

SEWACLEAR® TERTIARY TREATMENT SYSTEM

Description

The SewaClear® Tertiary Treatment System is an automatic filtration system designed to provide additional "polishing" of secondary treated wastewater. The SewaClear® system processes water with a BOD/TSS of approximately 20/30 to a BOD/TSS level of 5/5 (with flocculation option). Three layers of media in each media tank remove organic and inorganic particles from water. Chlorine dosing, free chlorine controller, flocculation and turbidity management are options on all SewaClear® models.

SewaClear® options shall include:

Flocculation: The Flocculation option shall increase the collective capacity of the system by removing colloidal particles from the effluent to improve the permeate quality. This option shall be required where maximum particle removal is required. This option shall include a tank, dosing pump and cyclone mixer and shall be available on all SewaClear® models.

Chlorine Dosing: The Chlorine Dosing option shall allow for automated dosing of hypochlorite/chlorine gas to help destroy pathogens and micro-organisms in the treated water and shall be available on all SewaClear® models.

Free Chlorine Controller: The Free Chlorine Controller option shall be fully automatic and shall integrate with the chlorine dosing option to provide for additional dosing control as well as residual chlorine monitoring and readout. It shall be available on all SewaClear® models and shall require addition of the Chlorine Dosing option.

Turbidity Management: The Turbidity Management option shall provide for water clarity to 5 ntu. It shall constantly monitor the entire filtration process and make automatic adjustments to deliver the desired clarity of water. The Flocculation option shall be required with Turbidity Management. It shall be available on all SewaClear® models.

Construction

SewaClear® shall be available in the following flow rates: 6 GPM, 10 GPM, 15 GPM, 25 GPM, 37 GPM, 60 GPM, 92 GPM, and 135 GPM. SewaClear® shall have a minimum operating pressure of 44 psi (3.0 bar). Maximum operating pressure shall be 117 psi (8.1 bar) (88 psi (6.1 bar) on 135 GPM model). Maximum working temperature shall be 113° F (46°C). Standard power supply shall be 110 VAC single phase with other power options available.

Filters, hydrocyclone body and manifold material & coating shall be constructed from carbon steel. All steel parts shall have a 100 micron protective coating of extra durable polyester

protection, applied electrostatically on a zinc-phosphate base coat and oven cured for maximum anti-corrosion protection.

Isolation valves on each tank shall allow media to be replaced without shutting the entire unit down.

All components shall be weather-proof making protective covering optional. Normal winterizing precautions shall be taken in freezing conditions.

Operation

Installation of SewaClear® shall be as detailed. SewaClear® shall be capable of operating 24 hours a day. SewaClear® shall meet California's Title 22 Water Reuse requirements when using the flocculation option.

Automation and Control

The SewaClear® treatment system shall be controlled by a Siemens PLC that shall manage all aspects of the filtration and backwash processes. Backwashes shall be performed automatically by pressure, at pre-set intervals or by manual activation.

SewaClear® shall be capable of being wired into other control systems if unified project control is required. The PLC shall allow for remote system monitoring (other components may be required)

Prefiltration

The prefiltration function shall be performed by an automatic, 200 mesh/80 micron self-cleaning screen filter. The filter shall employ an automatic suction system for cleaning the screen. The automatic flushing process shall start whenever the pressure between the inlet and the outlet of the filter reaches a predetermined differential that lasts for 10 seconds. Inline water pressure shall control the operation without interfering with the filtration process.

Flocculation Unit (Optional)

A coagulant shall be mixed with incoming water. The unit shall include a tank, dosing pump and cyclone mixer to ensure proper mixture of coagulants with the water. Common coagulants such as alum, aluminum chlorohydrate, calcium oxide, iron chloride, iron sulfate, sodium aluminate, and sodium silicate may be used.

Multi-Media Depth Filtration

The four multi-media filters shall use a combination of media layers of basalt, quartz sand and anthracite to remove suspended organic matter and inorganic particles from the water. Flow rates through the filters shall be less than 5 GPM per square foot. The multi-media filters shall have a total media height of 40" in each filter and shall utilize a double-bottom chamber design separated by a reinforced steel plate. Slotted, conical "mushroom" diffusers

shall allow the filtered water to flow into the bottom of the tank as well as acting as the “nozzles” during backwash. The diffusers shall be designed to help eliminate channeling and caking of debris by delivering a uniform dispersion of water throughout the entire media bed during the backwash cycle.

Filter Flushing

The flushing process shall be able to start automatically, according to whichever of the following conditions occur first:

- The differential pressure between inlet and outlet of the multi-media filters reaches a preset differential
- At a specific time set by the system operator
- Manual activation by the operator

The flushing process shall include a filter backwash and a direct wash.

Backwash of Multi-Media Filters

During filter backwash, water flow shall be reversed and sent up into the filters' media beds, fluidizing the media layers and causing a turbulent expansion of the media. Any debris from the media layers shall be carried out to the drain through a backwash outlet valve. The backwash process shall occur in one media filter at a time, allowing for filtered water from the other three filters to be used. Filtered water shall enter through the outlet/backwash manifold, and the backwash filter inlet/backwash outlet valve shall be closed to inlet and open to backwash outlet.

Direct Wash

A direct wash shall be performed automatically in all four filters at the same time immediately following the filter backwash. This operation shall help resettle the media into layers so the filtration process can resume. Water shall enter the filters through inlet/backwash outlet valves, (valves are open to inlet and closed to backwash outlet), exit the filters from the drain manifold in the bottom of the filters and flow out through the drain valve.

SewaClear[®] shall be Netafim Model Number 23SewaClear ___-___-___-___ and shall be as specified by Netafim USA.