

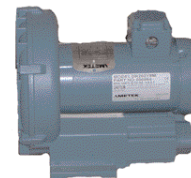
AERATION SYSTEMS QUESTIONNAIRE



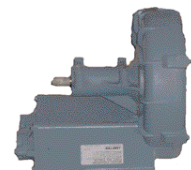
Aquaculture Research/Environmental Associates, Inc. P.O. BOX 901303 Homestead, FL 33090-1303
 TEL: 305/248-4205 E-MAIL: info@areainc.com WEB: www.areainc.com FAX: 305/248-1756

Dear Client:

Thank you for trusting in our experience and professionalism and allowing us to design your system. For over 37 years, we are proud to be the leader in providing quality **aeration system design** and equipment to the industry. We introduced the **Rotron Regenerative Blower** as the air source of choice. We are also proud to be the developer of the **Industry Standard 'Pro-Glass' II Fused Alumina Diffuser** which is the diffuser of choice for any aeration application. With over 3,500 products, our **FREE** systems design allows us to incorporate our equipment into the **Most Efficient** and **Cost Effective Systems** with the **Most Management Flexibility**. Our systems design we provide you will include everything you require to make the most informed decision which will include **Manifold Drawings, Detailed Quotation, Product Sheets** and a **Detailed Letter** explaining the system.



If you are planning to construct a hatchery, investigating ways to increase productivity from your ponds, aerating your intensive culture system, looking for a better way to aerate your live haul tanks, or replacing units currently in operation, let us assist you. Our staff is current in all devices and methods for all types aeration and our **R & D Department** is always developing new systems for same.



In order to properly size your aeration system, below is a list of information we require to ensure you receive the best system for your particular application. Please fill out the form below and **FAX** back to **305-248-1756** to the attention of our **Engineering Department**. If you received this via E-MAIL, send the filled out form to **areainc@aol.com** or to the FAX number previously mentioned.

Thank you again for the opportunity and we look forward to having the opportunity to serve you and your equipment/system needs. You can also visit our full service website at **www.areainc.com** for our **On-Line Catalog, Newsletter, Area In Action**, and more.

AERATION SYSTEM FORM

Below is the information we require to design the best aeration system for your application. In addition to sizing the appropriate equipment, we will also provide an **Air Distribution Layout** with pipe sizes. To do so, please provide over a sketch depicting the actual or anticipated tank arrangement with distances indicated as well as the location(s) of power supply.

ORGANISM: _____

MAX. DENSITY/BIOMASS: _____

ELECTRICAL SUPPLY: VOLTS _____ PHASE _____ HZ _____

ELEVATION (MSL): _____

MAX. DENSITY/BIOMASS: _____

| <u>QTY OF TANKS</u> | <u>USE</u> | <u>DIMENSIONS</u> (l x w x d OR Ø x d) | <u>APPLICATION DEVICE</u> (If Unknown, We Will Recommend) |
|---------------------|------------|---|--|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |



HEATING / CHILLING QUESTIONNAIRE



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Dear Client:

Thank you for trusting in our experience and professionalism and allowing us to design your Heating and/or Chilling system. For over 37 years, we are proud to be the leader in providing quality systems design and our experienced staff will analyze the information you provide and will design the most efficient and cost effective system that offers you the most management flexibility. Before we begin, please provide the following contact information so that we can effectively process your request.

COMPANY NAME _____ CONTACT NAME _____
 MAILING ADDRESS _____ CITY _____
 STATE _____ ZIP/POSTAL CODE _____ COUNTRY _____
 TELEPHONE _____ FAX _____ E-MAIL ADDRESS _____

There are three (3) primary factors, other than the type of solution, to consider when sizing temperature control equipment for liquids. They are:

TEMPERATURE MAINTENANCE: This is the amount of energy required to maintain the temperature of the solution when the ambient air temperature is different than the temperature you wish to maintain. This is a function of the surface area of the container(s) in which the solution is held. It is defined in terms of BTUH (BTU's/Hour) or kwh (kilowatts per hour) that is either lost or gained due to the ambient air temperature.

TEMPERATURE CHANGE: This is the amount of energy required to change a given volume of solution from one temperature to another. This is a function of the volume of the solution. It is also defined in terms of BTUH (BTU's/Hour) or kwh (kilowatts per hour), thus the amount of energy required is divisible by the number of hours one is willing to allow this to occur in.

NEW SOLUTION: This is the amount of energy required to change the temperature of solution being added. This is a function of the volume of the solution added within a one hour period. It is also defined in terms of BTUH (BTU's/Hour) or kwh (kilowatts per hour).

Final sizing is then a function of **Temperature Maintenance + Temperature Change** in a situation where the solution is continually recycled. If new solution is added, then final sizing may be a function of all three. One may decide to use just **Temperature Maintenance + New Solution** if the amount of **New Solution** is considerable and one is willing to wait for the **Temperature Change** to occur over an extended period of time. In order to assist you, please fill in the blanks below.

1/ What Is The **Solution** That You Are Trying To Heat And/Or Chill? _____

2/ Please List The **Three Dimensional Information** On All Tanks In The System Including The Reservoir (if any):

| No. TANKS | VOLUME | DIMENSIONS (l x w x d or ø x d) |
|-----------|--------|------------------------------------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

3/ What Temperature Is The Solution Now And What Temperature Do You Wish To Maintain? **Now** ____ °C **Desired** ____ °C

4/ How Much Time (in hours) Do You Wish To Allow For The **Temperature Change** To Occur In? **Time** _____ Hours

5/ What Is Your Ambient Air Temperature? **Temp** ____ °C

6/ How Much **New Solution** Is Added?? **GPM** _____ or **GPH** _____

7/ What Is The Temperature Of This **New Solution**? **Temp** _____ °C

8/ What Is Your Available Electrical Power Rating? **Volts** _____, **Phases** _____, **Cycles** _____, **Hz** _____,

To avoid any confusion regarding flow rates reflected on our 'Pro-Cool' Titanium Chillers/Heat Pumps product sheet, the minimum flow recommended has to do with preventing freezing of the solution on the titanium heat exchangers. The maximum flow rate is the flow that should not be exceeded which will result in inefficient heat transfer due to a lack of adequate contact with the heat exchangers. If your planned flow rate is within these limits, then the chiller may be mounted in-line. If your planned flow rates are not within these limits, then the chiller may not be mounted in-line. A reservoir of not less than twice the hourly flow rate (gph) should be installed with the chiller operating on a closed circuit with the reservoir. Water may be added and/or removed from the reservoir at the desired flow rate.

RECIRCULATING SYSTEM QUESTIONNAIRE



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Dear Client:

Thank you for trusting in our experience and professionalism and allowing us to design your recirculating system. For over 33 years, we are proud to be the leader in providing quality systems design and our experienced staff will analyze the information you provide and will design the most efficient and cost effective system that offers you the most management flexibility. Before we begin, please provide the following contact information so that we can effectively process your request.

- CONTACT NAME _____
- E-MAIL ADDRESS _____
- COMPANY NAME _____
- PROJECT NAME _____
- MAILING ADDRESS _____
- CITY _____
- STATE _____
- ZIP/POSTAL CODE _____
- COUNTRY _____
- PHONE _____
- FAX _____



The designing of recirculating systems is very complex and very critical to the success of the system. Please ensure you provide as much specific information a possible so that we can design the best system for your application.

SYSTEM TYPE

- Flow Thru OR Recirculation _____
- Desired Flow Rate _____
- Make Up Water Flow Rate _____
- Percent (%) Of Total Volume Replaced Per Day _____
- Indoor, Indoor Greenhouse, Outdoor, Outdoor Covered (Describe) _____
- Clear Water OR Green Water (Algal) _____
- Solids Removal System (Describe) _____
- Solids Filter Particle Removal Size (Microns) _____

PRODUCTION PLAN

- Specie(s) Being Cultured _____
- Altitude Of Site (Feet Above Sea Level) _____
- Average Individual Body Weight At Harvest
— Pounds (lbs) _____
— Grams _____
- Typical Feed Rate (% Of Body Weight Per Day) _____
- Feeding Frequency Prior To Harvest (Times Of Day) _____
- Feed Type (Describe) _____

WATER SOURCE

- Describe Your Water Source (Well, Reservoir, Municipal, Etc.) _____
- Chlorine _____ mg/L • Is The Water Chloramine Treated (Y / N) _____
- Dechlorination Method _____
- Dissolved Oxygen Concentration Of New Water Replacement
Added To The Culture System _____ mg/L
- Total Ammonia Nitrogen Concentration (TAN) _____ mg/L
- Nitrate Concentration _____ mg/L
- Maximum Sustained pH For 12 Hours _____
- Alkalinity _____ mg/L • Total Hardness _____ mg/L

WATER QUALITY REQUIREMENTS

- Temperature Range (°F to °F) _____
- Salinity (Parts per Thousand) _____
- Maximum Sustained pH Of Culture Water For 24 Hour Period _____
- Culture Water Alkalinity (mg/L) _____
- Quantity Of Tanks _____
- Tank Dimensions (Ø x d OR l x w x d) _____
- Total Number Of Tanks Treated By Biofilter _____
- Total System Water Volume Treated By Biofilter (Gallons) _____
- Total Number Of Systems (Number Of Biofilters) _____

WATER SYSTEM QUESTIONNAIRE #1



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Dear Client:

Thank you for trusting in our experience and professionalism and allowing us to design your water system whether your need is pumping, filtration, or both. For over 33 years, we are proud to be the leader in providing quality **water pumping** and **water filtration system design**. Relative to your water system(s), the information requested below is required to assist in sizing the appropriate system. In *Water/Pumping Systems*, there are typically two (2) segments. These include the **Primary Water System** and the **Secondary Water System**. Please be advised that if you are getting your new water from the ocean, well or a pond and pumping it to a reservoir and then to the hatchery; please use both water questionnaire below. When only one system is employed, use the appropriate questionnaire.

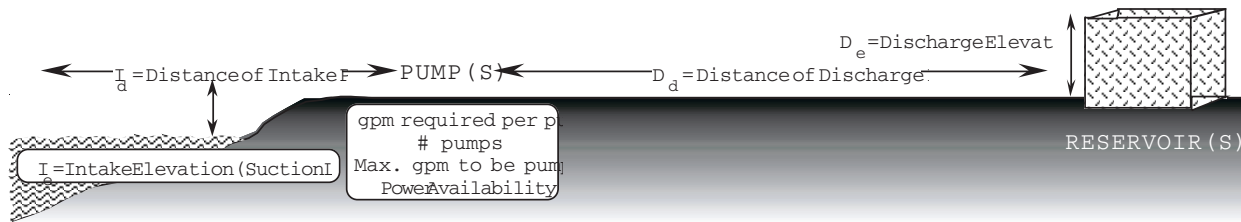
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WATER SYSTEM FORM (PRIMARY WATER)

PRIMARY WATER SYSTEM (Source to Reservoir)

- Horizontal Distance Of Pipe From Source To Pump _____
- Maximum Vertical Elevation Differential Between The Source And Pump _____
- Horizontal Distance Of Pipe From Pump To Reservoir _____
- Vertical Elevation Differential Between Pump To Reservoir _____
- Flow Rate (GPM) You Desire Delivered To The Reservoir _____
- Flow Rate (GPM) You Desire From Each Pump _____
- Filtration You Desire (if any) _____
 - Biological _____
 - Carbon _____
 - Cartridge _____
 - DE _____
 - Ozone _____
 - Protein Skimmer _____
 - Sand _____
 - UV _____
- Specific Objectives Of System _____
- Worst Case Turbidity Level Of Intake Water _____
- Power Availability Volts _____ Phase _____ Hz _____
- Type System Desired (**Manual** - On/Off or **Auto** - Demand) _____



Real Solutions. Fast Response.

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WATER SYSTEM QUESTIONNAIRE #2



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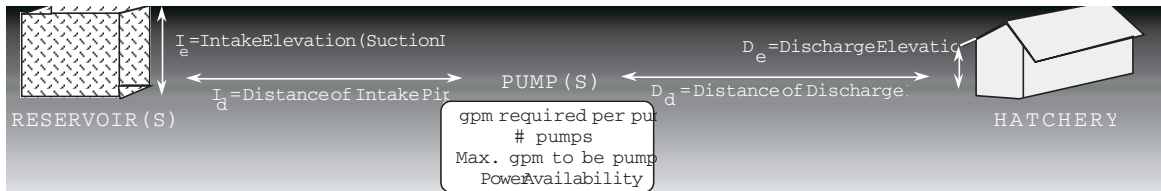
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WATER SYSTEM FORM (SECONDARY)

SECONDARY WATER SYSTEM (Reservoir to Facility)

- Horizontal Distance Of Pipe From Reservoir And Pumps _____
- Maximum Vertical Elevation Between Reservoir And Pumps _____
- Horizontal Distance Of Pipe From Pumps And Facility _____
- Vertical Elevation Between Pumps And Facility _____
- Do The Pumps Have a Flooded Intake? _____
- Gallons Per Minute You Desire Pumped _____
- Gallons Per Minute You Desire From Each Pump _____
- Filtration You Desire (if any) _____
 - Biological
 - Carbon
 - Cartridge
 - DE
 - Ozone
 - Protein Skimmer
 - Sand
 - UV
- Power Availability Volts _____ Phase _____ Hz _____
- Type System Desired (**Manual** - On/Off or **Auto** - Demand) _____



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