



SHOOT

SHT-10KG Sodium Hypochlorite Generator

User's Guide

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Foreword

Respected user:

Hello! Thank you very much for your use the system of the sodium hypochlorite generator produced by our company.

Our company specializes in producing and sterilizing equipment. In order to make our equipment better to play its excellent performance for your service, please read the product specification carefully before the operation is used, follow the safety precautions, and set the technical parameters and the operating equipment strictly according to the specification. If there is a technical problem, please consult the after-sales service call. We will serve you wholeheartedly! Please keep all the instructions and relevant technical information in order to check them!

一、 Overview

Sodium hypochlorite is a strong oxidizing agent, which has a strong bactericidal ability. A certain concentration of sodium hypochlorite solution can quickly kill all kinds of pathogens and viruses, and effectively destroy the surface antigen of the virus.

Sodium hypochlorite solution is the most mature and widely used broad-spectrum disinfectant because of its simple, economical preparation, high efficiency, broad spectrum, harmless and no toxic residue.

The complete set of sodium hypochlorite generator system includes soft water unit, dissolved salt and matching unit, sodium hypochlorite generator unit, storage unit, hydrogen discharge unit, dosing unit, pickling unit, safety monitoring unit, electrolytic unit, control unit, etc.

The generator host adopts the latest voltage regulation power supply technology, which is provided as the power supply of the generator, and pure titanium protected by special material surface coating is used as the electrolytic electrode of the generator. The tank at all levels is made of food-grade PE material, and other components are made of food-grade UPVC material resistant to strong acid and alkali. The disinfection solution of food grade sodium hypochlorite can be prepared conveniently, safely and stably.

Sodium hypochlorite disinfectant is widely used in food processing,

medical and health systems, public places, aquaculture, drinking water, production water, sewage, industrial circulating water, such as disinfection, algae, scale, color, flavor and other treatment, can also be used for fruit, fruit, vegetable surface pesticide residue degradation or removal.

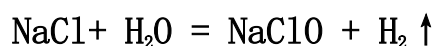
The bacteria index in drinking water treated by the disinfection solution produced by the equipment conforms to the requirements of "Sanitary Standard for Drinking Water" GB 5749-2006.

二、 System parameter

- 1、 Input voltage: 380VAC 50Hz (with ground);
- 2、 Rated current: $\geq 90\text{A/Kg.CL}$;
- 3、 Installed power: $\geq 59.4\text{KW/Kg.CL}$;
- 4、 Electrolytic voltage: $\leq 48\text{VDC/}$ single group of electrolytic cell;
- 5、 Electrolytic current: $\geq 1000\text{A/Kg.CL}$;
- 6、 Chlorine production: \geq rated production $\pm 10\%$ g/h;
- 7、 Effective chlorine content: 7000-9000ppm (made liquid);
- 8、 Electrolysis solution: 2.8-3.0% dilute brine;
- 9、 Dosage: $2\text{-}4\text{g/m}^3$ (based on efficiency);
- 10、 Disinfection time: not less than 30 minutes.

三、 Working principle of sodium hypochlorite generator

The main reaction process of sodium hypochlorite generator electrolysis can be expressed by the following equation:



Electrolytic salt water type sodium hypochlorite generator electrolysis process is an electrochemical reaction process, its only raw material is salt water, no other additional ingredients, made of sodium hypochlorite solution pure quality.

Its working principle is: sodium chloride solution under the action of a certain tank voltage, a series of electrochemical reactions occur in the

electrolytic cell, and finally generate sodium hypochlorite solution.

Because the molecular weight of NaClO is 1.05 times that of Cl₂, and the charge transfer number of each NaClO molecule is the same as that of Cl₂ molecule during oxidation reaction, each gram of NaClO produced by electrochemical reaction is equivalent to the consumption of 0.952 grams of Cl₂ during the production of sodium hypochlorite.

The process of generating sodium hypochlorite also produces a considerable amount of hydrogen. Because in the process design, a centrifugal fan is used to blow in fresh air to mix with the generated hydrogen, the amount of hydrogen is calculated based on the cathode producing 100% hydrogen at the maximum input current. According to this calculation, approximately 0.35 liters of H₂ are generated for every 1 gram of NaClO produced.

四、 Sodium hypochlorite generator system characteristics

◆ Easy to operate and high reliability

All units of the system are centrally controlled by the "intelligent control center PLC", and the control cabinet is equipped with instructions and operation keys for each function. Users can understand the current operating status of the system through these instructions, and realize each function through the keys. The system itself has automatic detection and self-protection functions, and the machine runs

automatically without manual care, stable and reliable operation. Simple, convenient and safe operation.

◆ **Simple and fully automatic production**

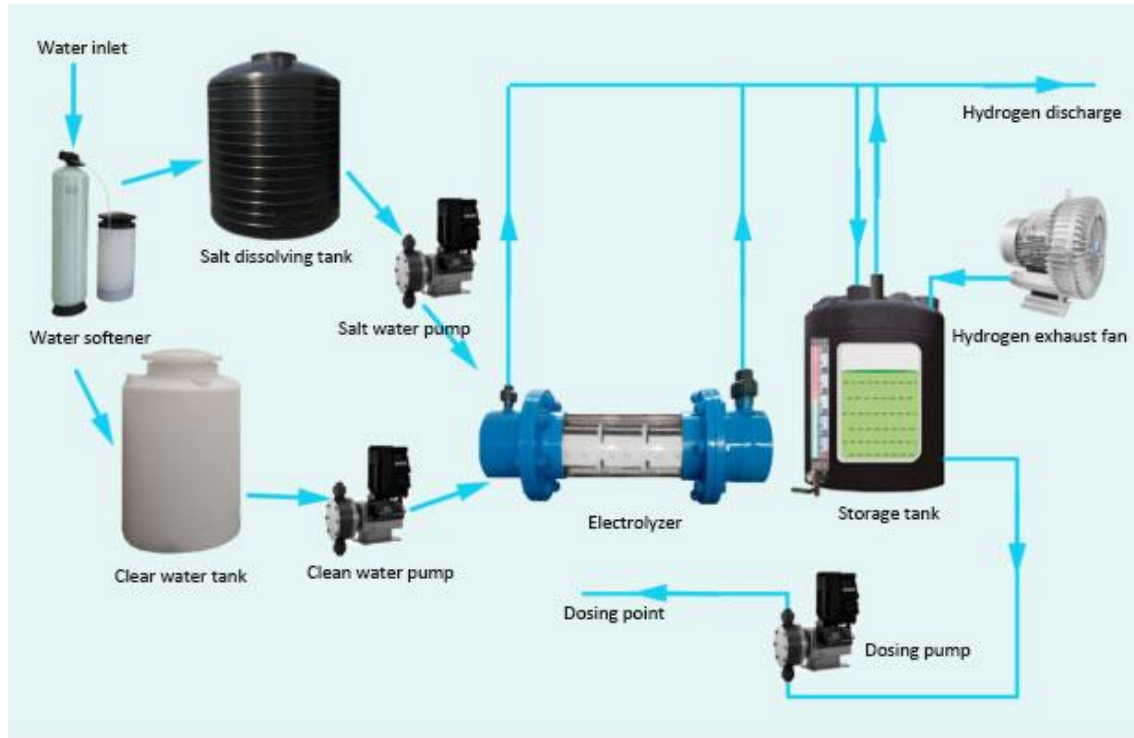
The generator system uses dilute brine as the electrolytic raw material, the equipment uses 380VAC as the power supply, and uses direct current electrolytic power supply during operation, the equipment runs safely and has a long service life.

◆ **High yield, pure quality**

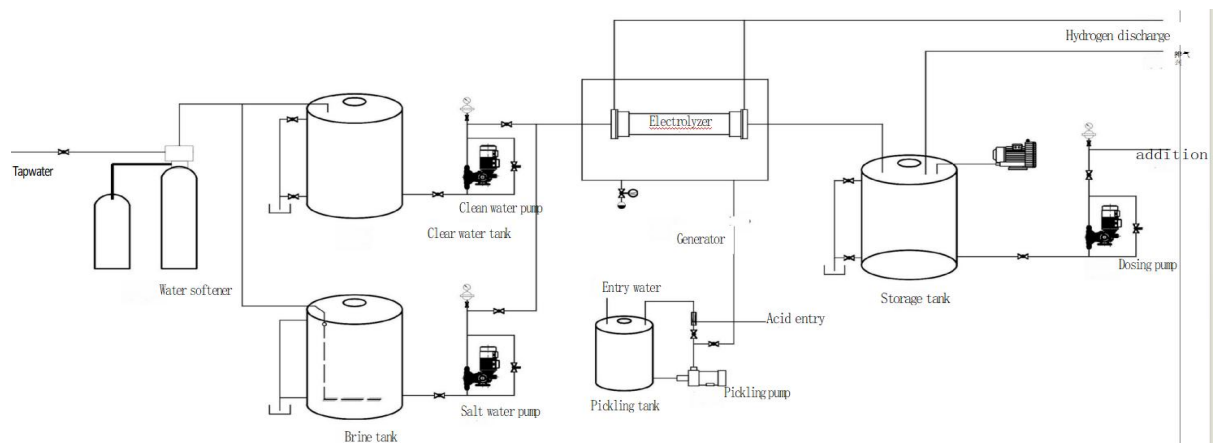
The use of new electrolytic electrode, high efficiency; The use of dilute salt water as a production raw material, into the electrolytic cell, electrolytic cell electrode electrolysis will produce sodium hypochlorite solution, low cost, pure quality, and achieve make as you go, so that the quality of the disinfectant is controlled by the quality system, conducive to safe production.

五、Sodium hypochlorite generator system introduction

(一) Structure diagram



(二) Process flow



(三) The main components of the unit

1、Soft water unit

If the water hardness of the user is higher than 8 degrees, it is equipped with a softening water device. Tap water through the water softener, the ion exchange reaction occurs, to remove the calcium and magnesium hardness in the water. Part of the softened water provides dilution water for the sodium hypochlorite generator, and the other part goes into the salt solution tank.

2、 Dissolved salt and configuration unit

Including salt dissolving tank, liquid level control, distributor, electric valve, pipeline and other components to form a set of automatic salt dissolving device to form saturated brine; Then, the saturated salt water and production water are automatically mixed and diluted into 3.0% dilute salt water, and the electricity is used.

- 1) Material: PE material of food grade;
- 2) Includes components: salt inlet, liquid level high limit overflow, liquid level low limit control, etc.;

3) Function

3-1 Salt and salt amount: Add 1 ton of uniodized refined salt during initial use, and the height of the salt from the bottom of the bucket to the top during use is not lower than the minimum salt level (about 40cm).

3-2 Water replenishment: The water is automatically replenishment by the ball valve. After the ball valve floats, the water is stopped.

4) Matters needing attention:

◆ Salt water pump is a mechanical diaphragm metering pump, to keep the pump body dry, so as to avoid corrosion of the pump body, regularly check whether the pump interface is intact, if there is leakage phenomenon, it needs to be treated and used again after normal;

◆ Regular cleaning of the inside of the dissolved salt tank and keeping the tank clean can ensure that pure sodium hypochlorite solution is obtained;

◆ Salt must be replenished regularly to ensure that the liquid in the dissolved salt tank is 3% solution to avoid normal production due to liquid level or salt problems;

3、 Sodium hypochlorite generator unit

1) Transfer pump

1-1、 This system uses a mechanical diaphragm metering pump, which is used to transport concentrated brine to the electrolyzer.

1-2、 Initial transport flow: about 12.5L/Kg.CL;

1-3、 When the liquid level of the dissolved salt tank drops below the low control point, it indicates that the dissolved salt tank is short of water and salt, and the system will automatically stop the operation of the conveying pump and continue to operate after the state recovers.

2) Electrolyzer

2-1、 The electrolytic cell is a sodium hypochlorite solution generating

component of the sodium hypochlorite generator system. The dilute brine solution between the anode and cathode of the electrolytic cell is ionized by the current input from the electrolytic power supply, and sodium hypochlorite solution is produced. There is a set of electrodes in the electrolytic cell of this system, and the dilute salt is input to the electrolytic cell by a metering pump.

2-2 、 The electrolytic cell body adopts one-time molding engraving technology, and the PE material is used as a cushion between the electrodes, which ensures that the plate does not deform, but also avoids the short-circuit phenomenon caused by the deformation of a plate.

2-3、 The electrode plate uses TA1 grade pure titanium material (cathode and anode all use pure titanium) as the substrate, and the anode surface is coated with ruthenium-iridium metal oxide particles with a fine degree of 20 nanometers, the coating thickness is 20 microns, and the coating is divided into 25 times, which can ensure the high yield and long life of the anode.

4、 Storage unit

Storage of finished sodium hypochlorite solution, equipped with a magnetic turnover liquid level gauge, real-time display of storage high, medium and low liquid levels, and PLC control system linkage on and off.

1) Material: food-grade PVC or PE material;

2) The storage tank is a storage tank for all sodium hypochlorite solution produced by the generator, with high, water replenishment and low level control. When the liquid level reaches a high level, it is in a full tank state, and the generator will suspend operation. With the gradual use of the solution, when the liquid level drops to the middle level, the generator will restart operation. It indicates that the sodium hypochlorite solution in the storage tank is low, and the system will suspend the automatic chlorine injection until the liquid level rises above the low control point.

5、 Hydrogen exhaust unit

The electrode hydrogen separator is equipped above the electrolytic cell to remove the hydrogen generated by the electrolytic process of each cell in time. The storage tank is equipped with a hydrogen exhaust fan to dilute the hydrogen concentration to less than 1% and discharge it to the outside. The hydrogen exhaust pipe is equipped with a wind pressure switch for secondary protection.

6、 Dosing unit

According to the actual water requirements, automatic dosing is realized; It can realize quantitative dosing, flow control (optional), residual chlorine control (optional), flow + residual chlorine control (optional) dosing.

7、 Pickling unit

In order to keep the electrode in a good electrolytic state, an automatic pickling device can be used to clean the electrode regularly.

8、 Safety monitoring unit

The whole set of equipment is equipped with residual chlorine monitor, chlorine leakage alarm, hydrogen alarm, safety monitoring of residual chlorine in water, indoor chlorine concentration, hydrogen concentration, linkage with PLC control system.

9、 Electrolytic power supply

- 1) Working power supply $\leq 48\text{VDC}$, current $\geq 1000\text{A/Kg.CL}$;
- 2) After strict three prevention treatment: after dust, corrosion, moisture treatment, can resist the general humidity, dust and high salinity corrosion environment (high salinity in the air between the generator);
- 3) With input overvoltage/undervoltage protection, output overvoltage /overcurrent/short circuit protection, machine overheating protection.

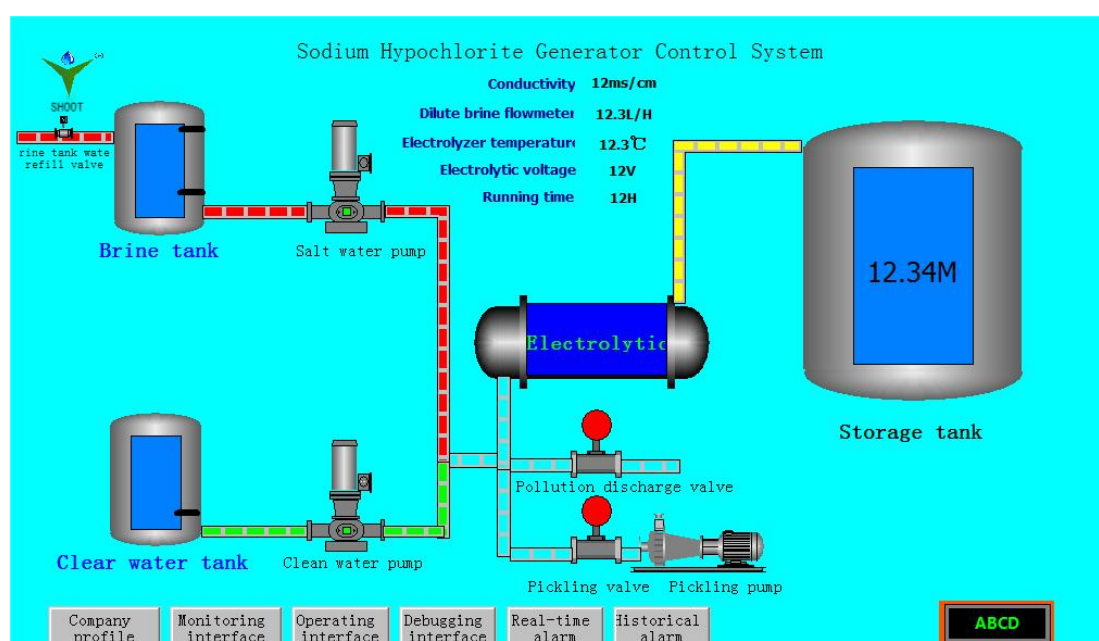
10、 Control center

Collect the detection signal of each work area to drive the corresponding controller to ensure the normal operation of the system; Display, set the working parameters of each area, alarm abnormal working parameters; Automatic control, intelligent industrial man-machine interface, support a variety of communication protocols, and can achieve integrated data remote transmission and monitoring with the host computer.

六、 Introduction to the control panel

The company name, contact information, and device name are displayed. Tap in any area to go to the device monitoring page. It can be divided into electrolytic control system and dosing control system. The following is the electrolytic control system:

1、 Monitoring interface



(1) Menu bar: Click to select the interface you want to enter.

(2) Indicator bar: The green light indicates that the device is running, and the red light indicates that the device is stopped.

(3) Pump body indicator light display: green indicates operation, red indicates stop.

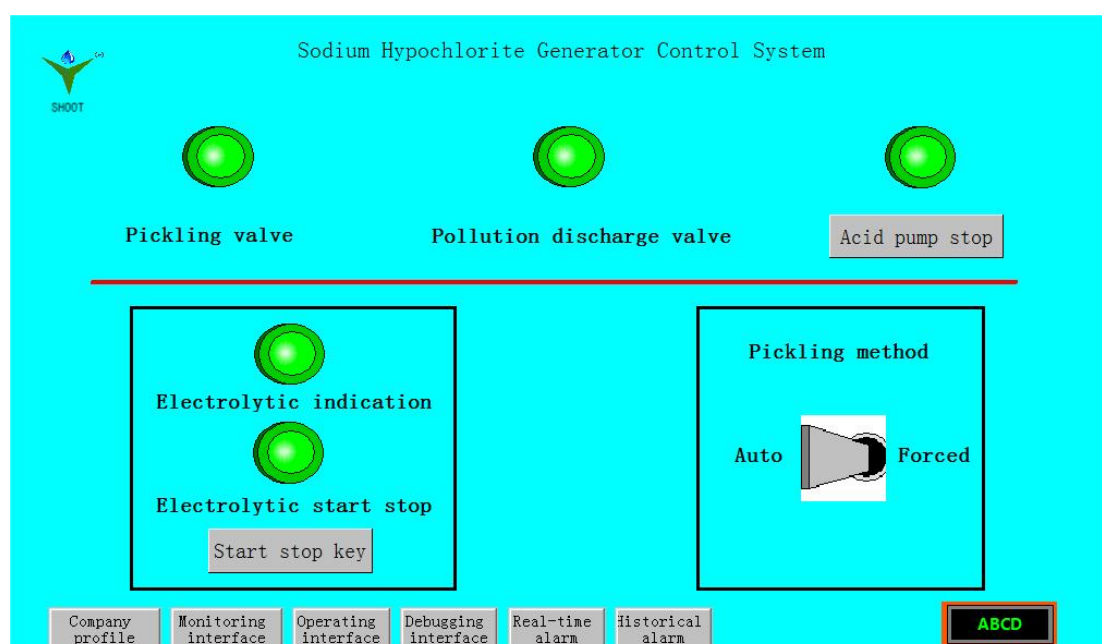
(4) Electric valve: red indicates closed, green indicates open.

(5) electrolytic cell temperature display: display the current

temperature value of the electrolytic cell, alarm reminder when the temperature is too high.

(6) Automatic pickling time: After the accumulated running time of electrolysis reaches the set value of automatic pickling time, pickling will start automatically. When the electrolysis is running, the pickling is in a waiting state, and when the electrolysis stops, the pickling will run automatically. The default value of automatic pickling time is 6000 hours.

2、 Operating interface

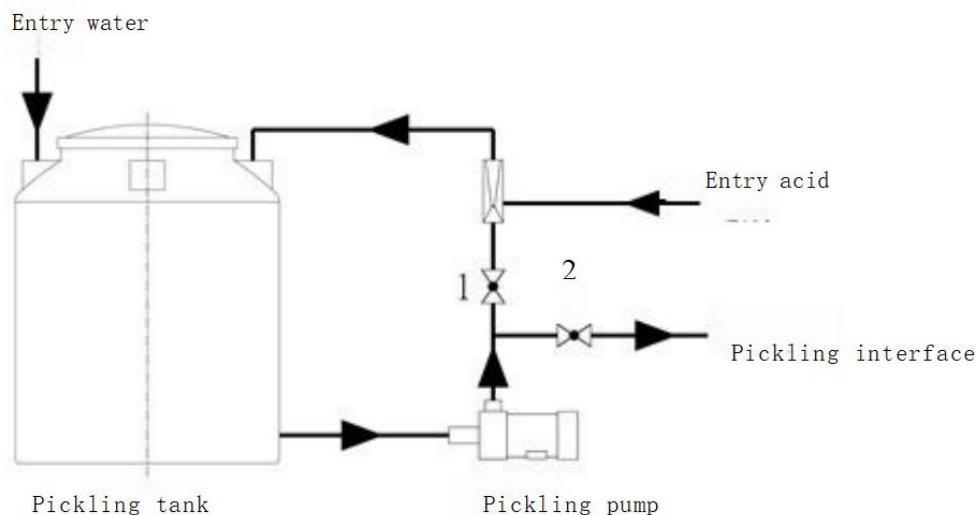


(1) start-stop button, start-stop indicator, electrolysis indicator: when the storage tank level is lower than the median, the brine tank level, the clean water tank level is higher than the low, press the start-stop button, the machine starts electrolysis, the start-stop indicator and the electrolysis indicator light up, press the start-stop button again, the

electrolysis stop, the start-stop indicator and the electrolysis indicator are off. In the process of electrolysis, when the storage tank reaches a high level, the system automatically stops electrolysis, the electrolysis indicator is off, but the start-stop indicator is kept on, the system is in standby state, and when the storage tank liquid level is lower than the median, the system automatically starts electrolysis

(2) Acid discharge pump button: The user will first add the water in the pickling tank to the specified level, and then insert the pickling pipe into the 31% concentration hydrochloric acid barrel purchased by himself, close the valve 2 and open the valve 1 (see the following figure), click the acid discharge pump button, then the indicator light will be on, the acid discharge pump will start, the water will be circulating between the tank and the pipeline, and the required acid will be pumped into the pickling tank through the suction of the water injector, after reaching the specified level, Close the acid discharge pump, then close valve 1, open valve 2, and wait for the system to automatically pickling signal; When changing acid, it is necessary to manually open the acid tank drain ball valve and empty the liquid in the acid tank.

Note: The acid pump is an anti-corrosion plastic pump, and the water level in the tank must be higher than the outlet position of the pump before adding acid, otherwise it cannot be normal acid adding.



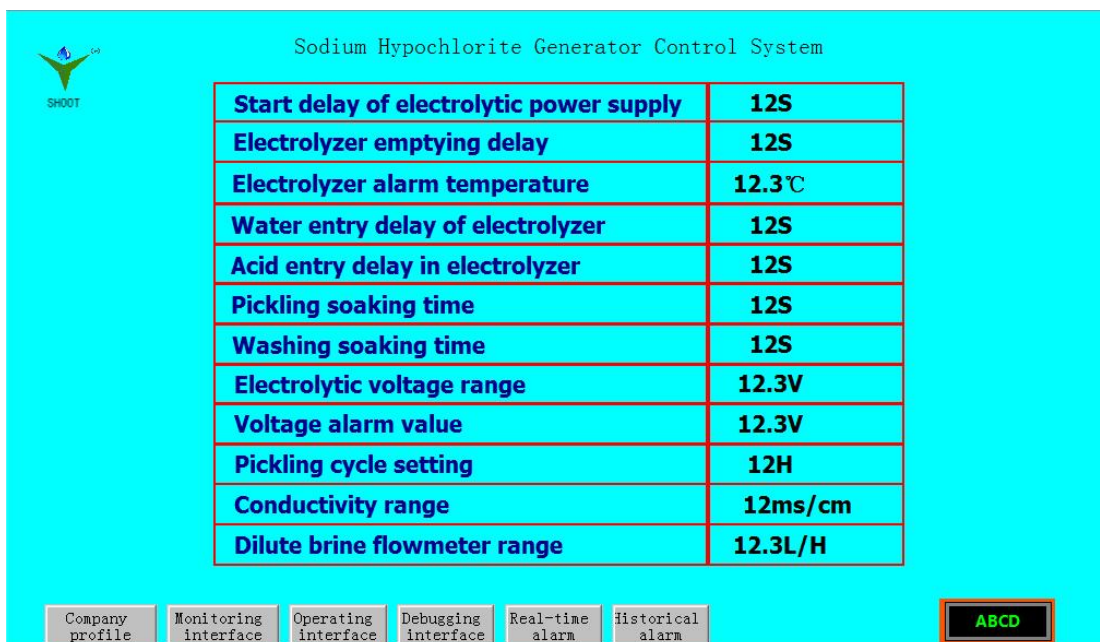
(3) Pickling button, pickling start and stop indicator, pickling indicator:

This system has automatic pickling function. The key and indicator are only used for manual pickling. Under normal circumstances, users do not need to use the key for pickling. When manual pickling, press the forced pickling button, pickling start and stop indicator light, if the device is electrolysis, then pickling is in standby state, only wait for the automatic stop of electrolysis, automatic completion of washing, pickling program will start to execute, at this time pickling indicator light. After the pickling is completed, the system will automatically exit the pickling program, and the pickling start/stop indicator and the pickling indicator are off. (Note: When manual pickling is required, if the device is electrolysis, the user can also press the electrolysis start and stop button to manually stop the electrolysis, and then press the pickling button to manually pickling after the system automatically completes the flushing.)

3、 Debugging interface

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Sodium Hypochlorite Generator Control System	
Start delay of electrolytic power supply	12S
Electrolyzer emptying delay	12S
Electrolyzer alarm temperature	12.3℃
Water entry delay of electrolyzer	12S
Acid entry delay in electrolyzer	12S
Pickling soaking time	12S
Washing soaking time	12S
Electrolytic voltage range	12.3V
Voltage alarm value	12.3V
Pickling cycle setting	12H
Conductivity range	12ms/cm
Dilute brine flowmeter range	12.3L/H

Company profile Monitoring interface Operating interface Debugging interface Real-time alarm Historical alarm **ABCD**

(1) Debugging parameters: This parameter is mainly used for equipment debugging. After debugging, do not modify it.

(2) electrolytic control: electrolytic start mode - delay, in the delay mode, saturated salt water pump and soft water pump running electrolytic start delay set time, electrolytic power start; When the liquid level mode is set, after the saturated salt water pump and soft water pump run, the liquid level of the electrolytic tank is detected to reach the required liquid level, and the electrolytic power supply starts.

(3) Flushing program, pickling program: When the flushing program and pickling program are opened, the equipment automatically executes the flushing program and pickling program.

4、Alarm interface

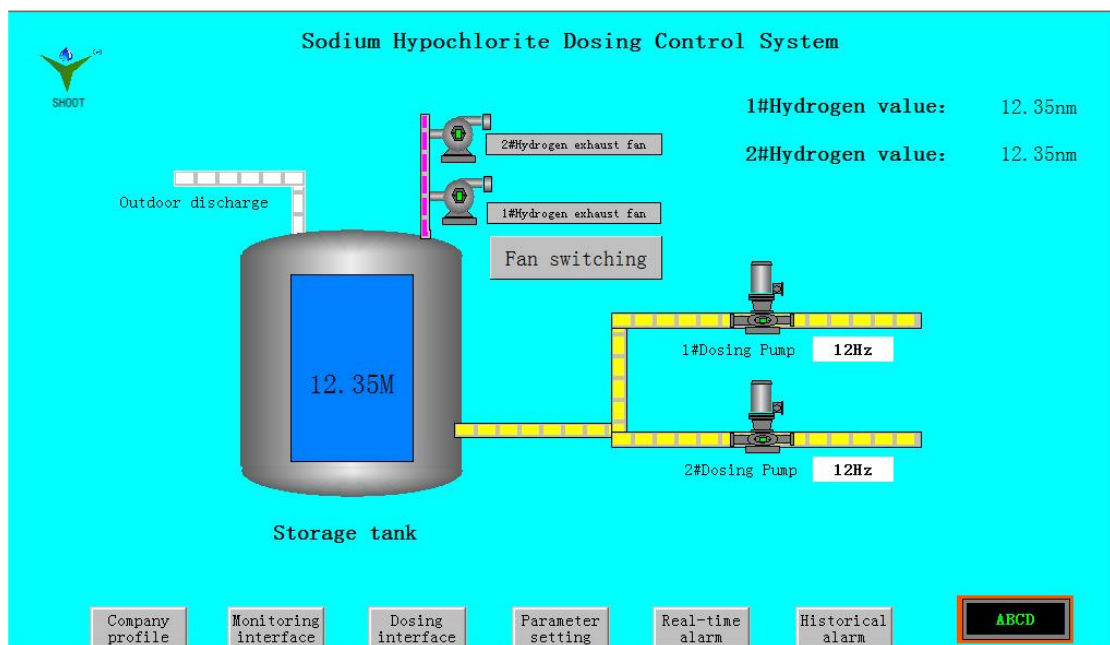
It is divided into real-time alarm interface and historical alarm interface



Displays current or historical alarm information

The following is the dosing control system:

1、Monitoring interface



(1) Menu bar: Click to select the interface you want to enter.

(2) Indicator bar: The green light indicates that the device is running, and

the red light indicates that the device is stopped.

(3) Pump body indicator light display: green indicates operation, red indicates stop.

(4) Storage tank liquid level display: display real-time liquid level value.

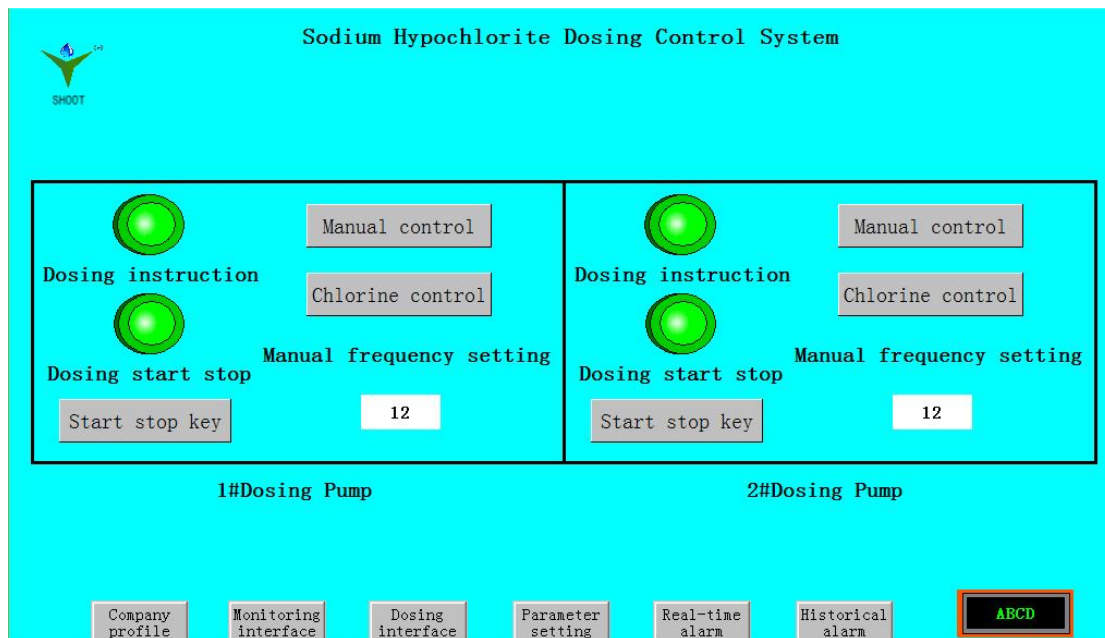
(5) Pump operating frequency display: display real-time frequency value.

(6) Fan operation display: green indicates operation, red indicates stop.

Can manually switch the operating fan.

(7) Hydrogen value display: display real-time hydrogen value, when greater than the set value, alarm output, equipment shutdown.

2、Dosing interface



(1) Start-stop button, start-stop indicator, electrolysis indicator:

Divided into No. 1 dosing pump and No. 2 dosing pump, each dosing

pump is divided into manual control and automatic control two ways, click the button to switch: when the manual control mode, when the storage tank level value is greater than the set low level, after setting the manual operation frequency, press the No. 1 or No. 2 start-stop button, dosing pump starts to work, the indicator is on; Press the start and stop button again to stop the pump from working; When the automatic control mode is used, the dosing pump can automatically adjust the frequency according to the flow rate or the residual chlorine mode.

3、Parameter setting interface

Sodium Hypochlorite Dosing Control System			
Setting the upper li of residual chlorine	12.35 PPM	Setting the upper li water flow	12 m ³ /H
Setting the lower li of residual chlorine	12.35 PPM	Setting the lower li water flow	12 m ³ /H
Upper limit of meteri pump frequency	12 HZ	Water flow compensation	12.35 m ³ /H
Lower limit of meteri pump frequency	12 HZ	Setting of water flow range	12 m ³ /H
Residual chlorine compensation	12.35 PPM	Setting of rated residual chlorine	12.35 PPM
Storage tank level ran	12.35 M	Storage tank low level	12.35 M
Storage tank medium level	12.35 M	Storage tank high level	12.35 M
1#Hydrogen value range	12.346 NM	2#Hydrogen value range	12.346 NM

Company profile Monitoring interface Dosing interface Parameter setting Real-time alarm Historical alarm **ABCD**

(1) Residual chlorine control: When selecting residual chlorine control, the dosage is controlled according to the residual chlorine value. The residual chlorine rating is set according to the 4-20mA

output value of the residual chlorine detector. Positive compensation Negative compensation is used to correct the difference between the residual chlorine detector and the touch screen display.

(2) Flow control: The rated flow rate should be the same as the value of the meter's 4-20mA output 20mA. The coefficient and frequency upper limit are used to adjust the dosage. The lower frequency limit is used to control the lowest operating frequency of the dosing pump. When it is lower than this value, the dosing pump stops working. Positive compensation Negative compensation is used to adjust the difference between the flowmeter and the touch screen display.

(3) Storage tank level setting: divided into low, medium and high 3 level values.

(4) Hydrogen leakage alarm setting: set the range, and the alarm value is fixed.

4、 Alarm interface

It is divided into real-time alarm interface and historical alarm interface

- 1、 Water pressure check: check whether the water pressure meets the requirements, open the water pipe valve.
- 2、 Pipeline system valve inspection: Check whether all manual valves on each pipeline are switched to the correct position and switched to the correct state.
- 3、 Check the control system: check whether the control system has power supply and whether the display is normal after power transmission. Avoid damage to control system and equipment.
- 4、 Metering pump inspection: check whether the metering pump inlet and outlet pipe is tight, no leakage phenomenon. Start the metering pump for a short time to check whether it works normally. Stop the machine immediately if there is any abnormality.
- 5、 Check whether the salt level in the dissolved salt tank is normal.

(三) Device boot

- 1、 Before starting the machine, make sure that the valve switch position of the pipeline system is correct.
- 2、 Power up the control system, check and set the metering pump frequency value, residual chlorine or flow value.
- 3、 Button start electrolytic system, dosing system.

(四) Device shutdown

Stop electrolysis system and dosing system by pushing buttons. Power off after no other anomalies are detected.

(五) Routine inspection

- 1、 Visual inspection equipment;
- 2、 Record the current and voltage of the electrolytic power supply;
- 3、 Check the salt content of the tank;
- 4、 Check whether the system alarm and alarm situation;

(六) Weekly check

- 1、 Check the operation of the electrolytic power supply, and whether the cooling fan is working, and check whether the shell temperature is normal;
- 2、 Use a salinometer to see if salinity changes, requiring a concentration of 3%;
- 3、 Test the hardness of water quality, if there is a softening water device to check whether the hardness of the softening water device is normal;
- 4、 Check all filters and strainers as necessary for cleaning;

(七) Monthly inspection

- 1、 Check whether the electrolytic cell scale and there are no other impurities;

- 2、 Check whether the instrument is normal display and operation;
- 3、 Cleaning equipment and ventilation sanitation;

(八) Quarterly inspection

- 1、 Pickling equipment, cleaning electrolytic cell;
- 2、 Check whether there is any problem with each cable connection;
- 3、 Check whether the pipe connection is normal;
- 4、 Check whether the electrical terminals and buttons are normal;

八、 **Operation precautions**

- 1、 In the production process, it should be carried out in strict accordance with the operating procedures.
- 2、 There is 380VAC power supply in the control cabinet. Do not touch the bare metal part in the control cabinet by hand.
- 3、 During the operation of the equipment, the display value of the electrolytic power supply in the control cabinet should be observed from time to time. When the display of the voltage or ammeter is found abnormal, please stop the machine immediately and find and remove the fault. For the specific fault phenomenon, please refer to Appendix 1.
- 4、 In the sodium hypochlorite generator equipment room and equipment room near the hydrogen outlet, it is strictly prohibited to open fire.

5、 During the preparation of sodium hypochlorite, it is forbidden to open the lid of the storage bucket, and the seal of the storage bucket should be checked regularly.

6、 Do not touch the sodium hypochlorite liquid with bare hands. When the sodium hypochlorite generator is added and the drug delivery pipeline is maintained, rinse it with clean water before handling it.

7 、 Only qualified personnel are required to maintain all electrical equipment.

8、 Pipe filters should be cleaned regularly to prevent clogging.

9 、 Winter should pay attention to equipment and pipeline system anti-freeze, to ensure the normal use of equipment.

九、 **Daily maintenance of equipment**

1、 Keep the generator components clean, dust-free and dry.

2、 Keep the floor of the generator room dust-free, avoid power supply damage due to dust entry, and keep the generator room dry.

3、 This manual is a conventional manual, if there is any discrepancy in the material, our company will not explain separately, please understand the majority of users.

Appendix 1: Common failure analysis table

No.	Fault Phenomenon	Fault Analysis	Problem Resolution
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1	Turn on the power switch. The power indicator is off	The power input cable is improperly connected	Check the wiring and connect securely.
		The power breaker is not switched on	Switch on the power breaker.
		The indicator or power switch is damaged	Replace the indicator or power switch.
2	Electrolysis cannot be started by pressing the start stop button	The liquid level of the storage tank is higher than the high level	The tank is full and can be started when the liquid level drops to the median.
		The liquid level of the dissolved salt tank or softened water tank is below the low level	Tap water is insufficient and cannot be matched into dilute salt water.
		The temperature of the electrode plate exceeds the set value	Contact our after-sales service.
		The starting relay is damaged and the power cannot be started	Contact our after-sales service.
3	The circuit breaker of the control cabinet or the circuit breaker of the electrolytic power supply trips when the device is powered on again after being in the power failure state for a long time	The internal charging capacitor of the electrolytic power supply has been discharged, and the instantaneous charging current is too large, causing the circuit breaker to trip	Just switch on the circuit breaker again.
4	The effective chlorine concentration of the prepared solution was low	The salinity of dilute salt water is too low	The lack of salt in the saturated salt tank leads to insufficient salt concentration, Add salt in time.
		Electrolytic current is too small	The current output can be adjusted within a certain range through the adjustment knob of the electrolytic power supply panel.

		The flow of dilute salt water into the electrode is too large	Adjust the flow of softened water transfer pump and saturated salt pump.
5	The voltmeter indicates a high voltage, while the ammeter indicates a low current	The salinity of dilute salt water is too low	Add salt in time.
		Power failure	Contact our after-sales service to replace or repair the power supply.
6	The liquid level of the soft water tank or saturated brine tank drops or overflows	The power water pressure is insufficient or the water refill valve is damaged	Check whether the power water pressure is between 0.2 and 0.4Mpa. If the water pressure is normal, replace the water refill valve
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