Hanshin Engineering Co., Ltd.

Submerged Mechanical Aerator/Agitator

Applications
Sewage treatment, factory effluent treatment equipment
Bioreactor equipment (activated sludge process)

- **Energy-efficient, diffusion-type aerator (bioreactor equipment)**

Features

- **Can be installed in new and existing aeration tanks (activated sludge process) used in wastewater treatment facilities (motor power: from 1.5 to 30 kW).**
- **Operates with either anaerobic or aerobic mixing.**
- **Outstanding mixing capability, excellent oxygen transfer efficiency; easy installation and removal.**

AQUARATOR

Overview (Technical principles, actions, etc.)

AQUARATOR (submerged mechanical aerator/agitator)

Conventionally, bioreactors used in wastewater treatment systems have used blowers to blow in air through diffuser pipes, diffuser tubes, diffusion plates or the like set in the aeration tank.

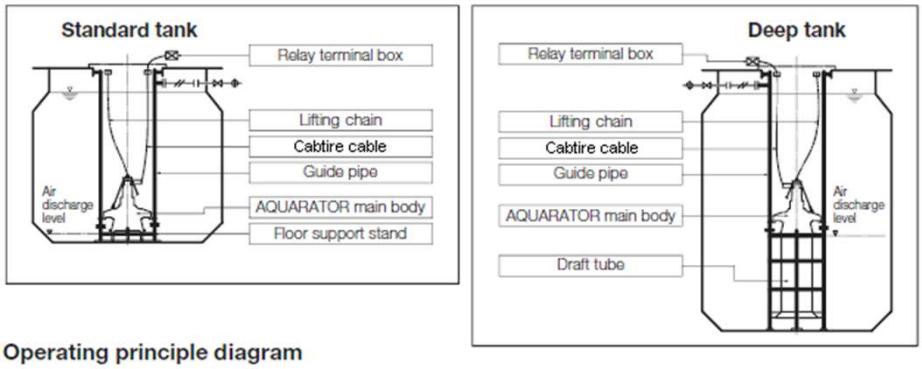
Because this method uses a single source of power, and because large amounts of air must be constantly blown in to maintain agitation ability (to prevent the sludge from settling) even, for example, when the amount of water flowing in is extremely small, and because of inadequate functions to track responses to changes, there have been increasing calls for improvements in both the water treatment technology and water treatment costs.

AQUARATOR aeration system improves the functions needed for aeration by separating the power sources for the air supply function and the air diffusion function, and logically embodying the former function in a blower and the latter function in a AQUARATOR, thereby significantly improving the power efficiency in aeration (Ministry of Land, Infrastructure, Transport and Tourism Approval No. 81102).

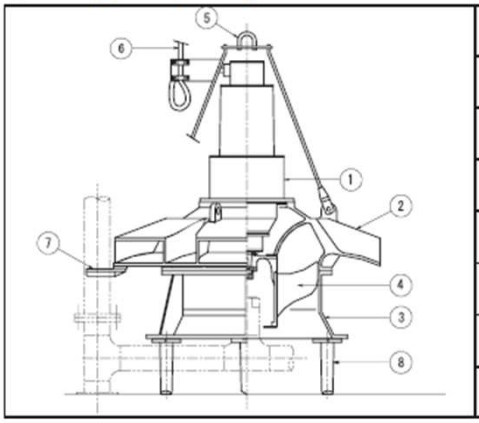
Separating the power sources enables AQUARATOR to function as a submerged agitator for both anaerobic and aerobic applications, and can be easily be optionally selected for standard methods, or for anaerobic or aerobic processes according to the method for sewage disposal.

Being able to freely control the air supply (blower) and air diffusion (AQUARATOR) functions either individually or both together makes it a device capable of cutting waste in energy consumption, as well as dramatically reducing water treatment costs.

Overall functional block diagram



Operating principle diagram



①	Submerged driving unit
②	Upper casing
③	Lower casing
④	Impeller
⑤	Lifting lug
⑥	Cabtire cable
⑦	Guide piece
⑧	Leg

Introductory Track Record

- Sewage treatment plants, industrial wastewater treatment facilities
- Countries and regions with installations include Korea, China, Taiwan, Thailand and Philippines

Effects

Water treatment technologies and economic efficiency

At present, the activated sludge method is the predominant process used for water treatment at sewage treatment plants and industrial wastewater treatment facilities, and this method is expected to continue to come into even wider use. Consequently, what will be increasingly important is the ease and economic efficiency of operation and maintenance. Easy operability and maintainability are strongly related to economic efficiency. In terms of water treatment technology, operation and maintenance can be summarized in the following three points:

(1) Overcoming solid/liquid separation problems (bulking) resulting from filamentous fungi and actinomycetes etc.
(2) Preventing deterioration in water quality as a result of nitrification and denitrification.
(3) Preventing eutrophication from nutrients such as nitrogen and phosphorus.

The above points can be eliminated or countered by being able to freely operate as anaerobic or aerobic conditions. This substantially decreases water treatment costs.

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