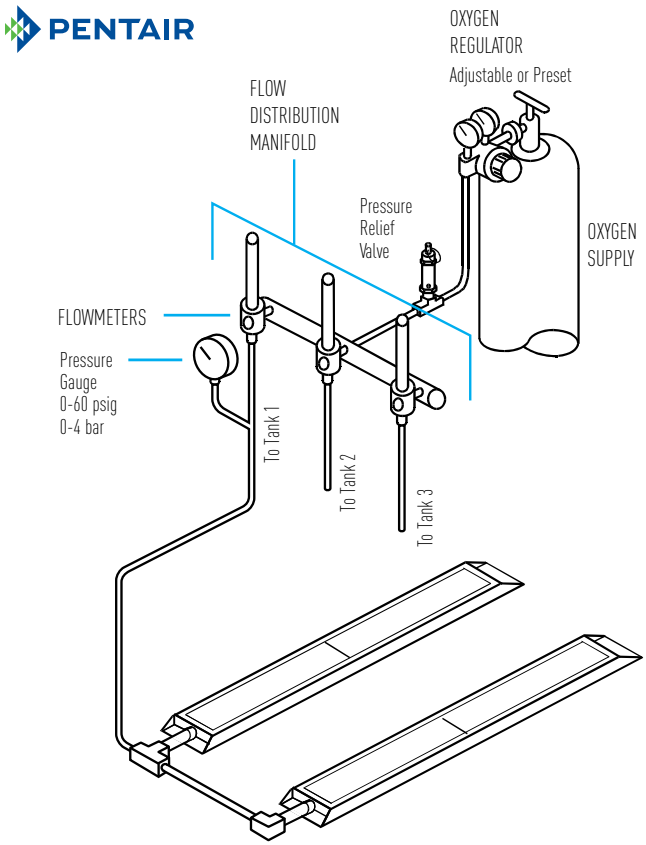
SWEETWATER® MEDIUM PORE DIFFUSER SPECIFICATIONS

BODY	2,000°F GLASS-BONDED SILICA
FITTING	ABS (**AS1** & **AS2**) LINEAR POLYETHYLENE OR SPECIAL ORDER
MAXIMUM PORE SIZE	140 MICRONS (.0055 INCHES)
BUBBLE SIZE	1–3 MM (.04–.15 INCHES)
NOMINAL PARTICLE RETENTION	50 MICRONS
SERVICE LIFE AT PH BELOW 8.0	UNLIMITED
FLEXURAL STRENGTH	2,500 PSI

2-YEAR WARRANTY

MODEL	LENGTH* IN	WIDTH* CM	SUGGESTED IN	CM	CFM	AES	AIR SUPPLY CONNECTION	SHIP WT (LBS)
AS1	1.5	4	.50	1.3	.05	1.5	3/16" O.D. (4 MM), ABS	.03
AS2	1.5	4	.75	2	.10	3	3/16" O.D. (4 MM), ABS	.06
AS3	2.0	5	1.0	2.5	.20	5	3/16" O.D. (4 MM), PE	.10
ALS3	2.0	5	1.0	2.5	.20	5	1/4" NPT, PE	.10
AS4	1.5	4	1.5	4	.25	7	3/16" O.D. (4 MM), PE	.21
AS5S	3.0	8	1.0	2.5	.30	8	3/16" O.D. (4 MM), PE	.16
AS5L	3.0	8	1.0	2.5	.30	8	1/4" O.D. (6 MM), PE	.16
ALS5	3.0	8	1.0	2.5	.30	8	1/4" NPT, PE	.16
AS8S	3.0	8	1.5	4	.35	10	3/16" O.D. (4 MM), PE	.39
AS8L	3.0	8	1.5	4	.35	10	1/4" O.D. (6 MM), PE	.39
ALS8	3.0	8	1.5	4	.35	10	1/4" NPT, PE	.39
ALR8	3.0	8	1.5	4	.35	10	1/2" NPT, PE	.39
AS15S	6.0	15	1.5	4	.50	14	1/4" O.D. (6 MM), PE	.75
AS15L	6.0	15	1.5	4	.50	14	3/8" O.D. (9 MM), PE	.75
ALR15	6.0	15	1.5	4	.50	14	1/2" NPT, PE	.75
AS23S	9.0	23	1.5	4	.75	20	1/4" O.D. (6 MM), PE	1.35
AS23L	9.0	23	1.5	4	.75	20	3/8" O.D. (9 MM), PE	1.35
ALR23	9.0	23	1.5	4	.75	20	1/2" NPT, PE	1.35
AS30S	12.0	30	1.5	4	1.00	27	1/4" O.D. (6 MM), PE	1.50
AS30L	12.0	30	1.5	4	1.00	27	3/8" O.D. (9 MM), PE	1.50
ALR30	12.0	30	1.5	4	1.00	27	1/2" NPT, PE	1.50
ASW88S**	3.0	8	3.0	8	.70	19	1/4" O.D. (6 MM), PE	.70
ASW88L**	3.0	8	3.0	8	.70	19	3/8" O.D. (6 MM), PE	.70

*Dimensions of length and width are ±1/8" (3 mm). **Fitting is in center of 3" x 3" dimension. The suggested cfm shown above is typical for aquaculture; higher cfm amounts will create larger bubbles. Nonstandard fittings are available on request. PE is high-density linear polyethylene. ABS is green plastic.



POINT FOUR™ MICRO BUBBLE OXYGEN DIFFUSERS (MBD)

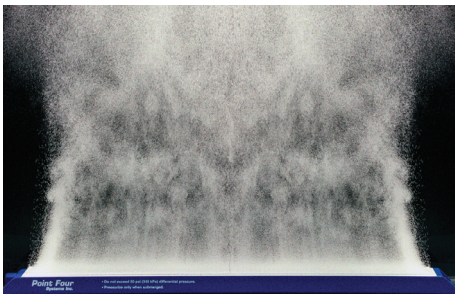
AQUACULTURE DUTY

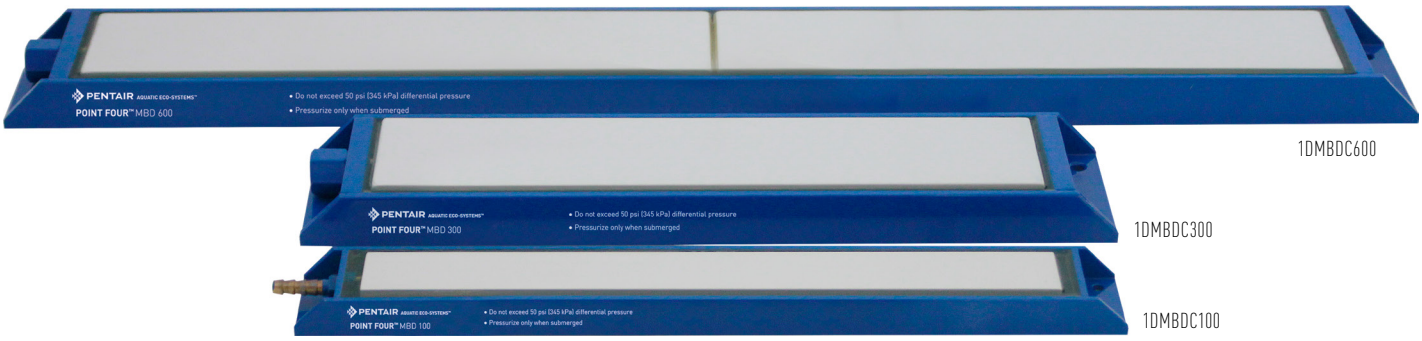
One of the simplest ways to dissolve gases, such as oxygen or carbon dioxide, in water is to introduce the gas as small bubbles - the smaller the bubbles the more efficient the absorption of the gas.

These aquaculture-duty diffusers are among the most efficient diffusers available, allowing you to increase yield while controlling the cost of expensive gases. Made from premium materials and subject to rigorous testing, MBD diffusers provide the kind of performance and reliability our reputation is built on.

Point Four diffusers use a specially developed, ultra fine pore ceramic plate that produces a cloud of extremely fine bubbles of approximately 100–500 microns; far superior to airstones, porous hose or membrane type designs. The flat plate design ensures uniform bubbles across the entire surface and minimizes bubble coalescence to achieve an absorption rate in excess of 80%, depending on depth and flowrate. Bubbling Pressure is 25 to 35 psi. (1.7 to 2.4 bar).

- One of the most efficient diffusers available
- Robust construction—ceramic plates set in a rigid aluminum base with solidbrass connection fittings
- Easy to install and use—trouble-free operation
- Flexible, modular design lets you easily add or subtract diffusers as your needs change
- Simple ceramic plate maintenance - provides reliable bubbling performance





1DMBDC600

1DMBDC300

1DMBDC100

MODEL	OVERALL SIZE (IN/CM)	SHIP WT (LBS/KG)	REC. OPERATING RANGE (LPM/SCFH)	MAX FLOWRATE @ 50 PSI (3.5 BAR) (LPM/SCFH)	GAS INLET CONNECTION
1DMBDC100	14½" X 1¾"/37 X 4.5	1.2/0.535	UP TO 1.5/3.2	4.5/9.5	¼" HOSE BARB
1DMBDC300	15¼" X 3¼"/39 X 8.3	2.8/1.3	UP TO 3/6.5	9/19	¼" FEMALE
1DMBDC600	27½" X 3¼"/70 X 8.3	5/2.3	UP TO 6/12.7	18/38	¼" FEMALE
1DMBDC900	39¾" X 3¼"/102 X 8.3	7.3/3.3	UP TO 9/19.5	27/58	¼" FEMALE
1DMBDC120	52" X 3¼"/132 X 8.3	9.5/4.3	UP TO 12/26	36/78	¼" FEMALE

OXYGEN/OZONE CONTACT CONES

Pentair Aquatic-Eco Systems Oxygen/Ozone Contact Cones

- Formerly HE Group
- 100% Utilization of gas
- Designed for maximum utilization of gas transfer area
- Provided with 25 psi pressure relief valve
- Available in many sizes for various flow requirements
- Designed for containerized shipping anywhere in the world
- Top inlets allow for multiple inputs

MODEL	DIAMETER (IN.)	HEIGHT (IN.)	SHIP WEIGHT (LBS)
O2C-025-012	12	31	54
O2C-025-018	18	42	71
O2C-025-024	24	56	106
O2C-025-027	27	64	126
O2C-025-030	30	69	142
O2C-025-033	33	76	182
O2C-025-036	36	82	219
O2C-025-042	42	96	309
O2C-025-048	48	111	414
O2C-025-054	54	118	462
O2C-025-060	60	133	695
O2C-025-072	72	159	1110
O3C-025-012	12	31	54
O3C-025-018	18	42	71
O3C-025-024	24	56	106
O3C-025-027	27	64	126
O3C-025-030	30	69	142
O3C-025-033	33	76	182
O3C-025-036	36	82	219
O3C-025-042	42	96	309
O3C-025-048	48	111	414
O3C-025-054	54	118	462
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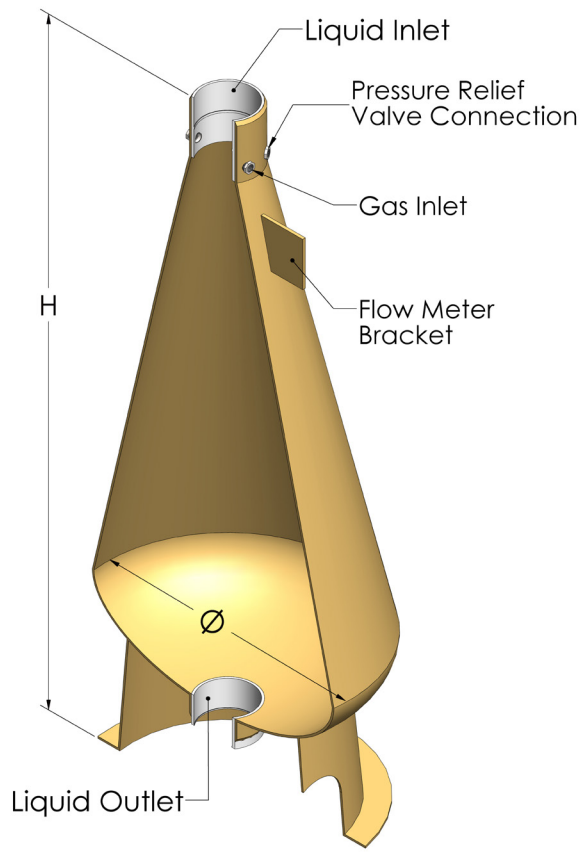


Available in other pressure ratings. Contact PAES for more information

Oxygen/Ozone Contact Cone

Technical Data

Model Number			O2C-025-012 O3C-025-012	O2C-025-018 O3C-025-018	O2C-025-024 O3C-025-024	O2C-025-027 O3C-025-027	O2C-025-030 O3C-025-030	O2C-025-033 O3C-025-033	O2C-025-036 O3C-025-036	O2C-025-042 O3C-025-042	O2C-025-048 O3C-025-048	O2C-025-054 O3C-025-054	O2C-025-060 O3C-025-060	O2C-025-072 O3C-025-072
Diameter	**in**	**D**	**12**	**18**	**24**	**27**	**30**	**33**	**36**	**42**	**48**	**54**	**60**	**72**
Overall Height	in	**H**	31.0	41.9	56.4	63.7	69.0	76.2	81.8	96.3	110.8	118.4	132.9	159.1
Inlet / Outlet Ø	in	**LI/LO**	1.5	3.0	3.0	3.0	4.0	4.0	6.0	6.0	6.0	8.0	8.0	10.0
Liquid Flow - Max	gpm		46	103	186	236	289	351	412	565	742	933	1,157	1,664
	m^3/min		0.18	0.39	0.70	0.89	1.10	1.33	1.56	2.14	2.81	3.53	4.38	6.30

Note: Units include [2] ¾"x¼" 316SS bushings for pressure gauge and pressurized O^2 / O^3 inlet & [1] ¾"x½" 316SS bushings for pressure relief.

Oxygen Absorption Lbs/Hr @ 10 psi												
5°C	0.6	1.3	2.4	3.1	3.8	4.6	5.4	7.4	9.6	12.1	15.0	21.6
10°C	0.5	1.1	2.1	2.6	3.2	3.9	4.6	6.3	8.2	10.3	12.8	18.4
15°C	0.5	1.0	1.8	2.3	2.9	3.5	4.1	5.6	7.3	9.2	11.4	16.4
20°C	0.4	0.9	1.6	2.1	2.5	3.1	3.6	5.0	6.5	8.2	10.2	14.6
25°C	0.4	0.9	1.7	2.1	2.6	3.1	3.7	5.0	6.6	8.3	10.3	14.8

Oxygen Absorption - Lbs/Hr @ 25 psi												
5°C	1.3	2.8	5.1	6.5	8.0	9.7	11.4	15.6	20.5	25.8	32.0	46.0
10°C	1.1	2.5	4.5	5.8	7.1	8.6	10.1	13.8	18.1	22.8	28.3	40.6
15°C	1.0	2.2	4.0	5.1	6.3	7.6	9.0	12.3	16.1	20.3	25.1	36.1
20°C	0.9	2.0	3.7	4.6	5.7	6.9	8.1	11.1	14.6	18.4	22.8	32.8
25°C	0.8	1.8	3.3	4.2	5.1	6.2	7.3	10.0	13.1	16.5	20.5	29.4

** Shipping weight are based on 25psi design thickness. Weights will change at other design pressures.*

OXYGEN/OZONE CONTACT CONES

100% efficiency potential

Pentair Aquatic Eco-Systems Sweetwater cones are designed to optimize the saturation of gases in water, and gas transfer efficiencies of up to 100% are possible. Operation of the cone is simple: as water and gas (either pure oxygen, ozone or other gas) enter from the top at a relatively high velocity, the water shears and moves the bubbles downward. As the cone widens the velocity is reduced. The undissolved bubbles keep returning to the top, so only water without bubbles can exit the bottom. At higher pressures, the dissolved oxygen concentration may be increased significantly above saturation. For example, a Sweetwater cone operating at only 10 psi can deliver water with a dissolved oxygen concentration above 25 mg/L. Sweetwater cones may be operated at a pressure of up to 21 psi. No matter what concentration of dissolved oxygen is needed, Pentair AES has the right cone for your application. Please contact a Pentair AES technician for assistance with sizing and complete skid systems.

MODEL	FLOW RANGE	SUGGESTED FLOW METER*	GALLONS (APPROX.)	INLET/ OUTLET	SHIP WT (LBS)
OY30F-1	73–130	**MFR440**	45	3"	65
OY60F-1	150–260	**MFR4150**	110	4"	100
OY110F-1	280–480	**MFR4150****	195	5"	245
OY140F-1	350–600	**MFR4150****	335	6"	290

*See Index for flow meters, flanges and valves. **Two required.

DIMENSIONS

	OY30F-1	OY60F-1	OY110F-1	OY140F-1
A	68"	85"	107"	129"
B	24"	34"	40"	48"
C	16"	16.5"	19.5"	22"
D	3.5"	4"	5.5"	6"
E	8"	9"	10"	11.5"

OXYGEN CAPACITY AT MAXIMUM FLOWRATES, VARIOUS TEMPERATURES AND PRESSURES, SALINITY 0, SEA LEVEL, INFLOW SAT. 100%, CONTACTOR SAT. 60%

			TEMP 50°F (10°)			TEMP 68°F (20°)			TEMP 86°F (30°)		
	Gauge Pressure		Oxygen Capacity		D.O.	Oxygen Capacity		D.O.	Oxygen Capacity		D.O.
	psi	bars	lbs/hr	kg/hr	mg/L	lbs/hr	kg/hr	mg/L	lbs/hr	kg/hr	mg/L
OY30F-1 130 gpm	10	0.7	3.2	1.5	61	2.6	1.2	49	2.1	1.0	39
	15	1.0	3.8	1.7	70	3.1	1.4	56	2.5	1.1	45
	20	1.4	4.4	2.0	80	3.5	1.6	64	2.8	1.3	51
OY60F-1 260 gpm	10	0.7	6.6	3.0	62	5.3	2.4	50	4.2	1.9	40
	15	1.0	7.8	3.6	72	6.3	2.8	57	5.0	2.3	46
	20	1.4	9.1	4.1	81	7.3	3.3	65	5.8	2.6	52
OY110F-1 480 gpm	10	0.7	12.3	5.6	63	9.8	4.5	50	7.9	3.6	40
	15	1.0	14.6	6.6	72	11.7	5.3	58	9.3	4.2	47
	20	1.4	16.9	7.7	82	13.5	6.1	65	10.8	4.9	53
OY140F-1 600 gpm	10	0.7	15.4	7.0	63	12.3	5.6	50	9.9	4.5	40
	15	1.0	18.3	8.3	72	14.6	6.6	58	11.7	5.3	47
	20	1.4	21.2	9.6	82	17.0	7.7	66	13.6	6.1	53
OY10 12 gpm	10	0.7	0.17	0.08	39	0.13	0.06	31	0.11	0.05	25
	15	1.0	0.20	0.09	44	0.16	0.07	35	0.13	0.06	29
	20	1.4	0.23	0.10	49	0.18	0.08	40	0.15	0.07	32
OY18 25 gpm	10	0.7	0.50	0.23	52	0.40	0.18	41	0.32	0.15	33
	15	1.0	0.60	0.27	59	0.48	0.22	47	0.38	0.17	38
	20	1.4	0.69	0.31	67	0.55	0.25	53	0.44	0.20	43
OY35 65 gpm	10	0.7	1.5	0.7	59	1.2	0.6	47	1.0	0.4	39
	15	1.0	1.8	0.8	68	1.5	0.7	54	1.2	0.5	44
	20	1.4	2.1	1.0	76	1.7	0.8	61	1.4	0.6	49
OY35P 65 gpm	10	0.7	1.5	0.7	59	1.2	0.6	47	1.0	0.4	38
	15	1.0	1.8	0.8	68	1.5	0.7	54	1.2	0.5	44
	20	1.4	2.1	1.0	76	1.7	0.8	61	1.4	0.6	49
OY75 90 gpm	10	0.7	2.2	1.0	60	1.8	0.8	48	1.4	0.6	39
	15	1.0	2.6	1.2	69	2.1	0.9	55	1.7	0.8	45
	20	1.4	3.0	1.4	78	2.4	1.1	63	1.9	0.9	50
OY110 130 gpm	10	0.7	3.2	1.5	61	2.6	1.2	49	2.1	0.9	39
	15	1.0	3.8	1.7	70	3.1	1.4	56	2.5	1.1	45
	20	1.4	4.4	2.0	80	3.5	1.6	64	2.8	1.3	51
OY160 200 gpm	10	0.7	5.0	2.3	62	4.0	1.8	49	3.2	1.5	40
	15	1.0	6.0	2.7	71	4.8	2.2	57	3.8	1.7	46
	20	1.4	6.9	3.1	81	5.5	2.5	65	4.4	2.0	52
OY250 300 gpm	10	0.7	7.6	3.5	62	6.1	2.8	50	4.9	2.2	40
	15	1.0	9.1	4.1	72	7.3	3.3	57	5.8	2.6	46
	20	1.4	10.5	4.8	81	8.4	3.8	65	6.7	3.0	52
OY400 500 gpm	10	0.7	12.8	5.8	63	10.3	4.7	50	8.2	3.7	40
	15	1.0	15.2	6.9	72	12.2	5.5	57	9.7	4.4	47
	20	1.4	17.6	8.0	82	14.1	6.4	65	11.3	5.1	53

AES Multiply lbs/hr D.O. by 1,500 to estimate the lbs of fish that can be supported at 3% bodyweight (bw) feed per day (assumes oxygen/feed ratio of 0.5). 1 lb O_2= 12.08 ft^3 @ STP; 28 liters = 1 cubic foot; 1 kPa= .145 psi

DOCS 80-55 (Deployable Oxygen Concentration System) is capable of producing 80 liters per minute of 93% oxygen at 10-100.

PCI DEPLOYABLE OXYGEN CONCENTRATION SYSTEMS

PCI is a manufacturer of on-site oxygen generation systems using a proprietary reversible blower Vacuum Swing Absorption (VSA) technology. The DOCS (Deployable Oxygen Concentrator System) uses half the power of equivalent Pressure Swing Absorption (PSA) systems along with a significant reduction in footprint. Superior turndown and load following characteristics further enhance energy efficiencies not provided by PSAs.

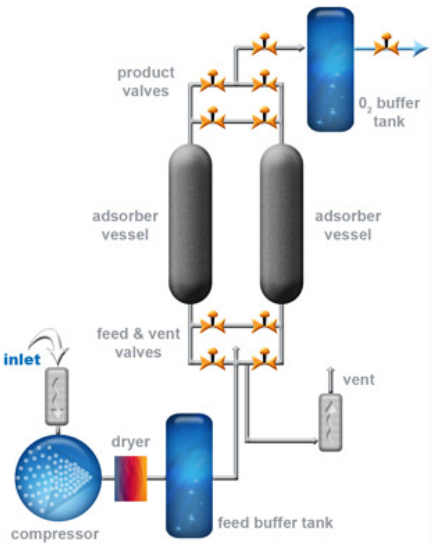
- Uses an oilless blower.
- Lower operating pressure minimizes the potential for water condensation.
- Not as susceptible to humid environments.
- Single-bed process eliminates all process valves and required manifolds.
- Low operating pressure minimizes sieve dusting because the pressure swing is an order of magnitude lower.
- VSA adsorber vessel has a much longer service life than PSA vessels.
- Shows significantly less degradation of performance at high altitudes.
- Needs no feed air compressor (> 50% saving vs. conventional systems)
- Meets the USP 93% standard and can be as high as 95%.
- Turnkey integrated solution—no need to size and source air compressors, dryer systems and product or feed buffer tanks.

CALL FOR MORE INFORMATION AND PRICING.

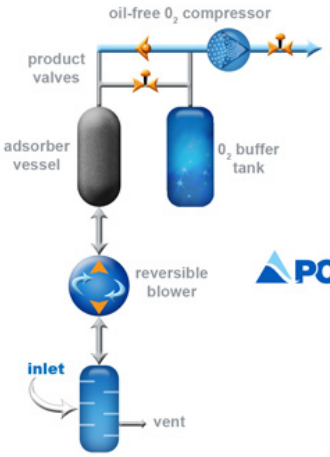
DOCS 500-55 (Deployable Oxygen Concentration System) is capable of producing 500 liters per minute of 93% oxygen at 10-100 psig

DOCS 500-55 (Deployable Oxygen Concentration System) is capable of producing 500 liters per minute of 93% oxygen at 10-100 psig

COMPLEX **PSA** TECHNOLOGY



SIMPLIFIED **VSA** TECHNOLOGY



Keeping Track	PSA	VSA
Power (kWh / m³):	1.6	0.8
Number of Main Components:	6	4
Number of Process Valves:	10	3

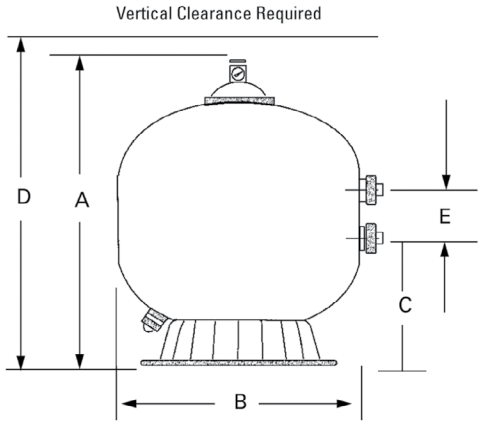
MODEL	PURITY	FLOW RATE (LPM)	FLOW RATE (SCFH)	FLOW RATE (M^3/HR)	OUTPUT PRESSURE (PSIG)	AVERAGE POWER USE (KW)	OPERATING POWER	BASE DIMENSIONS	BASE UNIT WEIGHT (LBS)
DOCS 80-55	93%	80	170	4.8	10 TO 100	4.2	460V OR 380V	52"L X 42"W X 56"H	1,500
DOCS 200-5	93%	200	435	12	5 TO 8	7.5	460V OR 380V	74"L X 74"W X 72"H	2,750
DOCS 200-55	93%	200	435	12	10 TO 100	9.5	460V OR 380V	74"L X 74"W X 72"H	3,050
DOCS 500-5	93%	500	1,060	30	5 TO 8	18	460V OR 380V	114"L X 72" W X 83"H	5,400
DOCS 500-55	93%	500	1,060	30	10 TO 100	21	460V OR 380V	114"L X 72" W X 83"H	5,700

10 YEAR TANK WARRANTY

ARIAS™ 8000 FILTERS

Fiberglass sand filter w/o valves

The Pentair Aquatic Eco-Systems Arias 8000 sand filters feature a process that creates a one-piece, reinforced fiberglass shell with a UV-resistant surface finish. Compatible multi-port valve available separately, refer below to part number VLVMPA-AQ. 10-year tank warranty, one-year standard warranty. Ship via motor freight. Made in USA.



MODEL	EFFECTIVE FILTRATION AREA (FT²)	FLOW RATE (GPM)[1]	MAX PRESSURE (PSI)	PEA GRAVEL REQUIRED (LBS)	SAND REQUIRED (LBS)	FILTER MEDIA ALL SAND REQUIRED (LBS)	DIMENSIONS A	B	C	D	E	SHIP WT (LBS)
A8000-100-AQ	4.91	98	50	150	450	600	39.75"	30.5"	16.50"	43.75"	7.5"	70
A8000-140-AQ	7.06	141	50	275	650	925	45.25"	36.5"	18.75"	49.25"	7.5"	82

OPTIONAL VALVE	
SMV2	MULTIPORT VALVE, 2" SIDE MOUNT

[1]Based on 20 gpm per ft².

TECH TALK

Mechanical Filtration and Biofiltration

In the world of aquaculture, mechanical filtration and biofiltration are very distinct and separate entities, and they must be treated as such. Mechanical filtration is the removal of solid waste, whereas biofiltration is the biological process that converts toxic nitrogenous wastes to low toxicity nitrate.

Solid waste is typically categorized by its size and specific gravity. Settleable solids are those solids which have a relatively high specific gravity compared to the water in which they exist. They will settle to the bottom. Suspended solids are those in a category that have a specific gravity the same as, or slightly higher than, the water. They tend to stay in suspension and will only "drop-out" over a long period of time. Dissolved solids are those which actually become a part of the water. The dissolved solids are eliminated by reverse osmosis, anion and cation resins, activated carbon, etc.

One method of removing solid waste from a round fish tank is to use a double drain. It will direct the settled solids to a separate area from the main flow. The settled solids can be directed into a small clarifier, much smaller than one sized to handle the entire flow of recirculating water. The other drain takes the suspended solids along with the nitrogenous waste.

Suspended solids can be removed by several methods. One is the bead filter, which incorporates the use of small polyethylene beads that have a positive electrostatic charge. These beads have an affinity for the negatively charged suspended solids. As the particles pass these beads, they are "statically" drawn to them. When the beads are loaded with solids, it is time to backwash them.

Suspended solids can also be removed by mechanical means such as bag filters, drum filters and vegetative filters.

Biofiltration is the aerobic (with oxygen) breakdown of dissolved nitrogenous fish waste. The process is accomplished by two or more strains of autotrophic bacteria. These bacteria are naturally occurring and will ultimately colonize the biomedia in the biofilter as well as the tank and pipe walls. The speed of this process is dependent on temperature, pH, salinity, surface area, flowrate, etc.

The autotrophic bacteria use oxygen in a two-step process to first convert the ammonia (NH3 or NH4+) to nitrite (NO2-). Another strain of bacteria converts nitrite (NO2-) to nitrate (NO3-). Nitrate is much less toxic and typically tolerated by most cultured species until it reaches very high levels. Controlling nitrate is accomplished by diluting with clean water or by using a denitrification chamber that converts nitrate into nitrogen gas (this is an anaerobic process that uses a group of heterotrophic bacteria). A third method to keep nitrate levels in check is the use of plants. You can have a green water system (using algae), a vegetative filter or even use a hydroponic plant system to remove nitrate.

Regardless of which type of filtering equipment you decide to use, the one thing to keep in mind is to stage the filtration. It is a common mistake to design a system that relies too heavily on a single filtering device to provide all of the filtering requirements of a recirculating system. By staging filtration components, the system will perform at or near its peak.

PR AQUA ROTOFILTER® DRUM FILTER

Rotary microscreen drum filters are ideal for the removal of fine suspended solids in recirculating systems where water reuse strategies are imperative—zoos, aquariums, greenhouses, aquaculture systems, wastewater treatment plants, and more. PR Aqua Rotofilters are trusted by facilities worldwide for critical filtration needs. Constructed of the highest-quality materials and engineered for the rigors of commercial aquaculture, PR Aqua Rotofilters provide exceptional reliability and a long service life. Designed with the needs of the commercial operator in mind, the filters are also inexpensive to operate. Rotofilters are also available in two configurations; fully-enclosed or frame-mounted. With flow rate capacities from 50 to 7,000 gpm (11 to 1590 M_3/HR) and micron ratings from 11–80 (custom sizes available upon request) there is sure to be a Rotofilter that meets the requirements of your application.

BENEFITS

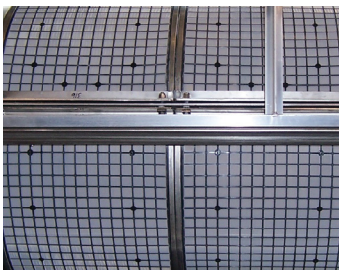
- Manufactured in North America with factory-direct service and spare parts.
- Removes excess feed, and other organic matter.
- Continuous filtering, even during backwashing.
- Very low operating cost and minimal backwash water consumption.
- Superior screen design for long service life.
- Ideal for sand filter backwash recovery.

FEATURES

- Fiberglass enclosure or stainless steel frame mount, stainless steel internals, and high-quality industrial drive components.
- Injection molded, one-piece screen eliminates the potential for screen delamination and allows for plugging of small holes without downtime.
- Inlet seal maintains a continuous positive seat against the rotating drum.
- Appropriate for corrosive environments. Metals passivated for saltwater applications.

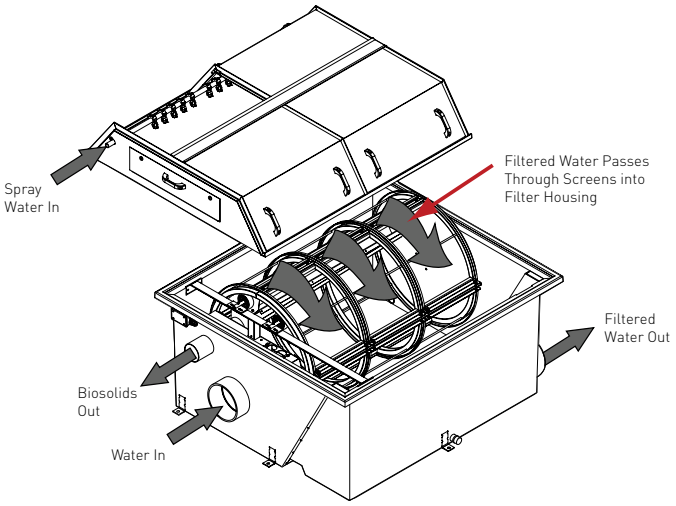
DESCRIPTION OF OPERATION

Untreated water is gravity fed or pumped into the drum, which has fine screens mounted to its periphery. Water flows through the screens while the solids adhere to the screen surface. The filtered water passes over a level control weir and then out of the filter by the use of gravity. As particles attach to the screen surface, the water level inside the drum rises. The rising water activates the automatic drum rotation and backwash system. A pressurized spray is used to clean the solids from the screen into an inclined trough. The solids flow by gravity from the filter for disposal or recovery. The cleaned screens are rotated into the water, lowering the water level. The backwash system shuts down automatically to save power and water.



Injection Molded Screens

Backwash Spray Nozzles



PR Aqua™
A PENTAIR AQUATIC ECO-SYSTEMS™ Division

PERFORMANCE DATA

RFF MODEL

	Micron Rating	3218	3236	3254	4848	4872	6072	6096	60120
SCREEN OPEN AREA	17	13%	13%	13%	13%	13%	13%	13%	13%
	21	15%	15%	15%	15%	15%	15%	15%	15%
	30	20%	20%	20%	20%	20%	20%	20%	20%
	40	25%	25%	25%	25%	25%	25%	25%	25%
	54	32%	32%	32%	32%	32%	32%	32%	32%
	80	39%	39%	39%	39%	39%	39%	39%	39%
10 MG/L TSS (INTAKE WATER, CLEAN FLOWS)	17	183	366	549	731	1097	1371	1829	2286
	21	238	477	715	954	1430	1788	2384	2980
	30	332	664	996	1329	1993	2491	3322	4152
	40	414	829	1243	1657	2486	2905	4143	5178
	54	487	973	1460	1947	2920	3650	4867	6083
	80	590	1180	1770	2360	3540	4425	5900	7375
15 MG/L TSS (HATCHERY INFLUENT)	17	165	330	495	660	990	1237	1649	2062
	21	218	436	654	871	1307	1634	2179	2723
	30	307	615	922	1229	1843	2304	3072	3841
	40	386	771	1157	1542	2313	2698	3855	4819
	54	455	909	1364	1818	2727	3409	4545	5682
	80	553	1106	1659	2212	3318	4148	5530	6913
25 MG/L TSS (RECYCLE SYSTEMS-COLD WATER)	17	52	104	156	207	311	389	519	648
	21	108	217	325	433	650	813	1084	1355
	30	204	407	611	815	1223	1528	2038	2547
	40	287	575	862	1149	1724	1949	2873	3591
	54	361	722	1083	1444	2166	2707	3610	4512
	80	466	932	1398	1864	2796	3495	4661	5826
25 MG/L TSS (RECYCLE SYSTEMS- WARM WATER)	17	34	69	103	137	206	257	343	428
	21	74	149	223	297	445	557	742	928
	30	142	283	425	567	850	1063	1417	1771
	40	201	401	602	803	1204	1360	2007	2509
	54	253	505	758	1011	1517	1896	2528	3160
	80	327	654	981	1309	1963	2454	3271	4089
40 MG/L TSS MUNICIPAL EFFLUENT POLISHING	17	42	84	126	168	252	315	420	525
	21	45	91	136	181	272	340	453	567
	30	51	102	153	204	305	382	509	636
	40	56	111	167	223	335	406	558	697
	54	60	120	180	240	361	451	601	751
	80	66	133	199	265	398	497	663	828

RFM MODEL

	Micron Rating	2014	3218	3236	3254	4848	4872	60096
SCREEN OPEN AREA	17	13%	13%	13%	13%	13%	13%	13%
	21	15%	15%	15%	15%	15%	15%	15%
	30	20%	20%	20%	20%	20%	20%	20%
	40	25%	25%	25%	25%	25%	25%	25%
	54	32%	32%	32%	32%	32%	32%	32%
	80	39%	39%	39%	39%	39%	39%	39%
10 MG/L TSS (INTAKE WATER, CLEAN FLOWS)	17	89	183	366	549	731	1097	1829
	21	116	238	477	715	954	1430	1829
	30	161	332	664	996	1329	1993	2384
	40	201	414	829	1243	1657	2486	4143
	54	236	487	973	1460	1947	2920	4867
	80	286	590	1180	1770	2360	3540	5900
15 MG/L TSS (HATCHERY INFLUENT)	17	80	165	330	495	660	990	1649
	21	106	218	436	654	871	1307	1649
	30	149	307	614	922	1229	1843	2179
	40	187	386	771	1157	1542	2313	3855
	54	221	455	909	1364	1818	2727	4545
	80	268	553	1106	1659	2212	3318	5530
25 MG/L TSS (RECYCLE SYSTEMS-COLD WATER)	17	25	52	104	156	207	311	389
	21	53	108	217	325	433	650	519
	30	99	204	408	611	815	1223	1084
	40	139	287	575	862	1149	1724	2873
	54	175	361	722	1083	1444	2166	3610
	80	226	466	932	1398	1864	2796	4661
25 MG/L TSS (RECYCLE SYSTEMS- WARM WATER)	17	17	34	69	103	137	206	343
	21	36	74	148	223	297	445	343
	30	69	142	283	425	567	850	742
	40	97	201	401	602	803	1204	2007
	54	123	253	506	758	1011	1517	2528
	80	159	327	654	981	1309	1963	3271
40 MG/L TSS MUNICIPAL EFFLUENT POLISHING	17	20	42	84	126	168	252	420
	21	22	45	91	136	181	272	420
	30	25	51	102	153	204	305	453
	40	27	56	112	167	223	335	558
	54	29	60	120	180	240	361	601
	80	32	66	133	199	265	398	663

FILTER DATA	
FLOW RANGE	50 TO 7,000 US GPM
ELECTRICAL SUPPLY	VARIOUS OPTIONS AVAILABLE
SCREEN SIZE (MICRON)	11, 21, 30, 37, 54, AND 80
NUMBER OF SCREEN PANELS	2 TO 50
MINIMUM DRUM SUBMERGENCE	40%
ROTATION	COUNTERCLOCKWISE OR CLOCKWISE (OPTION)
WEIGHT DRY/WET	190 TO 1,600/435 TO 12,200 LBS

MATERIALS OF CONSTRUCTION	
DRUM FRAME	304 OR 316 SS
DRUM SHAFT	316 SS
FILTER ENCLOSURE	FIBERGLASS REINFORCED PLASTIC OR STAINLESS STEEL FRAME
SECTIONAL LID	MARINE GRADE ALUMINUM OR FRP
SCREEN PANELS	INJECTION MOLDED POLYESTER FABRIC EMBEDDED IN POLYPROPYLENE GRIDS
DRUM SEAL	SYNTHETIC ELASTOMER SEAL WEAR RING

PLUMBING	
INLET SIZE	4" TO 24"
INLET TYPE	SOC OR FLANGE (RFM) OPEN DRUM OR FLANGE (RFF)
OUTLET SIZE	4" TO 24"
OUTLET TYPE	SOC OR FLANGE (RFM) DISCHARGES DIRECTLY INTO SUMP OR LEVEL CONTROL BASIN (RFF)
SOLIDS OUTLET	4" SS PIPE

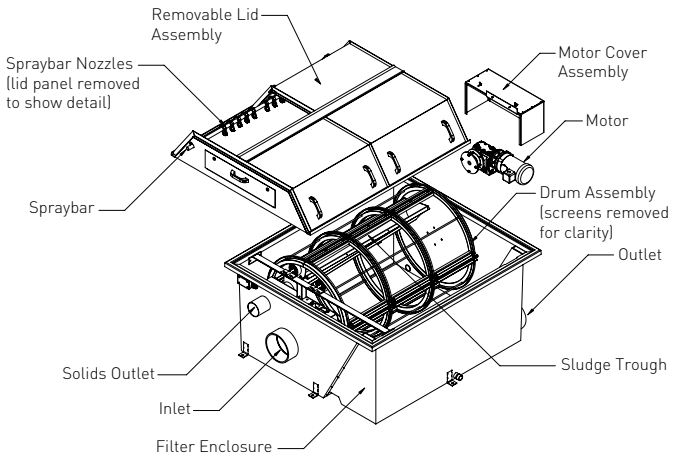
BACKWASH SYSTEM	
SUPPLY	OPERATES AT 100 PSI—BOOSTER PUMP AVAILABLE

CONTROL PANEL	
ENCLOSURE	NEMA 4X
BACKWASH CONTROL	MANUAL AND AUTOMATIC CONTROL (BY TIMER AND LEVEL CONTROL SWITCH)
DRY CONTACTS	RUN, TROUBLE, AND HIGH LEVEL

RFM MODEL—STAINLESS STEEL DRUM FULLY-ENCLOSED IN A FIBERGLASS HOUSING

Features

- Fiberglass enclosure, stainless steel internals, and high quality industrial drive components.
- Built-in overflow and water level control weir for easy process integration.
- Injection molded, polypropylene screen panels eliminate screen delamination.
- Inlet seal maintains a continuous positive seat against the rotating drum.
- Independent screen cells can be plugged with zero down-time.

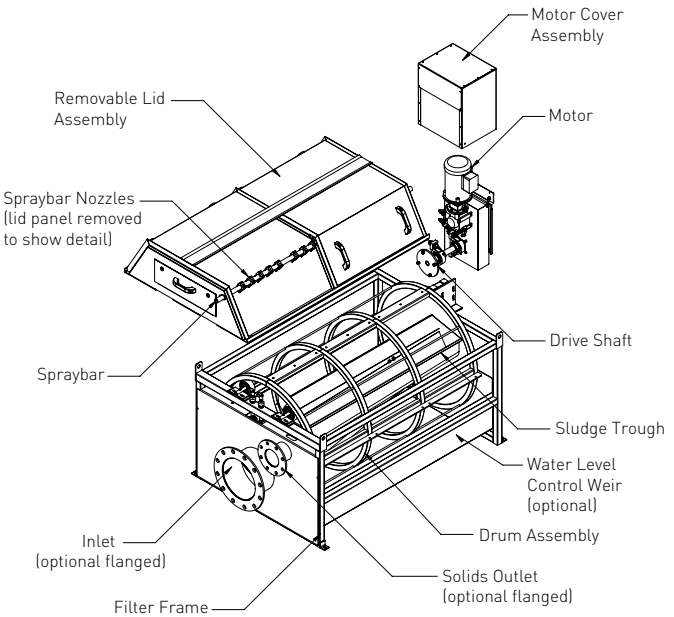


RFM Model Rotofilter

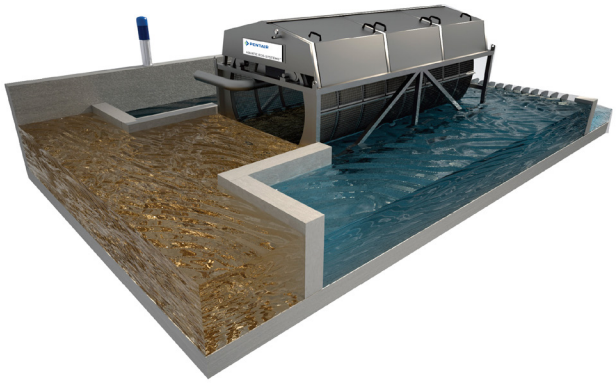
RFF MODEL—FRAME CONFIGURATION MOUNTED ON A STEEL FRAME , TYPICALLY INSTALLED IN A WET SUMP

Features

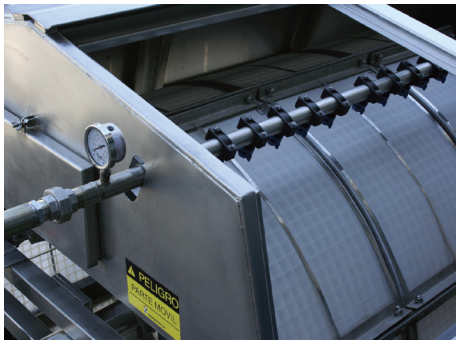
- Frame mounted for flexible integration into a variety of sump arrangements.
- Stainless steel construction and high quality industrial drive components.
- Injection molded, polypropylene screen panels eliminate screen delamination.
- Inlet seal maintains a continuous positive seat against the rotating drum.
- Independent screen cells can be plugged with zero down-time.
- Inlet and level control options available.



RFF Model Rotofilter



PC Filter in a channel installation.



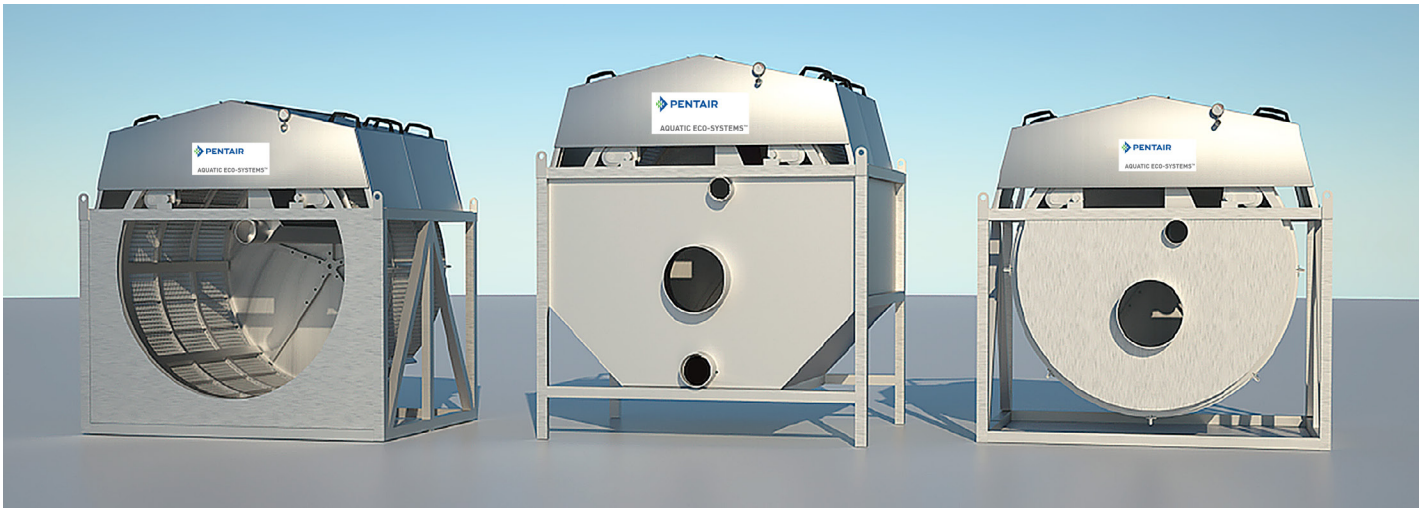
View of spraybar with top cover removed.

DSF SERIES™ DRUM SCREEN FILTERS

ROTARY MICRO FILTER

In demanding aquaculture applications, drum screen filters have proven to be highly efficient and reliable in removing solids from volumes of water large and small. Pentair Aquatic Eco-Systems is proud to offer our DSF Series™ line of drum screen filters, with a wide range of models, sizes and micron ratings to meet the specific needs of nearly any field application.

Featuring a field-proven design and the highest quality materials available, the DSF Series™ follow the simple, robust and time-tested principles of drum screen filter operation. Water containing solids enters the rotary drum in the front of the system. Water passes through the micro-mesh filter, which filters out solids (for increased durability, stainless steel wedge-wire filtration material is also available). As the filter mesh or wedge-wire material becomes increasingly loaded with solids, the water level within the drum increases to the point that it triggers the cleaning process. As the drum starts to rotate, the spraybar nozzles scour the filter mesh or wedge wire with high-pressure water, returning the screen to its original permeability. This allows the internal water level to drop and stop the cleaning process. Solids that are cleaned from the water are collected in a trough and transported away from the drum screen filter.



PC FILTER

Channel Installed

PC models are installed directly into a concrete water channel. Water flows into the center of the drum and passes through the screen material. After filtration, the water is discharged into the downstream channel. This configuration is commonly is used in high-throughput, large installations, often with multiple systems in parallel.

CE FILTER

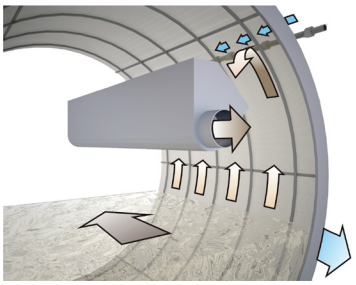
Integrated Tank with Pipe Inlet and Outlet

CE models offer integrated tanks and inlet/outlet ports for connecting directly to pipes. Water flows through a pipe as it approaches the filter, then flows into the drum where it passes through screen material. After filtration, the water is discharged into a downstream pipe. These models rest on an integrated framework, and they do not require construction of concrete channels for installation. The flexibility of these models makes them suitable for a range of applications.

PE FILTER

Hybrid Models with Pipe Inlet and Channel Outlet

Models with pipe inlet ports and channel outlets are like a hybrid: they feature an inlet port for connecting directly to pipes, while water leaves the filter by pouring into a channel. Water flows through a pipe as it approaches the filter, then flows into the drum and passes through the screen material. After filtration, the water is discharged into the downstream channel.

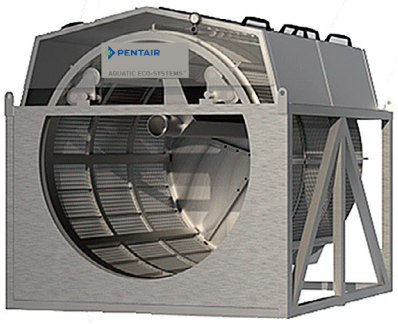


PRINCIPLE OF OPERATION

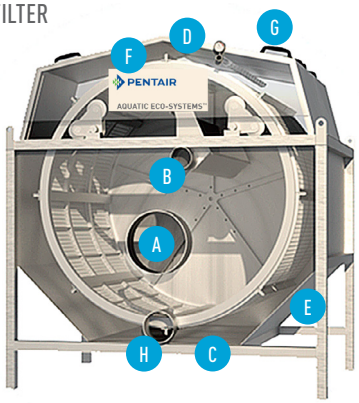
Liquid containing solids enters the rotary drum in the front of the system. Water passes through the micro-mesh filter, which filters out solids. As the mesh clogs with solids and sludge, the water level within the drum increases to the point that triggers the cleaning process. As the drum starts to rotate, nozzles scour the screen with high- pressure water, returning the screen to its original permeability. This allows the internal water level to drop and stop the cleaning process. Solids that are cleaned from the screen are collected in a trough and transported from the system for further processing.

DSF SERIES™ HYDRAULIC CAPACITY

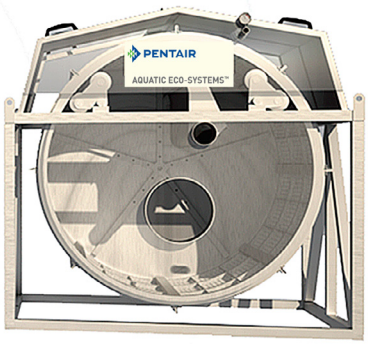
PC FILTER



CE FILTER



PE FILTER



A-Water inlet filter
B-Wash water outlet
C-Filtered water
D-Wash water inlet
E-Filtered water outlet
F-Inspection cover
G-Top cover
H-Water overflow

HYDRAULIC CAPACITY - M3/H

APPLICATION	MICRON RATING µm	CE FILTER				CE / PE / PC FILTER							PC / PE FILTER		
		4/1	4/2	6/2	6/3	8/3	8/4	8/5	8/6	10/5	10/6	10/7	10/9	10/10	10/12
Water collected from a river or lake, containing a maximum of 10 mg/L suspended solids.	18	47	94	141	211	282	376	469	563	587	704	821	1056	1174	1408
	30	78	156	234	351	468	624	780	936	976	1171	1366	1756	1951	2341
	60	116	233	349	524	699	932	1165	1398	1456	1747	2038	2621	2912	3494
	90	215	429	644	965	1287	1716	2145	2574	2681	3218	3754	4827	5363	6435
	120	286	572	858	1287	1716	2288	2860	3432	3575	4290	5005	6435	7150	8581
	150	358	715	1073	1609	2145	2680	3575	4290	4469	5363	6257	8044	8938	10726
Polished urban waste water, containing a maximum of 40 mg/L suspended solids.	20	9	18	27	40	54	71	89	107	111	134	156	201	223	268
	25	14	27	41	61	82	109	136	163	170	204	238	306	340	408
	30	16	32	48	71	95	127	158	190	198	238	277	356	396	475
	60	30	61	91	137	182	243	304	364	379	455	531	683	759	911
	90	46	91	137	205	273	364	455	546	569	683	797	1025	1138	1366
	120	61	121	182	273	364	486	607	729	759	911	1063	1366	1518	1821
Recirculation water in aquaculture containing a maximum of 25 mg/L suspended solids.	40	62	124	187	280	373	498	622	746	777	933	1088	1399	1555	1866
	60	85	171	256	384	512	683	854	1024	1067	1281	1494	1921	2134	2561
	90	109	218	327	491	655	873	1091	1310	1364	1637	1910	2456	2728	3274
	120	168	335	503	754	106	1341	1676	2011	2095	2514	2933	3771	4190	5029
	140	196	391	587	880	1173	1564	1956	2347	2444	2933	3422	4400	4889	5867
	160	223	447	670	1006	1341	1788	2235	2682	2794	3352	3911	5029	5587	6705
RESTRICTION OF CAPACITY. CE and PE FILTER		113	177	177	281	452	707	707	707	1122	1122	1122	1122	1122	1122

CE Filter incorporates an overflow (H) which allows the exit of the water if the internal water level exceeds the maximum level. The PC and PE Filters are designed to be installed into concrete channel or into a pond.

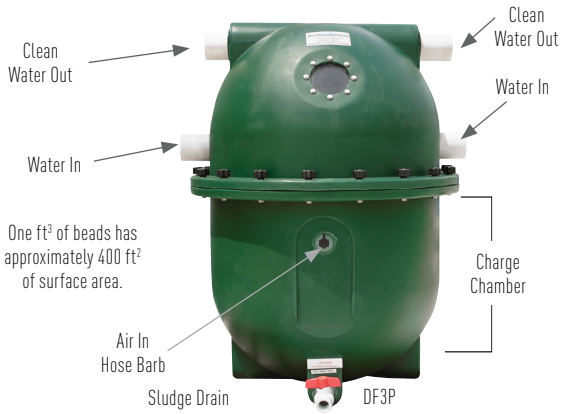
BUBBLE BEAD FILTERS FW SW

Constructed of heavy-duty plastic (HDPE) (**BBF1, BBF2P**) or food grade fiberglass (**BBF6, BBF10**). Both will give dependable fresh or saltwater service for many years. They are well suited for koi ponds and the smaller recirculating system. They are easy to clean and require very little energy to operate. Ship from factory. Made in USA. Price includes crating/boxing fee.

MODEL	MAXIMUM FLOWRATE	MAX PRESSURE (PSI)*	BEAD CAPACITY (FT^3)	HEIGHT	DIAMETER	INLET PIPE	OUTLET PIPE	BACKWASH WATER LOSS (GAL)	SHIP WT (LBS)
BBF1	16 GPM	10	1	45"	17"	1.5"	1.5"	12	65
BBF2P	30 GPM	10	2	59"	24"	1.5"	1.5"	25	129
BBF6	90 GPM	15	6	76"	36½"	3"	3"	60	490
BBF10	150 GPM	15	10	82"	42½"	3"	3"	150	576

*Do not exceed maximum pressure.

BBF2P



POLYGEYSER PNEUMATIC DROP BEAD FILTERS

Automatically backwash—no moving parts or electronics!

Designed as "bioclarifiers" these filters are capable of handling biological loads 50 to 100% higher than bubble or propeller-washed bead filters. Very resistant to clogging and caking-they backwash automatically every few hours using a burst of air from the charge chamber. **PR Series** filters (pump inlet/pressurized discharge) come with plumbing to accommodate a water pump (10 psi max). **AL Series** filters (gravity inlet/airlift discharge) are set up for airlift pumping.

Water and air flow into the vessel continuously. Water goes in the lower pipe, up through the media and back to the fish. Air is pumped into the charge chamber where it accumulates to a critical volume and releases the air in a burst, knocking the debris off the media. The debris then settles to the bottom and is removed through the 2" sludge drain every 2–3 days. Nitrotech media (included) gives 50–100% better nitrification rates than standard round bead media.

An air pump is required but is not included; it must produce more pressure than the water pump/system head. A check valve (**228225**) must be used in the air line. Max pressure 10 psi. Ship via motor freight, FOB factory. One-year warranty.

MODEL	DISCHARGE TYPE	MAXIMUM FLOW RATE	MAX PRESSURE (PSI)*	BEAD CAPACITY (FT^3)	HEIGHT	DIAMETER	INLET PIPE	OUTLET PIPE	BACKWASH WATER LOSS (GAL)	SHIP WT (LBS)
DF3P	PUMP	45 GPM	10	3	36"	34"	3"	3"	40	175
DF3A	AIRLIFT	45 GPM	10	3	36"	34"	3"	3"	40	175
DF3-FLOWKIT-CFH	FLOW METER, .2-2 LPM									5
AB1	REPLACEMENT BEADS, OVAL, APPROXIMATELY 1/32" X 3/16" DIA., 1.65 CU.F.T									55

*Do not exceed maximum pressure.
**Crating charge not included in price.

PBF3

PBF10

PROPELLER-WASHED BEAD FILTER FW SW

Improve the capture of small particles

Solids capture is one of the most important processes in a recirculating system. Although sedimentation/settling basins are generally effective for settleable solids larger than 80 microns, space constraints may render them impractical.

If this is your situation, then an expanded granular biofilter (EGB), specifically, a bead filter, may be the best alternative, as it reduces the retention time and improves the capture of small particles.

These bead filters can provide both filtration and biofiltration in a single device.

These bead filters employ low-density polyethylene beads (included) for their filter media in a pressurized up-flow configuration. The filter physically traps suspended solids while providing a large surface area for the growth of bacteria. Titanium-enhanced screens and automated backwash controllers available by quote.

Made from heavy-duty food-grade fiberglass, this filter will give dependable fresh or saltwater service for many years. Designed for larger recirculating aquaculture systems, the propeller-washed bead filters are easy to clean, easily automated, compact and very energy-efficient. Internal beads are cleaned by a motor-driven propeller. Prop wash models available with higher pressure capacity. Please inquire. Ships from factory. Made in USA. One-year warranty.

MODEL	MAXIMUM FLOWRATE (GPM)	MAX PRESSURE	BEAD CAPACITY	HEIGHT	DIAMETER	INLET PIPE	OUTLET PIPE	BACKWASH WATER LOSS (GAL)	SHIP WT (LBS)
PBF3	30	10	3	63"	33"	1.5"	2"	5-10	425
PBF10	100	20	10	87"	42"	1.5"	3"	10-30	750
PBF25	200	20	25	107"	60"	2"	3"	30-60	1,750
PBF50	300	20	50	110"	72"	3"	4"	50-150	3,250
AB1	REPLACEMENT BEADS, OVAL, APPROXIMATELY 1/32" X 3/16" DIA., 1.65 CU.FT.								55

*Do not exceed maximum pressure.
**Crating charge not included in price.

Remember to inspect and change filters regularly.

BEAD FILTER SYSTEMS

Aquadyne Bead Filter Systems are specifically engineered to host a multitude of aquatic inhabitants in both fresh and salt water. They offer high efficiency, low maintenance, mechanical and biological filtration in one package with up to 5300 ft2 of biological contact surface area in a small footprint. Aquadyne filtration systems are widely used in aquatic environments from ponds, public aquariums, zoos, hatcheries, research facilities, academics, aquaponics, quarantine and environmental biological recovery systems. The Dynamax blower aggressively agitates the debris collected in the media bed and suspends it in the water column which is easily backwashed to waste. Model BF22BHE includes a 2" high efficiency control head with 2" plumbing in and out. This is the same control head and column as used in the Model BF44B. The only difference is that the column is just 4 inches shorter in length, while maintaining the flow efficiency of the BF44B. This model accommodates customers who want to use a very energy-efficient pump and not have to sacrifice too much water flow.

Systems include pressurized bead filter, 115V 60 Hz blower, three each 1-1/2" or 2" self-sealing union valves and filter bead media. Ships Ground in multiple boxes (BF44B & BF88B ship by motor freight). One-year warranty.

- Water Flow Control System protects against friction loss, eliminating 90° turns inside the system allowing a more natural unrestricted water flow.
- Air Wash System fluidizes and pre-washes media prior to backwash, reducing the amount of water needed to clean the system, which increases biological efficiency.
- Bottom Mounted Sludge Drain discharges heavy solids without media interference
- Filter Media Bypass isolates beneficial bacteria and media without disturbing normal water flow. Ideal for medicating the aquatic environment without killing the beneficial bacteria.
- Micro Sediment Removal of smaller particulates than other filters, yielding greater water clarity.

MODEL	INLET/ OUTLET	MAXIMUM SYSTEM SIZE GAL/LITERS	FISH SUPPORTED (LBS)	BEAD MEDIA CAPACITY	DIMENSIONS (DIA X HEIGHT)	RECOMMENDED FLOW RATE (GPM)	SHIP WT (LBS)
BEAD FILTER SYSTEMS WITH BLOWER							
BF60BL	1½"	2,000/7,570	50	.60 FT3	16" X 33"	50	70
BF11B	1½"	4,000/15,141	75	1.1 FT3	18" X 34"	65	100
BF22B	1½"	8,000/30,283	165	2.2 FT3	24" X 42"	80 - 100	175
BF22BHE	2"	8,000/30,283	165	2.2 FT3	24" X 42"	80 - 100	178
BF44B	2"	16,000/60,566	330	4.4 FT3	30" X 46"	80 - 120	310
BF88B	2"	30,000/113,562	660	8.8 FT3	36" X 48"	80 – 135	485
BEAD FILTER REPLACEMENT PARTS							
AB2LB	REPLACEMENT FILTER BEAD MEDIA, 1.4 FT³						50
BF11BLOWER	REPLACEMENT 1HP BLOWER – FITS MODELS BF60BL, BF11B, BF22B, BF22BHE						11
BF44BLOWER	REPLACEMENT 1.5HP BLOWER - FITS MODELS BF44B & BF88B						11

RADIAL FLOW SETTLER 45°

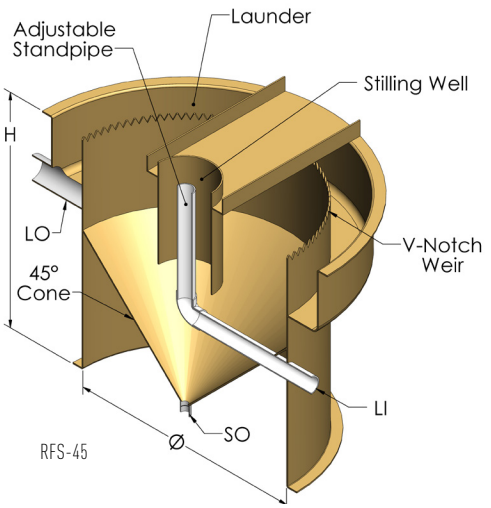
Pentair Aquatic-Eco Systems RFS 45

The Radial Flow Settler (RFS) is used to remove particulates from effluent water.Effluent water enters the RFS Liquid Inlet, flows upward through the adjustable Standpipe Assembly, and back down through the Stilling Well. Solid particulates settle to the cone bottom for removal through a Solids Outlet. The filtered water flows upwards over a V-Notch Weir into the Launder, exiting though the Liquid Outlet.

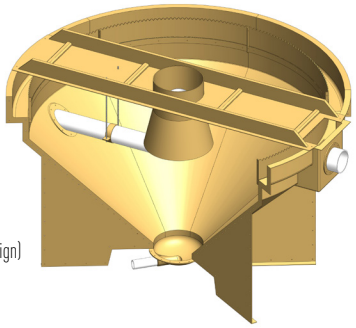
Features

- Greatly reduces solids loading in a system
- Passive piece of equipment and requires no additional energy to operate
- Requires routine cleaning only - no additional maintenance or servicing required
- Available in many sizes for various flow requirements
- Designed for containerized shipping anywhere in the world

MODEL	DIAMETER (IN.)	HEIGHT (IN.)	SHIP WT (LBS)
RFS-045-012	12	36	124
RFS-045-018	18	39	141
RFS-045-024	24	42	188
RFS-045-030	30	45	240
RFS-045-036	36	48	297
RFS-045-042	42	51	380
RFS-045-048	48	54	474
RFS-045-060	60	60	597
RFS-045-072	72	66	719
RFS-045-084	84	75	851
RFS-045-096	96	81	1004
RFS-045-108-5PNL	108	87	1009
RFS-045-144-6PNL	144	108	1165



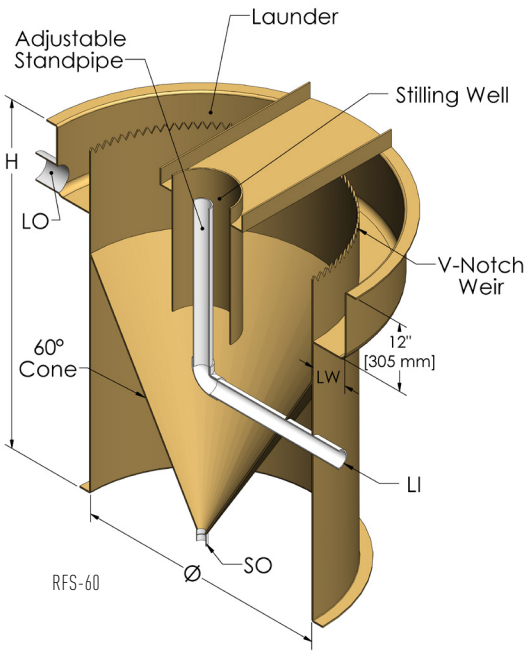
RFS-45


RFS-45-PNL
(Space saving panel design)

Radial Flow Settler 45

Technical Data

Model Number		RFS-045-012	RFS-045-018	RFS-045-024	RFS-045-030	RFS-045-036	RFS-045-042	RFS-045-048	RFS-045-060	RFS-045-072	RFS-045-084	RFS-045-096	RFS-045-108-5PNL	RFS-045-144-6PNL
Diameter (Ø)	**in**	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**60**	**72**	**84**	**96**	**108**	**144**
	mm	**305**	**457**	**610**	**762**	**914**	**1067**	**1219**	**1524**	**1829**	**2134**	**2438**	**2743**	**3658**
Overall Height (H)	in	36.0	39.0	42.0	45.0	48.0	51.0	54.0	60.0	66.0	75.0	81.0	87.0	108.0
	mm	1274	1381	1487	1593	1699	1805	1912	2124	2336	2655	2867	3080	3823
Max OD	in	22.5	28.5	35.5	41.5	47.5	54.5	62.5	74.5	88.5	100.5	112.5	126.5	162.5
	mm	572	724	902	1054	1207	1384	1588	1892	2248	2553	2858	3213	4128
Maximum Flow	gpm	2.9	7.2	11.8	21.0	28.8	37.5	46.6	73.1	105.5	143.9	188.3	238.6	425.1
@ 0.015 fps settling velocity	l/min	11.1	27.1	44.7	79.6	109.1	142.1	176.3	276.7	399.5	544.9	712.7	903.1	1609.3
Inlet Ø (LI)	in	0.75	1.00	1.50	2.00	3.00	3.00	3.00	4.00	4.00	6.00	6.00	6.00	8.00
	mm	19	25	38	51	76	76	76	102	102	152	152	152	203
Outlet Ø (LO)	in	1.00	1.50	2.00	3.00	3.00	4.00	4.00	6.00	6.00	6.00	6.00	6.00	10.00
	mm	25	38	51	76	76	102	102	152	152	152	152	152	253
Solids Outlet Ø (SO)	in	1.00	1.00	1.50	1.50	2.00	2.00	2.00	2.00	2.00	3.00	3.00	3.00	4.00
	mm	25	25	38	38	51	51	51	51	51	76	76	76	101
Weights & Loadings (1)														
Shipping	lbs	124	141	188	240	297	380	474	597	719	851	1004	1009	1165
Floor Load	lbs/sf	219.2	150.3	137.1	128.9	123.7	124.4	128.9	132.2	140.5	147.4	155.6	166.6	197.7



RADIAL FLOW SETTLER 60°

Pentair Aquatic-Eco Systems RFS 60

The Radial Flow Settler (RFS) is used to remove particulates from effluent water.Effluent water enters the RFS Liquid Inlet, flows upward through the adjustable Standpipe Assembly, and back down through the Stilling Well. Solid particulates settle to the cone bottom for removal through a Solids Outlet. The filtered water flows upwards over a V-Notch Weir into the Launder, exiting though the Liquid Outlet.

Features:

- Greatly reduces solids loading in a system
- Passive piece of equipment and requires no additional energy to operate
- Requires routine cleaning only - no additional maintenance or servicing required
- Available in many sizes for various flow requirements
- Designed for containerized shipping anywhere in the world

MODEL	DIAMETER (IN.)	HEIGHT (IN.)	SHIP WT (LBS)
RFS-060-012	12	41	141
RFS-060-018	18	46	197
RFS-060-024	24	51	272
RFS-060-030	30	55	343
RFS-060-036	36	59	441
RFS-060-042	42	64	630
RFS-060-048	48	68	751
RFS-060-060	60	77	910
RFS-060-072	72	85	1225
RFS-060-084	84	98	1489
RFS-060-096	96	107	1704

Radial Flow Settler 60

Technical Data

Model Number		RFS-060-012	RFS-060-018	RFS-060-024	RFS-060-030	RFS-060-036	RFS-060-042	RFS-060-048	RFS-060-060	RFS-060-072	RFS-060-084	RFS-060-096
Diameter (Ø)	**in**	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**60**	**72**	**84**	**96**
	mm	**305**	**457**	**610**	**762**	**914**	**1067**	**1219**	**1524**	**1829**	**2134**	**2438**
Overall Height (H)	in	41	46	51	55	59	64	68	77	85	98	107
	mm	1451	1628	1805	1947	2089	2266	2407	2726	3009	3469	3788
Max OD	in	22.5	28.5	35.5	41.5	47.5	54.5	62.5	74.5	88.5	100.5	112.5
	mm	572	724	902	1054	1207	1384	1588	1892	2248	2553	2858
Maximum Flow	gpm	2.9	7.2	11.8	17.8	24.8	37.5	46.6	73.1	105.5	143.9	188.3
@ 0.015 fps settling velocity	l/min	11.1	27.1	44.7	67.4	93.8	142.1	176.3	276.7	399.5	544.9	712.7
Inlet Ø (LI)	in	0.75	1.00	1.50	2.00	3.00	3.00	3.00	4.00	4.00	6.00	6.00
	mm	19	25	38	51	76	76	76	102	102	152	152
Outlet Ø (LO)	in	1.00	1.50	2.00	3.00	3.00	4.00	4.00	6.00	6.00	6.00	8.00
	mm	25	38	51	76	76	102	102	152	152	152	203
Solids Outlet Ø (SO)	in	1.00	1.00	1.50	1.50	2.00	2.00	2.00	2.00	2.00	3.00	3.00
	mm	25	25	38	38	51	51	51	51	51	76	76
Weights & Loadings (1)												
Shipping Weight	lbs	141	197	272	343	441	630	751	910	1225	1489	1704
Floor Load	lbs/sf	240.8	181.9	164.0	149.8	144.0	140.0	150.9	148.2	158.4	164.0	169.5

COMMERCIAL SYSTEM PAKS FW SW DESIGNED HERE

Applications:

- Public aquariums.
- Retail holding systems.
- Research systems.
- Aquaculture systems.
- Multitank rack systems.
- Seafood holding systems.
- Residential systems.
- Koi ponds.

These skid-mounted filtration systems provide complete filtration and circulation for larger recirculating systems. Each system is completely assembled and water-tested before shipping. Systems ship on plastic pallets via motor freight, FOB Orlando.

Pumps

Supplied with magnetic drive pumps or centrifugal pumps. All pumps are suitable for use in fresh and saltwater applications.

Filters

Supplied with a combination of mechanical and chemical filters that are specifically sized for the system and flow rate of the pumps. The mechanical filter is available in a pleated 20-micron cartridge, in-line bag with sizes from 1 to 800 microns (bags not included) or sand filter. Chemical filters hold carbon, zeolite or other chemical-removing media. UV sterilizer providing a minimum of 33,000 µWs/cm² included on each model.

Fittings

Systems are plumbed with Schedule 40 pipe (Schedule 80 available at added cost). Heavy-duty, true union and single union ball valves are plumbed throughout the system for easy disassembly. All filters and UV sterilizers have bypass lines to facilitate filter or lamp replacement.

Power

Standard systems are 115/208–230V, 60 Hz (**CSK6** series is 208–230V only).

Optional Features

Can be used with in-line heaters, water chillers, protein skimmers, stands and monitoring/control systems.

You must add a "**B-2**" for bag, "**C-2**" for cartridge or "**S-2**" for sand filter to the part number. Pricing shown below is for "**B-2**" option. Call our tech support for sizing assistance, options, etc.

MODEL	MAXIMUM FLOW (GPM)	INLET/ OUTLET	AMPS @ 115V/230V	DIMENSIONS (L X W X H)	SHIP WT (LBS)
CSK4	30	2"	9.4	48" X 40" X 54"	365
CSK4.5	45	2"	8.8/4.4	48" X 40" X 54"	397
CSK5	60	2"	16.8/8.4	48" X 40" X 68"	520
CSK6	100	2"	21/10.5	48" X 40" X 68"	570

Note: In 2015, these systems are migrating to black filters. Color may vary.

Pentair AES systems at Tropicana Field, home of the Tampa Bay Rays.

CSK4S-40-SU-A

CSK6C-2

CSK6B-2

CYCLONIC BIOREACTOR

Pentair Aquatic-Eco Systems Cyclonic Bioreactor

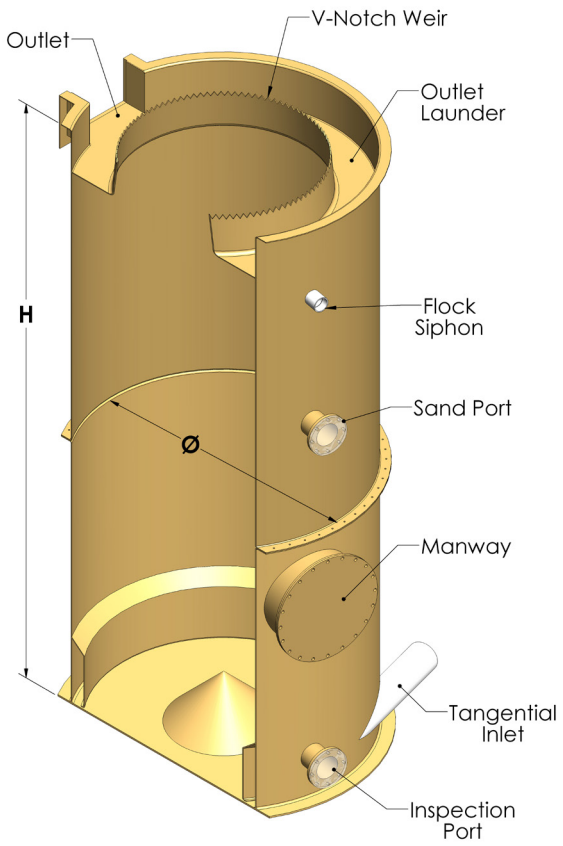
Formerly HE Group, the Pentair Aquatic-Eco Systems Cyclonic BioReactor (CBR) is a Fluidized Sand BioReactor (FSB) otherwise known as a Fluidized Sand Bio-Filter. The purpose of the CBR is to provide a vehicle for the Nitrification of Ammonia by fluidizing (or suspending in water) silica sand media. This is a two stage process where the Nitrifying Bacteria form a biofilm on the surface of the silica sand media that oxidizes Ammonia into Nitrite (Nitrosomonas) and Nitrite into Nitrate (Nitrobacter).

Features:

- Designed to maintain the highest level of system water quality with the lowest operating and maintenance cost
- A small footprint, ideal for confined spaces
- Available in many sizes for various flow requirement
- Diameters up through 84" (2134 mm) designed for containerized shipping anywhere in the world
- Multiple units can be connected in parallel for a larger flow rate

	DIAMETER (IN.)	HEIGHT (IN.)	SHIP WEIGHT (LBS)
CBR-012-084	12	84	165
CBR-018-096	18	96	237
CBR-024-096	24	96	311
CBR-030-120	30	120	441
CBR-036-144	36	144	566
CBR-042-156	42	156	795
CBR-048-159	48	159	924
CBR-060-162	60	162	1,311
CBR-072-168	72	168	1,640
CBR-084-192	84	192	2,320
CBR-096-234	96	234	2,726

Customization available.



Cyclonic Bioreactor

Technical Data

Model Number		CBR-012-084	CBR-018-096	CBR-024-096	CBR-030-120	CBR-036-144	CBR-042-156	CBR-048-159	CBR-060-162	CBR-072-168	CBR-084-192	CBR-096-234
Diameter (Ø)	**in**	12	18	24	30	36	42	48	60	72	84	96
	mm	305	457	610	762	914	1067	1219	1524	1829	2134	2438
Overall Height	in	84	96	96	120	144	156	159	162	168	192	234
	mm	2134	2438	2438	3048	3658	3962	4039	4115	4267	4877	5944
Tangential Inlet Ø	in	1.5	2.0	3.0	3.0	4.0	4.0	4.0	6.0	6.0	6.0	8.0
	mm	38	51	76	76	102	102	102	152	152	152	203
Outlet Configuration		Cplng	Cplng	Cplng	Cplng	Cplng	Cplng	Cplng	Cplng	Trough	Trough	Trough
- width	in									36.0	36.0	42.0
- height	in									12	12	12
Outlet Ø	in	2.0	3.0	3.0	4.0	4.0	6.0	6.0	8.0			
	mm	51	76	76	102	102	152	152	203			
Hydraulic Properties of the CBR with 0.19 mm sand												
Flow @ 10 gpm/sf	gpm	7.9	17.7	31.4	49.1	70.7	96.2	125.7	196.3	282.7	384.8	502.7
	l/min	29.7	66.9	118.9	185.8	267.6	364.2	475.7	743.3	1,070	1,457	1,903
Flow @ 15 gpm/sf	gpm	11.8	26.5	47.1	73.6	106.0	144.3	188.5	294.5	424.1	577.3	754.0
	l/min	44.6	100.3	178.4	278.7	401.4	546.3	713.5	1,115	1,605	2,185	2,854
Media Requirements												
Sand - Static Bed Height	in	28.0	32.0	32.0	40.0	48.0	52.0	53.0	54.0	56.0	64.0	78.0
- Volume	ft^3	1.8	4.7	8.3	16.2	28.1	41.3	55.0	87.3	130.1	202.3	322.6
Weights & Loadings (1)												
Shipping	lbs	165	237	311	441	566	795	924	1,311	1,640	2,320	2,726
Floor Load	lbs/sf	754	782	754	912	1,070	1,155	1,166	1,181	1,215	1,384	1,670

(1) Shipping weight are based on 25psi design thickness. Weights will change at other design pressures.

US Patent Pending, European Patent Allowed

SWEETWATER® LOW-SPACE BIOREACTOR FILTER

Fully automatic, self-adjusting and continuously self-cleaning

This is a robust, nonpressurized biofilter that is much less sensitive to flow rate variations and power interruptions than fluidized bed sand biofilters. When operated in low-head recirculating systems, it can easily be sunk into the floor to reduce the pump pressure. When installed this way, only a few inches of head loss will occur across the LSB. Because air is used to circulate the media, the LSB both adds oxygen and strips carbon dioxide! A hood can be placed over the bioreactor to vent the CO_2 outdoors. We have colored them blue/green to prevent algae growth inside and provide the dark environment preferred by the *Nitrobacter* bacteria.

Air diffuser depth can be adjusted for compatibility with your blower/compressor. LSBs are complete with media. Compressed air connections are ½" slip. Air pump not included. All you need are male-threaded pipe connections. **We can also custom build larger sizes. Ship motor freight.**

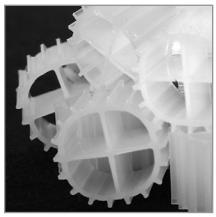
- Up to 12 kg feed/m^3 media (35.3 ft^3)
- Non-pressurized, gravity drain
- Low head
- CO_2 stripping

PACKS A HUGE AMOUNT OF USABLE SURFACE INTO A SMALL VOLUME.

MEDIA WITH NO FLOW

MEDIA WITH WATER FLOW

MEDIA IN BIOREACTOR



BF150A

MODEL	TANK VOL (GAL)	D X H (INCHES)	MEDIA MAX. (FT^3)	FLOWRATE (GPM)	REQ'D AIR FLOW (CFM)	IN/OUT (INCHES)	AES/B*	FEED (LBS/DAY)	SHIP WT (LBS)
LSB2.5	35	18 X 33	2.5	3–9	1	1.25	119	1.5–3	40
LSB3	40	18 X 36	3	3–10	1	1.25	142	2–4	55
LSB5	70	23 X 43	5	7–20	1.5	2	236	3–6	140
LSB7	94	21.5 X 62	7	10–30	2	3	339	4–9	170
LSB8	105	31 X 37	8	10–30	2	3	376	5–10	175
LSB12	170	31 X 57	12	17–50	3	3	576	7–15	280
LSB25	323	47 X 50	25	25–90	4.5	4	1173	15–30	380
LSB35-2	480	47 X 71	35	40–200	4.5	6	1730	20–45	535
BF150A	BIO-MEDIA, 1 FT^3								10

*AES/B Number is a conservative amount of fish (lbs) supported.

PENTAIR

SWEETWATER™ SWX BIO-MEDIA

Successful biofiltration using moving bed technology requires the use of the right media. Pentair's Sweetwater SWX Bio-Media is the ideal choice at a great price. These biofilm carrier elements are made from 100% virgin high-density polyethylene. With a surface area of 274 ft^2/ft^3 this proven geometric design provides an abundant amount of surface area for bacteria to colonize. Robust bacteria colonization is essential to the nitrification process of converting ammonia to nitrite and ultimately nitrate. Pentair's Sweetwater SWX Bio-Media's positively buoyant characteristic allows for continuous movement in a bio-filtration tank with the use of an air pump or blower. The constant circulating action exfoliates the older, less active bacterial layer; which eliminates the need for backwashing and allows the media to be self-cleaning.

MODEL	SURFACE AREA	DIAMETER	LENGTH	QUANTITY
BF150A	274 FT^2/FT^3	7/16"	9/32"	ONE CUBIC FOOT
BF150B	274 FT^2/FT^3	7/16"	9/32"	ONE CUBIC METER

PENTAIR AQUATIC ECO-SYSTEMS WORLD AQUACULTURE TECHNOLOGY ENGINEERING & RESEARCH CENTER

(PAES WATER) COMING SOON

PAES WATER is our center for research and demonstration of Recirculating Aquaculture Systems (RAS) technology. This facility will be located on the existing campus of PAES, Apopka, Florida and we anticipate completion during the second half of February 2015. The purpose of PAES WATER is to establish leadership in RAS, as well as serve as a research, training, and demonstration center for this technology. It will house the Center of Excellence for UV treatment within Pentair. We plan to showcase our products and supplier's products in a modern, controlled environment where our staff, workshop students and visitors will have a first-hand look at the overall aquaculture process.

We want to demonstrate RAS technologies because RAS is a type of aquaculture that is equipment intensive. The culture conditions are more intensive and densities are higher than in traditional pond aquaculture (about eight times the production capacity per acre). PAES has significant product offerings for RAS including pumps, filters, controllers, UV treatment units, etc. RAS as an aquaculture type is growing at a fast rate. It requires less water and land resources, facilities can be located nearer to markets and can be located in wider range of areas than traditional pond aquaculture operations. Think in concept of food miles; how far did your meal travel today? RAS production systems are favored by Seafood Watch and Food & Water Watch organizations because they are proven to be more sustainable and environmentally friendly.

For more information, visit PentairAES.com

GAS CONTROL COLUMN

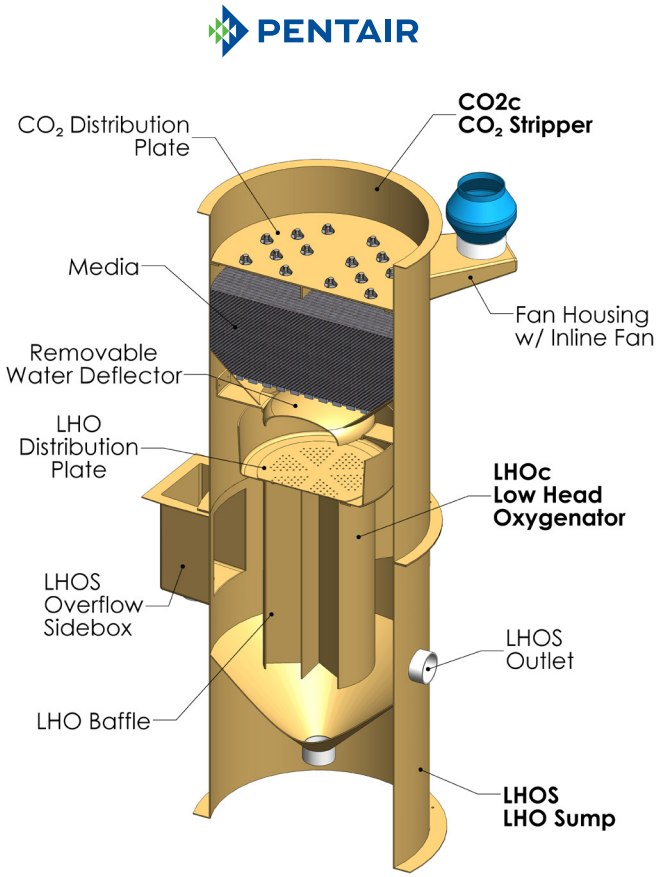
Pentair Aquatic-Eco Systems Gas Control Column

Formerly a product of HE Group, the Pentair Aquatic-Eco Systems the Gas Control Column (GCC) is used to maintain proper balance of dissolved gases in reuse process water. The GCT is comprised of three sections: the CO_2 Stripper (CO_2) and the Low Head Oxygenator (LHO) and the LHO Sump (LHOS).

Features:

- Designed to maintain the highest level of system water quality with the lowest operating and maintenance costs
- Customized configurations with optional components available to meet specific site requirements
- Easy access for cleaning and maintenance
- Designed for containerized shipping anywhere in the world

MODEL	GPM	HEIGHT (IN.)	SHIP WT (LBS)
GCC-024-018	157	156	754
GCC-030-024	245	159	888
GCC-036-030	353	162	1029
GCC-042-036	421	168	1179
GCC-048-042	628	192	1499
GCC-060-048	982	234	1891
GCC-072-054	1,414	234	2463
GCC-084-060	1,924	264	2914

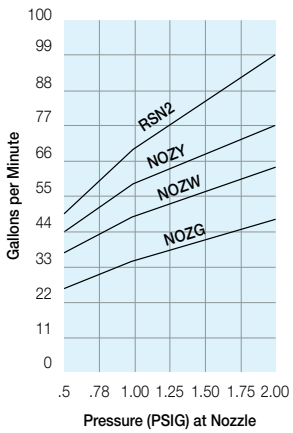


SPINFREE SQUARE ROTARY SPRAY NOZZLE

A new way to deliver water to static bed biofilters and degassing columns. Originally designed for the cooling tower industry, this all-plastic spray nozzle is extremely efficient for uniform water distribution over packed columns. It's capable of delivering a square pattern of water, so dry spots in the media bed can be eliminated in square or rectangular filter vessels. This will maximize usable surface area for gas exchange or nitrification.

Other Benefits

- Low-pressure operation
- Can be fitted with three different inserts to maintain velocity at a variety of different flowrates and delivery pressures (**RSN2** has 2" outer thread and a 1.5" orifice)
- Rotating distribution element minimizes biofouling
- Very little freeboard required. At recommended flows and pressures, only 3" of space is required between the nozzle and the media bed to obtain a 3' x 3' throwout
- Shearing action of the rotating element ensures a minimal dead zone directly beneath the nozzle



MODEL	
RSN2	SPRAY NOZZLE
NOZG	1" ORIFICE INSERT
NOZW	1.1" ORIFICE INSERT
NOZY	1.2" ORIFICE INSERT

Gas Control Column

Technical Data

Model Number		GCC-024-018	GCC-030-024	GCC-036-030	GCC-042-036	GCC-048-042	GCC-060-048	GCC-072-054	GCC-084-060
Design Flow Range	gpm	126 - 157	196 - 245	283 - 353	385 - 481	503 - 628	785 - 982	1131 - 1414	1539 - 1924
	lpm	476 - 595	743 - 929	1070 - 1338	1457 - 1821	1903 - 2378	2973 - 3716	4281 - 5351	5827 - 7283
GCC - CO^2 Stripper		CO2C-024-096	CO2C-030-096	CO2C-036-096	CO2C-042-096	CO2C-048-096	CO2C-060-096	CO2C-072-096	CO2C-084-096
Diameter (CO2-Ø)	in	24	30	36	42	48	60	72	84
	mm	610	762	914	1067	1219	1524	1829	2134
Height (CO2-H)	in	96	96	96	96	96	96	96	96
	mm	2438	2438	2438	2438	2438	2438	2438	2438
HLR Range	gpm/ft²	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50
	lpm/m²	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037
Inlet Configuration		Cplng	Cplng	Cplng	Trough	Trough	Trough	Trough	Trough
- width	in				36.0	36.0	42.0	42.0	42.0
- height	in				12	12	12	12	12
Inlet Ø	in	6.00	6.00	8.00					
	mm	152	152	203					
Structured Media - Splash Plate	in	36	36	36	36	36	36	36	36
No Media Depth	mm	914	914	914	914	914	914	914	914
Required Air Flow	SCFM	168 - 210	263 - 328	378 - 473	515 - 643	672 - 840	1050 - 1313	1512 - 1890	2058 - 2573
	m^3/min	5 - 6	7 - 9	11 - 13	14 - 18	19 - 24	29 - 37	42 - 53	58 - 72
Fan G:L		10:1	10:1	10:1	10:1	10:1	10:1	10:1	10:1
Weights									
Shipping	lbs	314	377	450	526	679	844	1182	1389
Operating	lbs	372	490	620	776	1011	1386	1984	2500
GCC - LHO (Low Head Oxygenator)		LHOC-018-060	LHOC-024-060	LHOC-030-060	LHOC-036-060	LHOC-042-060	LHOC-048-060	LHOC-054-060	LHOC-060-060
Diameter (CO2-Ø)	in	18	24	30	36	42	48	54	60
	mm	457	610	762	914	1,067	1,219	1,372	1,524
Height (LHO-H)	in	60	60	60	60	60	60	60	60
	mm	1,524	1,524	1,524	1,524	1,524	1,524	1,524	1,524
HLR Range	gpm/ft²	71 - 89	63 - 78	58 - 72	54 - 68	52 - 65	63 - 78	71 - 89	78 - 98
	lpm/m²	2897 - 3622	2546 - 3183	2347 - 2933	2218 - 2773	2129 - 2661	2546 - 3183	2897 - 3622	3194 - 3993
Chambers	qn	6	6	6	6	6	8	8	8
Height	in	48	48	48	48	48	48	48	48
Submergence	in	24	24	24	24	24	24	24	24
	mm	610	610	610	610	610	610	610	610
Inlet Gas Ports (316sst)	qn	2	2	2	2	2	2	2	2
	Ø	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½
Weights									
Shipping	lbs	215	248	288	316	404	462	594	648
Operating	lbs	183	221	258	296	384	445	580	640
GCC Sump		LHOS-024-060	LHOS-030-063	LHOS-036-066	LHOS-042-072	LHOS-048-096	LHOS-060-138	LHOS-072-138	LHOS-084-168
GCC Sump Diameter	in	24	30	36	42	48	60	72	84
	mm	610	762	914	1,067	1,219	1,524	1,829	2,134
GCT Sump Height	in	60	63	66	72	96	138	138	168
	mm	1,524	1,600	1,676	1,829	2,438	3,505	3,505	4,267
Operating Liquid Level	in	48	51	54	57	60	66	72	78
Outlet / Overflow Ø	in	4.0	4.0	6.0	6.0	8.0	8.0	10.0	10.0
	mm	102	102	152	152	203	203	254	254
Side Box Width	in	16	16	18	18	24	24	30	30
Depth (dimension from ta	in	12	12	14	14	16	16	18	18
Height	in	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Cone Drain	in	2	2	2	2	2	2	2	2
	mm	51	51	51	51	51	51	51	51
Weights									
Shipping	lbs	225	263	321	376	486	685	817	1037
Operating	lbs	708	922	1,178	1,553	2,637	5,220	6,510	9,800
GCC Assembly									
Overall Height (OAH)	in	156	159	162	168	192	234	234	264
	mm	3,962	4,039	4,115	4,267	4,877	5,944	5,944	6,706
GCC Assembly Weights & Loadings									
Empty	lbs	634	768	909	1,059	1,379	1,771	2,343	2,794
Floor Load - Flooded	lbs/sf	497.8	416.6	366.6	342.7	386.5	417.9	375.3	387.4

GAS CONTROL TOWER

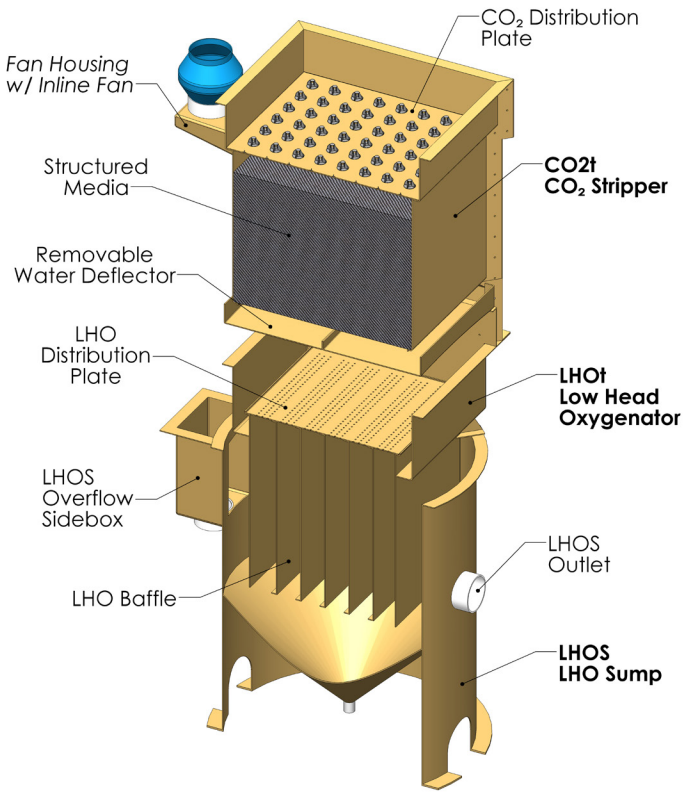
Pentair Aquatic-Eco Systems Gas Control Tower

Formerly a product of HE Group, the Pentair Aquatic-Eco Systems Gas Control Tower (GCT) is used to maintain proper balance of dissolved gases in reuse process water. The GCT is comprised of three sections: the CO_2 Stripper (CO_2) and the Low Head Oxygenator (LHO) and the LHO Sump (LHOS).

Features

- Designed to maintain the highest level of system water quality with the lowest operating and maintenance costs
- Customized configurations with optional components available to meet specific site requirements
- Easy access for cleaning and maintenance
- Designed for containerized shipping anywhere in the world

MODEL	GPM	HEIGHT (IN.)	SHIP WT (LBS)
GCT-024-018	200	159	827
GCT-030-024	313	162	987
GCT-036-029	450	168	1131
GCT-042-033	613	192	1498
GCT-048-039	800	234	1865
GCT-060-048	1250	234	2304
GCT-072-054	1800	264	2916
GCT-084-060	2450	264	3335



TECH TALK

Removing Carbon Dioxide

Did you know that for every 1 lb of oxygen consumed by fish they exhale 1.38 lbs of carbon dioxide? Carbon dioxide does cause problems in recirculating systems without aeration or degassing. This can be the case, for example, where pure oxygen is used in place of aeration. Carbon dioxide must be removed, or it can build up to dangerous levels...dangerous to the fish and to humans if the fish are raised in a closed building.

Here are some numbers to keep in mind. Oxygen is about 20.9% of the air and, because it is only slightly soluble in water, it becomes saturated at a level of about 9 ppm at 68°F (20°C). Carbon dioxide is .033% of the air and is saturated in water at about .5 ppm (the ratio is higher because it is more soluble than oxygen). The comparative concentration of these two gases in blood is similar to that of water. Therefore, a lot of carbon dioxide in the water means there will also be a lot of carbon dioxide in the blood of the fish. An excess of 5 ppm carbon dioxide in the water will affect the ability of the fish to breathe.

If intensive aquaculture operations are being conducted outdoors, a splash aerator or aeration with air diffusers will drive the carbon dioxide into the air. If the operations are in a closed building, very high levels of carbon dioxide can accumulate in the air (we've seen levels exceeding 4,000 ppm in the air in closed aquaculture facilities!). It then has to be removed from the building. Air ventilators can also remove a lot of heat along with the carbon dioxide.

We suggest that carbon dioxide be stripped with a degassing column that is ventilated to the outdoors. Outdoor air can be drawn directly into the bottom of the degassing tower, forced up through the downflowing liquid, then directed back outdoors separate from the inlet. In cold weather, there will be a significant cooling effect on the water because it is being degassed through cold, dry air. A simple air-to-air heat exchanger will help.

Gas Control Tower

Technical Data

Model Number		GCT-024-018	GCT-030-024	GCT-036-029	GCT-042-033	GCT-048-039	GCT-060-048	GCT-072-054	GCT-084-060
Design Flow Range	gpm	160 - 200	250 - 313	360 - 450	490 - 613	640 - 800	1000 - 1250	1440 - 1800	1960 - 2450
	lpm	606 - 757	946 - 1183	1363 - 1703	1855 - 2318	2422 - 3028	3785 - 4731	5450 - 6813	7419 - 9273
GCT - CO^2 Stripper		CO2T-024-072	CO2T-030-072	CO2T-036-072	CO2T-042-072	CO2T-048-072	CO2T-060-072	CO2T-072-072	CO2T-084-072
Width (CO2-W)	in	24	30	36	42	48	60	72	84
	mm	610	762	914	1067	1219	1524	1829	2134
Depth (CO2-H)	in	24	30	36	42	48	60	72	84
	mm	610	762	914	1067	1219	1524	1829	2134
Height (CO2-H)	in	72	72	72	72	72	72	72	72
	mm	1829	1829	1829	1829	1829	1829	1829	1829
HLR Range	gpm/ft²	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50	40 - 50
	lpm/m²	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037	1630 - 2037
Inlet Configuration		CpIng	CpIng	CpIng	Trough	Trough	Trough	Trough	Trough
- width	in			26.0	30.0	36.0	42.0	42.0	42.0
- height	in			12	12	12	12	12	12
Inlet Ø	in	6.00	8.00						
	mm	152	203						
Structured Media - Splash Plate - No Media Depth	in	36	36	36	36	36	36	36	36
	mm	914	914	914	914	914	914	914	914
Fan G:L		10:1	10:1	10:1	10:1	10:1	10:1	10:1	10:1
Weights									
Shipping	lbs	333	399	437	670	772	955	1237	1445
Flooded	lbs	543	749	949	1385	1711	2445	3404	4412
GCT - Low Head Oxygenator (LHO)		LHOT-018-060	LHOT-024-060	LHOT-029-060	LHOT-033-060	LHOT-039-060	LHOT-048-060	LHOT-054-060	LHOT-060-060
Width (LHO-W)	in	18	24	29	33	39	48	54	60
	mm	457	610	737	838	991	1,219	1,372	1,524
Depth (LHO-D)	in	18	24	29	33	39	48	54	60
	mm	457	610	737	838	991	1,219	1,372	1,524
Height (LHO-H)	in	60	60	60	60	60	60	60	60
	mm	1,524	1,524	1,524	1,524	1,524	1,524	1,524	1,524
HLR Range	gpm/ft²	71 - 89	63 - 78	62 - 77	65 - 81	61 - 76	63 - 78	71 - 89	78 - 98
	lpm/m²	2897 - 3622	2546 - 3183	2511 - 3139	2640 - 3300	2469 - 3086	2546 - 3183	2897 - 3622	3194 - 3993
Chambers	qn	6	6	6	6	6	8	8	8
Height	in	48	48	48	48	48	48	48	48
Submergence	in	24	24	24	24	24	24	24	24
	mm	610	610	610	610	610	610	610	610
Inlet Gas Ports (316sst)	qn	2	2	2	2	2	2	2	2
	Ø	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½	¾ x ½
Weights									
Shipping	lbs	231	277	328	362	428	552	661	742
Flooded	lbs	331	487	642	784	1027	1480	1845	2212
GCT Sump		LHOS-030-063	LHOS-036-066	LHOS-042-072	LHOS-048-096	LHOS-060-138	LHOS-072-138	LHOS-084-168	LHOS-096-168
GCT Sump Diameter	in	30	36	42	48	60	72	84	96
	mm	762	914	1,067	1,219	1,524	1,829	2,134	2,438
GCT Sump Height	in	63	66	72	96	138	138	168	168
	mm	1,600	1,676	1,829	2,438	3,505	3,505	4,267	4,267
Operating Liquid Level	in	51	54	57	60	66	72	78	84
Outlet / Overflow Ø	in	4.0	6.0	6.0	8.0	8.0	10.0	10.0	12.0
	mm	102	102	102	102	102	102	102	102
Side Box Width	in	16	18	18	24	24	30	30	36
Depth (dimension from t	in	12	14	14	16	16	18	18	20
Height	in	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Cone Drain	in	2	2	2	2	2	2	2	2
	mm	51	51	51	51	51	51	51	51
Weights									
Shipping	lbs	263	311	366	466	665	797	1017	1148
Flooded	lbs	1,167	1,472	1,896	3,029	5,710	7,098	10,486	12,559
GCT Assembly									
Overall Height (OAH)	in	159	162	168	192	234	234	264	264
	mm	4,039	4,115	4,267	4,877	5,944	5,944	6,706	6,706
Weights & Loadings									
Shipping	lbs	827	987	1,131	1,498	1,865	2,304	2,916	3,335
Floor Load - Flooded	lbs/sf	416	383	362	414	430	390	409	382

OPEN CHANNEL SAFEGUARD UV SYSTEMS™

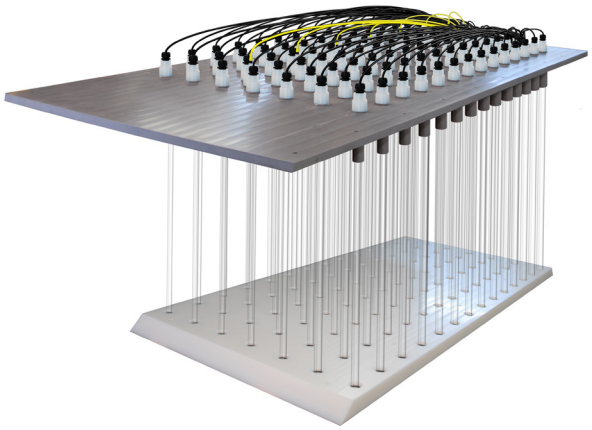
SAFEGUARD UV SYSTEMS VERTICAL OPEN CHANNEL UV

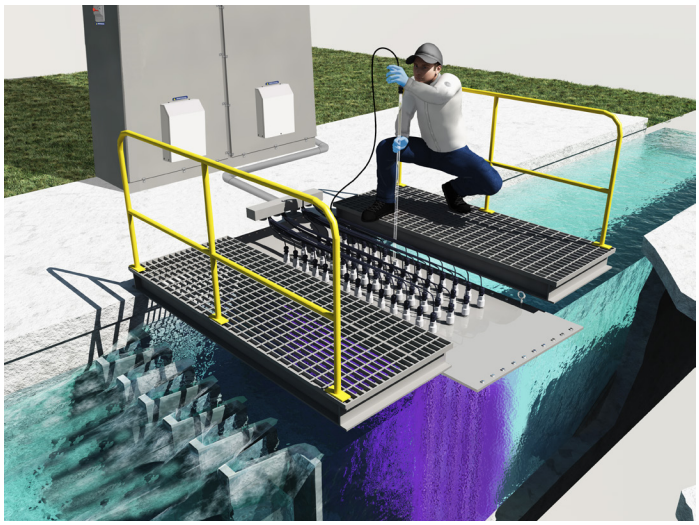
SafeGUARD UV Systems offers the most cost-effective germicidal disinfection solution for high-flow/high-fluence applications, ideal for use in hatcheries and raceways. An exclusive operator-friendly and easy-to-service design reduces labor and costly breakage. The vertical lamp field utilizes turbulent flow which achieves better hydraulic mixing compared to the laminar-flow created by less-efficient horizontal "rack style" open channel UV systems.

VERTICAL CHANNEL POLYMER PLATE (VCPP)

The design simplicity of the SafeGUARD UV Systems VCPP increases its versatility, making it adaptable for use in a number of applications. Just supply us with the application's existing water conditions, desired fluence, water flow rate, channel dimensions and power requirements (mechanical drawing). The entire system consists of a power enclosure, quartz ware module plates (upper & lower), quartz sleeves and lamps. A water level control weir maintains the correct water depth inside the channel, within the UV lamp field. The weir is equipped with a drain for easy channel cleaning and available in stainless steel or Schedule-80 Modified Polymer.

Pentair Aquatic Eco-Systems will work with you to customize a VCPP system to best suit your application. Due to the flexible design of the SafeGUARD UV Systems Vertical Open Channel UV configuration possibilities are endless. Module plates are engineered to specific application parameters, such as lamp array and plate dimensions. Once installed, these systems are meant to be fixed. Servicing is easy and labor is minimized with the single –end access to your UV lamps and quartz sleeves.

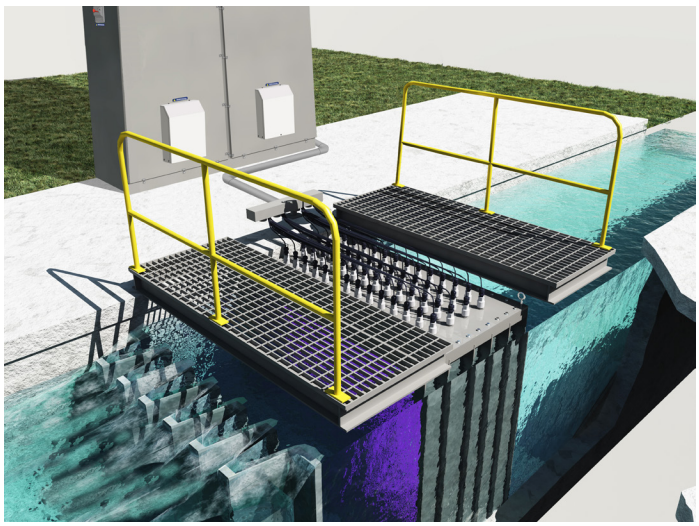




VCPP systems are engineered to specific parameters and are meant to be fixed.

VERTICAL CHANNEL POLYMER FRAME (VCPF)

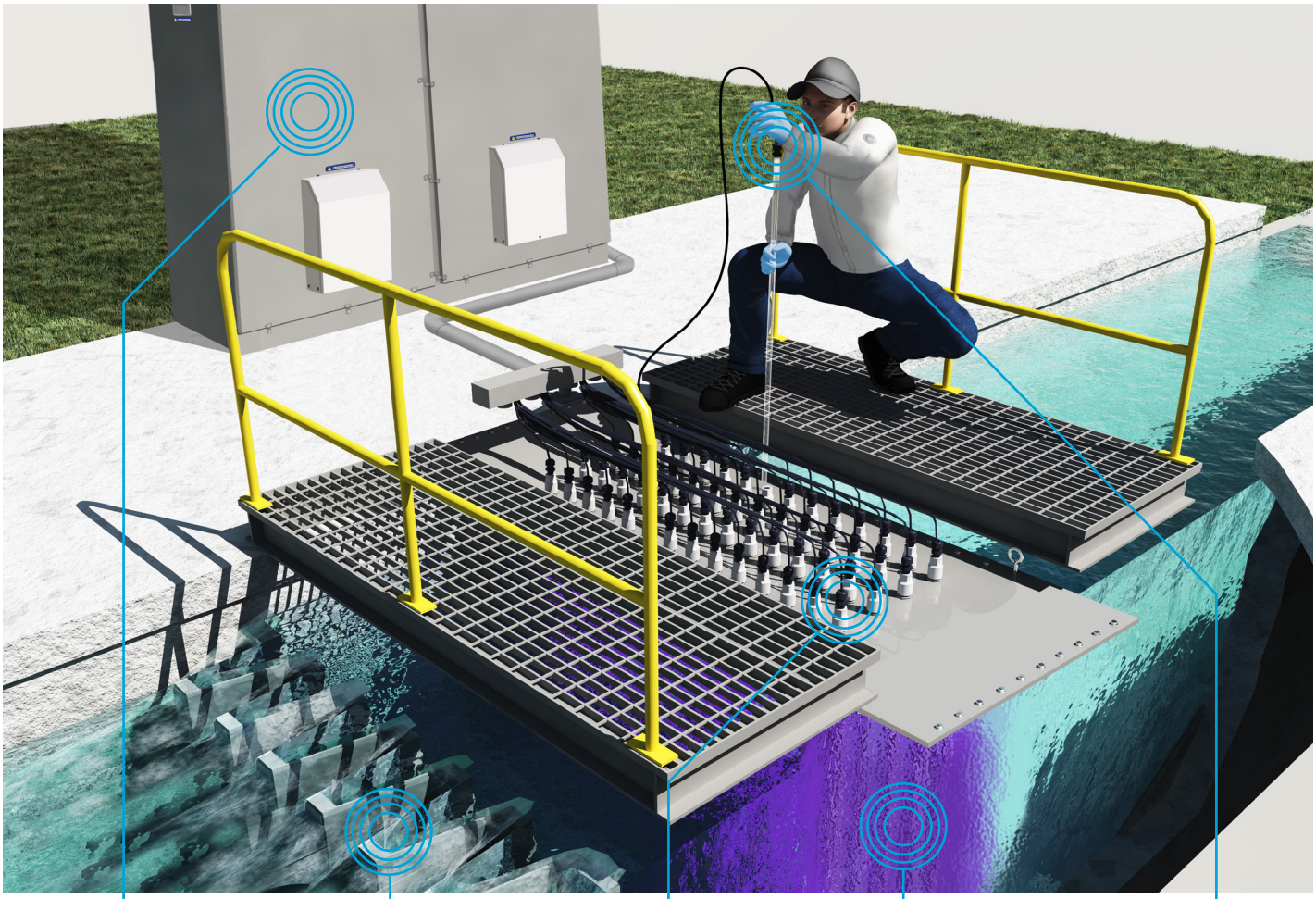
The SafeGUARD UV Systems VCPF is very similar to the VCPP. Instead of using plates to orient the lamp field, a frame is used. The frame is designed to be lowered and sealed into the channel and anchored down. The VCPF is a self-contained system that can be easier to install.



The VCPF is a self-contained system that can be easier to install.

SAFEGUARD UV SYSTEMS VERTICAL OPEN CHANNEL UV

Operator-Friendly, Cost Effective, Reliable UV Solution



WALKWAYS ARE CUSTOMER-SUPPLIED


1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5

System Features

1. Remote-Mounted Power Supply Enclosure with Control Package (Basic Included. PLC Optional)
2. A accurately designed weir is integral to the proper operation of an open channel system. Pentair AES will provide assistance with the sourcing and supplying of the weir in most cases.
3. Easy-Access through quick disconnect to UV Lamps and Quartz Sleeves for maintenance
4. Custom Designed Module Plates or Channel Frame
5. Highest-Quality American-Made Low-Pressure High-Output UV Lamps and Quartz Sleeves

EMPEROR SAFEGUARD UV SYSTEMS™ CUP SERIES

Commercial U-Shaped Polymer

The Emperor SafeGUARD CUP UV systems replace the successful "COM" UV series introduced in 1992. The CUP Series UVs carry on the 23-year tradition of quality, but with innovative improvements which include single-end quartz sleeves. Schedule-80 Modified Polymer construction ideally suited for corrosive saltwater conditions and a compact "U" vessel port orientation that reduces footprint. The CUP power supply enclosure is available in either a NEMA12 or NEMA 4X rating. Basic control package included (optional PLC package shown). Choose between either Low Pressure (LP) High Output (HO) or Amalgam UV lamps. UL listed. Made in USA.

System Features

- Enhanced, state-of-the-art electronic ballast, sized precisely to the lamp's power requirement, ensures optimal UV-C output and maximum useful-lamp-life
- Highest-Quality American-Made Low-Pressure High-Output UV lamps offer 12,000 hours* of continuous operation (80% efficient after 12,000 hours)
- Schedule-80 Modified Polymer** construction is stronger and can handle higher internal pressures than polypropylene and HDPE vessels
- Available in sizes to treat up to 5,000 gpm (18,925 lpm)
- Single-end UV lamp and quartz sleeve access for easy servicing
- Watertight design protects all electrical hardware from water damage
- Choice of inlet/outlet port styles.
- Power supply is 50/60 Hz capable
- 6' power cord and 20' lamp cables

PENTAIR

CALL FOR MORE INFORMATION AND PRICING.

*Limited 12,000 hr warranty on all lamps
**Limited 3 Year Warranty

MODEL	LAMPS/ WATTS	INPUT WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (L X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 120/230 VAC	MAX PSI/BAR	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
CUP4160HO6-XFB	2 / 80	160	54	52" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.0/1.5	50 / 3.4	81 / 314	13 / 52
CUP4240HO6-XFB	3 / 80	240	81	52" X 6""	14" X 12" X 8.4"	2", 3", 4"	4.0/2.0	50 / 3.4	119 / 461	20 / 77
CUP4320HO6-XFB	4 / 80	320	108	52" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.0/2.5	50 / 3.4	155 / 600	26 / 100
CUP6300HO6-XFB	2/150	300	114	70" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.75/1.8	50 / 3.4	174 / 675	29 / 113
CUP6450HO6-XFB	3/150	450	171	70" X 6"	14" X 12" X 8.4"	2", 3", 4"	5.5/2.7	50 / 3.4	250 / 969	41 / 162
CUP6600HO6-XFB	4/150	600	228	70" X 6"	16" X 14" X 8.4"	2", 3", 4"	7.5/3.7	50 / 3.4	331 / 1283	55 / 214
Safeguard UV System CUP Series Low-Pressure Amalgam										
CUP4130A6-XFB	1/130	130	40	52" X 6"	16" X 14" X 8.4"	2", 3", 4"	2.1/1.0	50/3.4	66/255	11/42
CUP4260A6-XFB	2/130	260	80	52" X 6"	16" X 14" X 8.4"	2", 3", 4"	3.9/2.0	50/3.4	112/434	18/72
CUP4390A6-XFB	3/130	390	120	52" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.8/2.9	50/3.4	161/624	27/104
CUP4390A8-XFB	3/130	390	120	54" X 8"	16" X 14" X 8.4"	3", 4" 6"	5.8/2.9	50/3.4	228/883	38/147
CUP4520A8-XFB	4/130	520	160	54" X 8"	20.2" X 16.3" X 8.4"	3", 4" 6"	7.5/3.7	50/3.4	296/1147	49/191
CUP4650A8-XFB	5/130	650	200	54" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.4/4.7	50/3.4	346/1341	58/223
CUP4780A10-XFB	6/130	780	240	60" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	11.2/5.6	50/3.4	480/1860	80/310
CUP4910A10-XFB	7/130	910	280	60" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	13.3/6.5	50/3.4	564/2185	94/364
CUP4910A12-XFB	7/130	910	280	62" X 12"	24.6" X 20.2" X 10.6"	6", 8"	13.3/6.5	50/3.4	648/2511	108/418
CUP41040A12-XFB	8/130	1,040	320	62" X 12"	30.5" X 24.1" X 12.6"	6", 8"	15.0/7.5	50/3.4	763/2956	127/493
CUP6320A6-XFB	1/320	320	98	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	3.2/1.6	50/3.4	165/639	27/106
CUP6640A6-XFB	2/320	640	196	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	6.0/3.0	50/3.4	276/1070	46/178
CUP6960A6-XFB	3/320	960	294	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	9.0/4.5	50/3.4	392/1519	65/253
CUP6960A8-XFB	3/320	960	294	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.0/4.5	50/3.4	587/2275	98/379
CUP61280A8-XFB	4/320	1,280	392	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	12.0/6.0	50/3.4	744/2883	124/480
CUP61600A8-XFB	5/320	1,600	490	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	15.0/7.5	50/3.4	848/3286	141/548
CUP61920A10-XFB	6/320	1,920	588	79" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	18.0/9.0	50/3.4	1,198/4642	200/773
CUP62240A10-XFB	7/320	2,240	686	79" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	*	50/3.4	1,405/5442	234/907
20218	UV VESSEL OVER-TEMP PROTECTION (RECOMMENDED FOR PLASTIC VESSELS)									
20218-EXTCABLE	12' EXTENSION CABLE FOR OVER-TEMP PROTECTION SENSOR (WORKS WITH BASIC CONTROL OPTION)									

When ordering: Replace '**X**' in part number with requested flange size; e.g., '2' for two-inch flange. Basic or Optional PLC Control Package available. ***230 VAC/11 AMPS.

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

EMPEROR SAFEGUARD UV SYSTEMS™ CLP SERIES

Commercial L-Vessel Polymer

CLP Series SafeGUARD UV Systems offer efficient operation, ensuring proper hydraulic mixing inside the UV vessel. This optimizes UV light intensity distribution throughout the lamp field for reliable fluence (UV dose) delivery. CLP models feature Schedule-80 Modified Polymer construction**, ideally suited for corrosive and saltwater conditions. CLP vessels are extremely durable (models NSF-50 Certified/operating pressures up to 150 PSI) and deliver a cost savings of up to 50% when compared to more expensive and corrosion-prone 316 stainless steel.

CLP Series SafeGUARD UV Systems feature single-end UV lamp and Quartz Sleeve assembly, remote NEMA Type 12 thermoplastic power supply enclosure, and are available with Basic or optional PLC(shown) Control packages with either LPHO or Amalgam UV lamps (available in sizes to treat up to 5,000 GPM/18,925 LPM). UL listed. Made in USA.

CALL FOR MORE INFORMATION AND PRICING.

*Limited 3 Year Warranty
**Limited 12,000 hr warranty on all lamps

System Features

- Enhanced, state-of-the-art electronic ballast, sized precisely to the lamp's power requirement, ensures optimal UV-C output and maximum useful-lamp-life
- Schedule-80 Modified Polymer construction is stronger and can handle higher internal pressures than polypropylene and HDPE vessels*
- Single-end UV lamp and quartz sleeve access for easy servicing
- Watertight design protects all electrical hardware from water damage
- Highest-Quality American-Made Low-Pressure High-Output UV lamps offer 12,000 hours** of continuous operation (80% efficient after 12,000 hours)
- Choice of inlet/outlet port styles
- Power supply is 50/60 Hz capable

MODEL	LAMPS/ WATTS	INPUT WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (L X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 120/230 VAC	MAX PSI/BAR	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
CLP4160H06-XFB	2/80	160	54	56" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.0/1.5	150/10.3	81/314	13/52
CLP4240H06-XFB	3/80	240	81	56" X 6"	14" X 12" X 8.4"	2", 3", 4"	4.0/2.0	150/10.3	119/461	20/77
CLP4320H06-XFB	4/80	320	108	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.0/2.5	150/10.3	155/600	26/100
CLP6300H06-XFB	2/150	300	114	85" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.75/1.8	150/10.3	174/675	29/113
CLP6450H06-XFB	3/150	450	171	85" X 6"	14" X 12" X 8.4"	2", 3", 4"	5.5/2.7	150/10.3	250/969	41/162
CLP6600H06-XFB	4/150	600	228	85" X 6"	16" X 14" X 8.4"	2", 3", 4"	7.5/3.7	150/10.3	331/1283	55/214
CLP Low-Pressure Amalgam UV Systems										
CLP4130A6-XFB	1/130	130	40	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	2.1/1.0	150/10.3	66/255	11/42
CLP4260A6-XFB	2/130	260	80	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	3.9/2.0	150/10.3	112/434	18/72
CLP4390A6-XFB	3/130	390	120	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.8/2.9	150/10.3	161/624	27/104
CLP4390A8-XFB	3/130	390	120	62" X 8"	16" X 14" X 8.4"	3", 4" 6"	5.8/2.9	150/10.3	228/883	38/147
CLP4520A8-XFB	4/130	520	160	62" X 8"	20.2" X 16.3" X 8.4"	3", 4" 6"	7.5/3.7	150/10.3	296/1147	49/191
CLP4650A8-XFB	5/130	650	200	62" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.4/4.7	150/10.3	346/1341	58/223
CLP4780A10-XFB	6/130	780	240	64" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	11.2/5.6	120/8.3	480/1860	80/310
CLP4910A10-XFB	7/130	910	280	64" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	13.3/6.5	120/8.3	564/2185	94/364
CLP4910A12-XFB	7/130	910	280	69" X 12"	24.6" X 20.2" X 10.6"	6", 8"	13.3/6.5	90/6.2	648/2511	108/418
CLP41040A12-XFB	8/130	1,040	320	69" X 12"	30.5" X 24.1" X 12.6"	6", 8"	15.0/7.5	90/6.2	763/2956	127/493
CLP6320A6-XFB	1/320	320	98	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	3.2/1.6	150/10.3	165/639	27/106
CLP6640A6-XFB	2/320	640	196	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	6.0/3.0	150/10.3	276/1070	46/178
CLP6960A6-XFB	3/320	960	294	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	9.0/4.5	150/10.3	392/1519	65/253
CLP6960A8-XFB	3/320	960	294	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.0/4.5	150/10.3	587/2275	98/379
CLP61280A8-XFB	4/320	1,280	392	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	12.0/6.0	150/10.3	744/2883	124/480
CLP61600A8-XFB	5/320	1,600	490	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	15.0/7.5	150/10.3	848/3286	141/548
CLP61920A10-XFB	6/320	1,920	588	88" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	18.0/9.0	120/8.3	1,198/4642	200/773
CLP62240A10-XFB	7/320	2,240	686	88" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	11 AMPS*	120/8.3	1,405/5442	234/907
CLP62240A12-XFB	7/320	2,240	686	90" X 12"	30.5" X 24.1" X 12.6"	6", 8"	11 AMPS*	90/6.2	1,611/6243	268/1040
CLP62560A12-XFB	8/320	2,560	784	90" X 12"	30.5" X 24.1" X 12.6"	6", 8"	13 AMPS*	90/6.2	1,839/7126	306/1188
CLP62880A14-XFB	9/320	2,880	882	92" X 14"	30.5" X 24.1" X 12.6"	8", 10", 12"	14 AMPS*	50/3.4	2183/8461	364/1410
CLP63200A16-XFB	10/320	3,200	980	94" X 16"	30.5" X 24.1" X 12.6"	10", 12", 14"	16 AMPS*	50/3.4	2,544/9858	424/1643
20218	UV VESSEL OVER-TEMP PROTECTION (RECOMMENDED FOR PLASTIC VESSELS)									
20218-EXTCABLE	12' EXTENSION CABLE FOR OVER-TEMP PROTECTION SENSOR (WORKS WITH BASIC CONTROL OPTION)									

When ordering: Replace '**X**' in part number with requested flange size; e.g., '2' for two-inch flange. Basic or Optional PLC Control Package available. *230 VAC.

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

CALL FOR MORE INFORMATION AND PRICING.

*Limited 12,000 hr warranty on all lamps
**Limited 3 Year Warranty

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

EMPEROR SAFEGUARD UV SYSTEMS™ CUS SERIES

Commercial U-Shaped Stainless Steel

Emperor SafeGUARD UV Systems CUS Series provides reliable protection against harmful waterborne pathogens. The "U" style UV vessel allows for space-saving horizontal mounting. CUS Series use either LPHO or Amalgam UV lamps and are available in various models suitable for a wide variety of application sizes.

CUS Series UV feature single-end lamp and quartz sleeve access for easy servicing. The CUS power supply enclosure is available in either a NEMA12 or NEMA 4X rating. Basic control package included (optional PLC package shown). UL listed. Made in USA.

System Features

- Enhanced, state-of-the-art electronic ballast, sized precisely to the lamp's power requirement, ensures optimal UV-C output and maximum useful-lamp-life
- Highest-Quality American-Made Low-Pressure High-Output UV lamps offer 12,000 hours* of continuous operation (80% efficient after 12,000 hours)
- 316L Stainless Steel** vessels with an electropolish finish and removable ends for internal inspection and cleaning
- Available in sizes to treat up to 5,000 gpm (18,925 lpm)
- Single-end UV lamp and quartz sleeve access for easy servicing
- Watertight design protects all electrical hardware from water damage
- Choice of inlet/outlet port styles
- Power supply is 50/60 Hz capable
- 6' power cord and 20' lamp cables

MODEL	LAMPS/ WATTS	INPUT WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (L X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 120/230 VAC	MAX PSI/BAR	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
CUS4160HO6-XFB	2/80	160	54	52" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.0/1.5	150/10.3	85/322	14/53
CUS4240HO6-XFB	3/80	240	81	52" X 6"	14" X 12" X 8.4"	2", 3", 4"	4.0/2.0	150/10.3	115/435	19/72
CUS4320HO6-XFB	4/80	320	108	52" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.0/2.5	150/10.3	158/598	26/98
CUS6300HO6-XFB	2/150	300	114	70" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.75/1.8	150/10.3	178/674	29/110
CUS6450HO6-XFB	3/150	450	171	70" X 6"	14" X 12" X 8.4"	2", 3", 4"	5.5/2.7	150/10.3	250/946	41/155
CUS6600HO6-XFB	4/150	600	228	70" X 6"	16" X 14" X 8.4"	2", 3", 4"	7.5/3.7	150/10.3	346/1310	57/216
SafeGUARD CUS-Series Amalgam UV System										
CUS4130A6-XFB	1/130	130	40	55" X 6"	16" X 14" X 8.4"	2", 3", 4"	2.1/1.0	150/10.3	66/255	11/42
CUS4260A6-XFB	2/130	260	80	55" X 6"	16" X 14" X 8.4"	2", 3", 4"	3.9/2.0	150/10.3	112/434	18/72
CUS4390A6-XFB	3/130	390	120	55" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.8/2.9	150/10.3	161/624	27/104
CUS4390A8-XFB	3/130	390	120	57" X 8"	16" X 14" X 8.4"	3", 4" 6"	5.8/2.9	150/10.3	228/883	38/147
CUS4520A8-XFB	4/130	520	160	57" X 8"	20.2" X 16.3" X 8.4"	3", 4" 6"	7.5/3.7	150/10.3	296/1147	49/191
CUS4650A8-XFB	5/130	650	200	57" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.4/4.7	150/10.3	346/1341	58/223
CUS4780A10-XFB	6/130	780	240	60" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	11.2/5.6	150/10.3	480/1860	80/310
CUS4910A10-XFB	7/130	910	280	60" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	13.3/6.5	150/10.3	564/2185	94/364
CUS4910A12-XFBX	7/130	910	280	62" X 12"	24.6" X 20.2" X 10.6"	6", 8", 10"	13.3/6.5	150/10.3	648/2511	108/418
CUS41040A12-XFB	8/130	1,040	320	62" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	15.0/7.5	150/10.3	763/2956	127/493
CUS6320A6-XFB	1/320	320	98	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	3.2/1.6	150/10.3	165/639	27/106
CUS6640A6-XFB	2/320	640	196	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	6.0/3.0	150/10.3	276/1070	46/178
CUS6960A6-XFB	3/320	960	294	75" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	9.0/4.5	150/10.3	392/1519	65/253
CUS6960A8-XFB	3/320	960	294	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.0/4.5	150/10.3	587/2275	98/379
CUS61280A8-XFB	4/320	1,280	392	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	12.0/6.0	150/10.3	744/2883	124/480
CUS61600A8-XFB	5/320	1,600	490	77" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	15.0/7.5	150/10.3	848/3286	141/548
CUS61920A10-XFB	6/320	1,920	588	79" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	18.0/9.0	150/10.3	1,198/4642	200/773
CUS62240A10-XFB	7/320	2,240	686	79" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	11 AMPS*	150/10.3	1,405/5442	234/907
CUS62240A12-XFB	7/320	2,240	686	81" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	11 AMPS*	150/10.3	1,611/6243	268/1040
CUS62560A12-XFB	8/320	2,560	784	81" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	13 AMPS*	150/10.3	1,839/7126	306/1188
CUS62880A14-XFB	9/320	2,880	882	83" X 14"	30.5" X 24.1" X 12.6"	8", 10", 12"	14 AMPS*	130/8.9	2183/8461	364/1410
CUS63200A16-XFB	10/320	3,200	980	85" X 16"	30.5" X 24.1" X 12.6"	10", 12", 14"	16 AMPS*	100/6.8	2,544/9858	424/1643
CUS63520A18-XFB	11/320	3,520	1078	87" X 18"	40.4" X 32.5" X 12.6"	12", 14", 16"	17 AMPS*	80/5.5	2,904/11,253	484/1876
CUS63840A20-XFB	12/320	3,840	1176	89" X 20"	40.4" X 32.5" X 12.6"	14", 16", 18"	19 AMPS*	65/4.4	3,434/13308	572/2218
CUS64160A24-XFB	13/320	4,160	1274	91" X 24"	40.4" X 32.5" X 12.6"	16", 18", 20"	20 AMPS*	50/3.4	3,821/14807	636/2468

When ordering: Replace '**X**' in part number with requested flange size; e.g., '2' for two-inch flange. Basic or Optional PLC Control Package available. *230 VAC.

PENTAIR

CALL FOR MORE INFORMATION AND PRICING.

*Limited 3 Year Warranty
**Limited 12,000 hr warranty on all lamps

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

EMPEROR SAFEGUARD UV SYSTEMS™ CLS SERIES

Commercial L-Vessel Stainless Steel

For applications requiring Stainless Steel, Pentair's CLS Series SafeGUARD UV Systems 316L Stainless Steel Vessels*, with an electropolish finish, provide reliable operation. Vessels are equipped with sensor ports. SafeGUARD UV Systems CLS models are available with LPHO or High-Intensity Amalgam UV Lamps. CLS UV systems provide the benefit of a compact, space-saving design allowing for in-line horizontal or vertical mounting.

CLS Series SafeGUARD UV Systems feature a single-ended quartz assembly, remote NEMA Type 12 thermoplastic power supply enclosure, and are available with Basic or optional PLC (shown) Control packages and either LP HO or Amalgam UV lamps. Available in sizes to treat up to 5,000 GPM (18,925 LPM). UL listed. Made in USA.

System Features

- Enhanced, state-of-the-art electronic ballast-sized precisely to the lamp's power requirement ensures optimal UV-C output and maximum lamp life
- 316L stainless steel vessel has removable faceplate for internal inspection and cleaning
- Single-end UV lamp and quartz sleeve access for easy servicing
- Watertight design protects all electrical hardware from water damage
- Highest-Quality American-Made Low-Pressure High-Output UV lamps offer 12,000 hours** of continuous operation (80% efficient after 12,000 hours)
- Choice of inlet/outlet port styles
- Power supply is 50/60 Hz capable
- 6' power cord and 20' lamp cables

MODEL	LAMPS/ WATTS	INPUT WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (L X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 120/230 VAC	MAX PSI/BAR	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
CLS4160HO6-XFB	2/80	160	54	56" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.0/1.5	150/10.3	81/314	13/52
CLS4240HO6-XFB	3/80	240	81	56" X 6"	14" X 12" X 8.4"	2", 3", 4"	4.0/2.0	150/10.3	119/461	20/77
CLS4320HO6-XFB	4/80	320	108	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.0/2.5	150/10.3	155/600	26/100
CLS6300HO6-XFB	2/150	300	114	85" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.75/1.8	150/10.3	174/675	29/113
CLS6450HO6-XFB	3/150	450	171	85" X 6"	14" X 12" X 8.4"	2", 3", 4"	5.5/2.7	150/10.3	250/969	41/162
CLS6600HO6-XFB	4/150	600	228	85" X 6"	16" X 14" X 8.4"	2", 3", 4"	7.5/3.7	150/10.3	331/1283	55/214
CLS Low-Pressure Amalgam UV Systems										
CLS4130A6-XFB	1/130	130	40	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	2.1/1.0	150/10.3	66/255	11/42
CLS4260A6-XFB	2/130	260	80	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	3.9/2.0	150/10.3	112/434	18/72
CLS4390A6-XFB	3/130	390	120	56" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.8/2.9	150/10.3	161/624	27/104
CLS4390A8-XFB	3/130	390	120	62" X 8"	16" X 14" X 8.4"	3", 4" 6"	5.8/2.9	150/10.3	228/883	38/147
CLS4520A8-XFB	4/130	520	160	62" X 8"	20.2" X 16.3" X 8.4"	3", 4" 6"	7.5/3.7	150/10.3	296/1147	49/191
CLS4650A8-XFB	5/130	650	200	62" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.4/4.7	150/10.3	346/1341	58/223
CLS4780A10-XFB	6/130	780	240	64" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	11.2/5.6	150/10.3	480/1860	80/310
CLS4910A10-XFB	7/130	910	280	64" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	13.3/6.5	150/10.3	564/2185	94/364
CLS4910A12-XFB	7/130	910	280	69" X 12"	24.6" X 20.2" X 10.6"	6", 8", 10"	13.3/6.5	150/10.3	648/2511	108/418
CLS41040A12-XFB	8/130	1,040	320	69" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	15.0/7.5	150/10.3	763/2956	127/493
CLS6320A6-XFB	1/320	320	98	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	3.2/1.6	150/10.3	165/639	27/106
CLS6640A6-XFB	2/320	640	196	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	6.0/3.0	150/10.3	276/1070	46/178
CLS6960A6-XFB	3/320	960	294	85" X 6"	24.6" X 20.2" X 10.6"	2", 3", 4"	9.0/4.5	150/10.3	392/1519	65/253
CLS6960A8-XFB	3/320	960	294	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.0/4.5	150/10.3	587/2275	98/379
CLS61280A8-XFB	4/320	1,280	392	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	12.0/6.0	150/10.3	744/2883	124/480
CLS61600A8-XFB	5/320	1,600	490	86" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	15.0/7.5	150/10.3	848/3286	141/548
CLS61920A10-XFB	6/320	1,920	588	88" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	18.0/9.0	150/10.3	1,198/4642	200/773
CLS62240A10-XFB	7/320	2,240	686	88" X 10"	30.5" X 24.1" X 12.6"	4", 6", 8"	11 AMPS*	150/10.3	1,405/5442	234/907
CLS62240A12-XFB	7/320	2,240	686	90" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	11 AMPS*	150/10.3	1,611/6243	268/1040
CLS62560A12-XFB	8/320	2,560	784	90" X 12"	30.5" X 24.1" X 12.6"	6", 8", 10"	13 AMPS*	150/10.3	1,839/7126	306/1188
CLS62880A14-XFB	9/320	2,880	882	92" X 14"	30.5" X 24.1" X 12.6"	8", 10", 12"	14 AMPS*	130/8.9	2183/8461	364/1410
CLS63200A16-XFB	10/320	3,200	980	94" X 16"	30.5" X 24.1" X 12.6"	10", 12", 14"	16 AMPS*	100/6.8	2,544/9858	424/1643
CLS63520A18-XFB	11/320	3,520	1,078	96" X 18"	40.4" X 32.5" X 12.6"	12", 14", 16"	17 AMPS*	80/5.5	2,904/11,253	484/1876
CLS63840A20-XFB	12/320	3,840	1,176	98" X 20"	40.4" X 32.5" X 12.6"	14", 16", 18"	19 AMPS*	65/4.4	3,434/13308	572/2218
CLS64160A24-XFB	13/320	4,160	1,274	102" X 24"	40.4" X 32.5" X 12.6"	16", 18", 20"	20 AMPS*	50/3.4	3,821/14807	636/2468

When ordering: Replace '**X**' in part number with requested flange size; e.g., '2' for two-inch flange. Basic or Optional PLC Control Package available. *230 VAC.

VESSEL OVER-TEMP PROTECTION INCLUDED FOR THIS SERIES.

EMPEROR SAFEGUARD UV SYSTEMS™ CVP SERIES

Commercial Vertical Polymer

When operating space is restricted, our CVP (Vertical) Series SafeGUARD UV Systems provide the small footprint you need. CVP models feature single-end, top-loading quartz ware to minimize space required and maximize serviceability! Each model is extremely durable and features a corrosion-resistant remote power supply enclosure and UV vessel. All models are designed to deliver optimum UV performance by utilizing their UV lamp's UV-C output to its maximum potential. CVP LPHO and Amalgam SafeGUARD UV Systems are watertight and designed for indoor/outdoor use. Each model is equipped with a flanged base for easy installation. UL Listed. Made in the USA.

System Features

- Control Package included (optional PLC Package shown).
- Enhanced, state-of-the-art electronic ballast, sized precisely to the lamp's power requirement, ensures optimal UV-C output and maximum "useful lamp life"
- Small footprint: vertical operation reduces required horizontal space
- Schedule-80 Modified Polymer construction is stronger and can handle higher internal pressures than polypropylene and HDPE vessels*
- Single-End UV lamp and quartz sleeve access for easy servicing
- Watertight design protects all electrical hardware from water damage
- Highest-quality American-made low-pressure high-output UV lamps offer 12,000 hours of continuous operation (80% efficient after 12,000 hours)**
- Choice of inlet/outlet port styles
- Over-Temp System Shutdown Sensor shuts down the lamp field to avoid damage when water temperature inside the vessel exceeds 120° F
- 6-foot power cord and 20-foot lamp cables

*Limited 3 Year Warranty
**Limited 12,000 hr warranty on all lamps

MODEL	LAMPS/ WATTS	INPUT WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (H X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 120/230 VAC	MAX PSI/BAR	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
CVP4160H06-XFB	2/80	160	54	57" X 6"	14" X 12" X 8.4"	2", 3", 4"	3.0/1.5	50/3.4	81/314	13/52
CVP4240H06-XFB	3/80	240	81	57" X 6"	14" X 12" X 8.4"	2", 3", 4"	4.0/2.0	50/3.4	119/461	20/77
CVP4320H06-XFB	4/80	320	108	57" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.0/2.5	50/3.4	155/600	26/100
CVP Low-Pressure Amalgam UV Systems										
CVP4130A6-XFB	1/130	130	40	57" X 6"	16" X 14" X 8.4"	2", 3", 4"	2.1/1.0	50/3.4	66/255	11/42
CVP4260A6-XFB	2/130	260	80	57" X 6"	16" X 14" X 8.4"	2", 3", 4"	3.9/2.0	50/3.4	112/434	18/72
CVP4390A6-XFB	3/130	390	120	57" X 6"	16" X 14" X 8.4"	2", 3", 4"	5.8/2.9	50/3.4	161/624	27/104
CVP4390A8-XFB	3/130	390	120	63" X 8"	16" X 14" X 8.4"	3", 4" 6"	5.8/2.9	50/3.4	228/883	38/147
CVP4520A8-XFB	4/130	520	160	63" X 8"	20.2" X 16.3" X 8.4"	3", 4" 6"	7.5/3.7	50/3.4	296/1147	49/191
CVP4650A8-XFB	5/130	650	200	63" X 8"	24.6" X 20.2" X 10.6"	3", 4" 6"	9.4/4.7	50/3.4	346/1341	58/223
CVP4780A10-XFB	6/130	780	240	68" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	11.2/5.6	50/3.4	480/1860	80/310
CVP4910A10-XFB	7/130	910	280	68" X 10"	24.6" X 20.2" X 10.6"	4", 6", 8"	13.3/6.5	50/3.4	564/2185	94/364
CVP4910A12-XFB	7/130	910	280	75" X 12"	24.6" X 20.2" X 10.6"	6", 8"	13.3/6.5	50/3.4	648/2511	108/418
CVP41040A12-XFB	8/130	1,040	320	75" X 12"	30.5" X 24.1" X 12.6"	6", 8"	15.0/7.5	50/3.4	763/2956	127/493

When ordering: Replace '**X**' in part number with requested flange size; e.g., '2' for two-inch flange. Basic or Optional PLC Control Package available.

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

EMPEROR SAFEGUARD UV SYSTEMS™ HOSS SERIES

High-Output Stainless Steel

Quality craftsmanship meets superior design to deliver years of dependable and trouble-free operation. HOSS Series SafeGUARD UV Systems combine the latest, most efficient Low-Pressure (LP) UV lamp technology with robust stainless steel UV vessel construction to create a versatile, high-quality UV system suited for freshwater Aquaculture and light-Industrial applications. HOSS UV Systems feature a thermoplastic NEMA 4X or Type 12 power supply enclosure mounted to the UV vessel brackets, allowing 4-way orientation for either horizontal or vertical system mounting. HOSS controls consist of analog re-settable hour meter, lamp-status LEDs, input power LED, and external on/off switch. Single-end UV lamps and quartz sleeve access allows for quick-easy servicing. Cable hardware protects lamp connections from water damage and is durable and inexpensive to replace.

HOSS UV systems are available with LP high-output or high-intensity Amalgam UV lamps. The system's design (lamp array) yields efficient and cost-effective UV lamp performance. The Highest-Quality American-Made Low-Pressure High-Output UV Lamps offer 80% efficiency after 12,000 hours** of continuous operation. All HOSS UV vessels feature stainless steel threaded ports and flanges. UL listed. Made in USA.

System Features

- Housing Material*: Stainless Steel (316L or 316L with Electropolished Finish)
- UV Lamp: Low-Pressure High-Output, T-6 style
- Control Enclosure: NEMA 4X or Type 12

Monitoring System:

- Main Power Indicator Light
- Elapsed Run-Time Hour Meter
- UV Lamp Status Indicator

*Limited 3 Year Warranty
**Limited 12,000 hr warranty on all lamps

MODEL	LAMPS/ WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (H X D)	POWER ENCLOSURE DIMENSIONS (H X W X D)	AVAILABLE INLET/OUTLET PORT(S) (FLANGE)	AMPS MAX LOAD @ 115/230 VAC	MAX PSI/BAR	30 MJ/CM²* GPM/LPM	180 MJ/CM²** GPM/LPM
COM480HOSS	1/80	27	42" X 11"	12.5" X 10.5" X 7.7"	2" MNPT	1.25/0.75	50/3.4	47/182	8/30
COM4160HOSS	2/80	54	42" X 11"	12.5" X 10.5" X 7.7"	2" MNPT	2.5/1.25	50/3.4	75/290	12/48
COM4240HOSS	3/80	81	42" X 11"	12.5" X 10.5" X 7.7"	2" MNPT	3.5/1.75	50/3.4	112/434	18/72
COM4320HOSS	4/80	108	42" X 11"	12.5" X 10.5" X 7.7"	2" MNPT	5.0/2.5	50/3.4	146/566	27/94

*Recommended flowrate for algae and bacteria.
**Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

EMPEROR SAFEGUARD UV SYSTEMS™ HIGH-OUTPUT SINGLE-LAMP UV STERILIZERS

Research facility staff and other aquatic husbandry personnel will find our Emperor SafeGUARD HO UV Sterilizers are easy to install, operate and maintain. Single-end access allows for time saving serviceability of the lamp and quartz sleeve. The Highest-Quality American-Made Low-Pressure High-Output UV Lamps offer 80% efficiency after 12,000 hours of continuous operation. Units are 115V/60 Hz and have a one-year warranty on ballasts, limited lifetime warranty on the housing and 90-day warranty on lamps. Made in USA.

System Features

- Housing Material: Heavy-Wall UV Resistant High-Density Polymer
- Housing Pressure (Max.): 20 psi / 1.378 bar
- Housing Inlet/Outlet Port Size: 2" Union
- UV Lamp(s): Low-Pressure High-Output, T6-Style

Optional Monitoring System

- Control Enclosure: NEMA 4X
- Control Enclosure Size: 14" H x 12" W x 8.4" D
- Main Power Indicator Light
- Elapsed Run-Time Hour Meter
- UV Lamp Status Indicator
- PLC package optional

Note: Fluence (UV Dose) calculated using UVT factors of 90%T and UV lamps at the end of their useful lamp life (12,000-hours).

VESSEL OVER-TEMP PROTECTION NOT AVAILABLE FOR THIS SERIES.

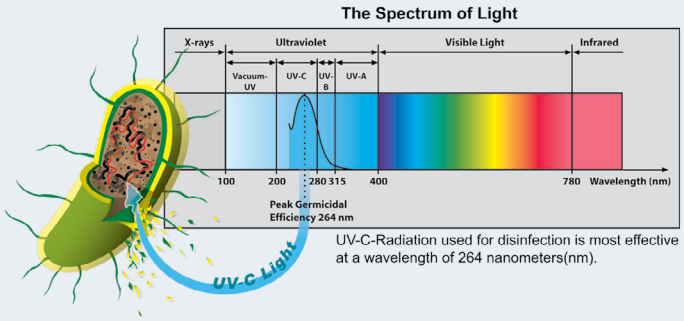
MODEL	LAMPS/ WATTS	UV-C OUTPUT WATTS	UV VESSEL DIMENSIONS (L X D)	AMPS MAX LOAD @ 120/230 VAC	30 MJ/CM² GPM/LPM	180 MJ/CM² GPM/LPM
COM250HO-2UB	1/50	15	28" X 6"	1.15/0.57	25/97	4/16
COM480HO-2UB	1/80	27	43" X 6"	1.15/0.57	45/170	7/26
COM5120HO-2UB	1/120	37	56" X 6"	1.15/0.57	64/242	10/38
COM6150HO-2UB	1/150	150	70" X 6"	1.85/0.85	100/387	17/65

TECH TALK

How does UV Sterilize the Organisms in my water?

When you hear "UV", tanning on the beach may come to mind, but the UV light that water treatment systems emit is not the same UV that turns your skin to that golden brown, or red! Light is divided into wavelengths; for example red light and blue light are emitted at different wavelengths. Similarly there are 3 principal bands or wavelengths of UV that are of interest here. The three bands are called UV-A (long wavelength), UV-B, (mid wavelength) and UV-C (short wavelength). Sunlight that reaches the surface of the earth is comprised primarily of UV-A and has some UV-B. These wavelengths are what reach your skin when you go outside on a sunny day. UV-C is emitted by our sun, but is blocked by our atmosphere. UV-C is very natural!

UV-C is emitted at a wavelength range of 200nm (or nanometers) to 280nm.



UV-C-Radiation used for disinfection is most effective at a wavelength of 264 nanometers(nm).

Light emitted in the UV-C range is very effective at sterilizing very small organisms such as bacteria, fungi, algae, spores, viruses, etc. UV-B and UV-A do as well, just with much lower effectiveness. The peak effective wavelength for micro-organism sterilization is right near the middle of the UV-C wavelength band and found at 262nm. Keep that number in mind! That is where the biology and lamps meet; UV lamps primarily emit UV-C light at 254nm. This wavelength, which happens to be very close to the peak effective sterilization wavelength of 262nm!

It should be also noted that different organisms require different levels of exposure to UV-C in order to be sterilized; some organisms are tougher than others! This level of exposure is called UV 'dose'. In basic terms dose is the intensity of the emitted UV light multiplied by the exposure time. For example when using the same UV treatment system for an application, doubling the flow rate through the reactor would halve the dose value. A doubled flow rate means that the water was exposed to the light from the UV lamp for half the time it had been before.

Harmful Pathogens associated with Aquaculture

	UV DOSE
ALGAE	
Chlorella Vulgaris	22 mJ/cm2
BACTERIA	
Aeromonas salmonicida	3.6 mJ/cm2 (log-3)
Pseudomonas fluorescens (fin rot)	11 mJ/cm2 (log-3)
PROTOZOA	
Myxobolus cerebralis (TAMs, Whirling Disease)	40 mJ/cm2
Ichthyophthirius multifiliis (freshwater white spot)	100 mJ/cm2
Cryptocaryon irritans (marine white spot)	280 mJ/cm2
VIRUS	
KHV (Koi herpesvirus)	4 mJ/cm2
IHNV (Infectious Hematopoietic Necrosis/RTTO)	30 mJ/cm2
VHS (Viral Hemorrhagic Septicemia)	32 mJ/cm2
IPNV (Infectious Pancreatic Necrosis Virus)	246 mJ/cm2

So, How Does a UV System Work?

The lamps used for disinfection are very similar to the lamps used in the fluorescent fixtures in your home. The primary difference is that the lamps in your home convert ALL of the UV-C generated by the lamp into visible light. The UV lamps in your water treatment system have no visible light converting phosphor (that white stuff on the inside of the fluorescent lamps), and special quartz envelopes that allow the UV-C to transmit outside of the bulb. The lamps in your home use a special glass envelope that totally blocks UV at any wavelength be it UV-A, UV-B, or UV-C.

UV treatment systems are comprised of a highly efficient UV lamp that is situated within a high quality UV-C transmitting quartz sleeve, and in turn that lamp and sleeve are placed within a flow chamber or vessel. The quartz sleeve is the boundary between the water and the lamp; we don't want our lamps to get wet!

Water flows through the chamber, and around the lamp/sleeve assembly. The UV-C generated by the lamp emits through the water, hits the organisms we want sterilized, and does its job.

So, What Do We Need to Know to Ensure Successful Installation of a UV Treatment System?

-Target organism – What dose do we need?

- Flow Rate – so we can get you the right dose at your flow rate

- UVT or Ultra Violet Water Transmission –What is that???

UVT or Ultra Violet Transmittance

Water as a fluid allows light to pass through it, we all know that. We also know that water 'attenuates' or absorbs light as you go deeper and deeper into it, i.e. a lake or an ocean. Many people that scuba dive know that water absorbs red light faster than blue light; when you dive down the reds disappear or get absorbed before the blue light does. What this demonstrates is that water absorbs light at different rates, dependent on the wavelengths.

UVT is not a common term, in fact many do not even know that this parameter is one of the most important aspects with regards to ensuring that a UV treatment system works well. UVT is the amount of light, ONLY at 254nm (or the wavelength that the lamp emits) that can go through 1cm, or about 2/5's of an inch of water. For example a UVT of say 90% means that 90% of the UV-C light will still be there, and not absorbed, after travelling through 1cm of water. The lower the UVT, the more the UV-C light is absorbed by the water, and generally that means that we have to pick a system with more lamp power. Ineffective UV treatment can be attributed to improper consideration of UVT when sizing a system.

Now UV-C light gets absorbed very quickly by water, even in very pure water. Even our atmosphere absorbs it. If you add things to the water, i.e. anything, the amount of UV-C that gets absorbed goes even higher and effectively the UVT value drops. At microscopic levels minerals, chemicals, tannins, biological debris, etc., can reduce the UVT value of your water. Some typical UVT values are:

- Pools: 85% to 95% UVT

- Aquaculture: 70% to 98%

- Public aquariums & zoo displays: 70% to 98%.

As the water UVT drops, UV systems need more lamp power to reach the same target dose!

Did you know that a system for 90% UVT water can sometimes require as much as 20% to 30% more lamp power than that of a system for water with a 95% UVT, even though they have the same flow rates and dose level requirements? UVT is very important! If you were to use 95% UVT as your criteria when you purchased your system, and your water was actually 90% UVT, your system would not treat your water appropriately; it would be undersized, and perhaps drastically undersized! This is a reason many people have trouble getting UV to work for them. They don't take the actual UVT of their water into account. If you need assistance calculating your UVT please do not hesitate to contact a Pentair Aquatic Eco-Systems representative today!

SALTWATER PROTEIN FRACTIONATORS

All RK2 fractionators are built of high-quality, long-lasting, salt water and ozone compatible materials. They feature dedicated venturi pumps, ozone-resistant PVDF injectors, washdown sprayers with electronic interval timers, EPDM flange gaskets, level control valves and unions or flanges at all ports. Motors available with any electrical configuration. AC models have clear bodies. PE models have high-density polyethylene (HDPE) bodies. All have clear acrylic collecton chambers. Ozone systems (with air dryers and oxygen generators) are sold separately. Ship motor freight, FOB California. Crating charge is included in price. One-year limited warranty. Made in USA.

RECOMMENDED OZONE GENERATORS

Part No.	Technical Info	Includes	Compatible Protein Fractionator(s)
6004	300 mg/hr @ 1.3% by weight at 6 scfh. 115V/60 Hz, 2.7 amps.	ORP controller with probe and mount. No air prep.	**RK10AC, RK25PE**
6009	1,000 mg/hr @ 1.3% by weight at 4 scfh. 115V/60 Hz, 2.7 amps.	ORP, temperature and pH controller, probes and mounts. Built-in air dryer.	**RK50PE, RK75PE**
6014	2,500 mg/hr @ 3% by weight at 8 scfh. 115V/60Hz, 3.1 amps	ORP, temperature and pH controller, probes and mounts. Built-in air dryer.	**RK75PE-HF,RK300PE, RK300PE-HF**
6016	4 g/hr @ 3% by weight at 4 scfh through external oxygen concentrator (included). 115V/60 Hz, 4.6 amps.	ORP, temperature and pH controller, probes, mounts and oxygen concentrator.	**RK150PE-HF, RK300PE, RK300PE-HF**
6017	8 g/hr @ 3% by weight at 8 scfh through external oxygen concentrator (included). 115V/60 Hz, 5.0 amps.	ORP, temperature and pH controller, probes, mounts and oxygen concentrator.	**RK600PE**
6024	15 g/hr @ 6% by weight at 6 scfh through external oxygen concentrator. (included). 115V/60 Hz, 7.6 amps.	ORP, temperature and pH controller, probes, mounts and oxygen concentrator.	**RK1000PE**
6030	27 g/hr @ 6% by weight at 12 scfh through external oxygen concentrator (included). 115V/60 Hz, 13.3 amps.	ORP, temperature and pH controller, probes, mounts and oxygen concentrator.	**RK2000PE**

The flowrates shown are the rates at which culture water can move through a foam fractionator with a two-minute residence, or dwell time.

RK75PE

RK10AC, RK25PE, RK50PE, RK75PE & RK75PE-HF ARE IN STOCK

Pump on the left is the culture water pump and is not included in price.

PROTEIN FRACTIONATORS	FLOW AT 2-MIN DWELL (GPM)	AMPS @ 230V/60 HZ/1PH	HEIGHT*	DIAMETER	BASE DIMENSIONS	SHIP WT (LBS)	OPTIONAL OZONE GENERATOR
RK10AC	10	.95	85"	10"	15" X 36"	200	**6004**
RK25PE	25	.95	85"	14"	24" X 30"	200	**6004**
RK50PE	40	1.3	99"	20"	24" X 42"	250	**6009**
RK75PE	70	4.3	102"	24"	24" X 42"	300	**6009**
RK75PE-HF	105**	5.75	102"	24"	24" X 42"	300	**6014**
RK150PE	155	6.9	101"	36"	36" X 54"	550	**6014**
RK150PE-HF	210**	8.3	101"	36"	36" X 54"	550	**6016**
RK300PE	290	8.3	110"	48"	48" X 66"	650	**6016**
RK300PE-HF	375**	7.8	110"	48"	48" X 66"	650	**6016**
RK600PE	600	8.3 (X2)	144"	60"	60" X 78"	1,000	**6017**
RK1000PE	1,100	8.3 (X4)	144"	84"	92" X 114"	1,500	**6024**
RK2000PE	1,500	7.88 (X4)	168"	84"	92" X 114"	1,800	**6030**

*Minimum clearance. Additional clearance for servicing is highly recommended. **Flow at 90 second dwell.

OZONE GENERATORS

The DEL OZONE Next Generation Eclipse Ozone Systems are compact and provide dependable, low- maintenance operation. Cabinets are made of extruded aluminum with molded plastic end caps and are wall-mountable. Electrodes are rated for 15,000 hours of operation at over 80% capacity. Power supplies are rated to operate for the life of the generator under normal conditions. Generators may be operated in a vacuum or with positive pressure.

When using O_2 as feed gas, you can expect approximately twice the concentration than with air as feed gas. Air compressor not included. All models require .25 cfm feed gas (air or oxygen). ¼" hose inlet and outlet. UL- and cUL-listed. 115V/60 Hz. One-year warranty.

- Improved water quality and clarity
- Kills up to 99.99% of harmful microorganisms
- Minimized operating and maintenance cost
- No unpleasant chemical odors
- High ozone output, low energy cost
- No Air Dryer required

MODEL	AVG O_3 CONC. (PPM)	O_3 OUTPUT (GRAMS/HR)	AMPS @ 115V	DIMENSIONS (W X H X D)	SHIP WT (LBS)
ECL10	450	.25	.06	7.8" X 8" X 2.5"	9
ECL20	700	.5	.12	7.8" X 14" X 2.5"	9
ECL40	1,350	1	.24	7.8" X 24 X 2.5"	14
90150E	ACCESSORY PACKAGE W/O MAZZEI® INJECTOR				
90210E	ACCESSORY PACKAGE W/MAZZEI® INJECTOR				

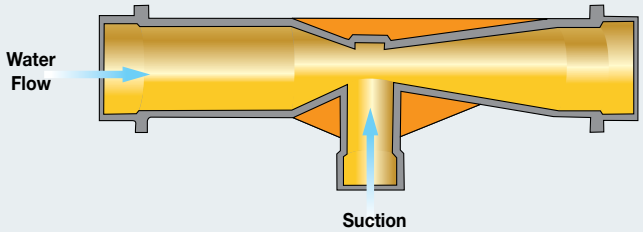
DEL Zone® and Eclipse™ is a trademark and/or registered trademark of DEL Zone Industries, Inc., Mazzei® is a registered trademark of Mazzei® Injector Corp.

ECL10 ECL20 ECL40

TECH TALK

Ozone Sizing: Know Your Goal

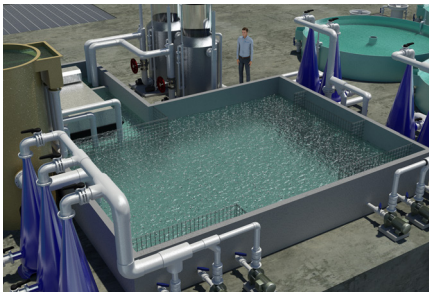
In sizing an ozone system the most important design factor is getting the correct ozone dose for your specific application. Ozone is used mainly to achieve two different goals: sterilization/oxidation and microflocculation. Maximizing mass transfer (getting the ozone from the gas phase into the water) is of primary importance for both. The most efficient method of dissolving ozone (or any gas) is achieved by using a venturi eductor, a device that passively pulls in ozone under a vacuum using the physical (motive) force of the water flowing in a pipe. The water enters the venturi where the velocity rapidly increases due to a cone-shaped restriction in the venturi throat. This increase in velocity causes a low pressure area to form at the point of maximum restriction (see diagram below), generating suction that pulls the ozone into the water stream. The venturi then rapidly expands in diameter, slowing the water down instantaneously, causing the water and gas to crash into each other at very high velocity and driving the gas into solution. The higher the pressure in the venturi and downstream piping, the more gas can be driven into solution. Air diffusers and pressurized injectors are also sometimes used but have lower transfer efficiencies. The real advantage in using a venturi from a safety standpoint is that with positive pressure ozone delivery systems (where the ozone is pumped into the system under pressure) a leak in the delivery hoses or piping can let ozone leak into the environment. With a properly sized venturi, if a leak occurs under vacuum, surrounding (ambient) air will be drawn into the delivery tubing, so there's no chance of affecting nearby people with ozone.



Ozone has long been known to be a very efficient oxidant. In typical aquarium/aquaculture applications ozone can greatly reduce total organic carbon (TOC) levels by direct oxidation of the organics or indirect oxidation by other powerful oxidants that naturally occurs when ozone reacts with water (free radical oxidation). Applied ozone doses for oxidation and disinfection are similar and fall witin .1 to 1.0 mg/L. Another rule of thumb for ozone sizing for oxidation is based on food loading. An ozone dose of 15–20 grams of ozone per kg of food fed is recommended by Doctors Timmons and Ebling for aquaculture systems.

The other use of ozone not nearly as well known in aquatic systems is as a microflocculent. When dosed at rates roughly 1/10 of the oxidation dose (.01–.1 mg/L), ozone can act as a flocculent, causing very small particulates that normally pass through mechanical filters to clump into larger particles that mechanical filters can capture. The ozone does this by causing electrical charges on the surface of the particles so that they become attracted to each other like microscopic magnets. This type of ozone dose is typically used in foam fractionators (protein skimmers), so the flocculated particulates are carried out of the system water in the foam column.

RECIRCULATING AQUACULTURE SYSTEMS (RAS) TECHNOLOGY WORKSHOP



Dr. Losordo has earned a Bachelor degree in Biology and a Masters degree and Ph.D. in Agricultural Engineering. Involved in aquaculture for 40 years, Dr. Losordo has extensive experience in the research, development, design, and implementation of recirculating aquaculture systems worldwide. Past president of both the World Aquaculture Society and the Aquacultural Engineering Society.

Dr. Thomas M. Losordo

TOPICS THAT WILL BE COVERED DURING THIS 2½-DAY WORKSHOP:

- An introduction to recirculating systems
- Critical considerations before designing recirculating systems
- Component options for use in recirculating production systems
- Developing an appropriate design for your aquaculture application
- The management of recirculating systems
- Waste management issues
- Economic considerations in creating, evaluating and operating recirculating systems

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

AQUAPONICS TECHNOLOGY AND DESIGN WORKSHOP

TOPICS THAT WILL BE COVERED DURING THIS 4½-DAY WORKSHOP:

- UVI aquaponic system & UVI-based system at PAES
- Fish production
- Marketing and economics
- Plant production
- Hands-on instruction
- Green Sky Growers rooftop greenhouse tour
- "Behind the Seeds Tour" at The Land at Epcot®

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

"Teaching at the aquaponics course sponsored by Pentair Aquatic Eco-Systems (PAES) was a real treat for me because PAES employees have an incredible depth of experience and knowledge that they share with their students as they guide them through all phases of constructing and operating an aquaponic system to establish a successful hobby or business."

Dr. James Rakocy, "Father of Aquaponics"

OXYTOWER™ GAS TREATMENT SYSTEM

PR Aqua's OxyTower Gas Treatment Systems for culture water deliver maximum value, performance, and security to aquaculture operators. One rugged, compact unit removes carbon dioxide and oxygenates water. The cost-effective design can be used in partial reuse systems, in recirculating aquaculture systems, or in flow-through systems.

Designed for optimal gas transfer performance, the OxyTower System delivers energy efficiency through precise pump sizing and low head oxygenation. Blowers are used to strip carbon dioxide. An optional alarm system is easily integrated.

Water enters the vessel from the top orifice plate and cascades down through a Carbon Dioxide Stripper. Blowers, sized specifically for desired flow rates and carbon dioxide removal, force fresh air across water droplets. This process drives off carbon dioxide and absorbs oxygen until the dissolved gases are close to saturation. Treated water flows into a stilling chamber and is delivered to the top of the LHO chamber where water is supersaturated with oxygen.

The OxyTower System, with integrated controls, can be installed into existing facilities and requires:

- Simple plumbing and electrical connections on site
- A pump, header tank, oxygen flow meter, and oxygen source

Key Advantages

- Combines carbon dioxide removal and oxygenation into one space-saving, energy-efficient unit
- Lowers energy costs by reducing pumping requirements
- Reuses 50 to 70% of water within a tank system
- Increases fish production without increasing water consumption
- Improves fish health by optimizing water quality
- Installs easily into raceways or tank culture systems
- Allows conversion of a flow-through system into a partial reuse system to significantly reduce water usage
- Treats flows of 100 to 2,000 gpm—seven models available
- Provides durability—aluminum construction
- Offers improved security with built-in blower redundancy
- Integrates with optional components for complete reuse packages

CALL FOR MORE INFORMATION AND PRICING.

PR Aqua™
A PENTAIR AQUATIC ECO-SYSTEMS™ Division

VACUUM DEGASSERS

The PR Aqua Vacuum Degasser is an open bottom column designed to be installed in a header tank containing water to a required depth. Water enters the vessel through a sealed top and cascades down into the vessel. A vacuum pump or blower creates lower pressure within the vessel thereby releasing gases from the water into the atmosphere. Stripped water is discharged into a header tank and is ready for further treatment if required.

Key Advantages

- Reduces TGP to below saturation
- Simplifies operation and maintenance
- Installs easily into a retrofit or into a new system
- Removes potentially harmful gases like hydrogen sulfide
- Offers rugged construction—stainless steel, aluminum, fiberglass or concrete with metal fittings
- Allows for addition of oxygen
- Includes sight tube for easy measurement of vacuum level within vessel

CALL FOR MORE INFORMATION AND PRICING.

CARBON DIOXIDE STRIPPER

Carbon Dioxide Strippers are ideal for water reuse and recirculating aquaculture systems. PR Aqua offers seven sizes for flow rates up to 2,000 gpm. Excess carbon dioxide in culture water can be toxic to fish, and removal of excess carbon dioxide is critical. The Carbon Dioxide Stripper simultaneously removes carbon dioxide and aerates water.

Water enters the vessel from the top and cascades inside the column. A blower, sized specifically for the desired flow and carbon dioxide removal, forces fresh air across the water droplets. Carbon dioxide is driven off and oxygen is absorbed until the dissolved gases are close to saturation. Treated water drops into the header tank and is ready for distribution.

Key Advantages

- Uses forced air to strip elevated carbon dioxide from culture water
- Reduces total gas pressure (TGP) when necessary
- Can use excess elevation from biofilter, which reduces pumping requirements
- Includes built-in blower redundancy

CALL FOR MORE INFORMATION AND PRICING.

LOW HEAD OXYGENATORS

The Low Head Oxygenator (LHO) System supersaturates water with oxygen without using high pressure pumps or compressed oxygen typical of other oxygenation equipment. PR Aqua customizes LHOs to meet desired oxygenation results, footprint restrictions, and flow rate requirements.

Water with a low dissolved oxygen concentration is distributed across an orifice plate at the top of the LHO. Water droplets fall evenly into chambers where oxygen (and/or ozone) is injected at one side of the vessel and passes through each chamber in series. Oxygen is driven into the water while nitrogen is forced out. The oxygen depleted gas mixture escapes by bubbling out of the burp tube.

Key Advantages

- Minimizes overall water consumption
- Installs easily into raceways, header tanks, or centralized treatment modules
- Efficiently distributes oxygen by using internal baffle design
- Requires minimal maintenance
- Uses gravity fed supply water to allow for low head requirement—no high pressure pumps
- Achieves up to 200% oxygen saturation with low pressure oxygen supply (less than 5 psi when using an oxygen generator)
- Offers durability—aluminum or stainless steel construction
- Uses either bulk or generated oxygen and can be used to dissolve ozone into water
- Allows for adjustment of burp tube depth to suit hydraulic loading rate

CALL FOR MORE INFORMATION AND PRICING.

PR Aqua™
A PENTAIR AQUATIC ECO-SYSTEMS™ Division

AEROBOOST™ AIRLIFT PUMPS

For over 25 years, PR Aqua has pioneered innovative solutions for aquaculture production. We offer expertise in aquaculture engineering and manufacturing. From conservation hatcheries to commercial operations, PR Aqua works with you to develop an integrated life support system tailored to your species and goals.

AeroBoost™ Airlift Pumps provide a low-cost, decentralized approach to water reuse for aquaculture systems. AeroBoost uses air injection to circulate and aerate the water in both circular and raceway culture tanks.

LOWER WATER DEMAND

- Reduce flow while maintaining or increasing production.
- Reduce water demand by up to 75 percent.
- Use limited and costly resources more efficiently.

EASY INTEGRATION

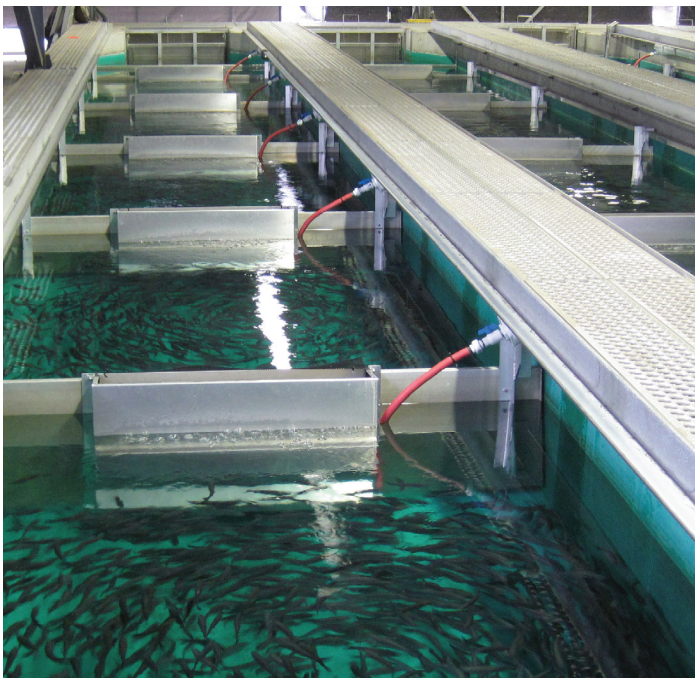
- Choose from raceway or circular tank versions.
- Install directly into new and existing tanks.
- Mount without making permanent modifications to tanks.
- Operate many units from a centralized air supply.

INCREASE PRODUCTION

- Sustain higher densities by maintaining consistent oxygen levels throughout rearing vessel.
- Strip carbon dioxide while adding oxygen.
- Attain better utilization of tank volume.
- Improve tank circulation and fish fitness.

LOWER COSTS

- Significantly reduce water pumping costs.
- Reduce labor costs associated with cleaning of raceways.
- Reduce maintenance and repair costs for influent supply infrastructure.
- Lower cost of entry compared to other reuse solutions.

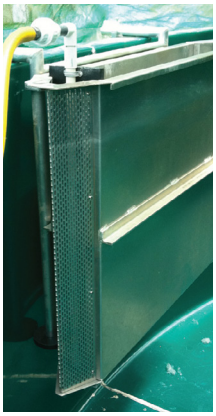


PR Aqua™
A PENTAIR AQUATIC ECO-SYSTEMS™ Division

AEROBOOST CT

In circular tank applications, AeroBoost Pumps are mounted inside the tank at the tank peripheral. Water flow throughout the unit imparts rotational velocity to the culture tank water, which exercises the fish, improves mixing, and assists in tank cleaning. The unit is hung from the tank wall without fasteners or permanent modification of the tank, which allows your AeroBoost to be easily removed for cleaning or redeployed to your highest density tank.

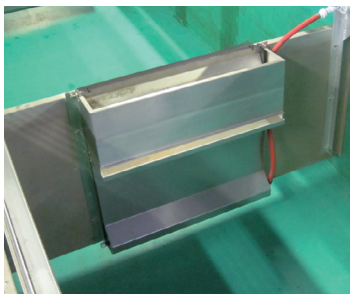
- Mounts from tank wall without tank modification
- Screened intake and adjustable discharge vane
- Configurable to suit tank rotation direction
- Portable—may be used in multiples or moved to highest density tank



AEROBOOST RC

In raceway tank applications, multiple AeroBoost Pumps are placed at regular intervals along the length of the raceway. Each unit is mounted to a vertical baffle, which is then mounted to the walls of the raceway. The baffle arrangement is such that the flow of water through the raceway must pass under the baffle, which increases velocity along the bottom of the raceway and moves solid waste to the end of the raceway. The AeroBoost RC pumps water from downstream of the baffle to the upstream side of the baffle. This supplements the flow passing under the baffle for improved velocity and cleaning. It also creates a mixed cell between the baffles, which results in more consistent oxygen and carbon dioxide levels throughout the raceway.

- Standard and custom baffle mounting available to fit any raceway
- Pump and baffle are easily removable to minimize impact to fish handling
- Adjustable spacing and baffle height to fit application requirements
- No reduction in raceway water level or rearing volume



CASE STUDY: FRESHWATER FISHERIES SOCIETY OF BC REDUCES ENERGY COSTS AND WATER USE

With a goal of reducing energy costs and water consumption, the Freshwater Fisheries Society of British Columbia (FFSBC) deployed AeroBoost Airlift Systems in its hatchery operations including both raceway and circular tank applications. With this low-cost water reuse strategy, FFSBC realized the folloiwng benefits:

- Reduced influent water by 75 percent
- Reduced energy use by 75 percent
- Reduced labor for cleaning raceways by 50 percent
- Reduced maintenance of pumps, wells, and associated equipment
- Decreased impact on water table and environment

SWEETWATER® HIGH-EFFICIENCY PUMPS

FW SW ★ TECH FAV

Low head, very quiet

- High-efficiency
- Stainless steel motor shafts
- Salt water compatible shaft sleeve and seal
- 1,725-rpm, thermally protected ODP motors
- Glass-filled polypropylene pump bodies
- 8' power cords and 1½" FNPT inlet/outlet (**SHE1.7** and **SHE2.4**)
- **SHE2.9** and **SHE4.4** have a 2" in/out with slip unions
- **SHE2.4**–**4.4** also available in 230V/50 Hz (add "**-230**")
- Made in USA

MODEL	WATTS @ 10' HEAD	AMPS @ 115V	SHIP WT (LBS)
SHE1.7	170	1.5	24
SHE2.4	220	1.9	28
SHE2.9	290	2.9	31
SHE4.4	450	4.0	35

We constantly preach energy conservation because it saves money. An aquaculture business cannot afford big monthly power bills nor should the hobbyist accept that. Compare our **SHE2.9** to a typical hardware store water pump when run continuously.

BRAND	GPM @ 10' HEAD	WATTS	COST/YR@10¢/KWH
SHE2.9	70	290	**$254**
TYPICAL PUMP	70	900	**788**

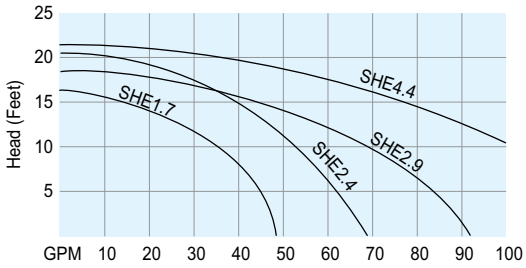
Our pump cost about $100 more but saved over $500/year. Which one is the bargain?

PENTAIR

SHE1.7

SHE4.4

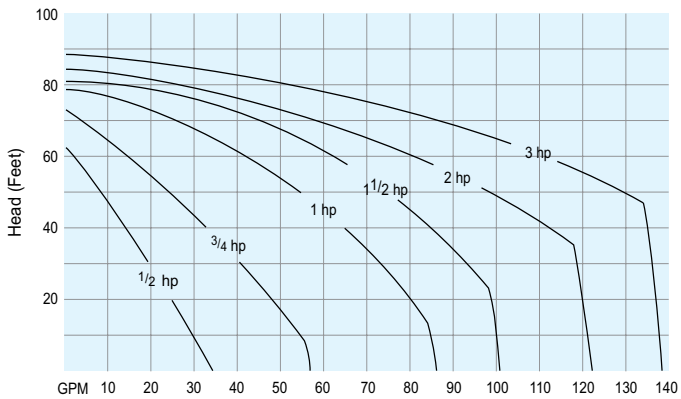
2-YEAR WARRANTY



PENTAIR

PS2SS

2-YEAR WARRANTY



SWEETWATER CENTRIFUGAL PUMPS FW SW

Medium and high head

These high-performance pumps are molded out of glass-filled PPO resin. They are fitted with a seal that prevents water from contacting any metal parts, making the pumps salt water compatible.

All pumps come with stainless steel hardware, 8' power cord (**PS2SS** through **PS4SS** models only). Inlet/outlet connections are 1½" FNPT on all pumps. 3,450 rpm, TEFC Baldor® motors are slightly oversized for the pumps, resulting in a cool-running, long-lasting, reliable pump. Two-year warranty. Made in USA.

MODEL	HP	VOLTS	PHASE	FULL LOAD AMPS	SHIP WT (LBS)
PS2SS	½	115/230	1	7.4 @ 115V	30
PS3SS	¾	115/230	1	10.8 @ 115V	35
PS4SS	1	115/230	1	12.0 @ 115V	36
PS5SS	1½	115/230	1	15.0 @ 115V	47
PS53SS	1½	208/460	3	4.2 @ 230V	41
PS6SS	2	230	1	11.5 @ 230V	63
PS63SS	2	208/460	3	4.6 @ 230V	45
PS73SS	3	208/460	3	5.4 @ 230V	49
1000.0414	REPLACEMENT SHAFT SEAL				1

SPARUS™ PUMP WITH CONSTANT FLOW TECHNOLOGY™

- The world's first aquaculture duty pump to deliver a CONSTANT user-defined flow rate
- Pump motor speed self-adjusts to maintain the constant flow rate setting, even as system conditions change
- Digital communication port RS-48 allows monitoring/control by PLC systems. Contact us for solutions utilizing a PLC.

PENTAIR

IN-HOUSE REPAIR AND SERVICE AVAILABLE
Contact Pentair Aquatic Eco-Systems for more details.

Under typical operating conditions, Sparus Pump with Constant Flow Technology offers the highest water flow rate of any high performance pump—with the lowest electricity consumption. Thanks to its integrated on-board variable frequency drive, this pump automatically calculates and self-adjusts to provide the exact operational speed needed to deliver the exact flow rate you establish. As system conditions change, it self-adjusts to achieve a constant user-specified flow rate. The result of this breakthrough technology is that you achieve the absolute minimum energy usage required to deliver any given flow rate! This high level of efficiency can save you thousands of dollars per year in pump operating costs.

No more closing valves to decrease flow rate or making manual adjustments. Simply select the flow rate you require and the Sparus Pump with Constant Flow Technology delivers. As system conditions change, the flow rate remains constant. Need a higher or lower flow rate? Simply adjust the desired flow rate by using the simple keypad. No matter what flow rate you select, you'll rest assured that your desired flow rate remains constant.

The law of physics known as the Affinity Law states that there is a cubic relationship between the speed of an electric motor and its power consumption. By decreasing the speed of a motor by only 10%, you'll reap up to 33% in electrical energy savings while still achieving the exact flow rate that your application requires. With conventional pumps, the motor is often operating at a speed that is needlessly high for the application. Users of conventional single-speed pumps often find that their only option to decrease their flow rate is to partially close a valve to "throttle" the flow rate. The Sparus Pump with Constant Flow Technology takes that paradigm and turns it on its head! The intelligence built into this pump means that you establish the desired flow rate and leave the decision-making to the pump.

SPARUS™ PUMP WITH CONSTANT FLOW TECHNOLOGY™

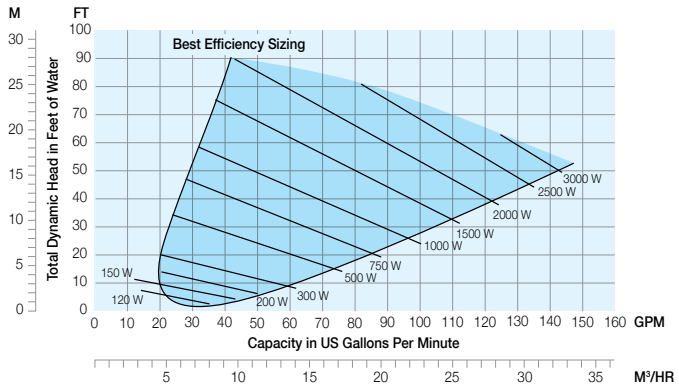
Sparus Pump with Constant Flow Technology(CFT) will always operate at the slowest speed required to achieve the user-established flow rate; the savings it provides is yours to keep! This pump delivers proven reliability thanks to its saltwater-rated stainless steel internal fasteners and highly robust mechanical seal. Sparus Pump with Constant Flow Technology is a self-priming pump, and it's also suitable for flooded-suction applications. UL778 listed. One-year warranty. Made in USA. Not certified for use in swimming pool applications.

Pump Features:

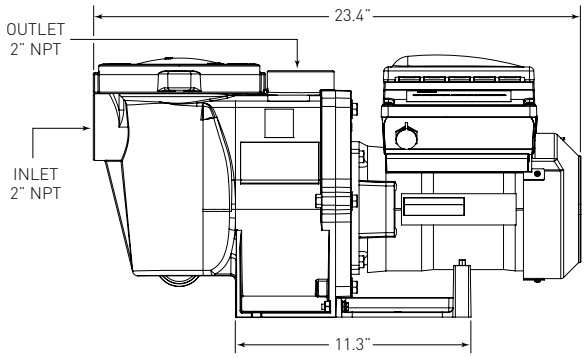
- Fully-programmable for any flow rate from 20–140 gpm
- On-board keypad for simple programming of desired flow rate
- 3 hp rating. 230V, single-phase, 50hz/60hz
- Ultra efficient permanent magnet TEFC motor
- 2" internally threaded NPT inlet/outlet ports and anti-blocking strainer basket ensure maximum flow and efficiency
- Easy installation and trouble-free servicing
- IP55-rated enclosure for wet locations and harsh conditions

Sparus with Constant Flow Technology in a five pump application at Pentair Aquatic Eco-System's PAESWATER facility in Apopka, FL.

Sparus Pump with Constant Flow Technology Performance Chart



Right Side View



MODEL	HP	VOLTS	HZ	PHASE	MOTOR ENCLOSURE	FULL LOAD AMPS	SERVICE FACTOR	SF HP	IN/OUT PORTS	L	W	H	SHIP WT
348045-AQ	3	230	50/60	1	TEFC	16	1.32	3.95	2"	23.4"	11"	12.6"	45 LBS

Operates with identical performance on 50 Hz or 60 Hz input power.

FULL CIRCLE CRAB

Full Circle Seafood in Columbia, NC is located near the Albemarle Sound, the East Coast's largest estuary. The Scuppernong River flows nearby, and it's in this maritime paradise that owner Willy Phillips established Full Circle Seafood. In an industry with high operating expenses, Full Circle reached out to Pentair Aquatic Eco-Systems to find the most energy-efficient equipment on the market. Seafood holding requires a reliable, continuous-duty water pump that runs 24 hours a day, 7 days a week. Full Circle's system requires several pumps, and the energy bill is a significant expense. Pentair AES assessed Full Circle's existing pumps and calculated the operating costs to be nearly a whopping $600 per season, per pump.

To decrease cost and maximize performance, Pentair AES installed a Sparus™ Pump with Constant Flow Technology and Full Circle Seafood has been experiencing cost savings every day. "In today's business climate for the seafood industry, with shrinking margins, one of the best ways to make money is to save money through conservation methods. I have tried numerous system types for shedding crab, including a variety of pumps, and the Sparus pump satisfies all my needs. I was trading my old pumps out every two years. The combination of an energy saving pump with a longer shelf life makes this type of pump a valuable asset to a crab shedding operation." said Phillips. Constant Flow Technology allows Full Circle to define the ideal flow rate for their system without having to restrict the flow by adjusting valves.

As the savings add up, Willy plans to replace all of the pumps in his system in the months to come. Pentair Aquatic Eco-Systems is proud to provide practical, reliable technology to help decrease operational expenses. Ask your knowledgeable Pentair sales/service rep how you can start saving money with Constant Flow Technology today. To read more of Willy Phillips' story and his savings, visit our blog at PentairAES.com.

SPARUS™ 160 ENERGY-EFFICIENT AQUACULTURE DUTY 50 & 60HZ CENTRIFUGAL PUMPS FW SW

Pentair Aquatic Eco-Systems Sparus™ 160 pumps offer extremely high water flow in a quiet, energy-efficient package making them effective in a wide range of Aquaculture applications. Saltwater compatible, corrosion-resistant plastic construction, 316SS stainless steel internal fasteners, oversized anti-blocking strainer basket and volute, and 2-inch female NPT inlet/outlet ports. EPDM/316SS mechanical seal. Compatible with a wide assortment of cleaning and filtration systems. Clear lid for easy inspection. Self-priming, also suitable for flooded suction applications. One-year warranty. UL778 listed. Not certified for use on swimming pools. Optional 3ft 115V, 20 amp power cord, model 79137800-AQ, is compatible with 115V Sparus and Taurus pumps. Includes a NEMA 5-15 three-prong plug and a 1/2" NPT cord-grip-gland with strain relief. UL listed. One-year warranty.


60HZ


50HZ

ALL PUMP MODELS:

- Single body design provides for quiet/durable operation
- High-temperature thermoplastic withstands harsh conditions and prevents corrosion
- Saltwater compatible construction
- Thermal protection built into single-phase motors
- Easy installation and trouble-free servicing
- Corrosion resistant, high-grade stainless steel motor shaft and internal fasteners

60HZ MODELS:

Available for shipment from our North American distribution center.

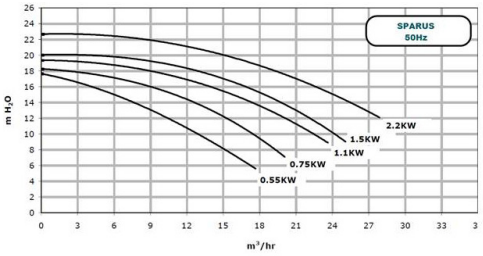
- 3-Phase models with TEFC Pentair motors. IP55 rated. UL approved
- 1-Phase models with ODP motors. (TEFC motors coming mid-2015.) UL approved

50HZ MODELS:

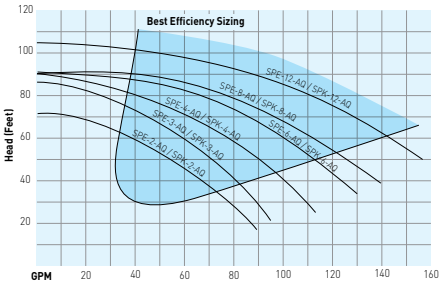
Available for shipment from our North American or European distribution centers

- 1-Phase and 3-Phase models with TEFC Pentair motors. IP55 rated. CE approved
- Unions included for both 50mm and 63mm connections

CALL FOR PRICING ON 50HZ MODELS.



50HZ Performance



60HZ Performance

60HZ MODELS	HP	VOLTAGE	HZ	PHASE	FL AMPS	MOTOR	L	W	H	SHIP WT (LBS)
SPE-2-AQ	1/2	115/208-230	60	1	8.8/4.5-4.4	ODP	24 1/2"	10 7/8"	12 3/4"	41
SPK-2-AQ	1/2	208-230/460	60	3	3.2-3.0/1.5	TEFC	24 1/2"	10 7/8"	12 3/4"	39
SPE-3-AQ	3/4	115/208-230	60	1	11.2/6.0-5.6	ODP	24 1/2"	10 7/8"	12 3/4"	41
SPK-3-AQ	3/4	208-230/460	60	3	3.8-3.6/1.8	TEFC	24 1/2"	10 7/8"	12 3/4"	42
SPE-4-AQ	1	115/208-230	60	1	14.8/7.8-7.4	ODP	24 3/4"	10 7/8"	12 3/4"	46
SPK-4-AQ	1	208-230/460	60	3	5.0-4.6/2.3	TEFC	24 3/4"	10 7/8"	12 3/4"	46
SPE-6-AQ	1 1/2	208-230	60	1	9.6-8.8	ODP	25 1/4"	10 7/8"	12 3/4"	54
SPK-6-AQ	1 1/2	208-230/460	60	3	6.4-5.8/2.9	TEFC	25 1/4"	10 7/8"	12 3/4"	54
SPE-8-AQ	2	208-230	60	1	11.0-10.2	ODP	25 3/4"	10 7/8"	12 3/4"	55
SPK-8-AQ	2	208-230/460	60	3	7.1-6.8/3.4	TEFC	25 3/4"	10 7/8"	12 3/4"	56
SPE-12-AQ	3	208-230	60	1	15.0-13.6	ODP	25 3/4"	10 7/8"	12 3/4"	56
SPK-12-AQ	3	208-230/460	60	3	11.0-10.4/5.2	TEFC	25 3/4"	10 7/8"	12 3/4"	58
79137800-AQ	OPTIONAL 3-FT POWER CORD FOR 115V SPARUS AND TAURUS PUMPS									1

50HZ MODELS	HP	VOLTAGE	HZ	PHASE	KILOWATTS	MOTOR	L	W	H	SHIP WT (LBS)
P-SPR-071-AQ	1/2	220-240V	50	1	0.55	TEFC	21 1/4"	11 7/8"	12 1/2"	32
P-SPR-073-AQ	1/2	380-420V	50	3	0.55	TEFC	21 1/4"	11 7/8"	12 1/2"	28
P-SPR-101-AQ	3/4	220-240V	50	1	0.75	TEFC	21 1/4"	11 7/8"	12 1/2"	30
P-SPR-103E2-AQ	3/4	380-420V	50	3	0.75	TEFC	21 1/4"	11 7/8"	12 1/2"	32
P-SPR-151-AQ	1	220-240V	50	1	1.10	TEFC	22"	11 7/8"	12 1/2"	34
P-SPR-153E2-AQ	1	380-420V	50	3	1.10	TEFC	22"	11 7/8"	12 1/2"	49
P-SPR-201-AQ	1 1/2	220-240V	50	1	1.50	TEFC	22"	11 7/8"	12 1/2"	37
P-SPR-203E2-AQ	1 1/2	380-420V	50	3	1.50	TEFC	22"	11 7/8"	12 1/2"	53
P-SPR-301-AQ	2	220-240V	50	1	2.20	TEFC	23 1/4"	11 7/8"	12 1/2"	51
P-SPR-303E2-AQ	2	380-420V	50	3	2.20	TEFC	23 1/4"	11 7/8"	12 1/2"	67

60HZ

50HZ

TAURUS™ 110 ENERGY-EFFICIENT AQUACULTURE DUTY 50 & 60HZ CENTRIFUGAL PUMPS

The Taurus™ 110 moves more water more efficiently for lower operating cost and super-quiet operation. Plus, by performing with less effort, there's simply less wear and tear—and that means longer life for a higher return on your pump investment. The Taurus 110 meets all the criteria for a superior pump: super energy efficient, super quiet and super easy to maintain. Plus, it's designed with innovative materials that will stand up to the most demanding installations and conditions. The Taurus™ 110 is performance and pressure tested to ensure superior quality. Self-priming for quick, easy start-up. 1 ½" x 1 ½" NPT port size (1 ½" NPT union set included). One-year warranty. UL778 listed. Not certified for use on swimming pools.

Optional 3ft 115V, 20 amp power cord, model 79137800-AQ, is compatible with 115V Sparus and Taurus pumps. Includes a NEMA 5-15 three-prong plug and a ½" NPT cord-grip-gland with strain relief. UL listed. One-year warranty.

All Pump Models

- Minimal energy consumption
- Cam and Ramp™ lid locks in place with a quarter-turn
- Thermal protection built into single phase motors
- Saltwater compatible construction
- Quiet operation due to superior internal flow design reduces hydraulic noise
- See-through lid permits easy inspection of strainer basket
- Corrosion resistant, high-grade stainless steel motor shaft and parts

60HZ Models

Available for shipment from our North American distribution center.

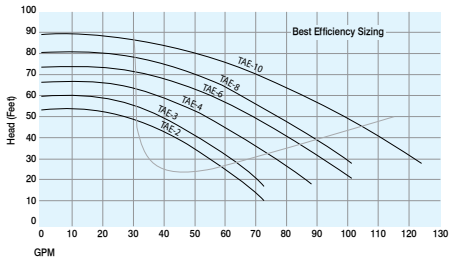
- 1 and 3-Phase models with TEFC Pentair motors
- IP55 rated, UL approved

50HZ Models

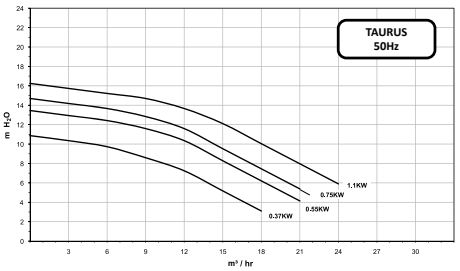
Available for shipment from our North American or European distribution centers.

- 1 and 3-Phase models with TEFC Pentair motors
- IP55 rated, CE approved
- Unions included for 50mm connections

CALL FOR PRICING ON 50HZ MODELS.



60HZ Performance



50HZ Performance

60 HZ MODELS	HP	VOLTAGE	HZ	PHASE	FL AMPS	MOTOR	DIMENSIONS L	W	H	SHIP WT (LBS)
TAE-2-AQ	½	115/208-230	60	1	8.8/4.5-4.4	TEFC	25"	10⅞"	10¾"	38
TAE-3-AQ	¾	115/208-230	60	1	8.8/4.5-4.4	TEFC	25"	10⅞"	10¾"	38
TAE-4-AQ	1	115/208-230	60	1	11.2/6.0-5.6	TEFC	25"	10⅞"	10¾"	38
TAE-6-AQ	1½	115/208-230	60	1	14.8/7.8-7.4	TEFC	25"	10⅞"	10¾"	40
TAE-8-AQ	2	208-230	60	3	9.6-8.8	TEFC	25"	10⅞"	10¾"	48
79137800-AQ	OPTIONAL 3-FT, 115V, 20AMP POWER CORD FOR 115V TAURUS AND SPARUS PUMPS									

50 HZ MODELS	HP	VOLTAGE	HZ	PHASE	KILOWATTS	MOTOR	DIMENSIONS L	W	H	SHIP WT (LBS)
P-TRS-051-AQ	½	220-240V	50	1	0.37	TEFC	21"	12"	11"	30
P-TRS-071-AQ	½	220-240V	50	1	0.55	TEFC	21"	12"	11"	31
P-TRS-073-AQ	½	380-420V	50	3	0.55	TEFC	21"	12"	11"	28
P-TRS-101-AQ	¾	220-240V	50	1	0.75	TEFC	23"	12"	11"	32
P-TRS-103E2-AQ	¾	380-420V	50	3	0.75	TEFC	21"	12"	11"	31
P-TRS-151-AQ	1	220-240V	50	1	1.10	TEFC	23"	12"	11"	34
P-TRS-153E2-AQ	1	380-420V	50	3	1.10	TEFC	22"	12"	11"	49

H3-PLUS SERIES™ & L3-PLUS SERIES™ ENERGY EFFICIENT LOW TO MEDIUM HEAD PUMPS FW SW

The new H3-PLUS SERIES and L3-PLUS SERIES were engineered using best-in-class technology. The proprietary impeller design delivers a higher level of precision concentricity for increased efficiency. The proprietary hydraulic isolator smooths the water flow inside the volute, raising the efficiency even higher. A rugged plastic construction delivers durable pumps at an affordable price. UL778 listed. Not certified for use in swimming pool applications.

The L3-PLUS pump is a low-head/high-flow pump designed for Aquaculture applications that call for large flow rates in low-head conditions. This high-quality pump features a four-pole induction motor that rotates at 1725 rpm when connected to 60hz input power. The relatively slow speed of this motor allows the pump to produce exceptionally high water flow rates; while performing in a highly-efficient manner. Available in three models: 100gpm, 120gpm, 160gpm. These pumps are perfectly suited for ponds, water features, fountains and aquaculture. One-year warranty.

The H3-PLUS pump is a medium-head/high-performance, aquaculture-duty pump designed for maximum up-time and reliable performance. This high-quality pump features an all-weather, ultra-heavy-duty TEFC (totally enclosed fan cooled) motor with an all-aluminum construction and an anodized finish for maximum corrosion resistance. The easy-to-access wiring compartment is located on top of the motor; with optimum accessibility for easy wiring, even in space constrained applications. Available in three models: 2HP, 3HP, 5HP. One-year warranty.

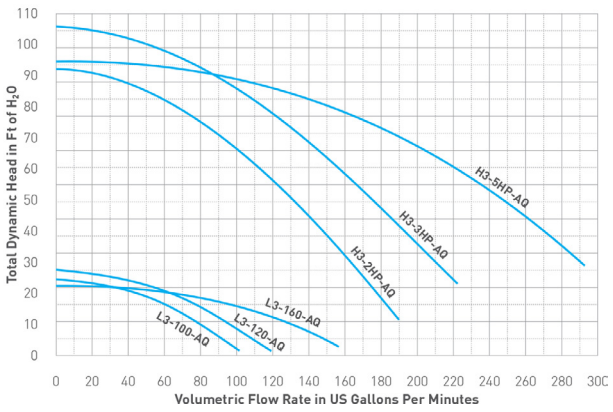
- Freshwater and Saltwater compatible, 316SS internal fasteners, EPDM/Stainless mechanical seal
- Hydraulic isolator separates priming water from pumping water for faster priming, more turbulent-free flow and increased efficiency
- H3-PLUS Models feature Aquaculture-duty, TEFC motors with anodized aluminum construction
- Union connectors included for connecting directly to 2.5" or 3" plumbing.
- Diamond seals made of oxidation-resistant, self-retaining EPDM rubber for increased durability and tighter seal
- Extra-large, robust basket with smooth surface for easy debris removal
- Easy-carry handle; easily removable, ergonomic lock ring; and see-through lid for easy basket inspection

PENTAIR

H3-PLUS

L3-PLUS

H3-PLUS AND L3-PLUS PERFORMANCE CURVES



H3-PLUS SERIES™

MODEL	HP	VOLTAGE	HZ	PHASE	FL AMPS	MOTOR	L	W	H	SHIP WT (LBS)
H3-2HP-AQ	2	208-230/460	60	3	7.5-7.2/3.6	TEFC	25"	11⅜"	14"	56.5
H3-3HP-AQ	3	208-230/460	60	3	9.8-9.4/4.7	TEFC	25"	11⅜"	14"	61
H3-5HP-AQ	5	208-230/460	60	3	13.9-13.1/6.6	TEFC	25"	11⅜"	14"	67

L3-PLUS SERIES™

MODEL	GPM	VOLTAGE	HZ	PHASE	FL AMPS	MOTOR	L	W	H	SHIP WT (LBS)
L3-100-AQ	100	115/230	60	1	8.0/4.0	ODP	26¼"	11⅜"	14"	50.5
L3-120-AQ	120	115/230	60	1	8.4/4.2	ODP	26¼"	11⅜"	14"	50.5
L3-160-AQ	160	115/230	60	1	9.6/4.8	ODP	26¼"	11⅜"	14"	50.5

VERUS™ 850 PREMIUM EFFICIENCY AQUACULTURE DUTY PUMPS FW SW

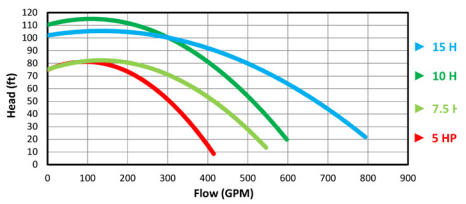
Pentair Aquatic Eco-Systems Verus™ 850 pumps are for commercial aquaculture and other heavy-duty water applications. Available in flows to 800 gpm, and from 3 to 15 hp. Verus™ 850 high-performance commercial pumps are designed for maximum efficiency and quiet operation in every detail. They are noncorrosive, all-plastic and designed exclusively for the commercial aquaculture industry. Stainless steel internals. Saltwater-rated. Verus 850 impellers are manufactured for true breakthrough performance, allowing for lower loads and longer motor life. Strainer pot sold separately.

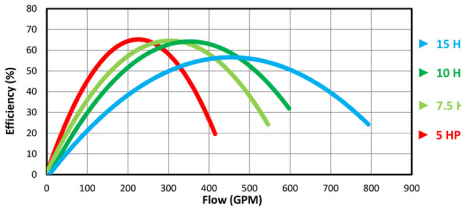
UL778 listing (for aquaculture). Not certified for use on swimming pools.

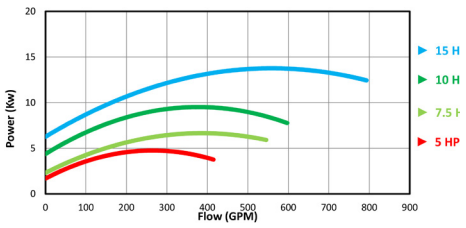
Standard Features

- Close-coupled for quiet, stable flow operation
- Lightweight for easy installation
- Cam and Ramp™ locking ring design with clear lid for added service convenience
- 6" suction and 4" discharge with strainer pot
- Closed impeller for long life and durability
- Available in single- and three-phase models
- Self-priming with use of strainer pot assembly, sold separately

MODEL	HP	VOLTAGE	AMPS	SHIP WT (LBS)
Single-phase (ODP Motors)*				
VRE-20-AQ	5	230	20.0	175
VRE-30-AQ	7.5	230	30.4	202
VRE-40-AQ	10	230	40.0	154
Three-phase with TEFC Motors*				
VREKT-20-AQ	5	208–230/460	13.5–12.3/6.2	102
VREKT-30-AQ	7.5	208–230/460	20.4–18.2/9.1	122
VREKT-40-AQ	10	208–230/460	27.0/26.2–13.1	168
VREKT-60-AQ	15	208–230/460	40.0–38.0/18.8	182
Three-phase, 50Hz 2875 RPM (ODP Motors)*				
VREK5-12-AQ	3	230/400	7.9/4.5	131
VREK5-20-AQ	5	230/400	12.3/7.1	235
VREK5-30-AQ	7.5	230/400	18.1/10.4	174
VREK5-40-AQ	10	230/400	24.0/13.7	152
Three-phase, 575 V (ODP Motors)*				
VREC-20-AQ	5	575	5.1	83
VREC-30-AQ	7.5	575	7.2	93
VREC-40-AQ	10	575	10.2	138
VREC-60-AQ	15	575	15.0	138
Single-phase, 1,750 RPM (ODP Motors)*				
VREW-12-AQ	3	208–230	19.5/19.2	138
VREW-20-AQ	5	208–230	23.0–20.1	175
Three-phase, 1,750 RPM (ODP Motors)*				
VREWK-12-AQ	3	208–230/460	8.4–7.8/3.9	180
VREWK-20-AQ	5	208–230/460	13.8–13.0/6.5	145
VR-STR-AQ	STRAINER POT ASSEMBLY, 6" X 6"			33
Flange Kits				
357262-AQ	4" ANSI FLANGE, W/GASKET AND SS HARDWARE			
357263-AQ	6" ANSI FLANGE, W/GASKET AND SS HARDWARE			
357212-AQ	6" ANSI FLANGE, W/GASKET AND SS HARDWARE USE ON VERUS PUMPS NOT EQUIPPED WITH STRAINER POT			







*Strainer pot sold separately.

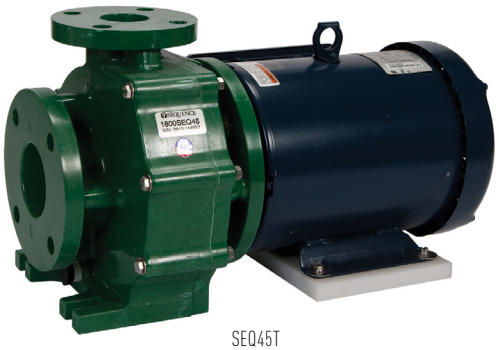
GENESYS® 2X3X6 CENTRIFUGAL PUMPS

The Genesys® nonmetallic, end-suction centrifugal pump line is designed and engineered for highly efficient pumping solutions. The interchangeable 2x3x6 model is a drop-in replacement for ANSI B73.1-conforming pumps. Composite construction with no wetted metal parts gives it compatibility with most aggressive chemistries. The unique closed impeller and time-tested volute design render performances up to 500 gpm (or 180' of shut-off head). And it can produce peak performances at 81% efficiency!

CALL FOR MORE INFORMATION AND PRICING.

Features

- Straightforward through-bolt construction for simplified field maintenance
- True closed-coupled/back pull-out design for ease of use
- No impeller or seal adjustment necessary. The simple assembly maintains proper heights
- Sizes range from ¾ to 15 hp



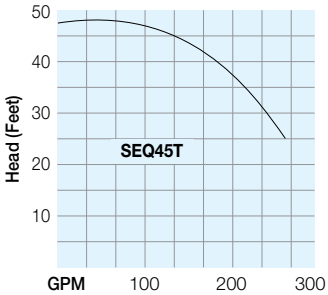
SEQ45T

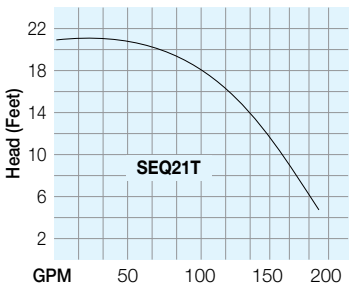
3-YEAR WARRANTY

SEQUENCE® TITAN CENTRIFUGAL PUMPS

As large water features and high turnover requirements continue to gain popularity, the cost of energy does not! Titan pumps will give you 12,000 gph for less than 845 watts! With flowrates between 12,000 and 18,400 gph and head capabilities between 21 and 45', they're sure to cover most large-scale water feature requirements. All have TEFC motor enclosure, 3" inlet and 2" discharge. Available in 115V or 230V. SEQ21T includes 115V or 230V power cable. Three-year warranty. Made in USA.

MODEL	HP	GPH	WATTS	AMPS	MAX HEAD
SEQ21T	¾	12,500	845	6	21'
SEQ45T	3	18,400	2,110	10.8	45'





PENTAIR

BERKELEY®

BVM (Cast Iron)

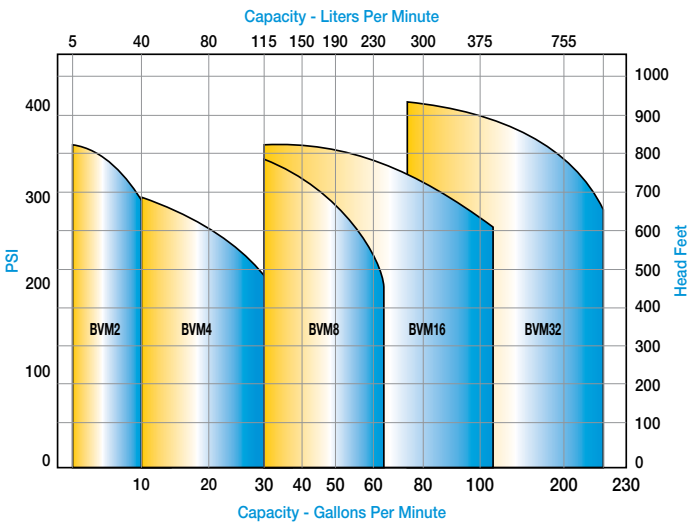
BERKELEY® BVM SERIES VERTICAL MULTI-STAGE PUMPS

Pumps water and non-corrosive liquids in the most demanding operating environments

Ideal for applications where pressure needs boosting and available space is an issue. Standing tall in demanding high-pressure and high-temperature applications, Berkeley vertical multistage pumps deliver outstanding reliability and performance. BVM's stainless steel construction with a heavy-duty cast iron base and motor bracket are designed for pumping water and noncorrosive liquids in the most demanding operating environments. One-year warranty from date of original installation or two years from date of manufacture, whichever comes first.

CALL FOR MORE INFORMATION AND PRICING.

BVM (Stainless Steel)



MODELS	SERIES	FLOW HP RANGE	GPM
BVM/BVMI	2	½–5	1–20
BVM/BVMI	4	½–7.5	3–40
BVM/BVMI	8	¾–15	5–65
BVM/BVMI	16	5–25	8–105
BVM	32	3–40	15–210

BVM—CAST IRON
BVMI—304 STAINLESS STEEL

PENTAIR

Float switch and two discharge port adaptors included

SUBMERSIBLE PUMP

This Pentair Aquatic Eco-Systems Submersible Pump, ¾ HP stainless steel pump is designed for draining and utility applications, with the capability to pump water down to 1⅜" in depth. The pump features improved flow rates, a superior stainless steel casing, suction strainer, impeller and shaft for greater corrosion resistance and longer service life. Debris and stones up to ¾" are able to pass through the pump. The pump features a 1-1/4" discharge port for faster draining. Two discharge port adaptors are included.

Equipped with an automatic reset thermal protector to help prevent premature failure caused by overheating. If the internal motor temperature rises to unsafe levels, the switch will protect the motor by causing it to stop. When the motor has sufficiently cooled, the switch will reset automatically and restart the motor, allowing you to resume pumping.

The external float switch allows for optional automatic operation of the pump. It is easily installed by plugging directly into an outlet and connecting the pump cord to the opposite end of the switch. The pump is then automatically activated when the surrounding water raises the float switch to a 45° angle from the handle. Once the water level and float switch return to its original position, the pump is automatically turned off. One-year warranty.

- 115V, 60 Hz, single phase, permanent split capacitor motor
- Automatic thermal overload protection
- Clog-resistant cast stainless steel impeller
- Accommodates water temperatures ranging from 32°F to 130°F
- Equipped with 15-foot, 18/3 grounding-type power cord
- Convenient top-mounted handle
- Rubber feet to eliminate scratching
- Includes adaptors; 1¼" Female NPT Elbow, 1¼" Male NPT to 1½" Female NPT

PUMP PERFORMANCE

MODEL	MINIMUM CIRCUIT REQ.	LIQUID TEMPERATURE RANGE	PUMPS DOWN TO
PCD-1000-AQ	15 AMPS	32/130° F, 0/54° C	1 ⅜" (3.5 CM)

	PUMP PERFORMANCE TDH/GPM				SHUT OFF HEAD
TDH	5'	10'	15'	20'	26.2'
GPM	45.5	34.0	21.5	12.0	N/A

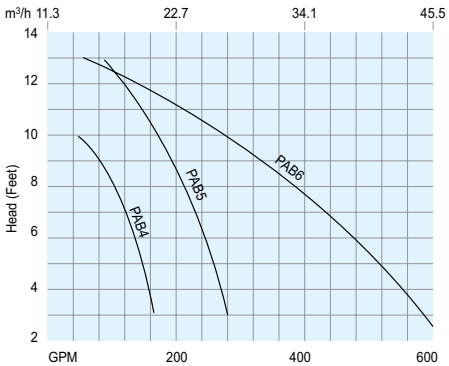
Note: The motor for the PCD-1000-AQ is water cooled. Oil however is used to lubricate the mechanical seal, 30.5 ml of medicinal grade white oil.

MODEL	HP	VOLTS	HZ	PHASE	FULL LOAD AMPS	RPM	SWITCH SETTING ON	SWITCH SETTING OFF	SHIP WT (LBS)
PCD-1000-AQ	¾	115	60	1	6.4	3450	12"	6"	19

PROPELLER PUMPS FW TECH FAV

This pump can't be beat for low-head, high-flow, continuous duty applications. The exterior housing is stainless steel, the top and inside portions are cast iron. They have double mechanical seals with silicon carbide faces and high-temperature C3 bearings rated for 60,000 hours. To make installation and removal easier, use our Quick Disconnect Fittings (see Index) to connect the outlet piping. All pumps will handle 5/16" solids. **PAB4** comes with a 16' power cord, **PAB5** and **PAB6** do not come with power cords. 60 Hz, not UL-listed, two-year warranty.

MODEL	HP	Ø	VOLTS	OUTLET	DIA. X HT.	AMPS	SHIP WT (LBS)
PAB4	½	1	115	4" MPT	10" X 19"	7.9	40
PAB5	1	3	208/230/460	5" FPT	10" X 19"	5.7	68
PAB6	2	3	208/230/460	6" FPT	11" X 23"	10.7	97



2-YEAR WARRANTY

200 GPM WITH ONLY 7.9 AMPS!

PENTAIR

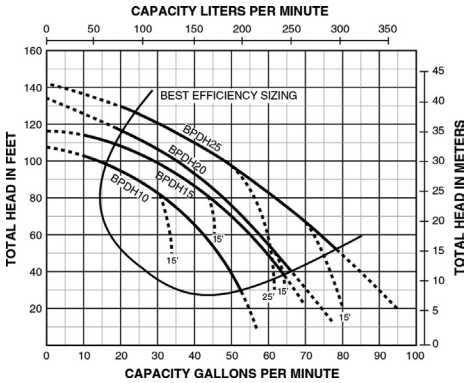
BERKELEY®

SELF-PRIMING PUMPS FW SW

These Berkeley BPD Series Pumps feature lightweight, corrosion-resistant construction in a self-priming design. Constructed of fiberglass reinforced thermoplastic body with reinforced ribs, 300 stainless steel motor shaft, engineered polymer impeller, polypropylene diffuser, and 2" suction. Applications include drawing fresh or salt water from tanks, wells, lakes, and off of docks. One year warranty. Made in USA.

Features

- 25' maximum suction lift
- Fiberglass-reinforced thermoplastic provides total corrosion resistance and high resistance to sandy water
- Composite impeller precision molded for perfect balance, performance and efficiency
- Normal wear parts are easily accessible for service or replacement without disturbing piping or mounting
- Dustproof cover protects electrical components from dust and insects
- Heavy-duty motors with stainless steel shafts designed for continuous operation
- Lightweight design makes these pumps more portable than conventional cast Iron pumps
- Simple, easy-to-change voltage settings



NOTE: Dotted lines indicate performance reduction at high suction lift.

MODEL	VOLTAGE*	HP	HZ	INLET (FNPT)	OUTLET	MAX FLOW GPM	L (IN.)	W (IN.)	H (IN.)	SHIP WT (LBS)
BPDH10-AQ	115/230	1	60	2"	1½"	50	18⅝	10½	11 3/16	29
BPDH15-AQ	115/230	1½	60	2"	1½"	65	19¾	10½	11 3/16	36
BPDH20-AQ	115/230	2	60	2"	2"	70	21	10½	12⅜	42
BPDH25-AQ	115/230	2½	60	2"	2"	80	21	10½	12⅜	43

*All motors shipped at 230V setting.

P5

PUMP TRAPS

Here is a pump trap (also known as priming pot) at a very reasonable price. Ideal for garden ponds, recirculating systems, swimming pools, etc. All-plastic trap has a 1½" FNPT inlet, 1½" MNPT outlet and weighs 2 lbs. Measures 11" H x 7" D x 7½" L. One-year warranty.

MODEL	
P5	PUMP TRAP
P5B	REPL. BASKET
P5C	REPL. COVER
P5R	REPL. O-RING

POLYETHYLENE TANKS

Inexpensive polyethylene tanks are gaining in popularity because of their low cost and long life expectancy. The smooth surface makes for easy cleaning, and their light weight allows for quick set-up and relocation.

Most of these tanks are nestable, which reduces their relatively high shipping cost. We stock these lightweight tanks in a marine blue color, but other colors are available on orders of 6 or more. All tanks have ultraviolet inhibitors for outdoor use. Black has the greatest UV resistance, providing a life expectancy of 25 years. All colors (except black) and materials used are FDA-approved. Another feature of polyethylene tanks is that they can be repaired. Just use heat to soften and reshape. **TP55** ships Ground; **TP90** and larger ship motor freight.

MODEL	CAPACITY (GAL)		I.D. X DEPTH	WALL THICKNESS	SHIP WT (LBS)
TP55	55	ROUND	21" X 38"	3/16"	17
TP90	90	ROUND	39" X 20"	3/16"	23
TP210	210	ROUND	48" X 30"	3/16"	49
TP250	250	ROUND	60" X 22"	3/16"	68
TP400F	460	ROUND	70" X 30"	3/16"	75
TP440A	410	ROUND	60" X 34"	3/16"	74
TP110	110	RECTANGULAR	55" X 31" X 18"	1/8"	44
TP130	130	MORTAR STYLE	73" X 36" X 12"	1/8"	39

YSI® PROODO® OPTICAL DISSOLVED OXYGEN METER

The YSI ProODO® is the first handheld optical dissolved oxygen meter designed for sampling applications. The ODO (Optical Dissolved Oxygen) luminescent sensor has no flow dependence, making it the perfect choice for applications where stirring is difficult or undesirable. This also reduces the possibility of operator error, ensuring high quality data. Unit is resistant to probe fouling from hydrogen sulfide and other gases. The digital ODO probe stores calibration data so probes can be interchanged between instruments without recalibration. Stores 5,000 data sets, and USB connection allows interaction with Data Manager software. Supports English, Spanish, German, Italian, Norwegian, Portuguese and French. IP67-rated case. Military spec connectors and field tested cables, 100 folders and site lists for logging data with user defined fields, and a graphic display with detailed Help visible with polarized sunglasses. Salinity input rate 0–70 ppt. Runs on two C batteries. 8.5" L x 3.25" W x 2.25" H, weighs 1 lb. Three-year warranty on instrument, two years on cable and probe.

MODEL	
Y6262	PROODO, METER ONLY
Y62504	CABLE & 4-M PROBE
Y625010	CABLE & 10-M PROBE
Y625020	CABLE & 20-M PROBE
Y6263	REPL. SENSING ELEMENT

Y6262

Cable & Probe Sold Separately

3-YEAR METER WARRANTY

Y606329

Cable & Probe Sold Separately

SYSTEM SPECS		
RANGES	O2	0–20 mg/L
	Sat.	0–200%
	Temp.	0–50° C
RESOLUTION	O2	0.01 mg/L
	Sat.	0.10%
	Temp.	0.1° C
ACCURACY	O2	± 1.5%
	Sat.	±1.5%
	Temp.	± 0.3° C

YSI® ODO200 OPTICAL DO & TEMPERATURE METER

The EcoSense® ODO200 handheld dissolved oxygen meter uses optical technology and provides the most accurate data in the most affordable format. Features an easy-to-use interface, one-hand operation, IP67 waterproof case, and low cost of ownership over the life of the product. The ODO200 simultaneously measures dissolved oxygen % and mg/L (optical) temperature. One-year warranty on meter, cables and sensor cap. Made in USA.

- Automatic temperature compensation
- Manual input for salinity and pressure compensation
- Low battery indicator with 100 hour battery life
- Auto shutoff function after 30 minutes of inactivity
- 50 data set reviewable memory

Optical benefits include

- No stirring requirement
- No warm-up time
- No electrolyte solutions
- No electrode maintenance
- No membranes
- No interferences from gases such as hydrogen sulfide

MODEL	
Y606329	OPTICAL DO/TEMP METER ONLY
Y606327	1-METER CABLE WITH DO/TEMP PROBE ONLY
Y606328	4-METER CABLE WITH DO/TEMP PROBE ONLY
Y606304	10-METER CABLE WITH DO/TEMP PROBE ONLY
Y606326	SENSOR CAP KIT
Y606330	HARD PLASTIC CARRYING CASE WITH FOAM INSERT

OXYGUARD HANDY POLARIS

The OxyGuard Handy Polaris is a portable D.O. meter that also measures % saturation, mg/L (ppm), temperature and has salinity compensation. Measurements are compensated for temperature and barometric pressure. The probe is galvanic type and fully field-serviceable. Has a large display with backlight and offers automatic calibration and a choice of language and units of measurement. Each unit is supplied with a detachable clip for easy attachment to a belt or clipboard. Battery life allows up to 1,400 hours of use from a single 9V battery.

- Automatic calibration with stability check.
- Compensates for changes in atmospheric pressure.
- Automatic shutdown for power saving.

MODEL	
10XHM053	HANDY POLARIS W/3-M (10') CABLE
10XHM058	HANDY POLARIS W/8-M (25') CABLE
10XHA013	HANDY MEMBRANE KIT, 10 PCS
10XPA014	STANDARD ELECTROLYTE, 1 L
10XPA015	STANDARD ELECTROLYTE, 250 ML
10XPA016	STANDARD ELECTROLYTE, 50 ML
10XHA010	MEMBRANE INSTALLATION TOOL
10XHA007	PROBE PROTECTION CAP
10XHA006	HANDY MEMBRANE CAP WITH MEMBRANE

SYSTEM SPECS

PARAMETERS	ppm (mg/L), % saturation, temperature (ºC or ºF), salinity compensation.	SALINITY COMPENSATION	0–59 ppt salinity (manually set).
DISPLAY	Large, easy to read graphical LCD display. Variable backlight.	ACCURACY, D.O.	Depends on calibration accuracy. Typically better than +/- 1% of measured value +/- 1 digit within the standard measuring range.
PROBE TYPE	Galvanic cell, self-polarizing, self-temperature compensating.	ACCURACY, TEMPERATURE	+/- 0.2ºC
CABLE LENGTH	Standard 3 m.	REPEATABILITY	Typically better than +/- 0.5% of measured range.
OPERATING CONDITIONS	Probe: -5 to +45ºC, Meter: -20 to +60ºC	SELF-CHECK OF	Probe function, meter function, cable, battery.
ENCAPSULATION (METER)	Short-term immersion proof to max. 5-m depth.	STANDARD ACCESSORIES	Membrane cap, membranes, electrolyte, cathode cleaning pad, storage pouch.
MEASURING RANGE	0–60.0 ppm (mg/L) and 0–600% saturation. Automatically compensated for temperature and barometric pressure. Manual salinity compensation. Temperature: -5 to +45ºC.		

OXYGUARD HANDY POLARIS 2

The OxyGuard Handy Polaris 2 is a portable dissolved oxygen (D.O.) meter that combines the features of the original Polaris with the convenience of data logging and data transfer capability. It measures % saturation, mg/L (ppm) and temperature and has salinity compensation. Measurements are compensated for temperature and barometric pressure. The galvanic probe is fully field-serviceable. Powered by a 9V battery. The Polaris 2 has a larger display with backlight and offers automatic calibration, and a choice of language and units of measurement. Includes a detachable clip for easy attachment to a belt or clipboard.

MODEL	
10XHM073	HANDY POLARIS 2 W/3-M (10') CABLE
10XHM075	HANDY POLARIS 2 W/8-M (25') CABLE
10XHM074	USB LINK W/SOFTWARE (ONLY 1 REQUIRED FOR MULTIPLE UNITS)
10XHA013	HANDY MEMBRANE KIT, 10 PCS
10XPA014	STANDARD ELECTROLYTE, 1 L
10XPA015	STANDARD ELECTROLYTE, 250 ML
10XPA016	STANDARD ELECTROLYTE, 50 ML
10XHA010	MEMBRANE INSTALLATION TOOL
10XHA007	PROBE PROTECTION CAP
10XHA006	HANDY MEMBRANE CAP WITH MEMBRANE

TECHNICAL ADVANTAGES

METER	• Data logging and data transfer capability—over 3,000 sets of complete info (mg/L, % sat, temp, events, etc.). Polaris 2 only. • Automatic calibration with stability check. • Automatic self-check of instrument. • Automatic check of cable and probe. • Compensates for changes in atmospheric pressure. • User-selectable language and main display parameter. • "On-screen" instructions. • 1,400 hours use from one 9V alkaline battery. • Illuminated display with variable intensity. • Automatic shutdown for power saving.	PROBE	• Galvanic type. • Self-polarizing. • No warm-up time. • Fully temperature compensated. • Remarkably short response time. • Stores dry. • Excellent long-term stability. • Tough membrane. • No need for regular service or renovation. • Probe renovation easy and fast when needed.

YSI® 550A DISSOLVED OXYGEN METER

★ TECH FAV

- Waterproof to 1 meter even with the battery door open
- 2,000-hour battery life
- Rugged aquaculture-grade cable
- New PE membranes lessen stirring dependence

The YSI 550A D.O. meter is field-rugged and sets the standard for aquaculture D.O. measurement. It is completely waterproof to 1 m (IP67-rated), impact-resistant and measures dissolved oxygen to 50 mg/L and 500% saturation.

It features a field-replaceable, polarographic D.O. probe that is weighted for quick sinking; easy-to-replace cap membranes, push-button calibration and temperature, salinity (to 70 ppt) and altitude (to 10,000') compensation. The large backlit display shows simultaneous readings of oxygen, temperature (°C or °F), and a low battery indicator. Includes four C batteries.

Three-year warranty on meter, one-year on probe. Spanish manual available.

Y550A12


Calibration Chamber

MODEL		SHIP WT (LBS)
Y550A12	YSI 550A D.O. METER W/12' CABLE	7
Y550A25	YSI 550A D.O. METER W/25' CABLE	10
Y550A50	YSI 550A D.O. METER W/50' CABLE	10
Y550A100	YSI 550A D.O. METER W/100' CABLE	10
Y5908	REPL. MEMBRANE KIT W/KCL, POLAROGRAPHIC	1
Y559	REPLACEMENT SENSOR FOR YSI 550 & 550A	1
Y5060	SOFT-SIDED CARRYING CASE	3
Y5085	HANDS-FREE HARNESS	1

3-YEAR METER WARRANTY

SYSTEM SPECS

D.O. RANGES	0–50 MG/L 0–500% AIR SATURATION
RESOLUTION	0.01 MG/L 0.1% SATURATION
ACCURACY	± 0.3 MG/L ±2% SATURATION
TEMPERATURE RANGE	-5–45°C

Y5905

YSI® BIOCHEMICAL OXYGEN DEMAND PROBE

The YSI 5905 biochemical oxygen demand (BOD) probe features a built-in stirrer and pre-tensioned cap membranes, which screw onto the sensor without wrinkles. Sensor tip is protected from accidental damage by a guard. It has a 5' cable and includes a package of six cap membranes and electrolyte solution. Use with **Y52** or **Y58**. One-year warranty.

MODEL		SHIP WT (LBS)
Y5905	BOD PROBE	2
Y5906	REPL. MEMBRANE KIT, GALVANIC	1

Y60500

Meter, Cable and Probe Sold Separately

CERTIFIED ON-SITE REPAIR CENTER

3-YEAR METER WARRANTY

YSI® PRO PLUS MULTIPARAMETER METER

- Measure combinations of D.O., temperature, pH, conductivity, salinity, TDS, ORP, ammonium, nitrate, chloride and barometric pressure
- Automatic temperature, salinity and barometric pressure compensation

Test up to 11 different parameters with one meter and only a simple cable change! Meter has a backlit display and keypad, graphic display with detailed messages and instructions plus a gauge that continuously shows the battery level. The rubber over-molded case has an IP67 waterproof rating and is drop rated to 1 meter. Instrument can log data (5,000 data-set memory with site identity and GLP event logging) and download it to a PC. Data Manager desktop software, a communication dock and USB cable are included. Meter measures 3.3" x 8.5" x 2.3", weighs 1 lb. Uses 2 C batteries (included). Three year warranty on meters, two years on cables and one year on probes (six-month warranty on ammonium, chloride and nitrate ISEs).

METER MODEL	
Y60500	PRO PLUS MULTIPARAMETER METER
CABLES	
Y614C	4 METER FOR ISE/TEMP
Y624C	4 METER FOR DO/TEMP
Y634C	4 METER FOR COND/TEMP
Y6114C	4 METER FOR ISE/ISE/TEMP
Y6124C	4 METER FOR ISE/DO/TEMP
Y6134C	4 METER FOR ISE/COND/TEMP
Y6234C	4 METER FOR DO/COND/TEMP
PROBES	
Y6202	GALVANIC DO (INCLUDES MEMBRANE KIT)
Y6203	POLAROGRAPHIC DO (INCLUDES MEMBRANE KIT)
Y6101	PH ISE

PROBES MODEL	
Y6102	ORP ISE
Y6103	PH/ORP COMBO ISE (NOT FOR USE ON DUAL ISE CABLES)
Y6104	AMMONIUM ISE (FRESH WATER ONLY)
Y6105	CHLORIDE ISE (FRESH WATER ONLY)
Y6106	NITRATE ISE (FRESH WATER ONLY)
SOLUTIONS	
CAL4	PH 4.01
CAL7	PH 7.00
CAL10	PH 10.00
Y3167-E	1,000 uS/CM PER PINT (FRESH WATER)
Y3168-E	10,000 uS/CM PER PINT (BRACKISH WATER)
Y3169-E	50,000 uS/CM PER PINT (SALT WATER)
Y3628	ZOBELL ORP TEST
7021	ORP CALIBRATION SOLUTION, 240MV
7022	ORP CALIBRATION SOLUTION, 470MV

SYSTEM SPECS (INSTRUMENT, PROBE & CABLE)

DISSOLVED OXYGEN (% SATURATION)	Range: 0–500% air saturation Accuracy: ±2% of the reading or ±2% air saturation Resolution: 1% or 0.1% air saturation	DISSOLVED OXYGEN (MG/L)	Range: 0–50 mg/L Accuracy: ±2% of the reading or ± 0.2 mg/L Resolution: 0.1 or 0.01 mg/L	TEMPERATURE	Range: -5–100°C (D.O. compensation range -5–45°C) Accuracy: ± 0.2°C (-5–70°C), ± 0.3°C (70 to 100°C) Resolution: 0.1°C
CONDUCTIVITY	Range: 0–200 mS/cm Accuracy: ± 0.5% of reading or ± 0.001 mS/cm (4-meter cable); ±1% of reading or ± 0.001 mS/cm (20-meter cable) Resolution: 0.001–0.1 mS/cm (Range-dependent)	SALINITY	Range: 0–70 ppt Accuracy: ±1% of reading or ± 0.1 ppt Resolution: 0.01 ppt	PH	Range: 0–14 units Accuracy: ± 0.2 units Resolution: 0.01 units
ISE	Range: -1,999–1,999 mV Accuracy: ±20 mV Resolution: 0.1 mV	TOTAL DISSOLVED SOLIDS	Total Dissolved Solids Calculated from conductivity (variable constant, default .65) Range: 0–100 g/L Resolution: 4 digits	BAROMETER	Range: 375–825 mmHg Accuracy: ±3 mmHg (within ±15°C of calibration temp) Resolution: 0.1 mmHg Units: mmHg, inHg, kPa

TOTAL DISSOLVED GAS PRESSURE (TGP) TRANSMITTER

The Pentair Point Four Systems TGP Transmitter is a stand-alone probe for the measurement of total dissolved gas pressure. It provides measurement for TGP (mmHg or % saturation), ΔP (TGP-BP), barometric pressure (BP) (mmHg) and temperature (°C).

Two analog outputs are available from each TGP probe. They are available in 0-20 mA, 4-20 mA or 0-5VDC and can be configured to any of the five available measurement parameters. Measurements are also available via RS-485 and can be viewed on a PC with the optional software package. TGP probes are not loop-powered and can accept a 9-33VDC power supply. 115VAC to 12VDC power supply is optional.

MODEL

1SSM002	TGP TRANSMITTER
1SSA025	REPL. TGP CARTRIDGE
1SSA029	PC SOFTWARE AND CABLE
1PTPS011	115VAC TO 12VDC POWER SUPPLY

SYSTEM SPECS

PARAMETER	RANGE	RANGE	RESOLUTION
MEASUREMENTS:	Total Gas Pressure (TGP)	0–1,550 mmHg	1 mmHg
	Barometric Pressure (BP)	0–1,550 mmHg	1 mmHg
	Temperature	0.0–40.0°C	0.1°C
DERIVED:	Total Gas Pressure (TGP)	0–200%	1%
	ΔP (TGP-BP)	-1,550–1,550 mmHg	1 mmHg

1SSM002

IN-HOUSE REPAIR AND SERVICE AVAILABLE
Contact Pentair Aquatic Eco-Systems for more details.

Cable & Probe Sold Separately

OXYGUARD PORTABLE CO_2 METER

The OxyGuard portable CO_2 meter is a reliable and easy-to-use instrument that measures dissolved carbon dioxide in water. The meter consists of a probe and a battery-powered transmitter. The meter displays CO_2 concentration and an analog signal as output. The transmitter has an on/off switch, "slope" and "zero" adjustments. Battery charger (230V), calibration accessories and 3-m cable are included. A version with built-in data logger is available.

Measures the CO_2 gas pressure directly and is not affected by carbonates or other dissolved substances. It is therefore possible to achieve simple, continuous direct measurements of carbon dioxide in water that affects fish.

Methods such as test kits, laboratory analysis and the detection of pH changes are subject to disturbance from the dissolved substances found in aquaculture water. The OxyGuard CO_2 measures only the CO_2 that affects the fish, which is the free dissolved CO_2 gas. It is reliable and accurate. Calibration accessories pack includes beaker with stirrer and magnet; 75 g of pH conditioner with dosing spoon; 100 mL of calibration solution with dosing syringe; and adjustment screwdriver.

MODEL

10XYC0485	OXYGUARD CO_2 PORTABLE
10XYC0495	OXYGUARD CO_2 PORTABLE W/DATA LOGGER, 230VAC CHARGER
10XYC0477	PH CONDITIONER, 75 G
10XYC0478	CALIBRATION SOLUTION, 100 ML
10XYC0476	CALIBRATION BEAKER W/STIRRER
10XYC0480	CALIBRATION ACCESSORIES PACK
10XYC0496	OXYGUARD DISSOLVED CO_2 PROBE
10XYC0497	EXCHANGE BATTERY FOR CO_2 METER

1SSM100

Meter,
Cable & Probe
Sold Separately

TOTAL DISSOLVED GAS PRESSURE (TGP) METER

The Pentair Aquatic Eco-Systems Point Four Tracker provides measurements for TGP (mmHg or % saturation), ΔP, barometric pressure (mmHg) and temperature (°C).

Increasing water temperatures, injection of air in water, algal blooms or pressurized pumping can result in gas supersaturation. This may lead to bubble trauma or sub-lethal toxicological problems for aquatic species. The TGP probe provides a rapid and accurate measurement of total dissolved gas pressure.

The Tracker has simple calibration procedures and easy to understand menus. The handheld meter features a tough membrane keypad and graphical display with a user-selectable backlight. The Tracker has two pressure sensors, one measures total dissolved gas pressure (TGP), and one measures barometric pressure (BP). Also has datalogging capabilities. The batteries are rechargeable and an AC adapter is included with each unit.

SYSTEM SPECS

PARAMETER	RANGE	RANGE	RESOLUTION
MEASUREMENTS:	Total Gas Pressure (TGP) Barometric Pressure (BP) Temperature	0–1,550 mmHg 0–1,550 mmHg 0.0–40.0°C	1 mmHg 1 mmHg 0.1°C
DERIVED:	Total Gas Pressure (TGP) ΔP (TGP-BP)	0–200% -1,550–1,550 mmHg	1% 1 mmHg

MODEL

1SSM100	PT4 TRACKER HANDHELD METER
1SSP0031	TGP/TEMPERATURE SMART PROBE, 5-M CABLE
1SSP060	LUMI4 TGP OPTICAL O_2/TEMP PROBE, 5-M CABLE
1SSA025	REPL. TGP CARTRIDGE FOR 1SSP0031
1SSP070	LUMI4 REPL. D.O. PROBE CAP
1SSP080	LUMI4 REPL. TGP CARTRIDGE
1SSA015	PT4 TRACKER EXTEND. DEPLOYMENT PACKAGE (CASE, BATTERIES, CHARGER)
9EPTPS003	GEL CELL BATTERY, 6V, 12AH
9EMSC033	NIMH RECHARGEABLE BATTERY PACK, 4 X AA
1SSA005	CHARGER CABLE W/AC ADAPTER
1SSA006	CHARGER CABLE W/CAR ADAPTER
1SSA007	DATA TRANSFER CABLE W/USB ADAPTER, BULGIN CONNECTOR

IN-HOUSE REPAIR AND SERVICE AVAILABLE
Contact Pentair Aquatic Eco-Systems for more details.

1SSP060 - Lumi4 Probe: Optical DO/Temp & TGP

YSI® 556 MPS (MULTIPROBE SYSTEM) TECH FAV

Rugged and reliable, this Multiprobe System combines the versatility of an easy-to-use, handheld unit with the functionality of a multiparameter system. Featuring an IP67 waterproof case, the YSI® 556 MPS simultaneously measures dissolved oxygen, pH, salinity, conductivity, temperature and ORP. One-, two- or three-point pH calibration.

Powered by four C cell batteries or an optional, rechargeable battery pack with fast-charge feature. Optional internal barometer can be user calibrated and displayed along with other data. The YSI® 556 comes with a soft-sided carrying case for the meter. Measures 4.7" W x 9" L. Three-year warranty on meter, one year on probe.

- Field-replaceable D.O., pH and ORP probes
- Compatible with Ecowatch® for Windows® software
- Internal memory has 35 file names and stores over 49,000 data setpoints

3-YEAR METER WARRANTY

Cable & Probe
Sold Separately

CERTIFIED ON-SITE REPAIR CENTER

METERS	
Y5561	YSI 556 MPS
Y5562	YSI 556 MPS W/BAROMETER OPTION

CABLE KITS WITH PROBES	
Y55634	4 METER WITH DO/TEMP/CONDUCTIVITY
Y556310	10 METER WITH DO/TEMP/CONDUCTIVITY
Y556320	20 METER WITH DO/TEMP/CONDUCTIVITY

PROBES ONLY	
Y5560	TEMP/CONDUCTIVITY
Y559	POLAROGRAPHIC DO
Y5564	PH
Y5565	PH/ORP

MEMBRANE KIT	
Y5909	2 MIL PE, EACH

SOLUTIONS	
CAL4	PH 4.01
CAL7	PH 7.00
CAL10	PH 10.00
Y3167-E	1,000 US/CM PER PINT (FRESH WATER)
Y3168-E	10,000 US/CM PER PINT (BRACKISH WATER)
Y3169-E	50,000 US/CM PER PINT (SALT WATER)
Y3628	ZOBELL ORP TEST

REPLACEMENT PARTS	
Y6118	RECHARGEABLE BATTERY KIT W/CHARGER
Y3059	FLOW CELL

WATER QUALITY TEST STRIPS

FW SW

These small test strips provide a rapid means of checking water quality. Simply dip a strip into the sample, wait for color to develop and compare color on the reagent pad to the color chart on the bottle. Each kit contains 50 tests, except **H27451**, **H27453**, **H27454** and **H27553** have only 25. Only parameters marked with an asterisk (*) can be used with salt water.

HACH® Be Right™

H27448

MODEL	TEST	RANGE
H27448	ALKALINITY	0–240 PPM
H27553	AMMONIA	0–5 PPM
H27451	COPPER (TOTAL)	0–240 PPM
H27450	FREE AND TOTAL CHLORINE*	0–10 PPM
H27452	HARDNESS*	0–425 PPM
H27453	IRON (TOTAL)	0–5 PPM
H27454	NITRATE/NITRITE	0–50 / 0–3 PPM
H27456	PH*	PH 4–9
H27571	PHOSPHATE*	0–5 PPM

SYSTEM SPECS	
DISSOLVED OXYGEN	Range: 0 to 500% air saturation; 0 to 50 mg/L Resolution: 0.1% air saturation; 0.01 mg/L or 0.1 mg/L (auto-scaling) Accuracy: (0-200%) (0-20 mg/L) ±1% of reading or ±1% air sat, whichever greater; ±0.1 mg/L or ±1% of reading, whichever greater (200-500%) (20-50 mg/L) ±10% of reading Response time: 90% of reading in 25 seconds; 95% of reading in 45 seconds (typical response times with no stirring; sample movement will improve typical response times)
TEMPERATURE	Range: 0 to 45°C (32 to 113°F) Resolution: 0.1°C Accuracy: ±0.2°C

YSI® 5500D OPTICAL D.O. MONITOR AND CONTROL

Continuous water quality monitoring for dissolved oxygen

Designed specifically for aquaculture systems, the YSI 5500D continuous monitor for dissolved oxygen and AquaManager® Software can be used to integrate process control, feeding, alarming and data management into one product or can be used to simply monitor one tank. With ODO® optical dissolved oxygen technology you'll benefit from reduced costs, less maintenance and better data. The ODO sensors require no membrane changes, no electrode cleaning, no stirring requirement and less frequent calibrations. NEMA 4X box is IP65 waterproof. UL- and CE-listed. 8.5" L x 6.5" H x 4.75" D (21.6 x 16.5 x 12.1 cm).

- MultiDO monitor using optical D.O. technology.
- Ethernet TCP/IP or wireless communications (optional).
- Event logging records calibrations, high and low conditions and more.
- Conditional feed timer with Feed Smart® software included.
- Networking capability up to 32 instruments per communications port or integration with 5200As and 5400s.
- Graphic interface function for quick, reliable system status with the use of AquaManager software.
- Plug-and-play...easy to install, setup and maintain; no need to hire consultants.
- Flexible control software.
- Tank-side calibration.
- Email and SMS alarming.
- AquaViewer app available for easy access to data at any time.

The standard conditional feed timer, Feed Smart®, manages food delivery based on user's preset criteria. Manage feed delivery based on user-selectable inputs for the number of daily feedings, daily feed weights, total biomass and feed conversion ratios (FCRs), along with parameter control based on water quality values. Interfaces with most auto feeders.

Optional AquaManager® desktop software allows you to view, configure, or setup instruments from the convenience of one central location. Instantly see an overview of your facility, manage parameter set points, and conveniently manage data to make informed operational decisions. The facility mapping feature provides an immediate overview of all ponds or tanks indicating their current state.

Applications include:

- Recirculating systems
- Raceways
- Ponds
- Sea cages
- Live haul
- Aquariums
- Research
- Tanks

MODEL	
Y5500D-1	SINGLE-CHANNEL MONITOR, 110-230 VAC
Y5500D-1-D	SINGLE-CHANNEL MONITOR, 12 VDC (POWER SUPPLY NOT INCL.)
Y5500D-2	TWO-CHANNEL MONITOR, 110–230 VAC
Y5500D-2-D	TWO-CHANNEL MONITOR, 12 VDC (POWER SUPPLY NOT INCL.)
Y5500D-4	FOUR-CHANNEL MONITOR, 110–230 VAC
Y5500D-4-D	FOUR-CHANNEL MONITOR, 12 VDC, (POWER SUPPLY NOT INCL.)
Y626320	REPL. SENSOR CAP
Y626250-4	PROBE ASSEMBLY W/4-M CABLE
Y626250-10	PROBE ASSEMBLY W/10-M CABLE
Y626250-20	PROBE ASSEMBLY W/20-M CABLE
Y626250-50	PROBE ASSEMBLY W/50-M CABLE
Y6505	WEATHER SHIELD
Y6509	RAIL MOUNT KIT
Y6510	PANEL MOUNT KIT
Y5209A	AQUAMANAGER DESKTOP SOFTWARE
Y5402	SERIAL TO ETHERNET MODULE

CERTIFIED ON-SITE YSI REPAIR CENTER

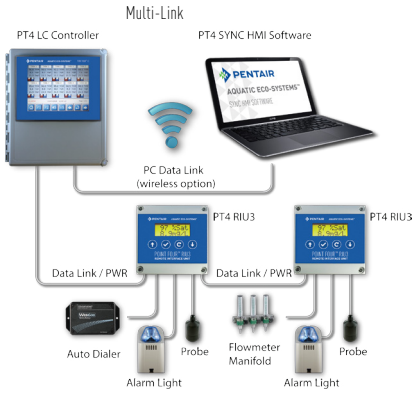
PENTAIR

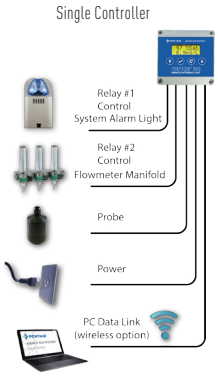
VARIOUS SENSOR INPUT TYPES:

Oxygen	Bp	Salinity
Temperature	pH/ORP	TGP
		Optical DO

2 RELAY OUTPUTS:

A lerting Alarm Conditions via Light, Siren or SMS and Dosing Oxygen or Controlling Blowers





POINT FOUR™ RIU3 REMOTE WATER MONITOR/CONTROLLER

The Point Four RIU3 (Next Generation Remote Interface Unit) offers a host of features suited to our customers' detailed requirements for continuous monitoring & control of water parameters.

The RIU3 functions as either a stand-alone field mounted transmitter/controller, or can be daisy chained to create a multi-linked network connection, supporting up to 99 units. An unlimited amount of multi-linked network connections can be made allowing for a scalable system from small hatchery operations to large RAS systems. Users can collect, manipulate and control all of their data via the Point Four RIU3 Controller, Point Four LC Touch Controller or using the Point Four Sync HMI Software (windows based).

The RIU3 will accept multiple input types (4-20mA/ 0 -5 V/ Modbus RS485) and contains 2 SPDT 4amp relays which can be setup for up to six control blocks. Control blocks are configured directly via the keypad, or through a PC using a computer connection cable; allowing users to setup local control, configure alarm conditions or even perform PID function. A key feature of the RIU3 is tank side probe calibration, which is easily performed using the weatherproof 4 button keypad. Probe calibration can now be done by just one operator, allowing the user to service the probe and adjust values all at the same probe location.

MODEL	
1SSS601	POINT FOUR RIU3 WATER MONITOR/ CONTROLLER
1SSS6011	PT4 RIU3 WITH DO/TEMP COMMANDER PROBE
1SSS6012	PT4 RIU3 WITH DO TYPE III PROBE (% SAT)
1SSS6013	PT4 RIU3 WITH DO TYPE III PROBE (MG/L)
1SSS6014	PT4 RIU3 WITH RDO OPTICAL DO PROBE
1SSS6015	PT4 RIU3 WITH SALINITY OXYGUARD PROBE
1SSS6016	PT4 RIU3 WITH TGP PROBE
1SSS6017	PT4 RIU3 WITH ORP PROBE
1SSS6018	PT4 RIU3 WITH PH 8000 PROBE
1SSA028	PC DATA CABLE AND SOFTWARE

The comparison table below outlines the core differences between the New RIU3 and the Original RIU:

COMPARISON	RIU3	RIU
INPUT	2 Inputs: Digital & Analog User Selectable	2 Inputs: Analog Factory Configured
OUTPUT	2 Relay Outputs	1 Relay Output
ALARM CONTROL	6 Control Blocks Configured via PC & 4 button weatherproof keypad	5 Control BlocksConfigured via PC
CALIBRATION	4 button weatherproof keypad	Magnetic switch controlled
NETWORK	Data link up to 99 units	Data link up to 54 units
EXPANSION PORT	Onboard Data Logging Capability	None

SYSTEM SPECS

POWER	12-24VDC, 120mA	SENSOR POWER	Onboard isolated 24VDC loop power supply (optional)	DISPLAY	8x2 Character, Large Font, LCD Backlit
INPUT	2 Sensor Input (user selectable): 1 Probe input (optically isolated) (4-20mA /0 -5V/ Modbus RS485) & 1 Aux input (optically isolated) for Temp or Bp	OUTPUT ALARM	Two SPDT 4 Amp relay-user configurable, LCD/LED Alarm Indicator Modbus RTU RS485 communication port, Network addressable 1-99.	CONTROL OUTPUT	Two relay outputs with selectable control band, ON/OFF or PID function [4-20mA / ModBus RS485 output]
ENVIRONMENTAL	NEMA 4X/IP65, Sealed Cable Glands	TEMPERATURE	-5 °C to +60 °C, - Operation -10 °C to +60 °C, - Storage	RELATIVE HUMIDITY	5% to 85% RH at up to +40 °C - Operation 5% to 40% RH above +40 °C up to +60 °C - Storage
ALTITUDE	Up to 3,000 m (10,000 ft) - Operation/Storage	DIMENSIONS	125mm x 145mm x 75mm [4.9" x 5.7" x 3"]	WEIGHT	457 grams [1 lb]
ACCESSORIES	Wall Mount Bracket/Weather Shield	EXPANSION PORT	Onboard Data Logging Capability		

Dissolved Oxygen Monitoring

Control: Oxygen dosing via onboard relay.

Easy, automatic calibration.

PENTAIR

IN-HOUSE REPAIR AND SERVICE AVAILABLE
Contact Pentair Aquatic Eco-Systems for more details.

POINT FOUR™ RIU REMOTE WATER MONITOR/CONTROLLER

The original Remote Interface Unit (RIU) is a field-mounted single sensor transmitter/controller. The unit will accept inputs from any sensor providing a voltage, 4-20mA or thermistor input. Equipped with a large-font 8x2 backlit display, the user can view readings directly at the sensor location.

The unit contains one SPDT 4-amp relay that can be setup for up to five control blocks. These control blocks are configured via a PC setup program using the optional computer connection cable. This allows the user to setup a local control, alarm or even PID function.

The unit also contains an automated calibration feature allowing calibration by simply holding a magnet to the enclosure side.

The original RIU will function as a stand-alone controller, or up to 54 units may be daisy-chained for a network connection. Many network connections can be made allowing for a scalable system from small to large. This allows the user to collect, manipulate and control all of the data via the PT4 LC Controller, PT4 RIU controller or using the PT4 Sync HMI Software (Windows-based).

Features and Benefits

- Large backlit local indicator display.
- Tank-side calibration, simple 1-touch magnetic calibration
- Control and alarm indicators
- Networkable units allow for a cost-effective scalable system

MODEL	
1SSS600	POINT FOUR RIU WATER MONITOR/ CONTROLLER
1SSS6001	PT4 RIU WITH DO/TEMP COMMANDER PROBE
1SSS6003	PT4 RIU WITH DO TYPE III PROBE (% SAT)
1SSS6004	PT4 RIU WITH DO TYPE III PROBE (MG/L)
1SSS6005	PT4 RIU WITH RDO OPTICAL DO PROBE
1SSS6006	PT4 RIU WITH SALINITY OXYGUARD PROBE
1SSS6007	PT4 RIU WITH TGP PROBE
1SSS6008	PT4 RIU WITH ORP PROBE
1SSS6009	PT4 RIU WITH PH 8000 PROBE
1SSA028	PC DATA CABLE AND SOFTWARE

The PT4 RIU3 is the next-generation of the RIU, with better features & control than the original RIU. 2015 is the last year the original RIU will be available.

SYSTEM SPECS

POWER	12-24VDC, 120mA	SENSOR POWER	Onboard isolated 24VDC loop power supply (optional)	DISPLAY	8x2 Character, Large Font, LCD Backlit
INPUT	2 optically isolated inputs, voltage, current or thermistor.	OUTPUT ALARM	One SPDT 10 Amp relay-user configurable, LCD/LED Alarm Indicator Modbus RTU RS485 communication port, Network addressable 1-54.	CONTROL OUTPUT	One relay outputs with selectable control band, ON/OFF or PID function
ENVIRONMENTAL	NEMA 4X/IP65, Sealed Cable Glands	TEMPERATURE	-5 °C to +60 °C, - Operation -10 °C to +60 °C, - Storage	RELATIVE HUMIDITY	5% to 85% RH at up to +40 °C - Operation 5% to 40% RH above +40 °C up to +60 °C - Storage
ALTITUDE	Up to 3,000 m (10,000 ft) - Operation/Storage	DIMENSIONS	115mm x 112mm x 58mm [4.5" x 4.4" x 2.3"]	WEIGHT	450 grams [1 lb]

YSI® 5200A WATER QUALITY MONITORING SYSTEM FW SW TECH FAV

Designed for aquaculture and other applications that require real-time monitoring, the 5200A RSM measures dissolved oxygen, pH, ORP, conductivity, salinity and temperature! The 5200A RSM can accept additional inputs, including total dissolved gas sensors, water level sensors, pressure sensors, flow sensors, etc. It's also a controller and alarm system. When used with AquaManager® software, it can email alarms if connected directly to a computer or phone alarms when connected to an internal modem. It will even network with other RSMs.

Advantages of the 5200A over the 5200

- Large graphic display allows for menu-driven operation.
- Shows all parameters simultaneously
- System status history at the push of a button
- No loss of data when power is lost
- Four cascading, 10-event timers
- Network speed is 20X faster
- Improved diagnostic capability
- AC or DC power
- Provides data that can be used for better system management

Applications include

- Recirculating aquaculture systems
- Research and laboratory systems
- Wastewater monitoring
- Live hauling
- Zoological exhibits/Aquariums
- Environmental monitoring
- Fish ponds and raceways
- Remote cage monitoring

The Y5200A RSM utilizes a multiprobe sonde for simultaneous oxygen, temperature, conductivity, salinity, pH and ORP measurement (calibration solutions sold separately). The probe can be submersed directly into a tank or threaded into a gland for in-line measurement. The polarographic oxygen probe requires little water movement to provide extremely accurate oxygen readings. Two-year warranty on meter, 1-year on probes and cable. NEMA 4X enclosure. CE-approved and UL-listed.

Probe & cable not included, see listing on next page for compatible probes.

Cable & Probe Sold Separately

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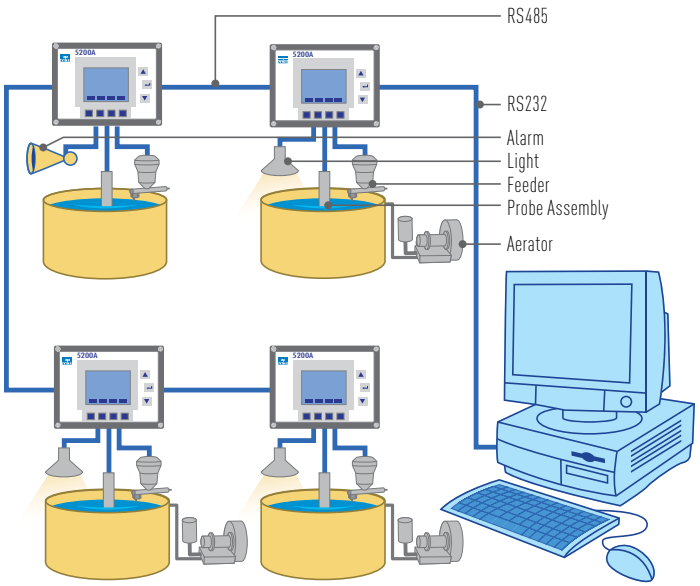
Y5200A shown in action at our in-house test facility.



MODEL	INSTRUMENTS	SHIP WT (LBS)
Y5200A	MONITORING ASSEMBLY, 115/230V W/115V CORD	10
Y5200A-DC	MONITORING ASSEMBLY, 12VDC	10

MODEL	PROBES	SHIP WT (LBS)
Y55624	4-M CABLE KIT WITH D.O./TEMP/CONDUCTIVITY*	2
Y556210	10-M CABLE KIT WITH D.O./TEMP/CONDUCTIVITY*	3
Y556220	20-M CABLE KIT WITH D.O./TEMP/CONDUCTIVITY*	4
Y55614	4-M CABLE WITH D.O./TEMP**	2
Y556110	10-M CABLE WITH D.O./TEMP**	3
Y556120	20-M CABLE WITH D.O./TEMP**	4
Y5564	PH KIT	2
Y5565	PH/ORP KIT	2
Y5560	CONDUCTIVITY & TEMPERATURE PROBE	2

* Does not include PH nor ORP probes. **Only D.O. and Temperature.

MODEL	ACCESSORIES	SHIP WT (LBS)
Y559	REPLACEABLE D.O. MODULE	10
Y5204	D.O. MEMBRANE KIT, 2 MIL	10
Y6509	RAIL MOUNT KIT	2
Y6510	PANEL MOUNT KIT	3
Y3059	FLOW CELL	4
Y6505	WEATHER SHIELD	2
Y5209A	SOFTWARE, AQUAMANAGER, SINGLE NETWORK USE	3
Y5285-A	OPTO-ISOLATOR (NOT INCLUDED)***	4
Y5402	SERIAL TO ETHERNET MODULE	1
ESP901	ETHERNET SERVER	2

***Required if unit is connected directly to computer.

MODEL	CALIBRATION SOLUTIONS	SHIP WT (LBS)
Y3167-E	1,000 M/CM, 1 PINT (FRESH WATER)	10
Y3168-E	10,000 M/CM, 1 PINT (BRACKISH WATER)	10
Y3169-E	50,000 M/CM, 1 PINT (SALT WATER)	2
Y3628	ZOBELL ORP TEST SOLUTION, 125 ML	3
Y5580	CONFIDENCE CALIBRATION SOLUTION, 1 PINT	4

SYSTEM SPECS

DISSOLVED OXYGEN (% SATURATION)	Range: 0–500% Accuracy: ±2% Resolution: 0.1%	PH	Range: 0–14 Accuracy: 0.2 pH Resolution: 0.01 pH	CONDUCTIVITY HR	Range: 0–200 mS Accuracy: ±0.5% Resolution: 0.1 mS
DISSOLVED OXYGEN (MG/L)	Range: 0–60 mg/L Accuracy: ±0.2 mg/L Resolution: 0.01 mg/L	ORP	Range: -2,000–2,000 Accuracy: ±20 mV Resolution: 1 mV	SALINITY	Range: 0–80 ppt Accuracy: ±0.1 ppt Resolution: 0.1 ppt
TEMPERATURE	Range: 0–45°C Accuracy: ±0.2°C Resolution: 0.1°C	CONDUCTIVITY LR	Range: 0–2,000 µS Accuracy: ±0.5% Resolution: 1.0 µS	DIFFERENTIAL TDGP	Range: ±400 mmHg Accuracy: ±1.0 mmHg Resolution: 0.1 mmHg

YSI® DISSOLVED OXYGEN MONITOR

Designed specifically for aquaculture systems, the YSI® 5400 continuous monitor for dissolved oxygen and AquaManager® Software can be used to integrate process control, feeding, alarming and data management into one product or can be used to simply monitor one tank. Powerful enough to manage a full-scale farming operation from anywhere in the world, yet simple enough for anyone to use.

The 5400 is perfectly suited for continuous D.O. monitoring of multiple locations. Up to 32 instruments per communications port can be configured on one local network, with each instrument capable of controlling four D.O. channels and additional inputs for temperature, level, pressure, CO_2, TGP sensors and more. Can also be networked with YSI® 5200A multiparameter monitors.

Relay outputs can control heaters, chillers, aerators, pumps, lights, feeders, etc. Alarming options include email and SMS from 3 to 10 email addresses, depending on configuration.

The YSI® 5400 also features flexible monitoring and control software with graphic interface function for quick, reliable system status checks. Includes conditional feed timer with Feed Smart® software.

Y5400

Cable & Probe
Sold Separately

CERTIFIED ON-SITE REPAIR CENTER

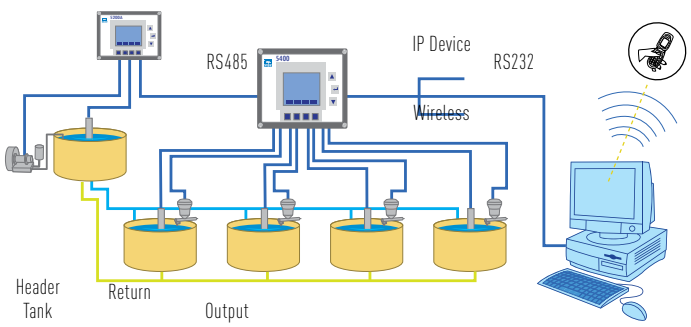
MODEL		SHIP WT (LBS)
Y5400	D.O. MONITOR, 12VDC	10
Y54002	D.O. MONITOR, 115–230VAC OR 12VDC	10
Y5424	4-M CABLE, D.O. ONLY	2
Y54210	10-M CABLE, D.O. ONLY	3
Y54220	20-M CABLE, D.O. ONLY	4
Y54230	30-M CABLE, D.O. ONLY	5
Y5434	4-M CABLE, D.O. W/TEMP	2
Y54310	10-M CABLE, D.O. W/TEMP	3
Y54320	20-M CABLE, D.O. W/TEMP	4
Y54330	30-M CABLE, D.O. W/TEMP	5
Y5402	SERIAL TO ETHERNET MODULE	1
Y5209A	SOFTWARE AQUAMANAGER, SINGLE NETWORK USE	

SYSTEM SPECS	
DISSOLVED OXYGEN (% SATURATION)	Range: 0–500% Accuracy: ±2% Resolution: 0.1%
TEMPERATURE	Range: 0–45°C Accuracy: ±0.2°C Resolution: 0.1°C
DISSOLVED OXYGEN (MG/L)	Range: 0–60 mg/L Accuracy: ±0.2 mg/L Resolution: 0.01 mg/L (0–10 mg/L); 0.1 mg/L (10–60 mg/L)

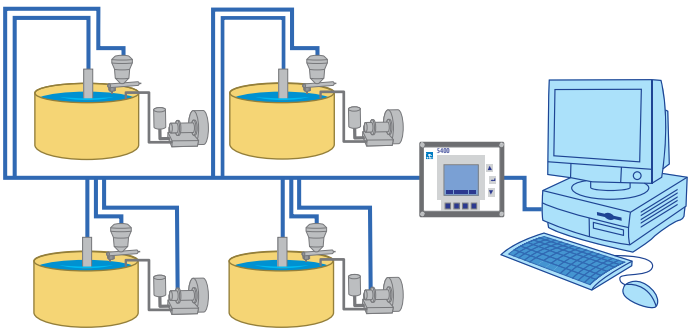
Thank you [Pentair] Aquatic Eco-Systems for keeping customer service #1. Our personal acct rep is familiar with, and understands, our daily procedures and challenges. The random issues that may occur are resolved immediately. Product is superior quality every time. Plus, you are a lot of fun to work with!

Diane M. Minge
Bass Pro Shops

Y5200A and Y5500D can be used in the same network to provide a solution when multiparameter measurements are required.

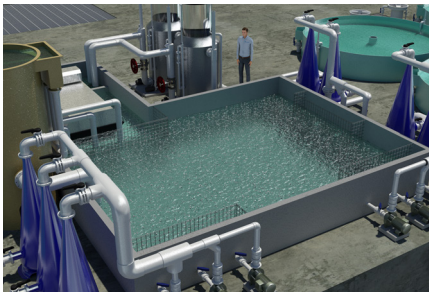


Combined Y5200A and Y5400 Networking



Example of one Y5400 controlling D.O. and feeding in four tanks.

RECIRCULATING AQUACULTURE SYSTEMS (RAS) TECHNOLOGY WORKSHOP



Dr. Losordo has earned a Bachelor degree in Biology and a Masters degree and Ph.D. in Agricultural Engineering. Involved in aquaculture for 40 years, Dr. Losordo has extensive experience in the research, development, design, and implementation of recirculating aquaculture systems worldwide. Past president of both the World Aquaculture Society and the Aquacultural Engineering Society.

Dr. Thomas M. Losordo

TOPICS THAT WILL BE COVERED DURING THIS 2½-DAY WORKSHOP:

- An introduction to recirculating systems
- Critical considerations before designing recirculating systems
- Component options for use in recirculating production systems
- Developing an appropriate design for your aquaculture application
- The management of recirculating systems
- Waste management issues
- Economic considerations in creating, evaluating and operating recirculating systems

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

AQUAPONICS TECHNOLOGY AND DESIGN WORKSHOP

TOPICS THAT WILL BE COVERED DURING THIS 4½-DAY WORKSHOP:

- UVI aquaponic system & UVI-based system at PAES
- Fish production
- Marketing and economics
- Plant production
- Hands-on instruction
- Green Sky Growers rooftop greenhouse tour
- "Behind the Seeds Tour" at The Land at Epcot®

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

"Teaching at the aquaponics course sponsored by Pentair Aquatic Eco-Systems (PAES) was a real treat for me because PAES employees have an incredible depth of experience and knowledge that they share with their students as they guide them through all phases of constructing and operating an aquaponic system to establish a successful hobby or business."

Dr. James Rakocy, "Father of Aquaponics"

SUBMERSIBLE HEATERS AND IN-LINE HEAT EXCHANGERS

Innovative Heat Concepts' Positive Temperature Coefficient (PTC) technology is custom-designed for the aquaculture industry. PTC technology brings together the heating element, thermostat and control device into a single component, enabling precise temperature specifications. PTC ceramic chip technology adjusts the amount of heat transmitted as ambient conditions change. As a result, they are safer and more cost-efficient than nichrome wire elements.
All heaters come with NEMA 4X-rated dual readout digital LED controls, and eliminate premature low liquid level burnout.

SUBMERSIBLE TITANIUM HEATERS

Titanium heaters ideal for marine aquaculture. Safe to bury under gravel. **HTS1**–**HTS5** include power cord and plug (15' cord from control to heater; 15' sensor from control); **HTS6**–**HTS7** do not include power cord. 230v models include 6-20p plug.

MODEL	WATTS	VOLTS	MAX AMPS	PHASE	LENGTH	WEIGHT (LBS)
HTS1	1,000	115	8.4	1	12.5"	8
HTS2	1,000	230	4.2	1	12.5"	8
HTS3	1,800	115	15	1	19"	10
HTS4	1,800	230	7.5	1	19"	10
HTS5	3,000	230	12.5	1	25"	19
HTS6	4,000	230	16.7	1	31"	26
HTS7	6,000	230	25	1	42"	29

Replacement Controls

QD20 standard control; operating temperature range is -32–230°F.
CNTRL3 has temp range of 0–754°F.

- Model **CNTRL1** for use on **HTS1** and **HTS3** Heaters
- Model **CNTRL2** for use on **HTS2**, **HTS4** and **HTS5** Heaters
- Model **CNTRL3** for use on **HTS6** and **HTS7** Heaters

MODEL	VOLTS	MAX AMPS	PHASE	SENSOR LENGTH	L X W X H	SHIP WEIGHT (LBS)
CNTRL1	115	20	1	15'	3" X 6" X 4"	3
CNTRL2	230	20	1	15'	3" X 6" X 4"	3
CNTRL3	230	40	1	15'	6" X 6" X 4"	3

Combination Controls

16 Series combination control; operating temperature range is 0 to 754°F.

- Models **CNTRL4** thru **CNTRL8** for use on many different types of heaters up to the given amp rating for the specified model. Single- or three-phase compatible, except model **CNTRL6**.

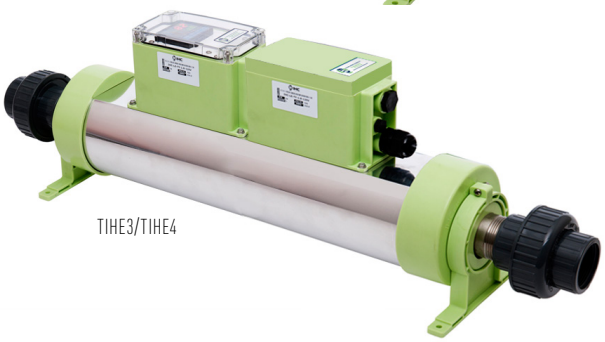
MODEL	VOLTS	MAX AMPS	PHASE	SENSOR LENGTH	L X W X H	SHIP WEIGHT (LBS)
CNTRL4	230	30	1 OR 3	15'	8" X 8" X 4"	13
CNTRL5	460	30	1 OR 3	15'	8" X 8" X 4"	16
CNTRL6	115	50	1	15'	8" X 8" X 4"	13
CNTRL7	230	50	1 OR 3	15'	8" X 8" X 4"	13
CNTRL8	460	50	1 OR 3	15'	8" X 8" X 4"	16

TITANIUM IN-LINE HEAT EXCHANGERS

The advanced technology in these heat exchangers ensures that water will never come into contact with the heaters. Units are corrosion-resistant and easy to maintain without disconnecting plumbing. They have built-in thermal protection and will not burn out if water flow stops. Digital temperature control has ±1° accuracy and field-selectable temperature settings (°C or °F). Max 50 psi. 1½" NPT inlet and outlet. These titanium heaters use PTC technology and are energy-efficient.

MODEL	WATTS	VOLTS	MAX AMPS	PHASE	L X W X H	WEIGHT (LBS)
TIHE1	1,800	115	15	1	24" X 7" X 10"	13
TIHE2	3,000	230	12.5	1	24" X 7" X 10"	13
TIHE3	6,000	230	14.5	3	31" X 7" X 10"	17
TIHE4	8,000	230	19.3	3	31" X 7" X 10"	17


TIHE1/TIHE2


TIHE3/TIHE4

"L" STYLE HEATERS

Heavy-duty, 2" diameter tube (1-kW models are 1¼" tubes) ideally suited for fluctuating solution levels or shallow tanks. Units have a 36" corrosion-resistant thermoplastic flexible conduit and a watt density of 35 watts/sq.in. Will work in high-viscosity liquids.

Single Tube "L" Style Heaters—Single phase.

WATTS	VOLTS	RISER HEIGHT	HOT ZONE	WEIGHT (LBS)	316L STAINLESS STEEL MODEL	TITANIUM MODEL
1,000	115	15"	13"	10	**SL1107**	**TL1107**
1,000	230	15"	13"	10	**SL1207**	**TL1207**
2,000	115	19"	17"	11	**SL2115**	**TL2115**
2,000	230	19"	17"	11	**SL2215**	**TL2215**
2,000	460	19"	17"	11	**SL2415**	**TL2415**
3,000	230	25"	21"	13	**SL3220**	**TL3220**
3,000	460	25"	21"	13	**SL3420**	**TL3420**
4,000	230	25"	25"	14	**SL4224**	**TL4224**
4,000	460	25"	25"	14	**SL4424**	**TL4424**
5,000	230	25"	32"	17	**SL5231**	**TL5231**
5,000	460	25"	32"	17	**SL5431**	**TL5431**

Triple Tube "L" Style Heaters—Three phase.

WATTS	VOLTS	RISER HEIGHT	HOT ZONE	WEIGHT (LBS)	316L STAINLESS STEEL MODEL	TITANIUM MODEL
3,000	230	15"	14"	23	**SL3207**	**TL3207**
3,000	460	15"	14"	23	**SL3407**	**TL3407**
6,000	230	19"	19"	27	**SL6215**	**TL6215**
6,000	460	19"	19"	27	**SL6415**	**TL6415**
9,000	230	25"	24"	32	**SL9220**	**TL9220**
9,000	460	25"	24"	32	**SL9420**	**TL9420**
12,000	230	25"	27"	42	**SL12224**	**TL12224**
12,000	460	25"	27"	42	**SL12424**	**TL12424**
15,000	230	25"	34"	49	**SL15231**	**TL15231**
15,000	460	25"	34"	49	**SL15431**	**TL15431**

Triple Tube "L" Style Vertical Stack—Three phase.

WATTS	VOLTS	RISER HEIGHT	HOT ZONE	WEIGHT (LBS)	316L STAINLESS STEEL MODEL	TITANIUM MODEL
3,000	230	15"	14"	23	**SLV3214**	**TLV3214**
3,000	460	15"	14"	23	**SLV3414**	**TLV3414**
6,000	230	19"	19"	27	**SLV6219**	**TLV6219**
6,000	460	19"	19"	27	**SLV6419**	**TLV6419**
9,000	230	25"	24"	32	**SLV9224**	**TLV9224**
9,000	460	25"	24"	32	**SLV9424**	**TLV9424**
12,000	230	25"	27"	42	**SLV12227**	**TLV12227**
12,000	460	25"	27"	42	**SLV12427**	**TLV12427**
15,000	230	25"	34"	49	**SLV15234**	**TLV15234**
15,000	460	25"	34"	49	**SLV15434**	**TLV15434**

BAYONET HEATERS

Super-efficient heaters have a 36" corrosion-resistant thermoplastic flexible conduit and a watt density of 35 watts/sq.in. Heavy-duty, 2" diameter tube (1-kW models are 1¼" tubes). Will work in high-viscosity liquids.

Single Tube Bayonet Heaters—Single phase.

WATTS	VOLTS	LENGTH	COLD ZONE	HOT ZONE	WEIGHT (LBS)	316L STAINLESS STEEL MODEL	TITANIUM MODEL
1,000	115	11"	4"	7"	5	**S1107**	**T1107**
1,000	230	11"	4"	7"	5	**S1207**	**T1207**
2,000	115	17"	7"	10"	9	**S2109**	**T2109**
2,000	230	17"	7"	10"	9	**S2209**	**T2209**
2,000	460	17"	7"	10"	9	**S2409**	**T2409**
3,000	230	22"	8"	14"	11	**S3214**	**T3214**
3,000	460	22"	8"	14"	11	**S3414**	**T3414**
4,000	230	29"	10"	19"	13	**S4218**	**T4218**
4,000	460	29"	10"	19"	13	**S4418**	**T4418**
5,000	230	35"	10"	25"	16	**S5225**	**T5225**
5,000	460	35"	10"	25"	16	**S5425**	**T5425**

Triple Tube Bayonet Heaters—Three phase.

Heavy-duty 2" diameter tubes (3-kW models are 1¼" tubes).

WATTS	VOLTS	LENGTH	COLD ZONE	HOT ZONE	WEIGHT (LBS)	316L STAINLESS STEEL MODEL	TITANIUM MODEL
3,000	230	11"	4"	7"	15	**S3207**	**T3207**
3,000	460	11"	4"	7"	15	**S3407**	**T3407**
6,000	230	17"	7"	10"	32	**S6209**	**T6209**
6,000	460	17"	7"	10"	32	**S6409**	**T6409**
9,000	230	22"	8"	14"	36	**S9214**	**T9214**
9,000	460	22"	8"	14"	36	**S9414**	**T9414**
12,000	230	29"	10"	19"	40	**S12218**	**T12218**
12,000	460	29"	10"	19"	40	**S12418**	**T12418**
15,000	230	35"	10"	25"	46	**S15225**	**T15225**
15,000	460	35"	10"	25"	46	**S15425**	**T15425**

1.5–4kW models

6–18kW models

IN-LINE HEATERS

The Aqua Logic® in-line heaters are easy to install and available in both stainless steel and titanium. Stainless steel models are excellent for a variety of applications such as koi ponds and freshwater recirculating systems. Titanium models are ideal for saltwater systems and hydroponic systems that have nutrients in the water that would cause failure in stainless steel heaters. Designed for indoor use or outdoors (if protected from the sun and direct weather), these robust, durable heaters pack a lot of kilowatts into a very compact package. CE approved.

- Easy to set digital temperature controller °F or °C
- Safety high limit switch to prevent overheating with manual reset
- Reversible flow switch allowing water input from either direction (1.5–4 kW models)
- Floor or wall mount

316 Stainless Steel Models

MODEL	KW	VOLTS	PHASE	AMPS	L	W	H	(LBS)
SSIL1	1.5	115	1	13	23"	6"	8.5"	12.00
SSIL2	2	115	1	17.4	23"	6"	8.5"	12.00
SSIL3	2	220	1	9	23"	6"	8.5"	12.00

Pure Titanium Models

MODEL	KW	VOLTS	PHASE	AMPS	L	W	H	(LBS)
TIL1	1.5	115	1	13	23"	6"	8.5"	12.00
TIL2	2	115	1	17.4	23"	6"	8.5"	12.00
TIL3	2	220	1	9	23"	6"	8.5"	12.00
TIL4	3	220	1	13.6	23"	6"	8.5"	12.00
TIL5	4	220	1	18	23"	6"	8.5"	12.00
TIL06	6	220	1	28	23.5"	8"	8.75"	13.00
TIL07	6	220	3	16	23.5"	8"	8.75"	14.00
TIL08	8	220	1	37	23.5"	8"	8.75"	13.00
TIL09	8	220	3	21	23.5"	8"	8.75"	14.00
TIL012	12	220	1	55	23.5"	8"	8.75"	13.00
TIL013	12	220	3	32	23.5"	8"	8.75"	13.00
TIL015	15	220	3	40	23.5"	8"	8.75"	13.00
TIL018	18	220	3	48	23.5"	8"	8.75"	13.00

Note: All three phase models use a delta configuration. Larger models available.

LIFETIME WARRANTY-TITANIUM HEAT EXCHANGER
10-YR WARRANTY - COMPRESSOR PARTS/LABOR

COMPARING THE COST TO HEAT YOUR BODY OF WATER OR AQUACULTURE SYSTEM

HEATER/FUEL TYPE	COST	BTU/$1.00
ELECTRIC	$.1065/KWH	32,000
LP GAS	$1.87/GAL	40,100
OIL	$2.22/GAL	47,200
NATURAL GAS	$1.218/THERM	67,300
XLHP HEAT PUMP	$.1065/KWH	185,600

XLHP™ HIGH PERFORMANCE HEAT/COOL PUMPS

With today's record energy costs, there's never been a better time to invest in a Pentair Aquatic Eco-Systems XLHP High Performance Heat/Cool pump. Compared to gas, oil or electric heaters, XLHP High Performance Heat/Cool Pumps use just a fraction of the energy to generate the same amount of heat. In fact, just 20¢ worth of electricity produces $1.00 worth of heat generated by other methods.

More standard features than any other

- Both the 120BTU and 140BTU model are capable of heating and/or cooling the water. Full heat/cool functionality.
- Provides an AutoSet Temperature Control feature as standard. It monitors water temperature and turns the pump on and off as needed, overriding the time clock to maintain desired temperature for convenient, hands-free control.
- Features the legendary Emerson® Copeland Scroll® Compressor that's more efficient, durable, reliable and quieter than any piston-driven compressor.
- EPA-recognized, environmentally safe, non-ozone depleting R-410A refrigerant.
- 100% titanium heat exchanger assures corrosion-free performance for extra long life and value.
- LCD control board displays an intuitive, menu-driven readout with easy to follow, full word messages—no codes to memorize.
- Self-diagnostic software continuously monitors system for peak performance.
- Thermostatic Expansion Valve (TXV) controls refrigerant flow for optimum efficiency and BTU output over a wider operating temperature range.
- Automatic defrost feature senses refrigerant temperature and helps prevent the XLHP™ heat pump from freezing, allowing the unit to operate effectively at even lower temperatures than many competing products.
- ETL listing is your assurance of safer, dependable operation.
- BTU and efficiency independently certified by the Air Conditioning, Heating, and Refrigeration Institute (AHRI). The AHRI Certified mark is applied only to HVACR equipment and components that have been independently tested to certify that manufacturers' performance claims are accurate.
- Maximum working water pressure is 50PSI.

MODEL		BTUH CAPACITY HEATING	BTUH CAPACITY COOLING	COP* RATING HEATING	COP* RATING COOLING	60 HZ VOLTS	PHASE	BREAKER RATING	FLOW (GPM) MIN-MAX	SHIP WT (LBS)
460900-AQ	HEAT PUMP XLHP 120 HEAT/COOL	127,000	71,000	5.4	4.1	230	1	50 AMPS	30-120**	278
460901-AQ	HEAT PUMP XLHP 140 HEAT/COOL	140,000	80,000	5.7	4.1	230	1	50 AMPS	30-120**	320

*Coefficient of performance. ** If system flow rate exceeds 120gpm, a bypass valve is required.

HEAT PUMPS FW SW

They heat and cool!

Titan Air Cooled Heat Pumps by Aqua Logic® are designed for a wide range of applications such as a public aquarium, aquaculture facility, government or university research institution or hydroponics operation. All units are suitable for outdoor installation (but should be protected from direct weather). Heat pumps up to 5hp have a special "Spine Fin" condenser coil which has proven to have superior heat transfer performance and capacity over traditional radially finned heat exchangers. This style condenser also has a much greater resistance to corrosion in harsh environments such as moist salty air or chemically tainted rainwater.

In the cooling mode, the heat pump works as a chiller, cooling water to the temperature you select. In the heating mode, the heat pump works with the liquid refrigerant (Freon) flow in reverse. Freon absorbs heat from the air as it moves thru the condenser. As it heats, the Freon becomes a gas, which is then compressed by the compressor. The heat carried by the Freon is then released into the titanium heat exchanger and transferred into the circulated water.

These models feature titanium helix coils and powder-coated shrouds. 2" PVC slip, in and out fittings on 2–10 hp; 3" PVC slip on larger units. 230V models listed; 460V also available. Dual stage digital temperature controller is enclosed in a NEMA4X enclosure with easy 3 push button programming and will maintain water temperatures in the range from 45°-85°F (7 to 24°C); you must specify desired temperature operating range when ordering. Units will lose heating efficiently when air temperature is under 45°F (7°C). Note min/max flow requirements (water pump not included). The controller can display in either °F or °C and will maintain the water within 1 degree of the set point.

Water pressure should not exceed 40 psi. Allow a 4-week build time. Ship from factory via vmotor freight. One-year warranty. Made in USA.

- Heat or Chill with one unit
- Titanium Heat Exchanger
- Fresh or Saltwater use
- Dual Stage Temperature Controller

1½–5 HP Models

7½ & 10 HP Models

MODEL	HP	NOMINAL BTUH**	KW	VOLTS*	PHASE	AMPS RLA / LRA	FLOW (GPM) MIN-MAX	AIR OUTLET (CFM)***	L	W	H	SHIP WT (LBS)
HP1	1½	18,000	5.2	208-230	1	5.9 / 38.6	20 -40	1,550	38	26	62	406
HP2	2	24,000	7	208-230	1	8.7 / 57.8	20 -40	1,550	38	26	62	389
HP3	3	36,000	10.5	208-230	1	17.6 / 79	20 -40	4,385	48	35	62	500
HP33	3	36,000	10.5	208-230	3	7.8 / 75	20 -40	4,385	48	35	62	495
HP4	4	48,000	14	208-230	1	18.6 / 93.4	30-60	2,500	48	35	71	518
HP43	4	48,000	14	208-230	3	11.7 / 100.1	30-60	2,500	50	35	71	515
HP5	5	60,000	17.5	208-230	1	25 / 148	30-60	3,700	50	35	71	553
HP53	5	60,000	17.5	208-230	3	17.3 / 123	30-60	3,700	58	35	71	538
HP7.5	7½	90,000	26.3	208-230	3	29 / 164	60-120	6,530	50	43	68	667
HP7	10	120,000	35	208-230	3	36 / 225	60-120	9,800	61	48	74	850
HP15	15	175,000	52.7	208-230	3	60 / 164	120-180	9,750	112	54	75	1578
HP20	20	240,000	74.3	208-230	3	83 / 267	120-180	9,750	112	54	89	1657

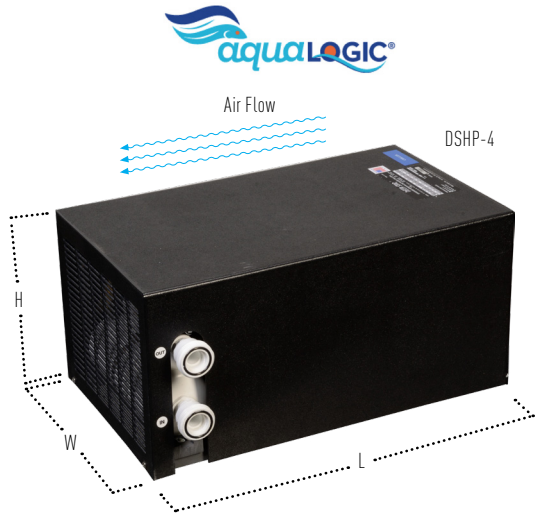
*460V options available. **ARI net cooling capacity. ***Amount of hot air discharged from unit when operating.

AIR COOLED HEAT PUMPS FW SW

Aqua Logic® Delta Star® Air Cooled Heat Pumps automatically handle both heating and cooling duties in fresh and saltwater applications. Titanium heat exchangers mean you get the best in corrosion resistance. A properly sized and installed heat pump will provide stable, controlled water temperature. Heat pumps include a dual stage digital temperature controller in a NEMA 4X-rated waterproof enclosure and will maintain water temperatures from 40–85°F (5–29°C). Controller will keep the temperature within 1° of the set point in °F or °C. Heat pumps should be mounted indoors where air temperatures stay above 55° F. One-year warranty. Made in USA.

Note: When in heating mode, place the unit in a drip pan that has a drain connection as condensation can form a water puddle around the unit.

- Heat or Chill with one unit
- Fresh or Saltwater use
- Compact Design
- Quiet Operation
- Dual Stage Digital Controller
- Ozone Friendly Refrigerant (134A)



MODEL	HP	NOMINAL BTUH	KW	VOLTS	PHASE	AMPS	IN/OUT (FPT)	FLOW (GPM) MIN-MAX	AIR OUTLET (CFM)	L	W	H	SHIP WT (LBS.)
DSHP-4	1/3	4,000	1.1	115	—	7.2	3/4"	10–20	260	22½"	14¼"	14"	90
DSHP-5	½	6,000	1.75	115	—	9.5	1½"	12–25	350	24"	15½"	16"	135
DSHP-6	½	6,000	1.75	230	1	4.8	1½"	12–25	350	24"	15½"	16"	135
DSHP-7	¾	9,000	2.7	115	—	13	1½"	15–30	590	24"	21"	15"	170
DSHP-8	¾	9,000	2.7	230	1	7	1½"	15–30	590	24"	21"	15"	170
DSHP-9	1	12,000	3.4	230	1	7.2	1½"	20–35	610	27"	24"	15"	180
DSHP-10	1½	21,000	6.1	230	1	10.5	1½"	25–40	772	31"	26"	19"	225

Do not operate in heat mode below 55°F air temperature.

TECH TALK

Heater Sizing

If you are bringing water into your facility that must be heated, you can use an electric heater for all or just a portion of your heating. For instance, you may use solar, waste heat or room heaters first and use thermostatically controlled electric heaters as the final temperature control.

To determine the approximate size heater to order, choose ONE of the three categories ... then follow the calculation.

1. Recirculating

In a nonflowing system, heat is only lost to the surrounding air. The temperature difference between the ambient air and the water is the biggest factor. Also, the open area of the tank, the amount of agitation and the heat loss through the tank walls should be considered. All external pipes, filters, pumps, etc. will further cool the water.

For every 9°F (5°C) difference, there should be 4 W of heat per gallon (3.8 liters) of water. Elevated, uninsulated tanks with a large amount of surface agitation, could require as much as 12 W per gallon per 9°F. For small glass aquariums use 8 W per gallon per 9°F.

2. Temperature Raising Only

Cool water is used to fill tanks, and the water needs to be warmed before the fish are added. Time and ambient temperature will be considerations. For every 1,000 gallons (3,800 liters), 1,200 W (1.2 kW) are needed to raise the temperature 10°F (6°C) in 24 hours (this assumes ambient temp is the same as the water).

3. Flow-Through Heating

A flow-through system has cool water entering and warmed water leaving (this is very wasteful and expensive without heat exchangers). Determine the maximum gallons per minute that you expect and the greatest temperature difference.

1,000 W (1 kW) will raise the temperature of 6 gallons of water (23 liters) 1°F (.55°C) per minute.

Example: 6 gpm with a 10°F difference = 10 kW.

Quick Heater Sizing Guide for Non-Flow-Through Calculation

It's difficult to simplify something that is complicated, but use this quick reference chart to estimate the size of an electric heater.

A tank with 1,000 gallons is in a room that will stay around 60°F, and you want the water temperature to be 87°F. If 4 W per gallon are needed for every 9°F, then:

DT = 27°, 27 ÷ 9 = 3, 3 x 4 W = 12 W per gallon, 12 W x 1,000 gallons = 12,000 W.

Assumes one large, uninsulated, uncovered fish tank plus one peripheral (such as a sand filter) and a pump with no extreme water/air interface (such as splash aerator or degassing tower). Minimize heater size and power use by insulating and covering.

Follow the chart to keep the water at desired temperature, but if a few degrees of temperature loss is tolerable during brief periods of cold weather, use that temperature on the chart.

For more accurate sizing, contact our technical department at 877-347-4788.

Tank Size (gallons)	Temperature Difference (°F) 9°	13.5°	18°	22.5°	27°
	Watts				
250	1,000	1,500	2,000	2,500	3,000
400	1,600	2,400	3,200	4,000	4,800
550	2,200	3,300	4,400	5,500	6,600
700	2,800	4,200	5,600	7,000	8,400
850	3,400	5,100	6,800	8.500	10,200
1,000	4,000	6,000	8,000	10,000	12,000

Round up when in between wattages.

WATER TO WATER HEAT EXCHANGER PACKAGES

Aqua Logic® complete, water-to-water heat exchanger packages are engineered for hot and cold water loop systems. The compact design and quiet operation make these systems perfect for indoor applications. Each package includes titanium heat exchanger, Schedule 40 PVC plastic shell (CPVC shell is available for an additional cost when the hot water supply is greater than 120°F), 304 stainless steel frame and hardware, digital temperature controller, water solenoid valve, flow meter, in-line strainer and customized plumbing. This system only requires an 115V power source and a hot or cold water supply. Prices are FOB CA.

- Fresh or saltwater Use
- Titanium Tube in a PVC Shell
- Preassembled and Ready for Easy Installation

Note: These heat exchangers directly absorb or reject heat from the tank system water into another water source (hot or cold). BTU capacities in the chart are based on the specific water temperature and flow rates shown. If any of these parameters change, the BTU removal capacity will change, and the heat exchanger may not meet your systems requirements. Contact us so we can assist you in the proper sizing of the equipment for your specific application.

HX-4W to HX-12W models

HX-24W to HX-60W models

HX-90W to HX-240W models

MODEL	NOMINAL BTUH*	KW	PROCESS WATER IN/OUT	PROCESS WATER FLOW (GPM)	COLD/HOT WATER IN/OUT	COLD/HOT WATER FLOW (GPM)*	L	W	H	SHIP WT. (LBS)
HX-3W	3000	0.9	¾" FPT	15	½" FPT	0.6 / .3	21"	6¼"	19"	30
HX-4W	4000	1.1	¾" FPT	20	½" FPT	0.8 / .4	23"	6¼"	19"	30
HX-6W	6000	1.7	1½" FPT	25	½" FPT	1.2 / .6	24½"	6¾"	19"	35
HX-9W	9000	2.6	1½" FPT	30	½" FPT	1.8 / .9	31"	6¾"	19"	35
HX-12W	12000	3.5	1½" FPT	35	½" FPT	2.4 / 1.2	34½"	6¾"	19"	40
HX-24W	24000	7	2" SLIP	40	½" FPT	5 / 2.5	34"	14"	23"	138
HX-36W	36000	10.5	2" SLIP	40	¾" FPT	7 / 3.5	41"	14"	23"	154
HX-48W	48000	14	2" SLIP	60	¾" FPT	10 / 5	49"	14"	23"	160
HX-60W	60000	17.5	2" SLIP	60	¾" FPT	12 / 6	56½"	14"	23"	207
HX-90W	90000	26.3	3" SLIP	90	¾" FPT	18 / 9	13½"	25"	43"	215
HX-120W	120000	35.1	3" SLIP	120	1" FPT	24 / 12	13½"	25"	53"	225
HX-180W	180000	52.7	3" SLIP	145	1½" FPT	36 / 18	13½"	25"	72"	232
HX-240W	240000	70.2	3" SLIP	180	1½" FPT	48 / 24	13½"	25"	82"	250

*Flow rate (gpm) and (BTU) rating is based on 40°f ewt @ 10°f Δ t (cold) or 180°f ewt @20 °f Δ t (hot) water supply.

AIR-COOLED WATER CHILLERS FW SW

Aqua Logic® Multi Temp Air-Cooled Water Chillers are used in aquaculture, public aquariums, live seafood holding and hydroponics systems. These large chillers have an insulated heat exchanger with titanium helix coils and commercial duty condensing units mounted on a stainless steel frame with bolt down leg tabs. Suitable for outdoor installations, but should be protected from direct weather. Digital temperature controller is in a splash-proof NEMA box with easy push-button programming. Controller displays in either °F or °C. Chillers operate between 40–80°F (4.5–27°C). Chillers 2–10 HP have a 2" slip inlet/outlet (15 HP and larger models have 3" inlet/outlet) and installed water flow switch to shut them down should flow to the heat exchanger stop. Water pressure should not exceed 40 psi. Ship motor freight from factory; allow a 4-week build time. For export, see Aqua Logic® DX Heat Exchanger Packages (see Index). Split models available (add "**-SPLIT**" to part number). One-year warranty. Made in USA.

- Fresh or Saltwater Use
- Insulated, Titanium Heat Exchanger
- Digital Temperature Controller
- Automatic Temperature Ranging
- Water Flow Safety Switch

7½ & 10 HP Models

2–5 HP Models

MODEL	HP*	NOMINAL BTUH**	KW	VOLTS	PHASE	AMPS RLA/LRA	FLOW GPM MIN-MAX	AIR OUTLET (CFM)***	L	W	H	SHIP WT (LBS)
MT-1	2	24,000	7	208 - 230	1	9 / 58	20-40	1,550	44	33	62	370
MT-3	3	36,000	10.5	208 - 230	1	14 / 72	20-40	2,175	44	33	66	396
MT-4	3	36,000	10.5	208 - 230	3	12 / 77	20-40	2,175	44	33	66	386
MT-5	4	48,000	14	208 - 230	1	21 / 109	30-60	2,500	51	38	62	474
MT-6	4	48,000	14	208 - 230	3	15 / 91	30-60	2,500	51	38	62	474
MT-7	5	60,000	17.5	208 - 230	1	27 / 158	30-60	3,700	56	38	70	520
MT-8	5	60,000	17.5	208 - 230	3	19 / 137	30-60	3,700	56	38	70	528
MT-9	7.5	90,000	26	208 - 230	3	28 / 164	60-120	6,530	48	42	68	670
MT-10	10	120,000	35	208 - 230	3	35 / 225	60-120	9,800	58	46	68	815
MT-15	15	180,000	52.7	208 - 230	3	55 / 164	120-180	9,750	112	56	75	1,559
MT-20	20	254,000	74.3	208 - 230	3	83 / 267	120-180	9,750	112	56	89	1,714

*Larger sizes and 460 voltage options available. **ARI net cooling capacity. ***Amount of hot air discharged from unit when operating.

PENTAIR AQUATIC ECO-SYSTEMS SPARUS™ PUMP WITH CONSTANT FLOW TECHNOLOGY™

- The world's first aquaculture pump to deliver a CONSTANT user-defined flow rate.
- Pump motor speed self-adjusts to maintain the constant flow rate setting, even as system conditions change.
- Fully-programmable for any flow rate from 20–140 gpm.
- 3 hp rating. 230V, single-phase, 50hz/60hz.
- Permanent magnet TEFC motor. 2" ports. UL listed.

- IP55-rated enclosure for robust service life in wet locations and harsh conditions
- Ask about how the Pump Affinity Law can save you money!

See page 58 for more info.

AIR COOLED WATER CHILLERS FW SW

Aqua Logic® Delta Star® in-line, air cooled, water chillers are built with helical titanium evaporator coils for maximum cooling efficiency. Titanium is safe for all aquatic animals in fresh or salt water systems. The low profile design allows for easy placement in tight places and the quiet, internal, spring-mounted hermetic motor/compressor provides years of reliable service.

All chillers come standard with a black ABS cover and digital electronic controller mounted on a 4' cable, remote from the chiller unit. It displays in either Fahrenheit or Celsius the current temperature, set point temperature and has a 1° differential. A direct immersion titanium sensor probe with a 6' cable is included with the controller. Delta Star® chillers are intended for use indoors or, if located outdoors, they must be installed in an enclosure protected from the direct weather in ambient air temperatures between 55°–90°F. If exposed to air temperatures outside of this range then optional ambient air control packages must be factory installed during the manufacturing of the chiller. All chillers require unrestricted air flow thru the condenser and thus must be located in a well-ventilated area. Maximum water pressure for all chillers is 20 psi. Units listed are compatible with 60 Hz current only. **AE3** thru **AE7** are charged with 134A CFC refrigerant, and **AE8** is charged with R-417 refrigerant. Allow 2 weeks for delivery. Prices are FOB CA. Made in USA.

Standard Models: for applications where the temperature to be maintained is in the range of 65°–80°F (18°–27°C) such as reef tanks and warm water fish exhibits.

Option A Models: are cool water units designed for a temperature range of 50°–65°F (10°–18°C) for bait fish and temperate fish species.

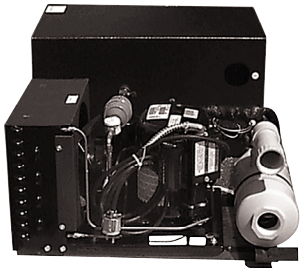
Option B Models: for those applications where the unit will need to maintain a very cold temperature in the range of 40°–80°F (4.5°–27°C) such as lobster tanks, cold water fish exhibits or research applications.

Important Temperature Range Information: Water chillers are built for different water temperatures in order to work efficiently and to provide the full rated BTU output.Please specify operating temperature at time of order.

Options available - bare sensors on controller, dry probe wells for inline sensors, outdoor enclosures, low ambient air controls, high ambient air controls, water flow switches and split systems with indoor heat exchanger and outdoor condensing unit - contact us.

2-YEAR WARRANTY
MOST UNITS SHIP SAME DAY

AE4



AE5 w/o Cover

HP	60 HZ VOLTS	NOMINAL BTUH	AMPS	AIR OUTPUT (CFM)	FLOW (GPM) MIN-MAX	L	W	H	SHIP WT (LBS)	STANDARD MODELS MODEL	OPTION A MODELS MODEL	OPTION B MODELS MODEL
¼	115	3,000	5.4	240	8-15	18¾"	12"	11"	53	**AE3**	**AE3A**	**AE3B**
⅓	115	4,000	7.2	260	10-20	22½"	13"	11"	62	**AE4**	**AE4A**	**AE4B**
½	115	6,000	9.5	350	12-25	23¾"	15¼"	13"	110	**AE5**	**AE5A**	**AE5B**
½	230	6,000	4.8	350	12-25	23¾"	15¼"	13"	112	**AE52**	**AE52A**	**AE52B**
¾	115	9,000	13	590	15-30	24"	20¼"	15¼"	145	—	—	**AE6B**
¾	230	9,000	7	590	15-30	24"	20¼"	15¼"	145	—	—	**AE62B**
1	230	12,000	7.2	610	20-35	25¾"	23¾"	15¼"	150	—	—	**AE7B**
1½	230	21,000	10.5	772	25-40	26¼"	26"	17½"	190	—	—	**AE8B**

WATER COOLED WATER CHILLERS FW SW

These Aqua Logic® Delta Star® inline water cooled water chillers have become very popular in the aquaculture and aquarium industries. These models feature water-cooled condensing units, making them ideal for installations with an existing freshwater supply. They use water to cool the condenser instead of air provided by a fan. Sources of cooling water could include a facility's chilled water loop, municipal water, cooling tower and well or spring water. The chillers' low heat emission and compact size make them perfect for placement in tight spaces with minimal ventilation. Units include ABS cover, temperature controller and a helix titanium coil. Chillers operate within 40–80°F (4.5–27°C). Allow 4 weeks for delivery. Prices are FOB CA, motor freight. One-year warranty. Made in USA.

- Fresh or Saltwater Use
- In-Line Tube In Shell Titanium Heat Exchanger
- Water Cooled Condenser
- Compact Design & Quiet Operation
- Remote Electronic Temperature Controller
- Ozone Friendly Refrigerant (R134A) and model 10WC (R417A)
- Larger Sizes Available

7WC w/ Cover

7WC w/o Cover

5hp water chiller installation.

MODEL	HP	60 HZ VOLTS	NOMINAL BTUH	KW	AMPS	FLOW (GPM) MIN-MAX	*CONDENSER WATER USE (GPM)	WATER IN/OUT FPT	L	W	H	SHIP WT (LBS)
3WC	¼	115	3,000	0.9	5.4	8-15	0.3	¾"	19"	13¾"	11"	65
4WC	⅓	115	4,000	1.1	7.2	10-20	0.5	¾"	22½"	13½"	11"	69
5WC	½	115	6,000	1.75	9.5	12-25	0.7	1½"	24"	15½"	13"	119
6WC	½	230	6,000	1.75	4.8	12-25	0.7	1½"	24"	15½"	13"	119
7WC	¾	115	9,000	2.7	13	15-30	1.0	1½"	25"	21"	15"	150
8WC	¾	230	9,000	2.7	7	15-30	1.0	1½"	25"	21"	15"	150
9WC	1	230	12,000	3.4	7.2	20-35	1.5	1½"	27"	24"	15"	160
10WC	1½	230	21,000	6.1	10.5	25-40	2.0	1½"	31"	26"	19"	250

*Condenser water use based on 55-60°F water temperature entering the unit. Water flows though unit only when the unit is running.

HX-90DX–HX-240DX

CHILLER BARREL PACKAGES

Aqua Logic® DX (Direct Expansion) Heat Exchanger Packages are complete refrigerant-to-water systems that are safe for both fresh and salt water systems. The heat exchanger can be connected to a central refrigerant loop or to a dedicated remote condensing unit. These packages are ideal for overseas installations where the condensing unit can be purchased and serviced locally saving significant freight and importation costs. Nominal BTU capacity is based on using R-134A refrigerant (for models **HX-3DX** thru **HX-12DX**) or R-410A refrigerant (for models **HX-24DX** and larger). If another type of refrigerant will be used, please consult us before ordering. Ship via motor freight. FOB CA. One-year warranty.

- Preassembled and ready to install
- Compact design
- Titanium tube and Schedule 40 PVC shell evaporator
- 304 stainless steel mounting stand and hardware
- Digital temperature controller, TXV, flow switch, moisture indicator
- 24 volt power supply required

Condensing units are also available for each DX Heat Exchanger Package, please refer to the Aqua Logic® Multi-Temp® Air Cooled Water Chillers or Aqua Logic® Titan Air Cooled Heat Pumps and request a "Split" option.

Note: Standard DX heat exchangers are manufactured for connection to cooling-only condensing units and WILL NOT work with a heat pump condensing unit. If being used with a heat pump condensing unit, add "**-HP**" to part number (call for pricing).

HX-4DX–HX-12DX

HX-24DX–HX-60DX

MODEL	HP	NOMINAL BTUH*	KW	FLOW (GPM) MIN/MAX	REFRIGERANT IN/OUT FIPT	PROCESS WATER IN/OUT	L	W	H	SHIP WT (LBS)
HX-3DX	¼	3,000	0.8	8 / 15	1 @ ⅜" / ⅜"	¾" FIPT	23"	7"	18"	25
HX-4DX	⅓	4,000	1.2	10 / 20	1 @ ⅜" / ⅜"	¾" FIPT	25"	7"	18"	28
HX-6DX	½	6,000	1.8	12 / 25	1 @ ⅜" / ½"	1½" FIPT	26"	7"	18"	30
HX-9DX	¾	9,500	2.6	20 / 35	1 @ ⅜" / ½"	1½" FIPT	32"	7"	18"	35
HX-12DX	1	12,000	3.5	25 / 40	1 @ ⅜" / ⅝"	1½" FIPT	35"	7"	18"	38
HX-24DX	2	24,000	7.0	20 / 40	1 @ ⅜" / ⅝"	2" SLIP	29"	14"	26"	129
HX-36DX	3	36,000	10.5	20 / 40	1 @ ⅜" / ⅝"	2" SLIP	36"	14"	26"	148
HX-48DX	4	48,000	14.0	30 / 60	1 @ ⅜" / 1⅛"	2" SLIP	45"	14"	26"	174
HX-60DX	5	60,000	17.5	30 / 60	1 @ ⅜" / 1⅛"	2" SLIP	52"	14"	26"	194
HX-90DX	7.5	90,000	28.0	100 / 180	1 @ ⅝" / 1⅜"	3" SLIP	20"	25"	52"	216
HX-120DX	10	120,000	35.0	100 / 180	1 @ ⅝" / 1⅜"	3" SLIP	20"	25"	62"	253
HX-180DX	15	175,000	51.2	100 / 180	1 @ ⅝" / 1⅝"	3" SLIP	20"	25"	80"	302
HX-240DX	20	223,000	65.3	100 / 180	2 @ ½" / 1⅜"	3" SLIP	20"	25"	92"	337

*For models **HX-3DX** thru **HX-12DX**, nominal BTUH is based on 134A refrigerant. For models **HX-24DX** and larger, nominal BTUH is based on R410A refrigerant.

TLD3

TLC3

2-YEAR WARRANTY

Delta Star®, Cyclone® and Aqua Logic® are registered trademarks of Aqua Logic, Inc.

AIR COOLED TRIMLINE WATER CHILLERS FW SW

These Aqua Logic® *TRIMLINE* air cooled, titanium water chillers have the same reliable design and features as the Aqua Logic® Delta Star® and Cyclone® Chillers but in a more compact package. TITANIUM is the only heat exchanger material proven to be 100% fish and coral safe in saltwater systems. These sleek chillers have a brushed stainless steel enclosure and ABS panel inserts. They use the helical coil heat exchanger design and include a digital temperature controller mounted with a 4' cable, remote from the chiller unit. They display temperature, set point, minimum and maximum in °F or °C. A titanium sensor probe with a 6' cable is included with the controller. ¼ & ⅓ hp models ship ground. Two-year warranty. Made in USA.

The ½ hp *TRIMLINE* Cyclone chillers with drop in coil come with a 6' flexible stainless steel line connecting to a 4" diameter chilling coil. The ¼ & ⅓HP models have 5' flexible line connecting to a 2½" diameter chilling coil.

- Fresh or Saltwater Use
- Compact Design & Quiet Operation
- For Indoor Use Only
- Remote Electronic Temperature Controller
- Ozone Friendly Refrigerant (134A)

Standard Models: For applications where the temperature to be maintained is in the range of 65–80°F (18–27°C) such as reef tanks and warm water fish exhibits.

Option A Models: are cool water units designed for a temperature range of 50–65°F (10–18°C) for bait fish and temperate fish exhibits.

HP	60 HZ VOLTS	NOMINAL BTUH	AMPS	FLOW (GPM) MIN-MAX	L	W	H	IN/OUT FIPT	SHIP WT (LBS)	STANDARD MODELS MODEL	OPTION A MODELS MODEL
DELTA STAR TRIMLINE FLOW-THROUGH MODELS											
¼	115	3,000	5.4	8-15	17"	9"	20½"	¾"	55	**TLD3**	**TLD3A**
⅓	115	4,000	7.2	10-20	19"	9"	21-½"	¾"	60	**TLD4**	**TLD4A**
½	115	6,000	9.5	12-25	21"	9"	23-½"	1-½"	80	**TLD5**	**TLD5A**
½	230	6,000	4.2	12-25	21"	9"	23-½"	1-½"	80	**TLD6**	**TLD6A**
CYCLONE TRIMLINE DROP-IN-COIL MODELS											
¼	115	3,000	5.4	8–15	12"	9"	20-½"	—	55	**TLC3**	**TLC3A**
⅓	115	4,000	7.2	10–20	15-½"	9"	21"	—	60	**TLC4**	**TLC4A**
½	115	6,000	9.5	12–25	15-½"	9"	23-½"	—	80	**TLC5**	**TLC5A**
½	230	6,000	4.8	12–25	15-½"	9"	23-½"	—	80	**TLC6**	**TLC6A**

TECH TALK

Chiller Installation and Sizing Tips

1. Insulate water lines to and from chillers.
2. Insulate as much of the water tank as possible.
3. Keep the chiller well ventilated. The higher the temperature around the chiller, the longer it has to work.
4. Submersible water pumps add heat to the water. If a submersible pump must be used, choose the next size larger chiller.
5. Water must be run through the chiller at all times while unit is on.
6. For tanks smaller than 3,000 gallons, allow 24 hours for initial chilling. For tanks larger than 3,000 gallons, allow 48 hours or more.
7. Reduce biofouling by filtering water prior to chiller. Check the filter often. If it clogs and reduces water flow below the minimum required, freeze damage can occur.
8. Consult the Pentair AES technical department for flow-through and other applications.
9. Ambient air temperature for sizing should be measured directly above the tank to be chilled.
10. An oversized chiller will not cost more to operate, as it only turns on when needed and runs for a shorter time.

Pentair AES Chiller Sizing Chart (in Gallons of Water Cooled) for Uninsulated Tanks

	Temperature Difference From Ambient (F°)			
Hp	10	20	30	40
⅙	90	45	30	23
⅕	144	72	50	40
¼	260	130	90	70
⅓	360	181	130	100
½	550	280	200	154
¾	826	420	300	231
1	1,321	672	500	370
1½	2,115	1,075	800	555
2	2,640	1,320	850	670
3	3,960	1,980	1,275	1,005
4	5,280	2,640	1,700	1,340
5	6,600	3,300	2,125	1,675
8	10,560	5,280	3,400	2,680
10	13,200	6,600	4,250	3,350

Splash aerators, degassing devices, etc., can add a great deal of heat not considered in the above chart. For insulated tanks (at least 2" on all sides), decreased heat loss will require less hp.

SCTK150

SCTK500/SCTK1000/SCTK2000

AQUARIUM CHILLERS

Easy to install high-performance units with titanium exchanger

Get stable, consistent temperatures from these Teco SEACHILL® Tank aquarium chillers. These chillers are easy to install—barbed in-line connections are included, and no hard plumbing is required.

Units have a modern look with sturdy construction and a small footprint. Small and mid-rage units have features that facilitate their placement in tight spaces, cabinets and stands. The digital thermostat with LED display will maintain desired set temperatures within 1°F. Unique to the **SCTK150** is a condenser system that also functions as the unit's chassis—providing an incredible amount of ventilation.

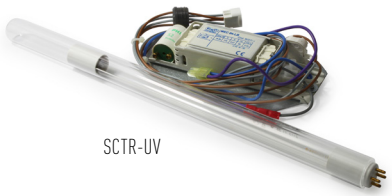
On top of the **SCTK500**, **SCTK1000**, and **SCTK2000** units is a rotatable exhaust conveyor to Direct ventilation in any direction. A front-side filter affixes magnetically for effortless maintenance. A built-in heater helps ensure temperatures stay optimal in most use conditions. 2-year warranty on ⅛–⅓ HP models, and 1-year warranty on ½ and 1 HP models.

2-YEAR WARRANTY
(⅛–⅓ HP MODELS)

TECO® SEACHILL®

SCTK3000/SCTK6000

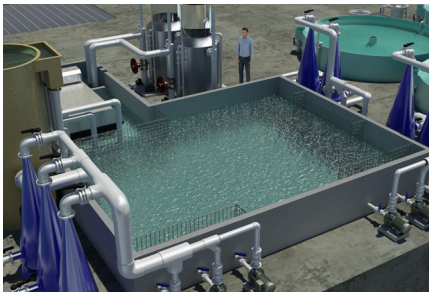
SCTR-FLOW



SCTR-UV

MODEL	HP	VOLTS	HZ	BUILT-IN HEATER	WATTS	FLOW RATE (GPM)	CAPACITY (GAL)	L	W	H	SHIP WT (LBS)
SCTK150	⅛	115	60	-	150	2.5-4.5	UP TO 60	14.2"	8.5"	12.4"	32
SCTK500	⅙	115	60	√	225	3-13	UP TO 120	12.2"	12.2"	16.4"	45
SCTK1000	¼	115	60	√	315	3-13	90-200	12.2"	12.2"	18	50
SCTK2000	⅓	115	60	√	440	3-13	130-150	12.2"	12.2"	19.7"	55
SCTK3000	½	115	60	-	750	4.5-13.5	UP TO 750	23.6"	15.2"	25.6"	85
SCTK6000	1	115	60	-	900	4.5-13.5	UP TO 1,300	23.6"	15.2"	25.6"	90
SCTR-FLOW	FLOW INDICATOR									1	
SCTR-HEAT	HEATER KIT FOR MODELS SCTK3000 AND SCTK6000									1	
SCTR-UV	UV KIT FOR MODELS SCTK3000 AND SCTK6000									2	
SCTR-UVB	UV REPLACEMENT BULB									1	

RECIRCULATING AQUACULTURE SYSTEMS (RAS) TECHNOLOGY WORKSHOP



Dr. Losordo has earned a Bachelor degree in Biology and a Masters degree and Ph.D. in Agricultural Engineering. Involved in aquaculture for 40 years, Dr. Losordo has extensive experience in the research, development, design, and implementation of recirculating aquaculture systems worldwide. Past president of both the World Aquaculture Society and the Aquacultural Engineering Society.

Dr. Thomas M. Losordo

TOPICS THAT WILL BE COVERED DURING THIS 2½-DAY WORKSHOP:

- An introduction to recirculating systems
- Critical considerations before designing recirculating systems
- Component options for use in recirculating production systems
- Developing an appropriate design for your aquaculture application
- The management of recirculating systems
- Waste management issues
- Economic considerations in creating, evaluating and operating recirculating systems

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

AQUAPONICS TECHNOLOGY AND DESIGN WORKSHOP

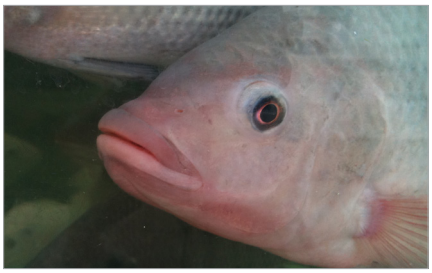
TOPICS THAT WILL BE COVERED DURING THIS 4½-DAY WORKSHOP:

- UVI aquaponic system & UVI-based system at PAES
- Fish production
- Marketing and economics
- Plant production
- Hands-on instruction
- Green Sky Growers rooftop greenhouse tour
- "Behind the Seeds Tour" at The Land at Epcot®

For more information about educational courses offered by Pentair Aquatic Eco-Systems, please email PAES.General@Pentair.com.

"Teaching at the aquaponics course sponsored by Pentair Aquatic Eco-Systems (PAES) was a real treat for me because PAES employees have an incredible depth of experience and knowledge that they share with their students as they guide them through all phases of constructing and operating an aquaponic system to establish a successful hobby or business."

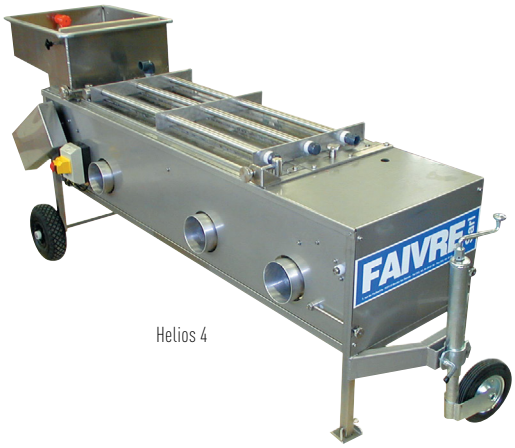
Dr. James Rakocy, "Father of Aquaponics"



FAIVRE FISH GRADERS

- Over 1,000 models in use worldwide!
- Grade trout, Atlantic and Pacific salmon, eel, sea bream, carp, sea trout, cod, tilapia and other species.

The high capacity and excellent workmanship of these live fish graders is what makes them so popular worldwide. Graders use a SPS grading technology that is very reliable and accurate. They have a graduated stainless steel channel through which the fish are lead by nylon finger rods running underneath the channel. As soon as the gap between the two side walls is wide enough, the fish fall down into one of the sections. Graders are light, compact and easy to move about a farm or hatchery. Made from aluminum and 316 stainless steel, they are both fresh and salt water compatible. Graders are available in both 115/230V, 50/60 Hz and ship via motor freight.



Helios 4

HELIOS 4 GRADERS

Helios 4 models have a channel length of 51" and a maximum grader opening size of 1.1". They have a maximum capacity of one ton per hour and require a water flow of 53 gpm to operate. Graders measure 99" L x 20" W x 49" H and weigh 243 lbs.

CALL FOR MORE INFORMATION AND PRICING.

SPECIES	TROUT/SALMON	BASS/BREAM	TILAPIA
MODEL	HELIOS 4	HELIOS 4S	HELIOS 4T
# OUTLETS	3 X 5"	3 X 5"	3 X 5"
FISH SIZE (MIN/MAX)	1 G/150 G	2.5 G/100 G	1 G/100 G

HELIOS 30 GRADERS

Helios 30 models have a channel length of 79" and a maximum grader opening size of 1.65". They require a water flow of 176 gpm to operate and have three grading speeds and two telescopic legs with crank. Measure 138" L x 39" W x 52" H and weigh 420 lbs.

CALL FOR MORE INFORMATION AND PRICING.

SPECIES	TROUT/SALMON	BASS/BREAM	TILAPIA
MODEL	HELIOS 30	HELIOS 30S	HELIOS 30S
# OUTLETS	6 X 6.25"	6 X 6.25"	6 X 6.25"
FISH SIZE (MIN/MAX)	5 G/1,000 G	5 G/600 G	2 G/600 G
FLOW (FISH PER HOUR) 10 G	60,000	30,000	50,000
FLOW (FISH PER HOUR) 100 G	40,000	25,000	35,000
FLOW (FISH PER HOUR) 200 G	30,000	20,000	30,000

Helios 30

HATCHING JAR

This McDonald-type hatching jar has become the industry standard. One-piece molded design allows a smooth interior—no lips or gaps for eggs to get caught on or bacteria to grow. It is a high-impact, all-plastic egg hatching system. Simply direct about 1 gpm of water (depending on the weight of the eggs) into the center. The eggs will be uniformly rotated.

The fish hatching jar comes with a 1,000-micron top screen that prevents the loss of eggs. When the fish hatch, remove the screen to let the fish swim out. Use it for trout, salmon, hybrid striped bass, catfish, tilapia and many others. Height 18", diameter 6¼", 6 liter capacity for approximately 100,000 trout eggs. Case quantity is 4. Price breaks available up to 12+ (call).

MODEL		SHIP WT (LBS)
J30	HATCHING JAR	4
J6	TUBE, REPLACEMENT	1
J8	SCREEN, REPLACEMENT	

JAR HANGER

The all-plastic hanger allows above jars to be used without a bench or stand. Accepts up to 1½" hanging lip.

MODEL
JH


Top Screen (J8)

Jar and hanger sold separately.

Helios 40

HELIOS 40 GRADERS

Helios 40 models have a channel length of 98" and a maximum grader opening sizeof 2.56". They require a water flow of 176 gpm to operate and have three grading speeds and two telescopic legs with crank. Measure 154" L x 39" W x 52" H and weigh 420 lbs.

CALL FOR MORE INFORMATION AND PRICING.

SPECIES	TROUT/SALMON	BASS/BREAM	TILAPIA
MODEL	HELIOS 40	HELIOS 40S	HELIOS 40S
# OUTLETS	8 X 8"	8 X 8"	8 X 8"
FISH SIZE (MIN/MAX)	5 G/1,500 G	5 G/800 G	2 G/800 G
FLOW (FISH PER HOUR) 10 G	60,000	30,000	50,000
FLOW (FISH PER HOUR) 100 G	40,000	25,000	35,000
FLOW (FISH PER HOUR) 200 G	30,000	20,000	30,000

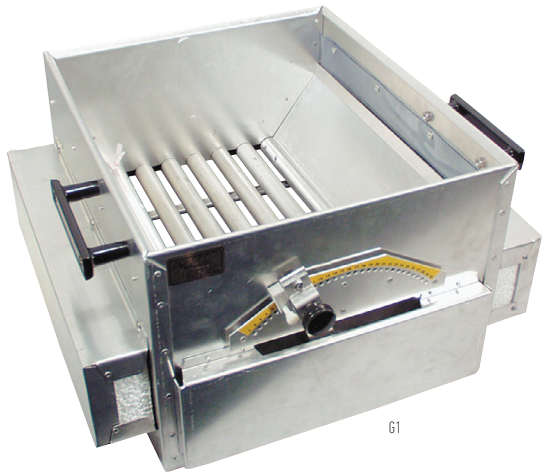
HELIOS 50 GRADERS

Helios 50 models have a channel length of 98" and a maximum grader opening size of 2.95". They require a water flow of 176 gpm to operate and have three grading speeds and two telescopic legs with crank. Measure 154" L x 48" W x 59" H and weigh 665 lbs.

CALL FOR MORE INFORMATION AND PRICING.

Helios 50

SPECIES	TROUT/SALMON	BASS/BREAM	BREAM	TILAPIA
MODEL	HELIOS 50	HELIOS 50S	HELIOS 50S	HELIOS 50S
# OUTLETS	8 X 10"	8 X 10"	8 X 10"	8 X 10"
FISH SIZE (MIN/MAX)	5 G/2,500 G	5 G/2,000 G	5 G/2,000 G	5 G/2,000 G
FLOW (FISH PER HOUR) 10 G	60,000	30,000	50,000	50,000
FLOW (FISH PER HOUR) 100 G	40,000	25,000	35,000	35,000
FLOW (FISH PER HOUR) 200 G	30,000	20,000	30,000	30,000


G1

FLOATING FISH GRADERS, ADJUSTABLE

Here are two easy-to-use, floating fish graders built to last a lifetime. Sturdy aluminum construction will stand up to rough handling and tough fish. The grader floats at the right depth and the large diameter grader bars pass undersized fish damage-free. Size adjustments are quick and accurate from a single lever with locking handle position. In seconds, select any of 30 gradations between ¼" (6.4 mm) and 1⅛" (29 mm) for **G1** and 50 gradations between 5⁄32" (4 mm) and 1⅜" (35 mm) for **G1B**. Grader bars are 11⁄16" (27 mm) diameter. **G1B** ships Oversize. Made in USA.

MODEL	INSIDE DIMENSIONS	DEPTH TO BARS	ACTUAL WT
G1	17" L X 15" W X 11½" D	7½"	16 LBS
G1B	28" L X 21" W X 16" D	11"	36 LBS

PR AQUA HEATHRO™ LIVE FISH & SHRIMP PUMP

To protect your investment during handling operations, you need a safe, gentle, fast way to transfer fish. Aquaculturists around the world use the Heathro Pump to move salmon, trout, char, tilapia, hybrid striped bass, mackerel, anchovy, yellowtail, shrimp, and other species.

The Heathro Pump makes it easier to move fish and shrimp efficiently and safely. The continuous pumping action keeps fish in the water at all times minimizing damage and increasing output. One operator can move up to 10 tons per hour, reducing labor costs and eliminating the need to lift heavy nets and buckets.

Product Highlights

- Cart-mounted pump includes a stainless steel cart with large pneumatic tires.
- Industrial self-priming pump
- Fish and shrimp can be transferred over long, horizontal distances. The maximum combined lift is 26.2 ft/8 m.
- Cast aluminum, hand-polished, single vane impellor is balanced to ensure precision.
- Optional wireless remote control is available.

PR Aqua™
A PENTAIR AQUATIC ECO-SYSTEMS™ Division

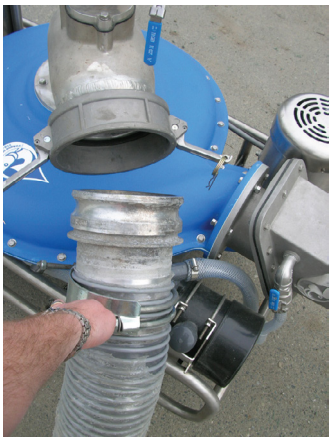
Electric model with optional remote control

Gas-powered model

Submersible model

FISH PUMP TECHNICAL SPECIFICATIONS

WEIGHT	200 kg (440 lbs)
DIMENSIONS (LXWXH)	170 x 81 x 119 cm (67 x 32 x 47 in)
INLET SIZE	150 mm (6 in) reduce to 100 mm (4 in) or 50 mm (2 in)
OUTLET SIZE	150 mm (6 in) reduce to 100 mm (4 in) or 50 mm (2 in)
MIN. FISH SIZE	0.05 g
MAX. FISH & SHRIMP SIZE	400 g (0.88 lbs) (based on Salmonid), Greater than U-10 size
MAX. PUMP OUTPUT	2,400 lpm (635 gpm)
PUMP SPEED	200 to 800 rpm
MAX. PUMP HEAD	5 m (17 ft)
MAX. PUMP SUCTION	3 m (10 ft)
HORIZONTAL TRANSFER	500 m (1,500 ft)
POWER OPTIONS	50 or 60 Hz 1 or 3 phase electric motor 9-horsepower gasoline motor



Easy-to-change fittings

MODELS AND CONFIGURATIONS

- Cart-mounted pumps: Both electric and gasoline powered models are available.
- Submersible pump: This model can be used in raceways, drain sumps and ponds.
- Inlet and outlet configurations: Pumps are easily reduced for 6-inch, 4-inch, and 2-inch hoses, which can safely move eggs and fish up to 400 g in size (based on Salmonid). Shrimp ranging from post-larval size to U-10 size or larger.

Heathro Pump with 6-inch to 4-inch camlock reducers

Heathro Pump with optional 3M Scotchkote™ fittings

PESCALATOR™ FISH ELEVATOR

The PR Aqua Pescalator is an ingenuous fish transport device that uses the Archimedean screw to gently lift fish out of ponds, raceways, or net pens for grading, vaccinating, sorting, or harvesting. Fish remain in the water at all times to reduce stress and harm. Easy to set up and relocate the Pescalator saves time and money. Many farmers entrust their broodstock with this innovative solution for their fish transfer needs.

Product Highlights

- Built-in fish attraction system
- Wide range of speed and angle adjustments
- Translucent UV-stabilized fiberglass cylinder allows for continuous monitoring
- Custom lengths available

JUMBO PESCALATOR	
DIAMETER	Main tube 3 ft, Inlet 5 ft
FISH SIZE	50 g to 25 kg (based on Salmonid)
CAPACITY	10 tonnes/hour
LENGTH	Up to 36 ft
WEIGHT	Varies depending on length
POWER	Electric or hydraulic

DIGITAL BENCH SCALES

The Ohaus Defender® 3000 Series is ideal for general weighing and simple counting applications in production, packaging, warehouse, inventory, shipping and receiving areas. Features a simple, yet rugged, tubular-frame base design and indicators with tactile keys, 1 inch high LCD weight display with high-contrast backlight, built-in rechargeable battery operation and flexible mounting capabilities. Parts counting mode with selectable sample sizes, last sample size and average piece weight data. T31P indicator features a high-impact durable ABS housing with reversible face for either wall, column or table-top mounting. One-year warranty.

- Measures in grams, kilograms, ounces, pounds, pound:ounce
- Maximum resolution 1:6000-7500d
- 304 stainless steel pan with painted carbon steel frame and aluminum IP67 load cell
- Adjustable non-slip rubber leveling feet with externally visible level indicator
- Built-in RS232 for printing and data connection
- Easy to operate with 4-key membrane keypad with raised tactile keys.
- AC adapter and internal rechargeable lead acid battery

MODEL	CAPACITY (LBS/KG)	READABILITY (LBS/G)	PLATFORM SIZE	SHIP WT. (LBS)
D66	66/30	0.01/5	14"X12"	33.0
D132	132/60	0.02/10	14"X12"	33.0
D330	330/150	0.05/20	21.7"X16.5"	51.0
D660	660/300	0.1/50	25.6"X19.7"	82.0

SP200

PORTABLE TOP LOADING SCALES

The OHAUS CL Compact scales are lightweight, portable scales perfectly suited for use in industrial, quality control, formulation, and dietary weighing. Rugged housing with integral platform ring for stacking and storing. One-year warranty.

- Durable ABS platform and housing
- Simple 2-button keypad
- RF protection for use near cell phones and production areas

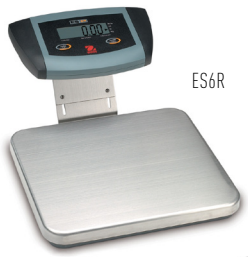
MODEL	CAPACITY (GRAMS)	READABILITY (GRAMS)	PLATFORM	SHIP WT. (LBS)
SP200	200	0.1	12.75"	1.3
SP2000	2000	1.0	12.75"	1.3
SP5000	5000	1.0	12.75"	1.3

COMPACT DIGITAL BENCH SCALES

The OHAUS SD Series Compact Bench Scales are perfect for shipping, receiving, and general bench applications. Easy two-button operation and a large LCD display help guarantee accurate and unmistakable results. The three-way mounting bracket allows you to mount the indicator to the scale base, above the scale platform, or on any vertical surface. AC adaptor (included) or three C batteries (not included). One-year warranty.

- Measures in kilograms and pounds
- Painted steel platform and frame
- Includes software for weighing, display hold and dynamic weighing

MODEL	CAPACITY (LBS/KG)	READABILITY	PLATFORM DIA.	SHIP WT. (LBS)
SC77	77/35	0.05LB/20G	12.4"X11"	8.1
SC165	165/75	0.1LB/50G	20.5"X15.7"	9.5
SC440	440/200	0.2LB/0.1KG	20.5"X15.7"	36.0


ES6R


ES100L

DIGITAL BENCH SCALES

The Ohaus ES Series contains large LCD, membrane keypad, autozero tracking and stability indicator. The 3-way mounting bracket allows the ABS plastic indicator to be mounted to the scale base, above the scale platform or on any ver tical sur face. Powered by a 9V adapter (included) or six A A batteries (not included). Indicator stand is 4". Stainless steel platform and painted steel frame. One-year warranty.

- Measures in kilograms, ounces, pounds, pound:ounce (except model **ES200L**)
- Low-profile platform
- 3-way mounting bracket included (column, wall and platform)

MODEL	CAPACITY (LBS/KG)	READABILITY (LBS/G)	PLATFORM SIZE (IN/MM)	SHIP WT. (LBS)
ES6R	13.2/6	.005/2	12.2X10.8/310X270	10
ES30R	66/30	.05/10	12.2X10.8/310X270	10
ES50R	110/50	.05/20	12.2X10.8/310X270	10
ES100L	220/100	0.1/50	20.5X15.7/520X400	36
ES200L	440/200	0.2/0.1 KG	20.5X15.7/520X400	36

PORTABLE SCALES

The OHAUS Scout Pro Portable Balances feature easy-to-use two-button operation, a high-contrast LCD display, multiple weighing units, four application modes, and the option of either RS232 or USB connectivity. Auto-calibrated. AC Adapter (included) or 4 AA Batteries (not included). One-year warranty.

- Measures in grams, kilograms, ounces, pounds, pound:ounce, pennyweight, ounce troy
- ABS housing, removable stainless steel weighing platform
- Low battery indicator and auto shut-off

MODEL	CAPACITY (LBS/KG)	READABILITY (GRAMS)	PLATFORM DIA.	SHIP WT. (LBS)
SB41	200	.01	4.5"	4
SB42	400	.1	4.5"	4
SB43	600	.1	4.5"	4
SB42-A	115/230V REPLACEMENT ADAPTOR FOR ABOVE MODELS			


SB41


SB200


SB120-AQ


SB2A

PORTABLE TOP LOADING SCALES

The OHAUS CS Compact scales, models SB200, SB2 and SB5 feature full capacity tare and high-contrast LCD display. Operates on 3 AA batteries or AC adapter (both included). One-year warranty.

- ABS housing, stainless steel pan
- Low battery indicator, auto shut-off, external push button calibration
- Measures grams, pound:ounce, newton

The OHAUS Navigator, model SB120-AQ, features automatic calibration. AC adapter (included) or use 8 AA batteries (not included). One-year warranty. Made in USA.

- Two touchless sensors free up your hands for handling samples
- Can withstand loads up to 400% of its rated capacity
- Measures grams, kilograms, pounds, ounces, pound:ounce, newton, and more

MODEL	CAPACITY (GRAMS)	READABILITY (GRAMS)	PLATFORM	SHIP WT. (LBS)
SB200	200	0.1	5.5" DIA.	3
SB2	2000	1.0	5.5	3
SB5	5000	2.0	5.5	3
SB120-AQ	2100	0.1	7.5" X 6.5"	4
SB2A	WEIGH PAN, 6½"X 6½" X 2" DEEP		1	

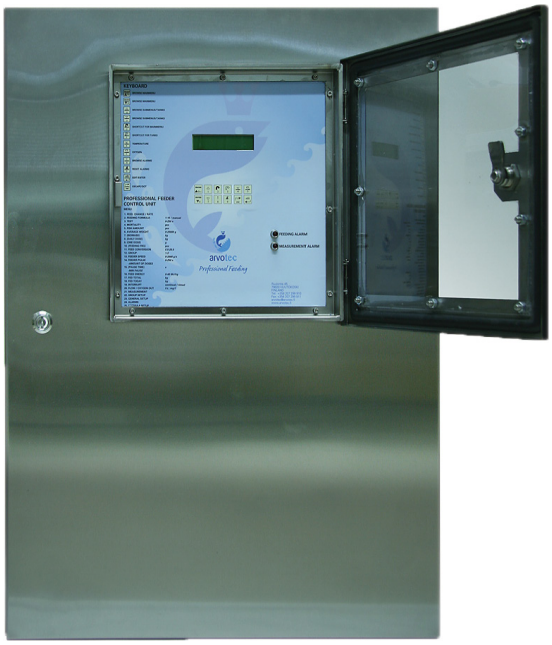
ARVO-TEC FEEDING TECHNOLOGY PROFESSIONAL FEEDING CONTROL SYSTEM

A fully integrated feeding, measurement and alarm system. Feed amounts are calculated separately for each tank according to automatically updated biomass data, incoming water temperature and oxygen content. The system is easy to use with a menu-driven display in the control unit or an optional PC connection. Feeding data can be exported to management software. Stainless steel cabinet withstands extreme conditions.

Specifications

- 115 or 230VAC.
- 8, 16, 24 or 32 independent feeder channels per control unit (use up to 30 control units in one system for 960 channels total).
- Cable, radio, TCP/IP and mobile phone communication options.
- 8 measurement inputs per control unit.
- 5 digital sensor inputs (e.g., level switch circuits) and 2 alarm/control outputs per control unit.

CALL FOR MORE INFORMATION AND PRICING.



ARVO-TEC PIPE FEEDING SYSTEM

The pipe feeding system is a centralized solution for distributing large quantities of feed. This system can be used in sea, land and recirculating aquaculture systems.

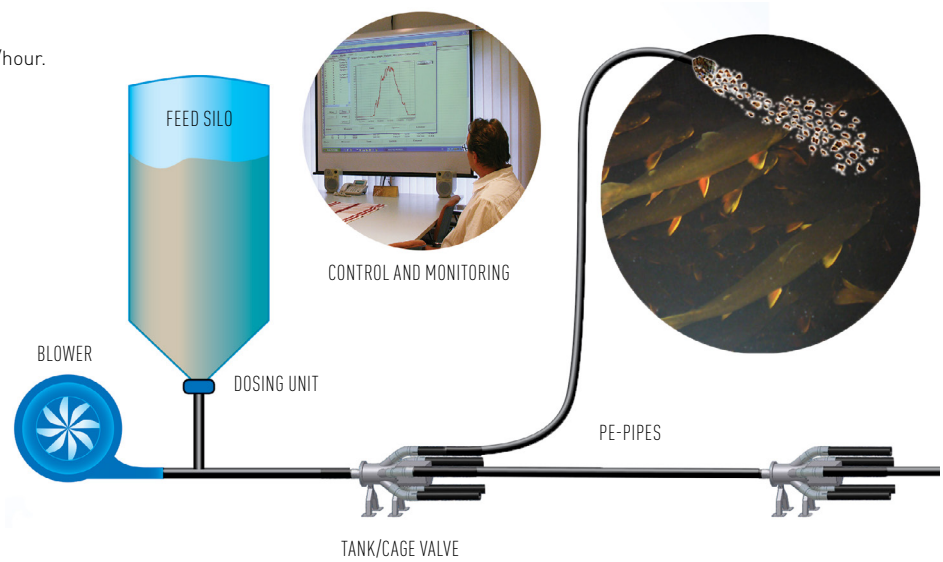
The system's reserve silos can be placed in a central feed storage area, where they can be refilled easily with large bags. The distribution system is based on a 75 mm PE pipe and can blow feed into the blower from up to 300 m away.

Arvo-Tec control system controls each tank entirely separately. Feed dosage requires precision, and the distribution valves uses electrical motor and revolver technology that is reliable and gentle on feed.

Specifications

- Feed up to 28 tanks, ponds or cages/one system.
- Double, triple, etc., systems for large farms.
- Maximum feeding capacity for each system is 650 kg/hour.

CALL FOR MORE INFORMATION AND PRICING.



ARVO-TEC ROBOT FEEDING SYSTEM

Improves feed efficiency and saves labor time. One feeding robot serves multiple tanks, eliminating the need for a feeder at each tank. A high feed turnover rate through the hopper prevents storage problems such as feed expiration. Controlled via local programmer or from a PC.

Specifications

- Travel speed 18 m/min.
- 24VDC rechargeable battery.
- Optical "eye" to avoid collision.
- Provides 2 feed types from 50-L silos.
- Each robot feeds up to 240 tanks, with a max rail length of 450 m.
- Rail: 80 mm steel I-Beam, INP80, DIN1025

Options include advanced PC control, automatic refilling and feed spreader.

CALL FOR MORE INFORMATION AND PRICING.

ARVO-TEC T DRUM 2000 FEEDER

The Arvo-Tec T Drum feeder has a very high accuracy, whilst remaining at a competitive price. The feeder is multifunctional and is suitable for start feeding in hatcheries to on-growing on tanks, ponds and cages.

Technical specifications

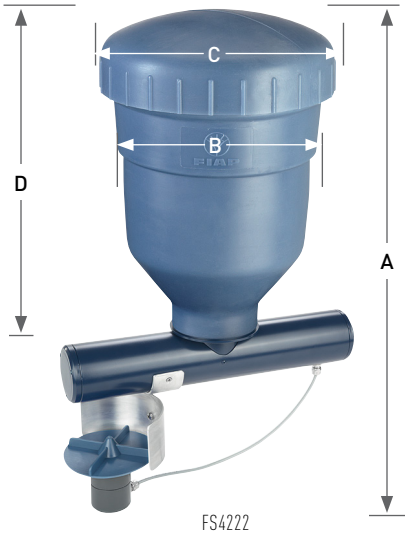
- 1, 6 or 10 litres transparent and 50, 150 or 600 white hoppers
- Standard motor 24 VAC, 11,3 W, 2 rpm
- Granule/pellet size 0,3–8 mm
- Minimum dose of 0,3, 1,5, 20, 45 or 100 g
- Strong, 316 stainless steel bracket
- Accuracy normally greater than 98%

CALL FOR MORE INFORMATION AND PRICING.

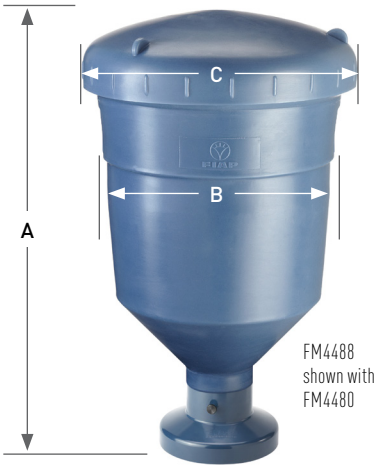
AUGER FEEDERS

These screw-style feeders are used throughout the world in commercial aquaculture facilities. They are very well built, durable and can be used both indoors and outdoors. Designed for highly accurate dispensing of feed, they feature a rheostat that can be set for both speed and duration. Screw feeders are 12V and draw approximately .5 amps. A power supply and time controller are needed but not included. One-year warranty.

MODEL	INCLUDES	CAPACITY (LBS/KG)	A	B	C	D
FS4022R2	FEED HOPPER, AUGER	22/10	26"	10"	12"	21"
FS4044R2	FEED HOPPER, AUGER	44/20	27"	12"	15"	21"
FS4088R2	FEED HOPPER, AUGER	88/40	35"	15"	19"	30"
FS4132R2	FEED HOPPER, AUGER	132/60	42"	19"	23"	36"
FS4222R2	FEED HOPPER, AUGER, SPREADER	22/10	26"	10"	12"	21"
FS4244R2	FEED HOPPER, AUGER, SPREADER	44/20	27"	12"	15"	21"
FS4288R2	FEED HOPPER, AUGER, SPREADER	88/40	35"	15"	19"	30"
FS4232R2	FEED HOPPER, AUGER, SPREADER	132/60	42"	19"	23"	36"
FS4059UPR2	AUGER ONLY					
FS4050AR2	AUGER W/SPREADER ONLY					



FS4222



FM4488 shown with FM4480

VIBRATORY FEEDERS

This 12V vibratory mechanism can be used with any of the hoppers on the next page. It is fully adjustable for dispensing both dry and moist feeds (1–12 pellets) without clogging. Feeders are 12VDC and draw .5 A. A timer is required but not included. We suggest the **H1201** to operate one feeder and **PA15** for 1 to 3 feeders. A 12V gel cell **1810** for up to 2 feeders or a 12V car/boat battery w/**1808** charger is recommended. Each vibratory mechanism includes 3' of cable for timer. Weighs 1.7 lbs. One-year warranty. See www.pentairAES.com for more information on the suggested timers.

MODEL		A	B	C
FM4422	VIBRATORY FEEDER, 22 LBS (10 KG)	22"	10"	12"
FM4444	VIBRATORY FEEDER, 44 LBS (20 KG)	23"	12"	15"
FM4488	VIBRATORY FEEDER, 88 LBS (40 KG)	31"	15"	19"
FM4132	VIBRATORY FEEDER, 132 LBS (80 KG)	37"	19"	23"
FM4480	VIBRATORY MECHANISM ONLY			

DEMAND FEEDERS

The unique twist-lock lid is wind and varmintproof on these high-quality, UV-resistant, polyethylene hoppers. All four sizes have the same pendulum demand feeding mechanism for #4 crumble to ¼" pellets. One-year warranty.

MODEL	CAPACITY	A	B	C	SHIP WT (LBS)
FH221	22 LBS (10 KG)	23"	12"	14"	5
FH441	44 LBS (20 KG)	23"	15"	18"	7
FH881	88 LBS (40 KG)	23"	19"	26"	10
FH133	132 LBS (60 KG)	23"	23"	33"	30

AR150K

ROTIFER PRODUCTION SYSTEMS DESIGNED HERE

High-density systems

Our intensive rotifer production systems are designed for high-volume production! These systems will save you a lot of money, space and work. Production densities exceed 5,000 rotifers per milliliter of *Brachionus plicatilis*. *B. rotundiformis* are also suitable for this system. Systems are complete, including culture tank, filtration system, pure oxygen diffuser and ammonia neutralizer dosing system. Since these systems use Instant Algae® marine paste, they eliminate the need for labor-intensive algae production. Only 30 minutes of tank maintenance per day is required to produce 100 million to 2.5 billion rotifers per day! Systems also include an operations manual and ClorAm-X® water conditioner. Three sizes are available: 150-liter, 450-liter and 1,000-liter systems. Available in 230V/50 Hz models; add "**-H**" to the part number.

MODEL	CAPACITY	AREA
AR150K	150 LITERS	1 M X 1.6 M
AR256K	450 LITERS	1 M X 2.2 M
AR1000K	1,000 LITERS	2 M X 2.2 M
WQB32	PLANKTON CULTURE MANUAL	
VM185YD	REPL. FILTER MATERIAL, PER YARD	

AR1000K

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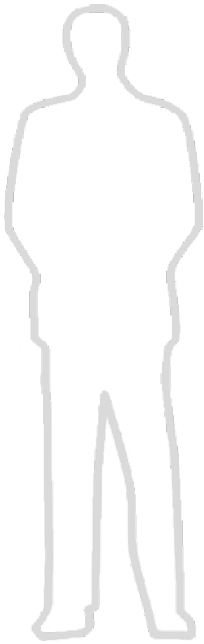
IP-PBR-1000L



IP-PBR-75L

ALGAE BIOREACTOR

Industrial Plankton Algae Bioreactors are a turn-key solution for aquaculture hatcheries, research, and biotech. Through automation, these bioreactors eliminate the majority of repetitive tasks involved in culturing algae. The equipment can be automatically cleaned and sterilized before inoculation by simply pressing a button on the touchscreen. The sealed chamber, when seeded with 20 litres of algae, is capable of growing up to 1,000 litres of pure culture in 7–10 days, while continuously monitoring algae growth using a built in sensor. The machine also self-harvests and replaces the harvested water with new water and nutrients, which are filtered and sterilized at the point of entry. The equipment greatly simplifies the complex and time consuming task of algae culture, while also increasing production reliability and biosecurity. Requires fresh or saltwater inlet line.

AQUACULTURE APPLICATIONS—Model IP-PBR-1000L uses real time monitoring, user friendly control system, and data logging, letting hatcheries focus on their livestock, and not their algae. Problems with algae production are often the causes of low or unreliable hatchery yields. This unreliability and high production costs of microalgae are limiting factors to the success of many hatcheries. Despite efforts over the past decade to develop cost-effective artificial diets to supplement live microalgae, on-site live microalgal production remains a critical element in the operation of most successful marine hatcheries.

RESEARCH APPLICATIONS—Model IP-PBR-75L combines cutting edge technology with meaningful production volume, simplifying production of live algae in universities, public aquariums, and industrial research. Researchers can see their culture parameters graphed continuously in real time, and sterilize the reactor between experiments with the push of a button – all in a fully automated closed system, featuring closed loop pH control, integrated heating/chilling, and remote access capabilities. The algae produced is ideal for feeding zooplankton and larval marine animals.

PRODUCTION MODES—Practically all species of freshwater and saltwater algae commonly used in aquaculture can be grown in the reactors. They can be operated in batch mode, or continuously using an automated top and drop, which harvests then replaces a portion of the culture each time the cell density exceeds a user setpoint.

BATCH (7-10 DAYS)		OPERATING EXPENSES (PER BATCH)*
Nutrients + CO_2		$10
Electricity (at ¢10/KWh)		$16
Labor (1 hour at $20/hour)		$20
Total		$46
SPECIES	**HARVEST**	**DENSITY**
T-Iso	1000L/batch	12M/ml
Nanno		130M/ml

CONTINUOUS		OPERATING EXPENSES (PER MONTH)*
Nutrients + CO_2		$39
Electricity (at ¢10/KWh)		$71
Labor (3 hours at $20/hour)		$60
Total		$170
SPECIES	**HARVEST**	**DENSITY**
T-Iso	350L/day	6M/ml
Nanno	450L/day	48M/ml

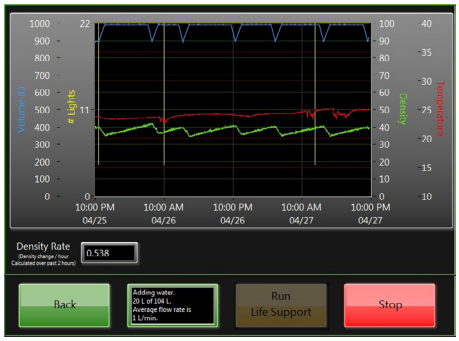
*Actual OPEX and production numbers may vary between facilities.

Features:

- **TANK—**The star shaped, corrugated tank doubles the surface area exposed to light, so cultures grow denser before cell shading limits growth. The tank bottom is sloped to facilitate circulation and drainage.
- **LIGHTS—**LED and T5 grow lights provide bright, evenly spaced light across the tank surface, providing maximum light without photo inhibition. To prevent photo inhibition during scale up, the bioreactor checks the culture density and only turns on lights as they are needed, based on user controlled setpoints. The brightness can also be controlled, allowing algae with a variety of light requirements to be cultured.
- **CLEANING & STERILIZING—**If you want to restart the culture it's a simple process. The tank is drained through the bottom, then pressure washed and sterilized by pushing a button.
- I**NOCULATION—**The bioreactor starts by adding water and nutrients, then adjusts temperature and light levels. Inoculation is simple, just hook up a carboy or flask to the machine's inoculation port, then use the onboard air supply to push the culture from the carboy into the bioreactor.
- **SCALE-UP—**To increase biosecurity the culture is scaled up gradually over the course of days, automatically adding water and nutrients whenever a set culture density is reached. (patent pending)
- **HARVEST—**A portion of the culture is harvested multiple times each day, then automatically replaced with new water & nutrients. Small frequent harvests increase the overall yield, and make the algae's nutrient profile more predictable. The whole tank can also be harvested with the push of a button.
- **BIOSECURITY—**Incoming water is slowly passed through a UV filter after being pre-filtered using a nominal micron filter. Nutrients are then added to the water and passed through 2 additional stages of absolute micron filtration, down to 0.1um. Air and CO_2 entering and leaving the tank are also passed through 0.1um filters. Harvesting is done automatically using a biosecure pinch valve.

	MAX CULTURE DENSITY MODEL IP-PBR-1000L
Nannochloropsis	187 million/ml
Isochrysis	15 million/ml
Tetraselmis	2 million/ml

A user friendly touchscreen interface lets you control the culture parameters and fine tune the operation for different species and situations. User controlled setpoints control parameters such as temperature, CO_2 injection, harvesting cell density, light levels, etc. In addition to automated controls the machine can be controlled manually, making it easy to harvest, or add water or nutrients at any point.



Culture parameters are logged and graphed in realtime on the touchscreen, making it easier to maintain a culture in exponential growth for continuous culture, or decide when a batch is ready for harvest. The controls, including these graphs, can be accessed remotely from a personal computer.

MODEL	VOLTS	HZ	AMPS	WATTS	TANK CAPACITY	INLET LINES	SPACE REQUIREMENT			SHIP WT
IP-PBR-1000L	120 230	60 50	30 15	1000	1000L	CO_2, Inlet Water, Chilled Water	4' L	4' W	7' H	400 LBS
IP-PBR-75L	120 230	60 50	20 10	300	75L	CO_2, Inlet Water	2' L	3' W	7' H	150 LBS

Note: Prices are FOB Victoria, Canada, motor freight. One-year warranty.

KEYSTONE COMPOSEAL RESILIENT SEATED BUTTERFLY VALVES WAFER STYLE

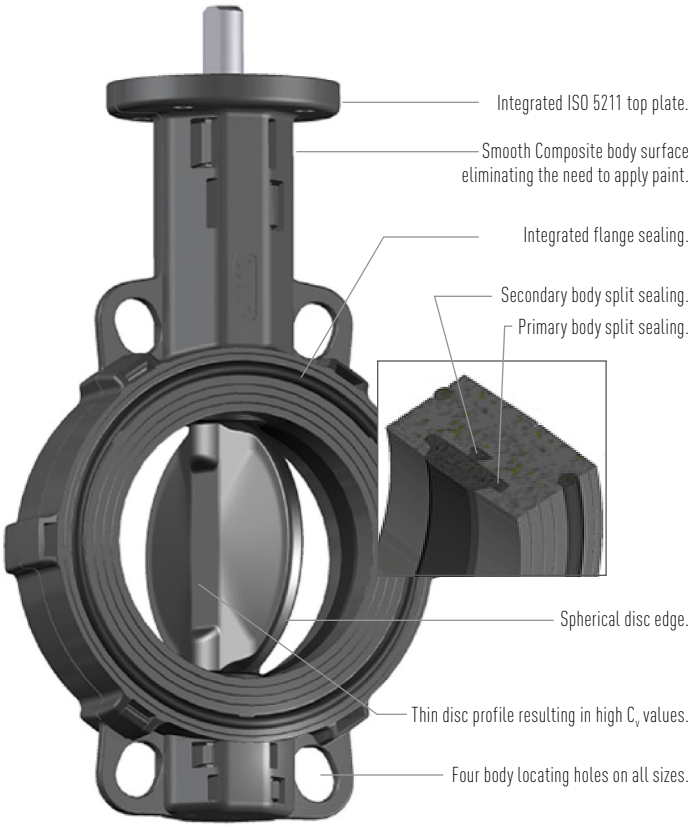
Resilient seated butterfly valves with valve body and disc in high engineered composite material providing excellent internal and external chemical resistance.

Since the entire valve exists of high engineered composite materials, it is perfectly suited for a wide range of applications such as; building services, hot water applications, industrial waste water and industrial water treatment like purification, ozone or demineralization.

The light weight valve can be perfectly used in transportation and cargo containers and in applications using metal, plastic or glass reinforced pipe lines.

Features

- Wafer style body and disc in high engineered composite results in excellent internal and external chemical resistance.
- Light weight construction results in lower cost and simplified installation.
- No extra pipe support needed when installed in plastic or GRP piping.
- Disc in high engineered composite material provides excellent corrosion resistance.
- All fasteners in stainless steel 316 as standard.
- Bubble tight shut-off in both directions, in accordance with EN 12266-1 leakrate A.
- Pressure range up to PN 16 at elevated temperature.
- Valve can be used in high line velocity applications up to 40 ft/sec.
- Spindle and primary valve seals are not influenced by the flange bolting force or pipe flange type.
- High C_v value.
- No need for flange gaskets.
- Primary stem sealing exceeds the pressure rating of the valve and prevents leakage through the shaft area to atmosphere.
- A secondary (shaft) sealing provides back-up safety.
- Four integrated locating holes ease installation and centering between the pipe flanges.
- Actuator flange acc. ISO 5211.
- Sustainable production philosophy as the valve materials are 100% recyclable.
- Use of composite material eliminates the need for machining and painting.
- Composite hand lever available.
- Available water approvals: KIWA, ACS, WRAS, NSF, BELGAQUA.
- Certified and approved according Det Norske Veritas (DNV).




Gear Operated


Lever Operated

Lever Handle

MODEL	MM	INCH	
CSW050442WM1LHE	50	2	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 050 / FIG 419 LEVER
CSW065442WM1LHE	65	2.5	WAFER TRIM 442 COMPOSITE/EPDM WA3 DN 065 / FIG 419 LEVER
CSW080442WM1LHE	80	3	WAFER TRIM 442 COMPOSITE/EPDM WA3 DN 080 / FIG 419 LEVER
CSW100442WM1LHE	100	4	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 100 / FIG 419 LEVER
CSW125442WM1LHE	125	5	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 125 / FIG 419 LEVER
CSW150442WM1LHE	150	6	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN150 / FIG 419 LEVER

Gear Operated - Hand Wheel

MODEL	MM	INCH	
CSW100442WM1GO	100	4	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 100 / GEAR OP.
CSW125442WM1GO	125	5	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 125 / GEAR OP.
CSW150442WM1GO	150	6	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 150 / GEAR OP.
CSW200442WM1GO	200	8	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN 200 / GEAR OP.
CSW250442WM1GO	250	10	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN250 / GEAR OP.
CSW300442WM1GO	300	12	WAFER, TRIM 442 COMPOSITE/EPDM WA3 DN300 / GEAR OP.

TYPE-21 BALL VALVE

- Pressure rated up to 230 psi (PVC, CPVC, PVDF)
- Double O-ring seals on stem for added protection
- Full bore, sizes ½"–2"
- Full vacuum rated, all sizes
- Blocks in two directions, upstream and downstream, leaving full pressure on the opposite end of the valve
- Integrally molded ISO mounting pad for both manual and actuated operations
- Integrally molded base pad to mount valves securely or panel mounting
- PTFE seats with elastomeric backing cushions ensure bubble-tight shut-off and a low fixed torque, while at the same time compensating for wear
- True Union design for easier installation or repairs without expanding the pipe system
- Built-in spanner wrench on the handle for valve disassembly and assembly
- Two sets of end connectors (socket and threaded) included with all PVC and CPVC valves in sizes ½"–2"
- CPVC threaded end connectors on sizes ½"–1" come with stainless steel reinforcing rings
- New PTFE Seat design—Facilitates easier field maintenance if required
- Tapered O-ring groove—Helps to Keep the end connector O-rings on the valve body during installation
- Body Flats—Flats have been added to either side of the valve body where a wrench can be applied to prevent the valve body from turning when the Union Nuts are tightened

ASAHI/AMERICA

MODEL		
1605005	½" TYPE-21 BALL VALVE	PVC/FKM SOCKET/THREADED COMBO
1605007	¾" TYPE-21 BALL VALVE	PVC/FKM SOCKET/THREADED COMBO
1605010	1" TYPE-21 BALL VALVE	PVC/FKMSOCKET/THREADED COMBO
1605012	1¼" TYPE-21 BALL VALVE	PVC/FKM SOCKET/THREADED COMBO
1605015	1½" TYPE-21 BALL VALVE	PVC/FKM SOCKET/THREADED COMBO
1605020	2" TYPE-21 BALL VALVE	PVC/FKM SOCKET/THREADED COMBO
1613015	1½" TYPE-21 BALL VALVE	CPVC/FKM SOCK X THRD
1609020	2" TYPE-21 BALL VALVE	CPVC/EPDM SOCK X THRD
1607030	3" TYPE-21 BALL VALVE	PVC/FKM THREADED
1607040	4" TYPE-21 BALL VALVE	PVC/FKM THREADED
1606030	3" TYPE-21 BALL VALVE	PVC/FKM SOCKET
1606040	4" TYPE-21 BALL VALVE	PVC/FKM SOCKET

ASAHI/AMERICA

TYPE 57 BUTTERFLY VALVE

- PVC Body and EPDM Seat PVC Disc
- Our 316 stainless steel shaft has full engagement over the entire length of the disc and is a non-wetted part, totally isolated from the media.
- Only solid and abrasion-resistant plastic disc and elastomeric liner are wetted parts.
- ISO bolt circle on top flange—no body or stem modifications required for accessories.

MODEL		
3722030	3" PVC BODY & DISC	EPDM SEALS LEVER-OP TYPE 57 BTRFLY
3722040	4" PVC BODY & DISC	EPDM SEALS LEVER-OP BTRFLY
3722060	6" PVC BODY & DISC	EPDM SEALS LEVER-OP BTRFLY

ASAHI/AMERICA

OMNI BALL VALVE

- Blocks in two directions
- Rugged structure
- Unibody construction
- Compact, low profile, short face-to-face dimensions
- PTFE seat backed by EPDM for low stem torque
- Rated for full vacuum service

MODEL		
1070005	½" OMNI BALL VALVE	PVC/EPDM SOCKET
1070007	¾" OMNI BALL VALVE	PVC/EPDM SOCKET
1070010	1" OMNI BALL VALVE	PVC/EPDM SOCKET
1070012	1¼" OMNI BALL VALVE	PVC/EPDM SOCKET
1070015	1½" OMNI BALL VALVE	PVC/EPDM SOCKET
1070020	2" OMNI BALL VALVE	PVC/EPDM SOCKET

KNIFE GATE VALVES, 1½" TO 8"

Perfect for waste drains and low-pressure aquaculture

Knife gate valves are economical, quick-acting valves for clean and dirty water low-pressure applications. They have become very popular in the aquaculture industry for several reasons: they can be easily taken apart, the seals can be changed and even the valve body can be changed without upsetting the ends that may be glued to your pipes. Therefore, they can be used in place of unions! If you have a valve glued in place, but want to take it out, you can simply unbolt it and purchase new side pieces.

They offer unrestricted flow and are quick opening, 100% water tested at the factory and quite low in cost. These 1½" to 8" valves are all PVC with stainless steel shafts, polypropylene knife gates (except for 4", 6" and 8", which are stainless steel), and have TPE seals. The valves listed are all slip x slip, but please note that you can order sides in various other styles below. Like most valves, they are not for use in freezing weather. One-year warranty.

MODEL		MAX PSI	SHIP WT (LBS)
GV11	1½"	45	1
GV2	2"	40	1
GV3	3"	30	2
GV4	4"	20	5
GV6	6"	10	18
GV8	8"	10	20

Larger sizes available, please call.


GV2


GV3


GV4

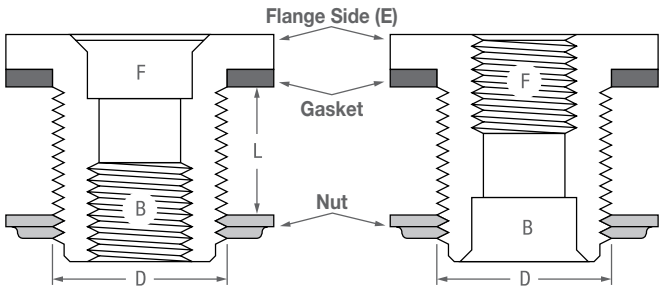
BULKHEAD FITTINGS, ECONOMY

Fittings include a gasket. Made of ABS plastic.

F = flange side; B = base/bottom side; D = diameter; L = length (width of glass or acrylic that will fit).


BKF10

MODEL	GASKET #	SIZE	F	B	D	L
BKF121	**Q10G**	½"	SLIP	SLIP	1⅛"	¾"
BKF122	**Q10G**	½"	SLIP	FIPT	1⅛"	¾"
BKF123	**Q10G**	½"	FIPT	SLIP	1⅛"	¾"
BKF124	**Q10G**	½"	FIPT	FIPT	1⅛"	¾"
BKF341	**GK1**	¾"	SLIP	SLIP	1⅜"	1"
BKF342	**GK1**	¾"	SLIP	FIPT	1⅜"	1"
BKF343	**GK1**	¾"	FIPT	SLIP	1⅜"	1"
BKF344	**GK1**	¾"	FIPT	FIPT	1⅜"	1"
BKF10	**GK2**	1"	SLIP	SLIP	1¾"	1½"
BKF11	**GK2**	1"	SLIP	FIPT	1¾"	1½"
BKF12	**GK2**	1"	FIPT	SLIP	1¾"	1½"
BKF13	**GK2**	1"	FIPT	FIPT	1¾"	1½"
BKF1120	**GK4**	1½"	SLIP	SLIP	2⅜"	1¾"
BKF1121	**GK4**	1½"	SLIP	FIPT	2⅜"	1¾"
BKF1122	**GK4**	1½"	FIPT	SLIP	2⅜"	1¾"
BKF1123	**GK4**	1½"	FIPT	FIPT	2⅜"	1¾"
BKF20	**GK5**	2"	SLIP	SLIP	2⅞"	1 15/16"
BKF21	**GK5**	2"	SLIP	FIPT	2⅞"	1 15/16"
BKF22	**GK5**	2"	FIPT	SLIP	2⅞"	1 15/16"
BKF23	**GK5**	2"	FIPT	FIPT	2⅞"	1 15/16"



PLASTIC MESH SCREENING

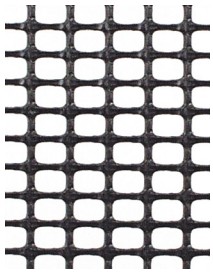
High-quality, extruded plastic netting is offered in both square and diamond configurations for a wide variety of aquaculture applications. Made from a pliable, yet durable semirigid polyethylene that is great for outdoor use. All screening is nontoxic.

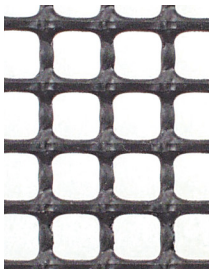
This netting is characterized by a smooth surface and heavy-duty construction. The surface minimizes algae growth, making cleaning easier and less frequent. The products are made with more weight than many competitive netting products, providing for greater durability and longer life. And the material is produced to high quality standards for consistency, uniformity and flatness—making fabrication into cages, traps and trays all the easier. Made in USA. Sold by the roll.

MODEL	MESH SIZE	WIDTH X LENGTH	MESH SHAPE	MESH OPENING*	WEIGHT PER ROLL
N1130	1/8"	36" X 50'	DIAMOND	5/32" (4.0 MM)	6 LBS
N1670	1/8"	48" X 50'	SQUARE	5/32" (2.4 MM)	10.5 LBS
N1170	1/4"	48" X 50'	SQUARE	5/32" (4.0 MM)	20 LBS
N1020	1/2"	48" X 50'	SQUARE	7/32" (14 MM)	22 LBS
N0350	3/4"	48" X 50'	SQUARE	15/16" (24 MM)	19 LBS
N1133	1 1/4"	48" X 50'	DIAMOND	15/16" (33 MM)	27 LBS

*The mesh opening refers to the widest space across the opening.


N1130


N1670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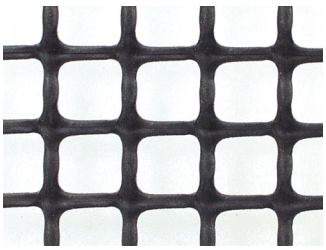
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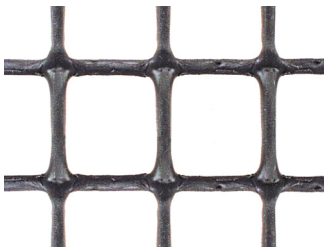

N0350

SEINES, SMALL

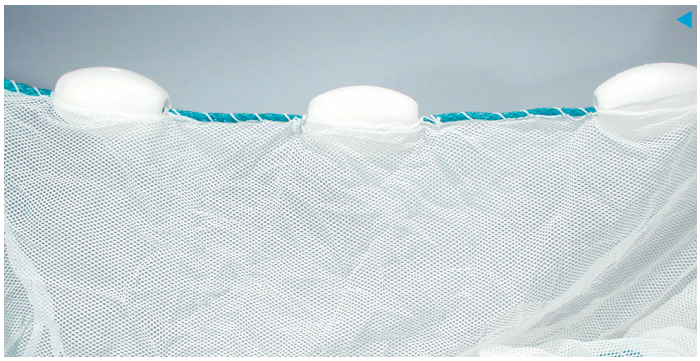
These small-mesh, commercial-grade seines are ideal for gathering fish in tanks and small ponds. They are made of white knotless nylon. Sponge floats. Seine handles not included.

MODEL	MESH SIZE	H X L	SHIP WT (LBS)
ML210	3/16"	4' X 10'	3
ML520	3/16"	6' X 20'	6

SEINES, LIGHT-DUTY

These seines are made of square mesh nylon netting that travels through the water easily. They are offered in mesh sizes small enough to net even two-week-old koi fry (1/8"). Seines include floats and lead weighted bottoms.

MODEL	MESH SIZE	D X L	SHIP WT (LBS)
LDS1	1/8"	8' X 20'	5
LDS2	1/4"	8' X 20'	4
LDS3	1/8"	8' X 40'	12
LDS4	1/4"	8' X 40'	8



SEINES, HEAVY-DUTY

These seines will stand up to the rigors of daily commercial use. Foam floats are sewn on 12" centers along the 3/8" braided float line. A braided lead line with internal leads (.16 lbs/ft), plus 4-oz external leads over the lead line on 8" centers, holds nicely to the bottom. 1/8" through 3/8" are knotless nylon, 1/2" is knotless polyester. Made in USA.

MODEL	MESH SIZE	H X L
HDS1	1/8"	4' X 10'
HDS2	1/8"	7' X 20'
HDS3	1/4"	4' X 10'
HDS4	1/4"	7' X 20'

MODEL	MESH SIZE	H X L
HDS5	3/8"	4' X 10'
HDS6	3/8"	8' X 20'
HDS7	3/8"	4' X 10'
HDS8	1/2"	8' X 20'

PROLINE AQUACULTURE BACTERIA CONCENTRATE

TECH FAV FW SW

ProLine Bacteria Concentrate is a high concentration of live bacteria specifically formulated for ammonia emergencies. Live bacteria begin ammonia removal immediately, possibly saving an entire system from disaster. One gallon of freshwater concentrate can treat up to 4,800 gallons (use freshwater for salinity of 7 ppt or lower). One gallon of saltwater concentrate can treat up to 2,400 gallons. The concentrate must be refrigerated at all times and has a shelf life of 3 months. All concentrate ships Next Day Air, orders placed by early AM will either ship that day or next day. Weighs 11 lbs.

MODEL	
239310	FRESHWATER, GALLON
239300	SALTWATER, GALLON

239310

GREENCLEAN® PRO GRANULAR ALGAECIDE HAZMAT AG R

This non-copper-based algaecide eliminates algae on contact. Designed for lakes, ponds and unpainted surfaces. Sodium carbonate peroxyhydrate destroys algal cell membranes and chlorophyll within 60 sec. Biodegrades completely and adds 13% bioavailable oxygen to the water. For spot treatments apply at a rate of 20–50 lbs/acre-foot; for algae blooms apply at a rate of 9–30 lbs/acre-foot; for filamentous algae blooms treat at a rate of 50–90 lbs/acre-foot. Safe for use with koi and trout. EPA-approved.

MODEL	
GC51-C	50 LBS

BLUE VAIL™ SUPER CONCENTRATED BLUE COLORANT

Harmless to animals and fish

Use only one-fourth as much Blue Vail™ as any other dye! That's right—use only one quart per 1,000,000 gallons of pond water. We recommend Blue Vail™ for use in controlled waterways like private ponds, lakes and fountains.

Blue Vail™ will turn water an attractive blue color and is harmless to animals and fish when used as directed. Lasts up to 4 months. Sold in quart containers (equal to one gallon of other brands).

MODEL	
OWD5	QUART

R

In certain states, herbicides and algaecides are restricted. Products with this symbol cannot be sold into the states of California, Connecticut, Iowa, Maine, Michigan, Nebraska, Montana, New Hampshire, New York, Vermont or Washington.

AQUASHADE® WEED CONTROL WATER COLORANT R

EPA-registered

Aquashade® is a water dye that filters sunlight to reduce the growth of aquatic weeds and algae.

It is also useful for coloring water an attractive blue to enhance its aesthetic quality. Apply to controlled waterways such as ornamental and golf course ponds, lakes, fountains and fish farms. May be used for swimming ponds (after complete dispersal). Results appear immediately and last up to four months in nonflowing waters. The typical application rate is 1 gallon per 1,000,000 gallons of water. Case contains 4 gallons.

MODEL		SHIP WT (LBS)
OWD2	GALLON	11

INSTANT OCEAN® SALTS

Instant Ocean® has been the preferred salt mix of public aquariums and home aquarists for many years. It is scientifically blended to contain every minor and major trace element required to make artificial seawater. Phosphate- and nitrate-free, it dissolves quickly without insoluble residue. Each package will make a 32-ppt salt solution at listed volume. Contains no chlorine remover. Pallet quantities available.

MODEL		SHIP WT (LBS)
IS50	50-GALLON MIXTURE	15
IS160	160-GALLON MIXTURE	50
IO200	200-GALLON MIXTURE	65

IS160

IS50

PROLINE ACTIVATED CARBON FW SW

A superior, high-purity, bituminous coal-based activated carbon. Preferred by public aquariums, research centers and government fisheries. The small particle size (approximately 1/16" to 1/8") provides a large surface area for rapid uptake and reduces water travel distances to interior adsorption surfaces. Adsorbs full range of organic contaminants, pesticides, odors, colors, chlorine, dissolved organics, ozone and many heavy metals. Carbon is dry-packed.

Can be retained using window screen size mesh.

Approximately .625 m^2 of surface area per gram.
Bulk density is approximately 24 lbs/ft^3.

AC412A

MODEL	
AC412A	1.5-LB CONTAINER
AC412	15-LB BUCKET
AC55	55-LB BAG

DECHLORINATOR, SODIUM THIOSULFATE FW SW

Sodium thiosulfate is the main compound in most chlorine neutralizers. Any time municipal water must be used for aquaculture, use sodium thiosulfate for instant neutralization of chlorine (do not add directly to water containing fish). Dosage rates vary with the pH of the water, but rates between 1.6 to 2.6 parts sodium thiosulfate per one part chlorine should be adequate (excess levels of sodium thiosulfate up to 100 ppm will not harm fish). Made in USA.

MODEL	
ST1A	4-LB JAR
ST1	50-LB BUCKET

ST1

ST1A

WATERPROOF OUTDOOR CASES

These polypropylene cases are perfect for tough outdoor use and are tested under extreme conditions. Able to withstand temperatures ranging from -40–80°C, they are stackable, airtight and waterproof. They are also crack-proof and virtually indestructible. Cases are equipped with dual padlock slots and foam inserts consisting of pre-punched cubic elements so you can customize your own interior. Optional black shoulder carrying straps include comfortable shoulder pad, and are made from denier nylon. 30-year Limited Warranty.

- IP67 Waterproof Case
- Shock, Corrosion and Chemical Resistant
- Automatic pressure relief valve
- Fully customizable interior
- Black or yellow case finish with foam inserts

BW4000B


BW1000Y

BW6700B

	SIZE	CAPACITY (FT³)	CAPACITY (LBS)	EXTERIOR DIMENSIONS L	W	H	SHIP WT (LBS)	BLACK CASE MODEL	YELLOW CASE MODEL
TYPE 500 CASE	SMALL	0.08	11	8¾	7	3½	1.75	**BW500B**	**BW500Y**
TYPE 1000 CASE	SMALL	0.15	22	10¾	8½	4	2	**BW1000B**	**BW1000Y**
TYPE 2000 CASE	SMALL	0.23	22	10¾	8½	6½	2.5	**BW2000B**	**BW2000Y**
TYPE 3000 CASE	MEDIUM	0.41	44	14¼	11¾	6¾	4.75	**BW3000B**	**BW3000Y**
TYPE 4000 CASE	MEDIUM	0.59	44	16½	13	7	6	**BW4000B**	**BW4000Y**
TYPE 5000 CASE	MEDIUM	0.78	55	18½	14½	7½	8	**BW5000B**	**BW5000Y**
TYPE 6000 CASE	MEDIUM	1.15	55	20	16½	8½	10.5	**BW6000B**	**BW6000Y**
TYPE 6700 CASE	LARGE	1.32	110	23¾	16⅞	10½	17	**BW6700B**	—

Optional Carry Straps For Black & Yellow Cases

MODEL		SHIP WT (LBS)
BW500CS	OPTIONAL CARRY STRAP FOR TYPE 500 & 1000 CASES	1
BW2000CS	OPTIONAL CARRY STRAP FOR TYPE 2000 CASES	1
BW3000CS	OPTIONAL CARRY STRAP FOR TYPE 3000, 4000, 5000 AND 6000 CASES	1

EPOXY PAINTS

Epoxy paint is recognized by the EPA as nontoxic (after curing), is extremely durable and has excellent adhesion to a wide variety of materials. Whether coating fiberglass, wood, steel, concrete or even galvanized surfaces, you won't find a better paint for aquaculture.

Simply clean and dry the surface (acid-etch concrete and steel, then use nonsudsing ammonia to neutralize acid residue and use **PT20** concrete primer; prime steel and galvanized surfaces). Then mix epoxy paint parts A and B, wait 30–60 minutes and spray, brush or roll on. Recoat after about four hours, if desired. The curing temperature range is 55–125°F. **Before adding live organisms, let cure for 7 days.** Excellent for drinking water, ozone contact, fresh and saltwater aquaculture, etc.

Kit will cover 260–288 ft² of smooth surface with a thickness of 4 mil (0.004 inch). This epoxy is 65 to 72% solids (depending on color) and has a two-year shelf life (after long exposure to UV, it typically develops a chalky surface). Sold in 120-oz kits only (a kit is 4 parts paint and 1 part activator) in the following colors:

PT2: White | PT3: L. Green | PT4: D. Green | PT5: L. Blue | PT6: D. Blue | PT72: D. Red | PT8: L. Gray | PT9: D. Gray | PT10: Black

Note:
Paint color shown is an approximation of the actual color. Do not use the color shown as a guide for purchases where exact color is a critical factor.

MODEL		MODEL	
PT1	CLEAR	**PT6**	DARK BLUE
PT2	WHITE	**PT72**	DARK RED
PT3	LIGHT GREEN	**PT8**	LIGHT GRAY
PT4	DARK GREEN	**PT9**	DARK GRAY
PT5	LIGHT BLUE	**PT10**	BLACK

PT6

EPOXY GEL HAZMAT AG

A great adhesive for crack repair that works on wet or dry surfaces. An epoxy gel that is not sensitive to moisture (may not be applied underwater, however). This is great stuff for patching, gap filling, joining dissimilar materials and overhead work. It doesn't sag, run or drain into cracks. Excellent for use on concrete, wood, fiberglass and steel.

When mixed, this two part epoxy (1 to 1) is a gray-colored heavy paste. The pot life is only about 20 minutes, it hardens in six hours, can be painted over after six hours but before 48 hours, and reaches its final cure after 72 hours at room temperature.

If not painting over, wash surface thoroughly with soap and water (after 72 hours) before adding fish. Acceptable for aquatic containment under USDA guidelines. Sold in two gallon kits, Part A and Part B. Two-year shelf life. Weighs 22 lbs. Made in USA.

MODEL
PT98

STEEL PRIMER, THINNER, CLEANER, ACTIVATOR

To thin epoxy for spraying, use **PT18**. Use **PT16** cleaner for washing out spray equipment after painting. Primer (**PT17**) should always be used before painting galvanized and bare steel surfaces (after HCl etching and nonsudsing ammonia rinsing). **PT15** activator is included with the epoxy paint and primer. Made in USA.

MODEL			
PT17	PRIMER, STEEL, 120 OZ	11 LBS	HAZMAT AG
PT18	THINNER, QUART	3 LBS	HAZMAT A
PT16	CLEANER, QUART	3 LBS	HAZMAT A
PT15	ACTIVATOR, 24 OZ	3 LBS	HAZMAT A

PT18

EPOXY CONCRETE PRIMER

A high-performance epoxy primer and coating for concrete (more than 20 days old). Deep penetrating properties provide pore filling and strengthening of the concrete top layer, forming a strong adhesive base for surface coating.

This is an excellent sealer for epoxy paint (will not fill large pores of cinder blocks), but cannot be used over an existing water-based paint coating. It may also be used on damp (not wet) concrete. For best results, acid etch, rinse with nonsudsing ammonia and pressure wash before application. The primer is clear (consistency of water) with a pot life of 8–10 hours after mixing. One gallon will cover about 200-300 ft² with a 3- to 3.5-mil layer. One-year shelf life. Sold in 2-gallon kit only. Weighs 20 lbs. Made in USA.

MODEL	
PT20	HAZMAT AG

SOLUTIONS

We know that our success is dependent upon yours. Anytime you have a product question, please call us at 877-347-4788. We expend a lot of resources maintaining a staff of 20+ aquatic specialists to assist you. Our goal is to provide you with the right product the first time. Where else can you get help from a team of specialists for free? If you need an in-depth system design or extensive consulting, our technicians will be happy to provide you with a rate quote.

FIVE WAYS TO ORDER

1) Place Your Order by Calling Toll Free: 877-347-4788

Se Habla Español

To help us expedite your order, please have customer number and part number(s) ready. We suggest that you organize your order on our order form before calling.

Office Hours

Monday–Thursday: 8 AM–7 PM Eastern Time, Friday: 8 AM–5 PM

If you are unable to order during our office hours, our answering machine will take your order. Just call either our regular office number, 407-886-3939 or 877-347-4788 (toll free). In-stock orders placed on Saturday will be shipped the next business day.

2) Order online: PentairAES.com

3) Fax the Order Form: 407-886-6787

Fill out an order form or use your own purchase order form and fax it to us.

Our shopping cart and checkout system make online ordering easy.

4) Mail us: Pentair Aquatic Eco-Systems, Inc.
2395 Apopka Blvd.
Apopka, Florida 32703-7730

5) Email us: PAES.General@Pentair.com

Ask for a free Pentair AES catalog to be included with your order.

PAYMENT OPTIONS

- Visa, MasterCard and American Express accepted, including credit gift cards.
- Sales tax will be charged for shipments into the following states: AL, CA, CT, FL, GA, IL, IN, MD, MA, MI, MO, NJ, NY, NC, OH, OK, PA, RI, SC, TN, TX, UT, VA, WA, WI.
- When shipping by motor freight, it is best to prepay your order and pay for the shipping only at the time of delivery. It's called "freight collect."
- Orders may be paid for in advance by any method. Shipments from our warehouse will immediately follow clearance of your payment.
- If you would like to open an account, send in a credit application and allow at least three weeks for processing (this applies to domestic orders only).
- Purchase orders from schools, government agencies and institutions will be accepted on Net 30-day terms.
- Factory Direct shipments over $200 and paid for by credit card will be charged at the time the order is placed. Freight will be billed later.

PRIVACY POLICY

Pentair Aquatic Eco-Systems, Inc., takes your privacy very seriously. We will never sell or share your personal information with third parties (except by court order).

Upon ordering, your contact information will be stored in our database so that we may send you future catalogs. To be removed from our mailing list, please call 877-347-4788 or email PAES.General@Pentair.com.

Although any searches on our website will be saved for research purposes, they will not be linked to anyone's personal information.

Price Quotations

If you require a large quantity of any item or if you have OEM applications, ask us for a special price quotation. We also welcome the opportunity to bid on government and institutional purchases.

Chemical Purchases

Please fill out the Chemical Purchase Form located on our website www.pentairAES.com prior to placing an order for FDA-controlled chemicals and fax it to us at 407-886-6787.

We will keep the form on file to expedite your shipment. These products are designated by this symbol: CHEMICAL Waiver Form Required

DOMESTIC SHIPPING INFORMATION

DOMESTIC SHIPPING: Pentair Aquatic Eco-Systems is now offering ALL items free ground shipping for orders over $50.00 (FEDEX, LTLs, and TLs). This includes oversized and HAZMAT, Continental United States, Canada, Alaska, Hawaii, Puerto Rico and US Virgin Islands. A flat rate of $7.99 will be applied to any purchase under $50.00. This offer does not include Mexico, international or priority (2 day, overnight) shipping. ALL international drop shipments and orders for customer service/repair do not receive free shipping. Domestic drop shipments are free. For phone orders & Tech Advice please call our specialists at +1 407-886-3939 or toll free (877) 347-4788.

*Free shipping for orders over $50 on all ground shipments (FEDEX, LTLs, TLs) including oversized and HAZMAT. Includes Continental United States, Canada, Alaska, Hawaii, Puerto Rico, and US Virgin Islands. A flat rate of $7.99 will be applied to any purchase under $50.00. Does not include PR Aqua Products, HE Group Products, Mexico, international, or priority (2 day, overnight). ALL international drop shipments and orders for customer service/repair do not receive free shipping. Domestic drop shipments are free.

*Restrictions apply. Exceptions: orders for Faivre or Arvotech that have to be drop shipped are excluded.

DELIVERY INFORMATION: Most orders received by 4 PM Eastern Time are shipped the same day the order is received. For phone orders, in-stock conditions will be indicated for each product.

RUSH DELIVERY: Delivery in 1 to 4 business days is available on most in-stock, nonoversized items. Additional charges vary by product. Call 877-347-4788 or visit PentairAES.com for details.

INTERNATIONAL DELIVERIES: Our International Sales Department can provide pro forma invoices and complete export services. Freight quotes will be provided at the time of your order. Please call the International Sales Department at 407-886-3939 or fax your order directly to them at 407-886-4884.

PHYSICAL ADDRESS: Only the US Postal Service (USPS) can deliver to Post Office Box addresses. Also, some carriers do not regularly deliver to remote locations.

FACTORY DIRECT SHIPPING: You will be notified when your items are coming from a source other than us. We currently do not provide online tracking for drop-shipped packages, but we can provide an estimated delivery date upon request. If the item is over $200 and you are paying with a credit card, we will charge the credit card for the merchandise at the time the order is placed. Freight, including any handling charges, will be billed later.

MINIMUM ORDER CHARGE: If the total price of your order is less than $50.00, there will be a flat rate of $7.99 applied to your order.

ENVIRONMENTAL PACKING MATERIAL: We are very concerned about the environment, so we reuse packing materials from our inbound freight, including peanuts, paper, cardboard and polystyrene foam. Our own loose fill material is starch-based, shredded cardboard or air-filled plastic, as appropriate to reduce weight and environmental impact.

REPAIRS

Download the repair form at PentairAES.com. Any item(s) sent in for repair will be charged an evaluation fee up front, due at the time we issue the RA or payment must be sent in along with the item. If your item is under warranty and has been purchased within the past 90 calendar days, the evaluation fee will be waived. We will not process any repair evaluation without the fee being paid up front. The evaluation fee will be credited toward the repair fee if you elect to have the repairs done.

Any item sent in for a repair evaluation and left for more than 90 calendar days will be considered abandoned and become the property of Pentair AES. We will make an attempt to contact you four times, once upon the initial evaluation, then at 30, 60 and 90 days. If you have any questions about a product warranty or have an item that needs repair, contact our representatives at 877-347-4783.

DISCLAIMER

PRICES, FEATURES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE TO CUSTOMER. ALL PRICES ARE IN U.S. CURRENCY. PENTAIR AQUATIC ECO-SYSTEMS, INC. ("PAES") USES ITS BEST EFFORTS TO ENSURE THE ACCURACY OF THE INFORMATION SHOWN IN ITS CATALOG; HOWEVER, ERRORS DO OCCUR. CUSTOMER SHOULD CHECK WITH A PAES REPRESENTATIVE BEFORE PLACING AN ORDER TO ENSURE CUSTOMER IS OBTAINING THE MOST ACCURATE AND UP TO DATE INFORMATION REGARDING THE PRODUCT.

CUSTOMER ORDER ACCEPTANCE
All orders are subject to acceptance by Pentair Aquatic Eco-Systems Inc. (PAES) and are not accepted by or binding upon PAES unless a signed notice of such acceptance is forwarded to the Purchaser in writing. ACKNOWLEDGEMENT OF THE ORDER, INCLUDING THESE TERMS AND CONDITIONS, FROM PAES WILL CONSTITUTE THE ENTIRE AGREEMENT BETWEEN THE PARTIES. FURTHER, THIS ACKNOWLEDGEMENT AND THE CONDITIONS STATED HEREIN SHALL BE DEEMED TO HAVE BEEN ACCEPTED BY THE PURCHASER UNLESS PAES IS NOTIFIED TO THE CONTRARY IN WRITING PRIOR TO SHIPMENT OF PRODUCT, BUT NOT MORE THAN FIVE (5) DAYS AFTER THE RECEIPT BY THE PURCHASER OF PAES CUSTOMER ORDER ACKNOWLEDGEMENT.

GOVERNING LAW; SOLE JURISDICTION AND VENUE
If any action is brought to enforce this Contract or for damages or any other relief wherein PAES is a party, Purchaser acknowledges and agrees that the action shall be instituted and maintained in Orange County, Florida, and shall be governed by the laws of the state of Florida. The State Courts located in Orange County, Florida shall have exclusive jurisdiction over the litigation with the venue of any litigation to be exclusively in Orange County, Florida.

LIMITED GUARANTEE
All PAES products are only guaranteed to perform to CURRENT published or written order specifications as they appear in this and attached documents. Purchaser's exclusive remedy for any failure to perform to such specifications is to return the product for full credit, less shipping, if claim of dissatisfaction is received in writing within thirty (30) days of shipment date or sixty (60) days in the case of overseas shipments. No returns will be accepted without PAES' prior written authorization. PAES reserves the right to correct within a reasonable time, at its own cost, any malfunctions reported by Purchaser in writing.

LIABILITY LIMITED TO PURCHASER'S COST OF PRODUCTS
PAES' warranty herein shall only apply in the event PAES has received payment in full for the products supplied. Purchaser's exclusive remedy is limited to a refund of the Purchase Price in the event the Purchaser has paid PAES the full Purchase Price and the product sold is defective. PAES' liability is expressly limited to an amount not to exceed the invoiced price for the property which is the subject matter of the warranty claim. PAES is not responsible for damage to any finished surfaces, such as chips, cracks, etc., as a result of any installation process. PAES does not warrant against deterioration and/or peeling of finished surfaces due to exposure to sun, salt, the elements or abrasions including minor blemishes incurred in manufacturing, shipping or installation. THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, THAT EXTEND BEYOND THOSE INDICATED HEREIN AND ONLY AS DESCRIBED ON THE FACE OF THIS DOCUMENT OR REFERENCED DOCUMENTS. Except for the above warranties the Purchaser assumes all risks and liabilities arising from any use of the goods proposed herein.

LIMITED WARRANTY
Pentair Aquatic Eco-Systems, Inc. (PAES) warrants that its products shall, at the time of delivery and for a period of twelve (12) months thereafter, except for filters, be free from l defects in materials and workmanship; and, if any such product shall prove to be defective in material or workmanship under normal intended usage and maintenance during the warranty period, upon examination by PAES or its authorized representative, then PAES shall repair or replace, at its sole option, such defective products at its own expense; provided, however, that the Purchaser shall be required to ship each such defective product, freight prepaid, to PAES' designated facility. The warranty on products and/or components not manufactured by PAES, is limited to the warranty, if any, provided by the original manufacturer of said product or component. PAES sole warranty in regard to any components or products that are not manufactured by it shall be limited to the repair or replacement of the product, as set forth herein, with the condition that the Purchaser first return such defective item, freight prepaid, to PAES' designated facility. After PAES has made an inspection of the product, and has confirmed that there is a defect in the manufacture of the product, a credit will be issued to Purchaser's account. PAES HAS MADE NO AFFIRMATION OF FACT AND HAS MADE NO PROMISE RELATING TO THE GOODS BEING SOLD THAT HAS CREATED OR AMOUNTED TO AN EXPRESS WARRANTY OR THAT THE GOODS CONFORM TO ANY AFFIRMATION OR PROMISE. PAES DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTIBILITY AND FITNESS. PAES SHALL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

This Warranty does not extend to any Equipment that have been subjected to:

1. Damage caused by careless handling, improper repackaging, or shipping.
2. Damage due to misapplication, misuse, abuse or failure to properly operate equipment.
3. Damage caused by improper installation or storage.
4. Damage due to unauthorized product modifications or repairs.
5. Damage caused by negligence, or failure to properly maintain products.
6. Accidental damage, fire, acts of God, or other circumstances outside the control of PAES.

SEVERABILITY
In the event a provision of this Agreement is held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not be affected.

FIELD INSTALLATION AND SERVICE
Field installation and use training are not included, unless otherwise agreed to in writing by the PAES, for which a separate charge will be imposed. PAES assumes no responsibility for damage to concealed lines, such as, but not limited to, electrical, alarm, water and air conditioning lines.

SHIPPING DAMAGE/LOSSES
All products are shipped F.O.B. shipping point. In the event of shipping damage, PAES must be notified, in writing, within FORTY EIGHT (48) hours of shipment receipt. Purchaser must hold all products and packing materials intact, until further disposition is provided by PAES in writing.

RETURN OF GOODS
All claims for the return of goods except for warranty related claims shall be handled in accordance with PAES' Merchandise Return Policy located on our website www.pentairAES.com.

DELIVERY DELAY
PAES shall not be liable for any delay or failure in shipment of goods covered hereunder because of acts of God, carrier delays, fire, strikes, war or due to causes beyond PAES' control.

CANCELLATION CLAUSE
It is agreed by the Purchaser that any purchase order, after acceptance by PAES, is not subject to cancellation or to any verbal agreement or conditions not stipulated in writing on the purchase contract and specifically agreed to PAES in writing.

CANCELLATION PENALTY
A cancellation fee equal to thirty percent (30%) of the stipulated price for non-stocked or custom products which have already been manufactured will be charged for any cancellations of non-stocked or custom products that have not been shipped to the Purchaser. "Non-stocked or custom products" are defined as goods that are made to order.

OVERDUE INVOICES
PAES RESERVES THE RIGHT TO ADD, AND PURCHASER AGREES TO PAY, INTEREST AT THE RATE OF 18% PER ANNUM, FROM DATE OF SHIPMENT, ON AMOUNTS INVOICED AND UNPAID IN ACCORDANCE WITH THE PAYMENT TERMS.

COLLECTION AND ATTORNEY'S FEES
In the event of any alleged dispute, breach or default of this Agreement necessitating PAES to retain an attorney to represent it, the Purchaser agrees to pay the PAES' costs and expenses including reasonable attorney's fees, incurred in connection with, related to or arising out of enforcement of any term or provision of this Agreement, whether or not in connection with any legal or administrative proceedings, plus pre- and post-judgment interest and costs incurred, through appeal, and such shall be in addition to any other remedies or damages to which the PAES may be entitled. Failure to pay these fees automatically voids any Warranty Provisions to which the Purchaser would otherwise be entitled.

TAXES
In the event that sale of products herein is subject to any federal, state, municipal or other tax now or hereafter enacted, the amount of any such taxes will be the responsibility of the Purchaser and shall be in addition to the purchase price. In those jurisdictions in which PAES does not collect and remit tax, Purchaser is solely responsible for assessment and payment of any applicable use tax in accordance with the regulations established by their local taxing authority.

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- Diseño adaptado a dispositivos móviles
- Testimonios de clientes
- Conversaciones técnicas
- Buscar por número de pieza

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- Pesquisa sobre aprendizado avançado
- Boletim digital Pentair Pulse
- Calculadoras para aquacultura
- Chat ao vivo com um representante
- Gerenciamento on-line da conta
- Manuais de Instruções de Produtos
- Anúncios de novos produtos
- Design compatível com dispositivos móveis
- Testemunho dos clientes
- Conversas técnicas
- Pesquisa por número de peça

PENTAIR AQUATIC ECO-SYSTEMS WANTS TO CONNECT WITH YOU!

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WATER QUALITY & MOVEMENT

ORDERS AND ADVICE:
+1 407 866 3939

SHOP ONLINE:
PentairAES.com

SAME DAY SHIPMENT ON MOST ORDERS ENTERED BY: 4PM EST MONDAY-FRIDAY
Phone lines are open 8AM-7PM EST Monday-Thursday • 8AM-5PM EST Friday