Jun, 2024
Vol 1, Edi 6

Wignity
Water Dignified

Wignity, ***adj.*** - to add dignity to the world of water management

Dear Water Warriors,

Liquid flow in a process is controlled by valves and the right selection is a matter of process expertise. Automation largely depends upon the condition of valve mostly open or mostly closed.

Further, for air distribution more than valve, the diffusers control the air volume and the efficacy of DO transfer . Let's get in details.

Technical Editor
Mr Sanjeev Srivastava
srivastava@aktionindiaa.com
+91 95128 55227

Nidhi Jain
Editor

The plant is well designed but we don't have enough flow, or we need to perform several steps such as operation, backwash, rinse, drain etc. How do we do that?

Here is the use of Valve, that is not just one "Word" but a "world" in itself. Manual or automatic, we need to define the purpose: On off, Controlling. Linear flow, Quick opening etc. We cover that in this edition.

But when it comes to Air flow e.g in Aeration Tanks, while valve are responsible for flow control, the efficient distribution of air to system to transfer DO in water from O2 gas is very important. This is an energy consuming or saving step.

In this edition we cover the aeration using diffusers. Different types, selection criteria etc.

So, enjoy the reading:

Valves...Important for Controlling & Regulating

We thank Aira Euro automation Pvt. Ltd. that contributed technical points on the Valves for this edition of Wignity.

Aira Euro automations Pvt. Ltd. is one of the leading manufacturer and exporter of automation and manual valves in the small sector in India having over 35+years of experience, maintaining one of the largest and most diversified markets of valves globally.

Pneumatic actuator operated valves can easily tolerate heavy loads and are easily available and inexpensive too. Their products meet a wide range of users from different fields in:

1. Fossil & Cogeneration Power
2. Nuclear
3. Refining
4. Petrochemicals
5. Pulp & Paper
6. LNG & Cryogenics
7. Pharma Industry

Explore Range of the Valves....

Valves are explored in two parts:

1. Valve Automation
2. Manual Valve

Valve Automation

Valve automation in water treatment not only improves operational efficiency and reliability but also enhances safety and regulatory compliance, making it an essential component of modern water treatment systems.

Below is the range of the Valve Automation:

A. Pneumatic Actuators
B. Ball Valve
C. Pneumatic Butterfly Valve
D. Pneumatic Control Valve
E. Solenoid Valve
F. Pneumatic Drum Type of Control Valve
G. Plug Valve

Pneumatic Actuators

There are many types of pneumatic actuators available but two of the functionality actuators are most common.

1. Single Acting Pneumatic Actuator
2. Double Acting Pneumatic Actuator

The single acting actuator is also known as the spring return actuator because there is a spring, and it needs only one-sided compressed air supply.

The compressed air pushes the actuator to either open or close. When the air supply stops, the spring pushes the actuator to its earliest position.

The double acting actuator needs two-sided air supply to open and close it. The pneumatic air system is cost efficient, spark free, and sustainable in hazardous and flammable environments compared to other energy sources.

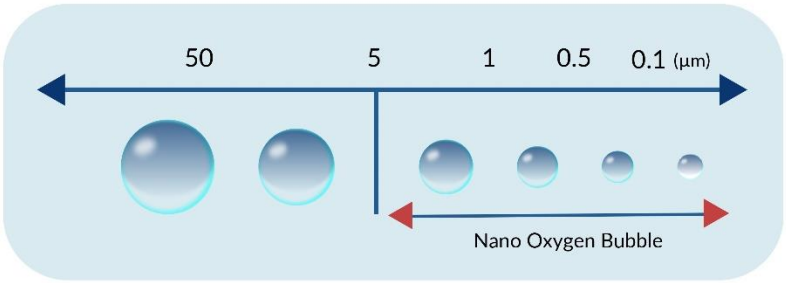
PureBubble™

EMBRACE THE POWER OF **NANOBUBBLES**

What are Nanobubbles?

Nanobubbles are a unique class of science that produce extraordinary improvements in water treatment, F&B and resource recovery. Pure Water's patented technology - PureBubble - injects trillions of nano-sized gas bubbles into liquid and deliver best-in-class gas-to-liquid transfer.

The key operating principal behind this significantly higher gas dossolution in water is the ability of nanobubbles to stay under the surface of water for a very long time without bursting, consequently increasing contact time.



- Bubble of less than diameter 1μm is called a **Nanobubble** (NB).
- 50μm diameter of Bubble and less is called a **Microbubble** (MB).

FEW OF THE MANY **APPLICATIONS:**

- **DRINKING WATER** - Higher ozone dissolution and superior disinfection
- **WATER/WASTEWATER** - Efficient aeration and significant COD/BOD reduction
- **AQUACULTURE** - Increased Dissolved Oxygen
- **HORTICULTURE** - Superior water quality for higher yield and longer shelf-life
- **PONDS & LAKES** - Effective bioremediation through a chemical-free solution
- **POULTRY/LIVESTOCK** - Improved water quality, higher yield and disease prevention

Pure**Bubble** - Nanobubble Generator At Work

www.purewaterent.net
info@purewaterent.net

PureBubble PURE WATER

Pneumatic Actuator Benefits

The pneumatic Actuator rotates 90° to 180° to operate the valve with just the compressed air. Hence, it has a low cost and low maintenance, which saves electricity and gives a fast movement compared to motorized actuators. The Pneumatic actuators are spark free, making them easily usable in a hazardous environment and safe for atomic plants. It has smooth working without any extra noise.

Pneumatic Actuators Features

1. Single Acting and Double Acting Rack & Pinion SIL 3, ATEX, CE Approved Actuators validated for 5,00,000 cycles.
2. Hard anodized Aluminum body is also available in Stainless Steel version.
3. ISO 5211 mounting pad in all Rotary Actuators for easy mounting.
4. A long list of torque ranges up to 1,10,000NM.
5. All automation accessories manufactured by us, such as Limit Switch, Positioner, FR, etc.

Selection of an Appropriate Pneumatic Actuators

During the selection of a single acting actuator, increase 25% of the required torque value for an acceptable safety factor. If you need 120NM torque to drive a valve, you must increase it by 25% -152NM for safety.

While selecting a double acting actuator, you need to increase the torque value by 15% for an acceptable safety factor. The safety factor depends on the media passing through the valve.

Ball Valve

These valves can easily tolerate heavy loads, and therefore, they have applications in various fields including Pharma, Refining, Nuclear, Petrochemicals, and other industry verticals.

Types of Ball Valves

Ball valves are primarily divided into two categories based on their design which further has various sub-categories based on their qualities and applications.

The major two categories are

(i) Trunnion Ball Valves
(ii) Floating Ball Valves/Float Ball Valves

The other classification is based on whether they are

(i) Motorized ball valves
(ii) Actuated ball valves or
(iii) Manual ball valves.

Ball Valve Applications

Mainly ball valves are used to regulate the flow of a fluid. As they are available either as manually operated or with a motorized control, they can be used as an application in a variety of settings. But mostly they are used for on-off services in pipes containing suspended solids, slurries, liquids, or gases.

Other applications that commonly employ ball valves are the tubing systems and industries that transport fluids such as mining, oil, and gas, agriculture, water, construction, etc.

Pneumatic Butterfly Valve

Pneumatic Actuator Butterfly Valves are generally used for liquid and slurry materials. These are very popular in the valve industry because of their easy to use and simple mechanism.

Pneumatic Butterfly Valves are very useful to control highly inflammable liquids like petro-chemicals, Oil, and Gas. It is operated by Pneumatic which allows fast functionality and safe from fire and electric short circuits. So it is an electricity efficient operated valve with the lowest cost.

Mechanism of Pneumatic Actuated Butterfly Valve

The pneumatic Butterfly valve works on a simple mechanism and is easy to use so it has low maintenance, these valves are fitted in mid of fluid flow.

There is a disc connected to a center rod, which rotates the disc quarterly to pass through to open and close. This metal disc called Butterfly rotates a quarter turn to allow fluid to pass indefinitely and so the slow opening valve will reduce the flow and turning the disc to close the valve and flow.

This valve is operated by pressurized air which is controlled by a pneumatic actuator that is fixed on it. So there is nobody who needs to operate but the pneumatic actuator operates this valve too fast and easily with the lowest cost and safety.

Solenoid Valve

Solenoid valves are available with various body materials to handle high temperature media. It's used in various applications like Air, Water, Gas, Light Oil, Light Chemical, Vacuum, Corrosive Fluids, Autoclaves, Gas Burning Equipements, Pump Seal Water Application, High Volume and Low pressure Application, Hot water, Steam, Dust collector Application, Low Pressure Water Circulation System, Solar Heating System, Gas Generator, High Temperature Fluids, LD Oil, Chemical, Ceramic Filters, Drain and Dispensing, Oil Centrifuge Plants, low oil pressure, etc.

Our huge range of solenoid valves is upgraded with the latest technology and user friendly for new generations. Therefore, our customers are very satisfied with our products.

Plug Valve

Plug valves are generally suitable for liquids like water, chemicals, oil as well as slurry materials and for steam, gases, etc.

Therefore, this valve is very useful in chemical industries, oil refineries, water plants, gas pipelines, and many other factors.

Plug Valve Mechanism

Plug valves are generally Cone or Cylinder shaped, a rotating hollow plug inside the body of a valve to control the flow. The plug has one or more passageways to control the flow. There is a handle attached to the inside plug, to operate the valve either open or close need to rotate the handle quarterly so the inside plug rotates, and flow passes from it.

Manual Valve

Exploration of Product Range of Manual Valve:

1. Manual Ball Valve
2. Manual Butterfly Valve
3. Manual High Pressure Halve
4. Manual Plug Valve
5. Pressure reducing Valve
6. Manual Drum type of Control Valve

For further details:

Ms. Anjana Rajput – Manager Projects & Approval
+91 9998051247

project1@airaindia.com
www.airaindia.com

Diffuser & Air distribution : Ensuring optimal Air Flow

SSI is a global leader in the design and manufacture of wastewater treatment plant equipment. This includes innovative, robust, and energy-efficient engineered membrane diffusers.

These include fine bubble diffusers, coarse bubble diffusers, and aeration systems. Their wastewater process division specializes in the moving bed biofilm reactor (MBBR) and integrated fixed film activated sludge (IFAS) processes.

Air diffusers play a crucial role in aeration tanks by efficiently distributing oxygen throughout the wastewater. This oxygen is essential for aerobic bacteria to break down organic matter, promoting effective wastewater treatment. Diffusers enhance the oxygen transfer efficiency, maintain dissolved oxygen levels, and ensure proper mixing, thereby optimizing biological processes and overall treatment performance.

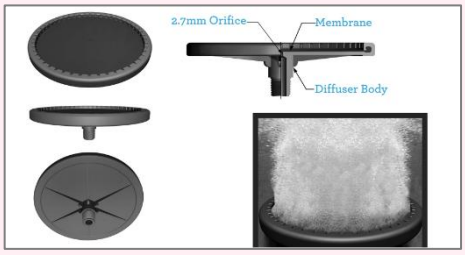
Fine Bubble Disc Diffuser

Fine Bubble Disc Diffusers for sale offer superior component quality and advanced engineering. They fit a wide range of engineering specifications, system standards, applications, and industries.

7" Fine Bubble Disc Diffuser

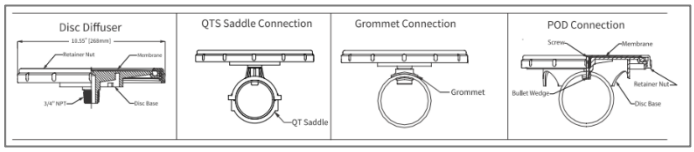
Bubble diffusers are a vital part of the wastewater aeration and treatment processes, making it possible to force air bubbles into water pipes to feed the microorganisms in the tanks responsible for processing the water. The quality of a company's wastewater treatment is only as good as its bubble disc diffuser.

SSI's 7-inch fine bubble disc diffuser is great for maximizing oxygen diffuser density in high-efficiency applications.



Industries all over the world use this bubble disc diffuser, and it meets or exceeds most industry standards for efficiency, life span and overall quality.

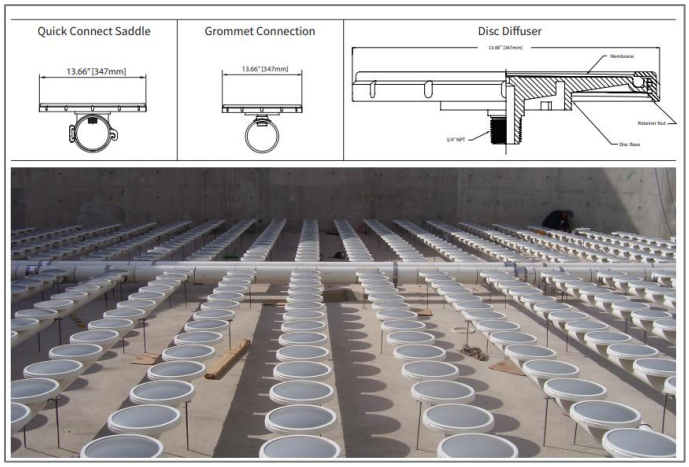
9" Fine Bubble Disc Diffuser



The SSI 9" Disc Diffuser System combines engineering excellence, superior component quality, and a technically advanced product design. Proven highly durable and efficient in thousands of municipal and industrial installations around the world, this advanced system has reliability built into every stage of performance.

12" Fine Bubble Disc Diffuser

SSI 12" Disc Diffuser systems combine engineering excellence, superior component quality, and a technically advanced product concept. Proven highly durable and efficient in thousands of municipal and industrial installations worldwide, this advanced system has reliability built into every stage of performance.

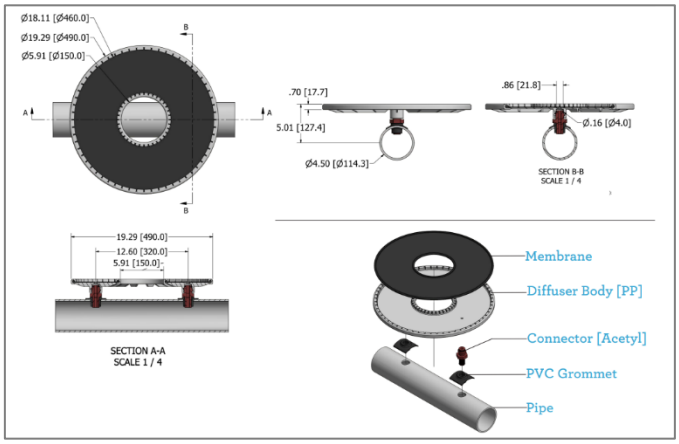


While the 9-inch fine bubble disc diffuser is a popular choice for many industrial wastewater treatment systems, some systems may require a larger model. SSI Aeration, Inc.'s 12-inch bubble fine disc diffuser is a preferred option for companies that need a cost-effective fine bubble disc diffuser with a greater active surface area.

These larger disc diffusers allow you to cover a significant amount of piping without the type of spiral flow from plate diffusers spread far apart on the pipe. Companies should benefit from less head loss as a result.

20” Fine Bubble Disc Diffuser

Some wastewater treatment systems may require customized components that are somewhat different from the industry standard. SSI Aeration, Inc. strives to supply these systems. For example, some systems require cost considerations and the need to cover a larger active surface area. To accommodate these systems, SSI Aeration, Inc. is a reliable 20-inch fine bubble disc diffuser supplier.



The 20-inch fine bubble disc diffuser should be sufficient for most large wastewater treatment system needs. Companies can enjoy maximum oxygenation efficiency with minimal head loss from the closer placement possible with disc diffusers over plate diffusers, which limits spiral flow.

Course Bubble Diffuser

Coarse bubble diffusers eliminate clogging in wastewater systems while maximizing airflow and mixing capabilities. Operators often use these as alternative methods to fine bubble diffusers, which are efficient but more susceptible to plugging risks.

Application

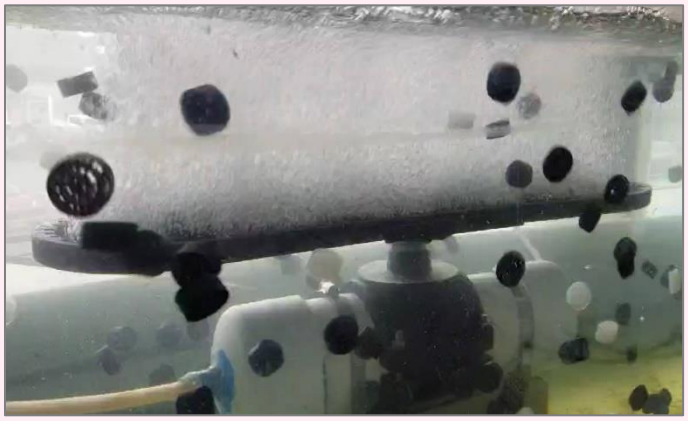
Coarse bubble diffusers are most used in secondary treatment applications, where substances such as sediment and carbonate can build up quickly. The growth of these materials can be detrimental to fine bubble diffusers, which have smaller openings that plug more easily. Engineers and operators often choose coarse bubble diffuser solutions for applications that require more space and larger openings. These uses may include aerobic digesters, grit chambers, sludge holding tanks and equalization basins.

Fine Bubble Plate Diffuser

SSI Aeration’s Fine Bubble Plate Diffuser is made with advanced manufacturing technology under strict ISO-9001:2015 quality control standards.

It provides a uniform bubble pattern from end to end and side to side, providing users with very high oxygen transfer efficiency at an affordable cost. SSI plate diffusers have been accepted worldwide by operators and engineers.

The Plate Diffuser Fine Bubble System combines outstanding product features, quality control and modern manufacturing technology.



The product and system are durable, and popular with wastewater treatment plant operators and consulting engineers worldwide. Quality is important to us, as is end user satisfaction.

For further details:

Mr. Sandeep kumbhargaonkar – Regional Manager BD
+91 8008713057

sandeep@ssiaeration.com
www.ssiaeration.com

Strength in Unity

Collaborative Excellence in Water Treatment

Join us in embracing the "Stronger Together"
This initiative aims to unite us all in our efforts, emphasizing collaboration, support, and synergy within our community.

Let's join hands and make a difference together!

Wignity is a E-magazine created by Aktion Waughter Private Limited for Water Community Knowledge Share