

**Meet the Needs of the SMT Age**

**VER 1.0**

**Please read this user's manual carefully before switch the power of this machine**

## **S-6200**

**Full Automatic High-efficiency Nozzle Cleaning Machine**

**User's Manual**



**Warning:**

- Be sure to read this manual very carefully.
- This equipment can be only operated by special maintenance or repair staff or trained eligible staff.
- Before switching on power, make sure that the external input power is in accordance with the equipment's rated voltage and current.
- This equipment has high voltage device and mechanical drive inside, keep safe while operating it.
- The cleaning lotion used by this equipment is natural, liquid like solvent is prohibited.
- No scratch with sharp objects or heavy knock on touch screen.

**Attentions:**

- Please read this user's manual carefully before operating this equipment.
- Do not install this equipment nearby the source with electromagnetism interference
- Keep this user's manual well for maintaining the equipment according to the requirements under this manual.
- Do not change the settings of softwares and hardwares inside the electrically-controlled box of this equipment, computer is specially used for controlling, any other usages are prohibited.
- According to the requirement of IEC61000-3-4, the Rsce value validated by authorized power supply department (such as electricity bureau) for connecting to power system should be above or equal to 120
- In order to meet the requirements of EN61000-3-11 criteria, this equipment should be connected to the power system that conforms to the following requirements: the power system's impedance Zsys should be less than or equal to  $0.34\Omega$ , the ratio between imaginary part Xsys and real part Rsys of the system impedance should be within the range between 0.5-0.7

**Packing list:**

(Except the main unit, the packing carton also includes the following accessories, if there is any missing, please contact Singrain Automation Equipment Co., Ltd.

- ◇ Nozzle Tray ( delivery on demand with specification appointed by customer)
- ◇ Unit's spare parts and tools ( customer's requirements)
- ◇ User's manual of this unit            1 copy
- ◇ If any special requirements are needed by customers, please refer to purchasing contract for checking and accepting.

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## 1.Summary

HL-893 Nozzle cleaning machine can automatically complete the nozzle cleaning & drying process, it is mainly used for cleaning and surface mounting small components such as 0603、0402、0201、01005 and high-precision nozzle.

HL-893 is a newly researched and developed nozzle cleaning machine by our company. While designing it, we utilize our company's rich developing experience of liquid equipments , prospect for the development trend of nozzle cleaning machine and adopt a lot of customer's ideas and suggestions, its advent initiates a new concept of nozzle cleaning machine.

This machine takes PLC as controlling core and adopts modularization control. Its design adopts multi-protection measure with high automatization, strong reliability, outstanding performance. The cleaning system of this machine adopts pulse cleaning mode, which has a higher efficiency and better cleaning degree comparing with the traditional machine.

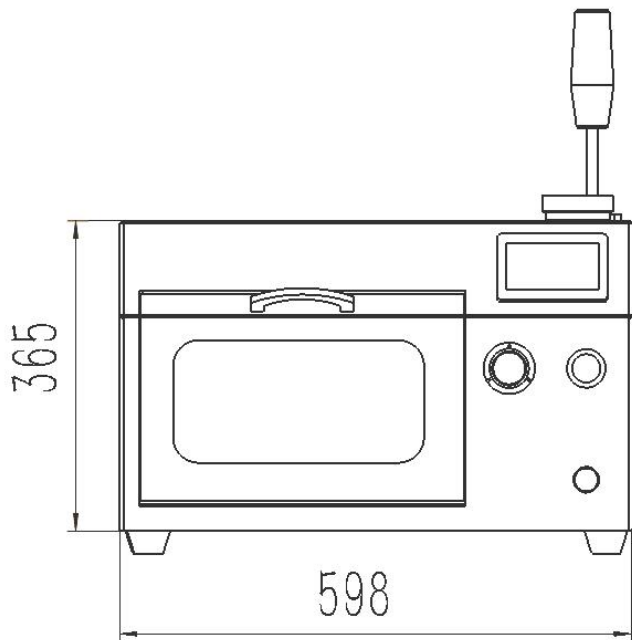
**Main features of this unit:**

- Streamline appearance with elegant design
- Adopt 20-30 nozzle to do cleaning simultaneously to achieve high efficiency and energy-saving;
- Inspection windows for the whole process, which makes maintenance and operation more convenient.
- The part touching with water adopts 304 stainless steel, which is anti-rusted, anti-corrosion, firm and stable;
- Humanized design which makes external buttons achieve start/stop through one key.
- Adopt touch screen + PLC distributed control, which makes performance stable and reliable;
- Easy operation, friendly interface and can be switched between English and Chinese at any moment.
- It has error-operation alarming system and emergency braking system , equipped with over-loading protecting system; Alarming system and
- Utilize environment-protecting industrial pure water free from contamination (HPvalue 5-7 soft water) ;
- Centralized collection of wastes, which makes maintenance more convenient;

## 2.Main technical parameters

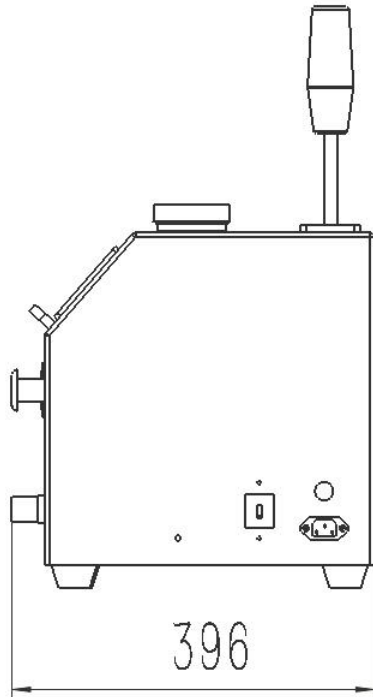
<b>Parameters of machine:</b>	
<b>Size: (L*W*H)</b>	<b>598mm × 396mm × 365mm</b>
<b>Power (three phase two wire )</b>	<b>2P2W, 220VAC , 50/60Hz, 20A</b>
<b>Power supply</b>	<b>250W</b>
<b>Air source pressure</b>	<b>0.5 - 0.6MPa (Normal operation time)</b>
<b>Weight</b>	<b>Approx. 40 KG</b>
<b>Parameters for electrical control:</b>	
<b>Total power</b>	<b>200W</b>
<b>Controlling mode</b>	<b>Touch screen+PLC</b>
<b>Air source</b>	<b>Pure compressed air</b>
<b>Jet pressure</b>	<b>≤ 0.4 MPa</b>
<b>Air wastage</b>	<b>Under 280NL/min</b>
<b>Liquid type</b>	<b>Industrial purified water</b>
<b>Liquid consumption</b>	<b>300cc/hour</b>
<b>Liquid storage capacity</b>	<b>800cc</b>
<b>Admission pipe/Drainpipe</b>	<b>Φ8 / Φ6</b>
<b>Specification of nozzle tray</b>	<b>Default30 nozzles</b>
<b>Specification of cleaning nozzle</b>	<b>0201 - 2512 (inch)</b>
<b>Noise</b>	<b>35-60 dB</b>

### 2.1 Fig. of Visual Size



(Pic. 1)

Units: mm



**(Pic. 2) Units: mm**

### 3 Machine Installation and Adjustment

#### 3.1 Operational environment and conditions:

1. This equipment should be put on ground, flat table or in dry and ventilated workshop.
2. Operational environment temperature should be between 5~45°C ;
3. Operational environment humidity should be between 20~95%;
4. 3P2, 220VAC , 50/60Hz, 10A
5. Use purified industrial gas source with 0.5~0.6Mpa (While working)

#### 3.2 Warning while adding water:

1. Do not open the cover of filling pipe end to add water while the equipment is under operation.
2. While adding cleaning lotion, pay attention to the water level in the water storage tank to prevent the water level from exceeding the upper limit. (If there is any overflow, unscrew the inner hexagon screw in the bottom of the water storage tank, after letting out of some water, screw it down tightly.
3. While adding cleaning lotion, pay attention to the filling pipe end to prevent excessive water injection from overflowing and damaging the electrical parts in the machine.

### 4. Explanation of operation

#### 4.1 Checking before power is turned on:

1. Check whether power supply is rated 220VAC power for this machine
2. Check whether equipment power is firmly grounded;
3. Check whether tray is well positioned
4. Check whether air pressure is adjusted to required value;
5. Check whether the "STOP" button bounces;

6. Check whether water level in the storage tank is marked within upper & lower limit

7. Check the warning and attention proceeding sections under this user's manual, make sure the adjustment of the machine has been completed.

#### 4.2 Operation:

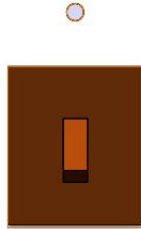
##### 4.2.1 Operation panel



1. Air Pressure



2. STOP



5. Power off / On



3. Air inlet pipe



4. Air Pressure Control



6. Power connection

##### 4.2.2 Operation illustration of operation panel

1. Air Pressure — Showing how much of air pressure on the screen.

2. Emergency button (STOP) — When the emergency button “Stop” is pressed down, all the actions which are operating stop, after rotating “Stop” Clock wisely, it restores to normal status (When equipment is operating, if any emergency case occurs or if you want to stop the operation, press this emergency switch “Stop”)

3. Air inlet pipe — Air come in and outside on this pipe.

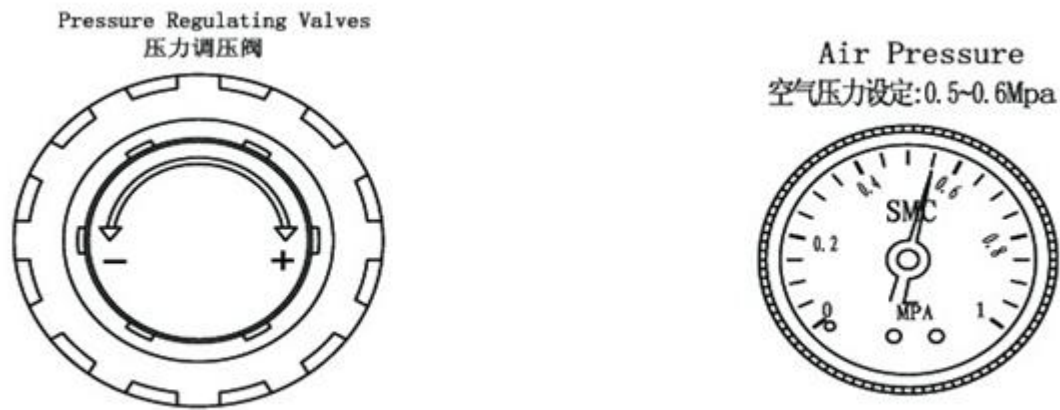
2. Air Pressure Control — Control air high or lowest in this button.

5. Power switch (POWER off/ on) — When OF switch is pull to ON status, press down “Power” to start the equipment, meanwhile the switch indicator light glows on.

6. Power connection — connect with machine and power.

Under this following conditions, the equipment can be switched on for operation:

1. “Stop” button is under normal status
2. Touch screen is under main menu interface
3. Safety door is under “close” status
4. Total air pressure is above 0.4Mpa



4. Pressure regulating valves (Pressure regulating valves) —Pull out the cover of pressure regulating valve, clockwise rotation means pressure increasing; counter-clockwise rotation means pressure decreasing.
5. Jet pressure settings (Jet Pressure) —Refers to jet nozzle's normal working pressure (0.38-0.4Mpa) which corresponds to the left regulating valve
6. Air pressure settings (Air Pressure) —Refer to total air source pressure, normal operation (0.5-0.6Mpa)

#### 4.3.1 Operation illustration of touch screen:

##### Preparation before operation:

01. Check whether power supply is AC220V with appointed rated voltage and rated current
02. Check whether power is connected to machine
03. Check whether equipment power is firmly grounded
04. Check whether emergency stop switch bounces
05. Check whether wiring socket inside electricity cabinet is well plugged and connected
06. Press touch screen frame (nearby rear cover) to check whether it normally starts/stops (Heavy pressure on the displaying area of touch screen is prohibited )

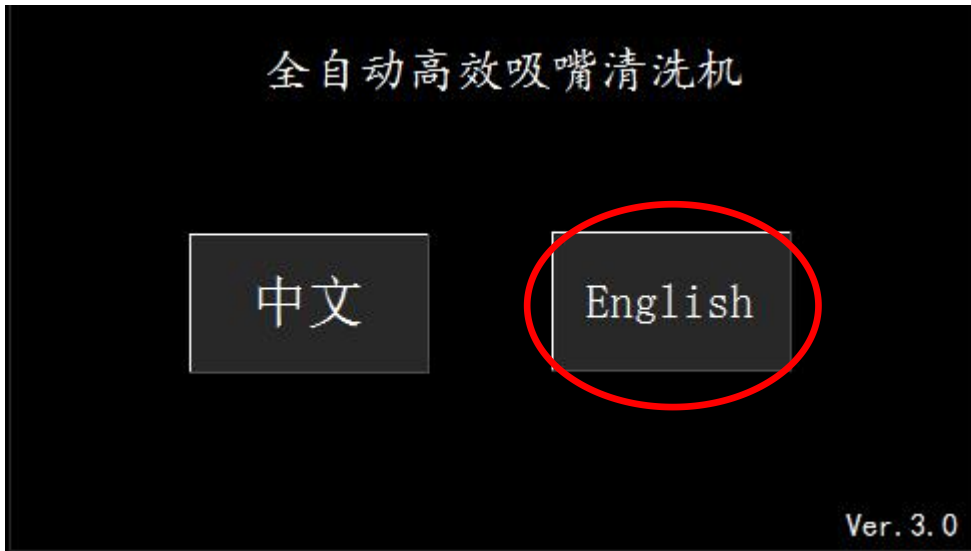
#### 4.3.2 Operation of touch screen

After touch screen is switched on, the displaying menu is as below, users can make normal operation. Under this menu, you are required to chose languages: Chinese or English (English)

After language is selected, the status menu appears, thus you can see the equipment's current operating status, on/off status and actual values of various parameters etc. If you want to turn on/turn off any item, just press the corresponding button to operate it.

1. After this equipment is switched on, the touch screen will display the menu as below, thus we are required to choose Chinese menu or English menu.





Displaying Menu of Welcome Interface

2. After select language, the following Status Display Menu appears (Eg. The following Chinese Display menu )



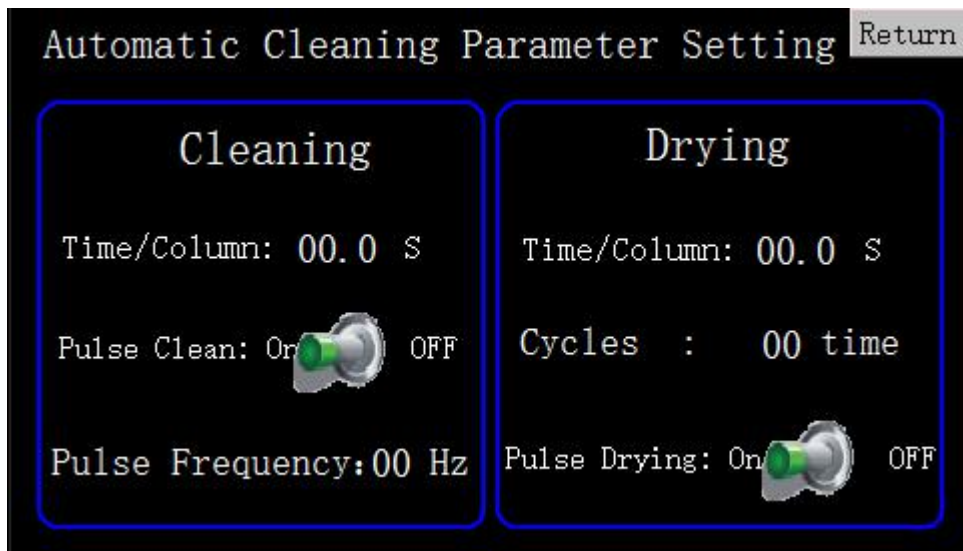
#### Operational Interface of the Home Page

- ★ **Start/Run** : Click it for starting the cleaning time and drying time automatically and completely set by equipment itself, after job is done, it will pop out the dialogue of cleaning completion
- ★ **Setting** : **click here can setting detail of clean and dry.**
- ★ **Manual Clean**: Move cleaning nozzle to wash nozzle by hand.
- ★ **Reset**: Clean nozzle back to the first place.
- ★ **Machine Status**: Showing status of machine, safe door, first place, and nozzle protect and move line, The machine only work while 4 of machine status appear in the screen. If one of it have problem the machine will not start work. Can push Alarm/Record to check which parts have problem.
- ★ **Alarm/ Record** : Push this can check safe door, first place, and nozzle protect

and move line are in correctly or not.

★ Clean time: Showing how long take to clean the nozzles.

3. Select “manual” option to enter the following menu displaying interface (eg “manual mode displaying menu”)



#### Operation Interface under Manual Mode

Cleaning to be divided two classes.”cleaning ”and “drying”.

##### 3.1 Cleaning

★ Cleaning time: Nozzle tray have 10 rows, every rows has 3 nozzle can be clean, that’ s mean can wash 30 nozzles on time, and totally take 99.9 second.

★ Pulse clean, open pulse clean, water inside thought air inlet pipe,cleaning nozzles regularly.

★ Pulse Frequency, Setting clean frequency, setting range is 1~10second.

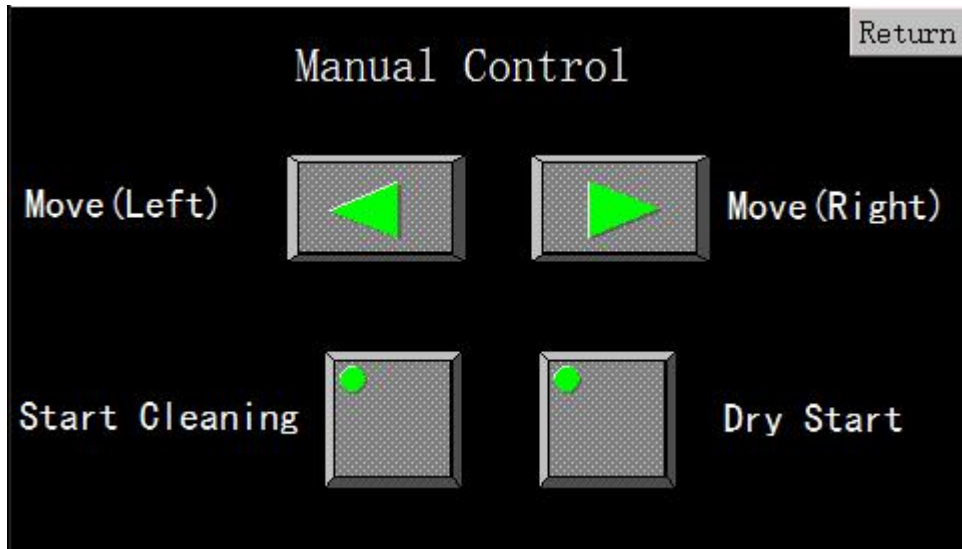
##### 4 Drying :

★ Drying time/ column, the longest time is 99.9 second.

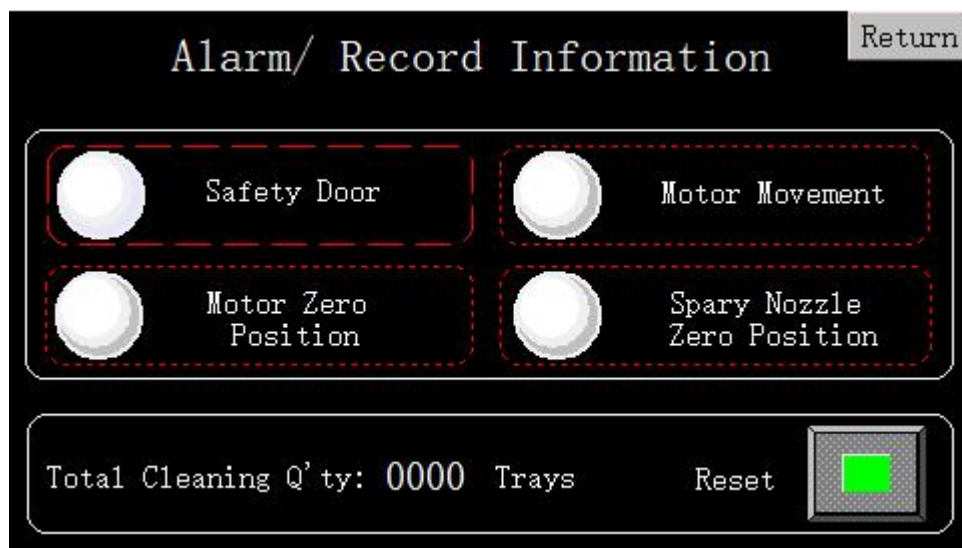
★ Drying Cycles, setting how many times drying nozzles, the upper limited is 99 times.

★ Pulse drying: After pulse frequency drying the nozzles.

5.Choose manual control into menu as below(Move nozzle cleaner left or right by hand)



#### 6. Alarm/ Record Information into menu



#### operation machine's homepage

- ★ Safety door: checking door is closed.
- ★ Motor Movement: If urgent push it, but motor movement is no work, checking motor is ready to work.
- ★ Motor Zero Position, checking motor is on the zero position, before the firstly row, and make sure can cleaning all rows.
- ★ Spary nozzle zero position, If nozzle dash the place, or leave the right place, this will in warning.
- ★ Reset: Cleaning all nozzle and reset to zero.

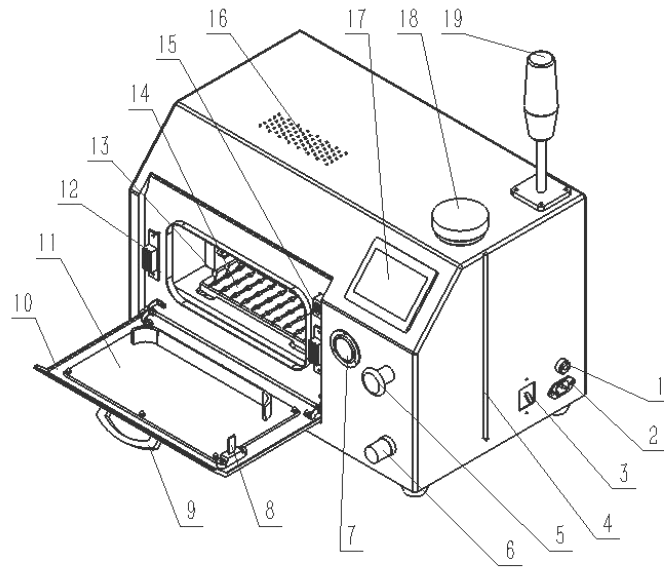
#### 7. Operation after cleaning is completed:

1. Shut down power and air source
2. Use wind gun to make water removing operation in the equipment's cabinet, after blowing it, use cloth to

wipe it dry.

3. Take out tray or put it into machine cabinet after the water on the tray surface is wiped dry
4. Dispose the waste drained water from machine cabinet carefully.

## 5.machinery specification



- |                                 |                   |                       |
|---------------------------------|-------------------|-----------------------|
| 1) Air inlet pipe               | 2) Power Port     | 3) Power switch       |
| 4) The water level display tube | 5) emergency stop |                       |
| 6) pressure-adjusting valve     | 7) pressure meter | 8) Safety plug        |
| 9) Safe door handle             | 10) Safety door   | 11) Safety door glass |
| 12) Magnetic Catche             | 13) Nozzle spray  | 14) Nozzles           |
| 15) Safety door base            | 16) Thermovent    | 17) Touch screen      |
| 18) water filling inlet         | 19) Working light |                       |

## 6. Typical malfunction and Troubleshooting

### 5.1 The equipment's typical malfunction and troubleshooting

Troubles	Causes	Troubleshooting	Machine status
No power supply after electricity is turned on	1.Creepage protective switch is not turned on 2.Main power supply has malfunction 3.24V power is damaged 4.Plug fuse is burnt out	1.Turn on the creepage protective switch 2.Replace power switch 3.Replace 24V power supply 4.Replace fuse	Stop status
Touch screen has no response after power is turned on	1. 24V power is damaged 2. fuse pipe is broken inside the touch screen 3. Circuit or joint has bad contact	1. Replace 24V power supply 2. Replace fuse pipe (1.25A) 3. Check circuit or plugs to make troubleshooting	Stop status
Equipment works normally but can get crushed very easily without any response	1.Power supply of equipment is not earthed 2.Over fast operation 3.Interference	1.Remember to make power supply be earthed 2.Do not operate it too fast, do not conduct the next step unless the previous procedure is finished. 3.Please put the equipment to places where there is no interference or little interference.	Stop status
Nozzle is not well cleaned	1. Main air source supply is not sufficient 2. Jet pressure is not big enough 3. Jet nozzle is not in line with suction nozzle.	1.Please supply the air source whatever the equipment required 2.Please adjust to required jet pressure and check whether the pipe line has been bent or not. 3.Re-calibrate the position between jet nozzle and suction nozzle	Stop status
Under normal working status, no water jet	1.The electro-magnetic of valve mist sprayer is broken 2.The boost jar has no water or its water injection is too much and exceeds the upper limit. 3.Pipe line is blocked up	1. Replace mist-spraying electro-magnetic valve 2.Pay attention to watch the water level 3. Clean up pipe lines	Stop status

## 7. Maintenance and Repair

s/n.	Item	Operational measures	time*
1	Machine case	Blow dry the stagnant water and the water in the top sound insulation cotton inside the machine cabinet after each use	Once /day
2		Blow dry the stagnant water inside the drain tank after each use.	Once /day
3		Check whether the positioning pin of the rotating tray is firmly fixed, remember to avoid bumping.	Once /day
4		Check whether the inner hexagon screws inside the cabinet become loose or not	Once /month
5	Electric cabinet and component	Clean out the dust of electric component & terminal blocks	Once /month
6		Check whether touch screen can be normally operated & touched	Once /day
7		Check whether terminal block and plug are tight enough	Once /half year
8		Check whether air pressure display is normal or not	Once /day

9		Check whether each electromagnetic valves and joints have air leakage	Once /month
10	Air source system	Check whether filter has a normal drainage( if too much water is formed, it needs being unassembled for cleaning up )	Once /month
11		Check whether pressure-adjusting valve can increase/decrease pressure normally	Once /month
12		Replace filter/ filter cartridge of oil contamination filter	Once / year
13	booster jar	Long-term use of impure water may cause water scale in inner wall, which must be cleared by suggested use of water scale cleaner or water scale remover sold in market.	Once /half year

\*The above table is only a regular maintenance time cycle under this user's manual, users can modify it according to their own situation

## 8. Attention

### Warning:

- This device can only be operated by special maintenance staff or trained eligible staff.
- Before switching power, make sure whether the external input power conforms to the rated voltage and current of this equipment ○ While turning off the power of touch screen, do not press it with heavy force;
- This device includes mechanical transmission inside, pay attention to keep safe while operating it.
- The cleaning lotion used for this device is industrial pure water (HP5-7 soft Water) ,do not use liquid similar to solvent
- The compressed air used for this device is pure gas, unfiltered gas is prohibited.

### Attention:

1. Please read this user's manual carefully before operating this device;
2. Please maintain this device according to Chapter 6 under this manual;
3. Do not install this device nearby places with electromagnetism interference;
4. Do not changes the software and hardware settings in the electrically-controlled box of this device.;
5. Please keep this manual well for future reference during maintenance and inspection;
6. Before the device power is turned on, please check the device carefully according to the section 5.1 under this manual;
7. Starting from the time when the equipment is bought, filter cartridge must be replaced once a year ( replacing of filter cartridge needs being charged)
8. If the machine has any malfunction, please solve it by referring to Chapter 5 or contact with the after service department of Singrain company;



