



Self flushing series water purifier

Summary:

ZNYG series self flushing water purifier introduces the technology of China Municipal Engineering southwest Design Institute and other units, integrates the advanced technology in current water treatment, absorbs the advantages of similar products, and makes a more reasonable design and combination of mixing, reaction, sedimentation, filtration and backwashing of filter materials, so as to reduce the high turbidity of rivers, rivers, lakes and streams all over the country, Medium turbidity and low turbidity can be adapted.



Due to the small volume of the equipment, small land occupation, low investment, fast start-up, energy saving and convenient management, the treated water quality can be less than 5 mg /L for low turbidity of raw water with turbidity less than 100 mg/L or high turbidity of raw water with turbidity of 3000 mg/L (up to 3000 mg/L in a short time). Therefore, it has become the most popular water purification equipment in rural areas, towns, small and medium-sized industrial and mining enterprises, construction sites, field work units and military barracks.

Working principle and structure:

The raw water is mixed, reacted, precipitated and filtered to make the water turbidity less than 5 mg/L.

Mixing is completed outside the equipment, that is, the coagulant is added into the suction pipe of the water pump, and the water pump is used to achieve mixing.

The mixed raw water is sent to the water purifier for purification. The water purifier is equipped with:

- a. Reaction, precipitation and filtration area;
- b. Sludge concentration area, in which a forced water outlet pipe is set, and its water output is 20% of the rated water volume of the whole equipment. The function of this area is to improve the sludge concentration, prolong the sludge discharge cycle, and save the water consumption for sludge discharge, so as to achieve the purpose of energy saving;
- c. The flushing water tank is used for automatic backwashing of the filter;



Main technical performance:

- a. Turbidity of raw water: ≤ 3000 mg /L (up to 6000 mg /L in a short time);
- b. Effluent turbidity: < 5 mg /L;
- c. Inlet pressure: > 0.06 Mpa:
 1. When the water source is close to the water plant, the water intake pump house can be combined with the water supply pump house. When the water source is far from the water plant, the water intake and purification facilities shall be built separately, and the process shall be arranged according to the specific local conditions.
 2. The suction pipe in front of the pump is used for dosing, the agent is basic aluminum chloride (less corrosive), and the bleaching powder or liquid chlorine is used for disinfection, which is put at the top inlet of the clean water tank.
 3. The purifier equipment foundation can be made of plain concrete, the foundation treatment is firm, the foundation is 100mm higher than the ground, the water seal groove is made of brick, the groove top is 200mm higher than the weir mouth, and the size is determined by the designer.
 4. When the sludge discharge pipe and sand discharge pipe are blocked, the water supply pipe can be used for regular backwashing.

Installation, operation and management

- a. Equipment installation:
 1. In most areas of the south, the equipment can be installed outdoors, but for cold areas, it can be considered to be placed indoors.
 2. The equipment foundation shall be leveled to ensure normal operation; After the pipeline is connected, check whether there is air leakage and water seepage.
 3. After installation, the interior of the equipment shall be inspected to remove dirt, gravel, iron filings, etc., especially to check whether the hole of the perforated water inlet pipe is blocked.
 4. The filter material shall be laid from bottom to top to ensure that the surface of the filter material layer is flat without random operation, so as to ensure the reasonable gradation of the filter material.
- b. Equipment operation:
 1. Before starting the equipment, open the water inlet valve and forced water outlet valve, and close all other valves. After the water pump starts, adjust the intake valve, use a smaller amount of water (generally $1/2 \sim 1/3$ of design flow), and increase the dosage (1.5~2 times of the normal dosage). When the water level rises to the top of the slag drain pipe, close the forced outlet valve. Take samples from the water distribution tank for observation. When the turbidity drops to about 20° and the suspension layer is stable from outside the audition, gradually open the inlet valve and the forced outlet valve. At this time, the coagulant dosage also decreases to the normal dosage.
 2. After the effluent from the sedimentation tank is qualified (generally controlled at $20 \sim 30$ mg/L). Open the inlet valve of the filter, control the inlet water to slowly enter the filter, infiltrate the filter material from top to bottom, and open the backwash valve after the flushing water tank is full. When backwashing the filter, pay attention to control the flushing

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intensity, and wash the impurities and inappropriate filter materials before putting the equipment into normal use.

3. The water inflow shall not change too much during operation, and the maximum water volume shall not exceed 1.2 times of the design rated flow.
4. The forced effluent ratio of effluent from sedimentation tank is 5:1.
5. When the water level of the filter tank (observe the water level gauge) is 1.5m higher than the water level of the filter tank, the filter tank can be backwashed.

Equipment management:

- a. The best coagulant is basic aluminum chloride with high efficiency and low corrosion performance. The feeding method can be vacuum feeding on the water pump suction pipe, so the feeding pipe should have good sealing conditions. The volume of dosing cylinder can be diluted according to the dosage of one shift or one day.
- b. When the equipment operates intermittently, the shutdown time should not be too long (not more than one day). When the equipment resumes operation, some aged sludge shall be removed. Increase the water inflow and dosage to activate the sludge at the bottom, and then adjust it to about 2/3 of the design water volume. After the effluent quality is stable, gradually increase the water volume and reduce the dosage to the normal value.
- c. When the sludge and sand discharge cannot work normally, the water supply pipe valve can be opened for flushing, and then the sludge and sand can be discharged.
- d. During the operation of the filter, the top cover plate of the filter shall be removed every six months to one year to check whether the filter material is flat and whether there are cemented mud balls. And check whether the perforated water inlet pipe and sludge discharge pipe are blocked.
- e. The equipment shall be subject to anti-corrosion treatment every two years.

Dosage of coagulant (calculated by alkali aluminum effective Al_2SO_3):

| Raw water turbidity (mg/L) | Dosage (mg/L) |
|----------------------------|---------------|
| 100-500 | 10< |
| 500-1000 | 10~15 |
| 1000-2000 | 15~25 |
| 2000-3000 | 25~40 |

Sludge concentration in reaction chamber and concentration chamber:

| Suspended solids content in raw water (kg/m ³) | Sludge concentration in reaction chamber (kg/m ³) | Concentration of sludge in concentration chamber (kg/m ³) |
|------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------|
| 0.1~1.0 | 2~5 | 200 |
| 1.0~2.0 | 5~8 | 200 |
| 2.0~3.0 | 8~11 | 200 |