

*Meet the Needs of the **SMT** Age*

VER 1.0

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

HENC-12

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 pure industrial water (HP Value 5-7 soft water) , 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 sup 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 0.34Ω , 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 sales@smtbox.com)

- ◇ 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

HENC-12 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、1005 and high-precision nozzle.

HENC-12 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 12 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

Parameters of machine:	
Size: (L*W*H)	554×495×805MM
Power	84~240VAC 50/60Hz 10A
Power supply	250W
Air source pressure	0.5 - 0.6MPa (Normal operation time)
Weight	Approx. 70KG
Parameters for electrical control:	
Total power	200W
Controlling mode	Touch screen+PLC
Air source	Pure compressed air
Jet pressure	0.38 - 0.4 MPa
Air wastage	Under 280NL/min
Liquid type	Industrial purified water
Liquid consumption	200cc/hour
Liquid storage capacity	1000cc
Admission pipe/Drainpipe	∅12 / ∅10
Specification of nozzle tray	Default 12 nozzles
Specification of cleaning nozzle	1005-2125

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 ventilative workshop.
2. Operational environment temperature should be between 5~45℃ ;
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



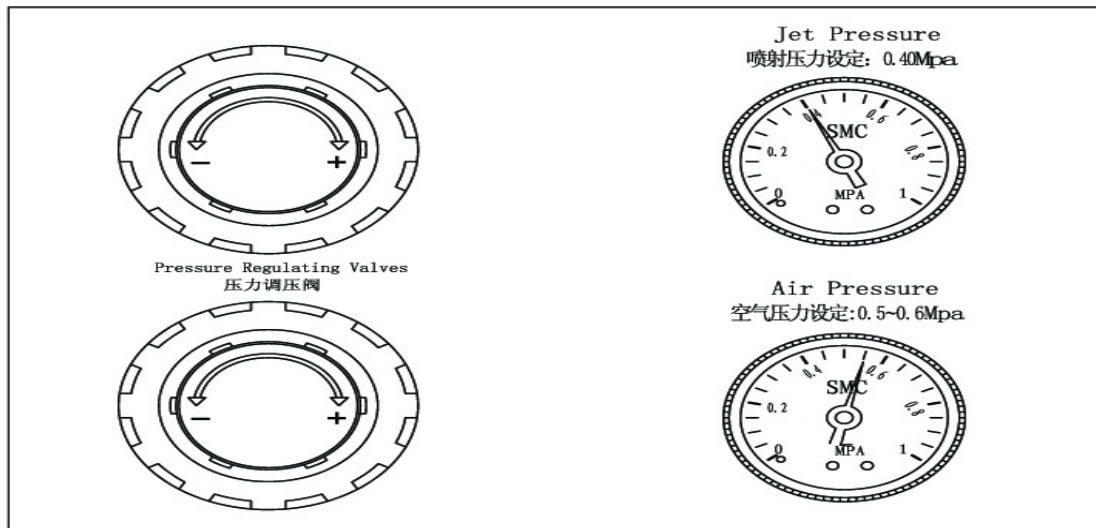
4.2.2 Operation illustration of operation panel

1. Power switch (POWER) —When OF switch is pull to ON status, press down “Power” to start the equipment, meanwhile the switch indicator light glows on.
2. Emergency button (STOP) —When the emergency button “Stop” is pressed down, all the actions which are operating stop, after rotating “Stop” clockwise, 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. Auto (AUTO) —Press down “Power” button, the equipment enters into normal operation , meanwhile the switch indicator light glows on.

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)
7. Pressure switch (Pressure switch) — When total air source pressure is below 0.35Mpa (default setting), the machine gives alarm and stops all operation which is running, thus the pressure regulating valves must be adjusted or air source must be checked, if the above conditions are fulfilled , it resumes to normal status.

Pressure setting ranges for pressure switch:

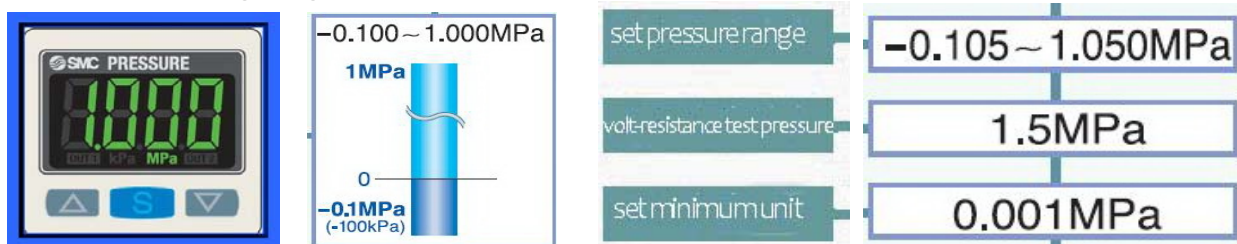


Illustration of each part:

- Unit display**
It indicates the present unit specification (only for displaying unit with kPa and MPa)
- Output (OUT1) display (green)**
Switch output: OUT1 light turns on when under “ON” status
- ▲ Key (Up)**
Mode selection & increase ON/OFF setting value; It is used when switched to peak value displaying mode.
- S key (Set)**
It is used while confirming each modification of modes and setting values



- LCD Display**
It indicates the present pressure status, mode setting status, code error display. Generally it adopts solid color green or red to display; When output is continuous, we may choose changes from green to red, or from red to green totally 4 kinds of displaying methods.
- Output (OUT2) display (red)**
Switch output: OUT2 light turns on when under “ON” status
- ▼ Key (Down)**
Mode selection & decrease ON/OFF setting value; It is used when switched to valley value displaying mode.

4.3 Operation illustration of touch screen:

4.3.1 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 choose languages: Chinese or English (English)

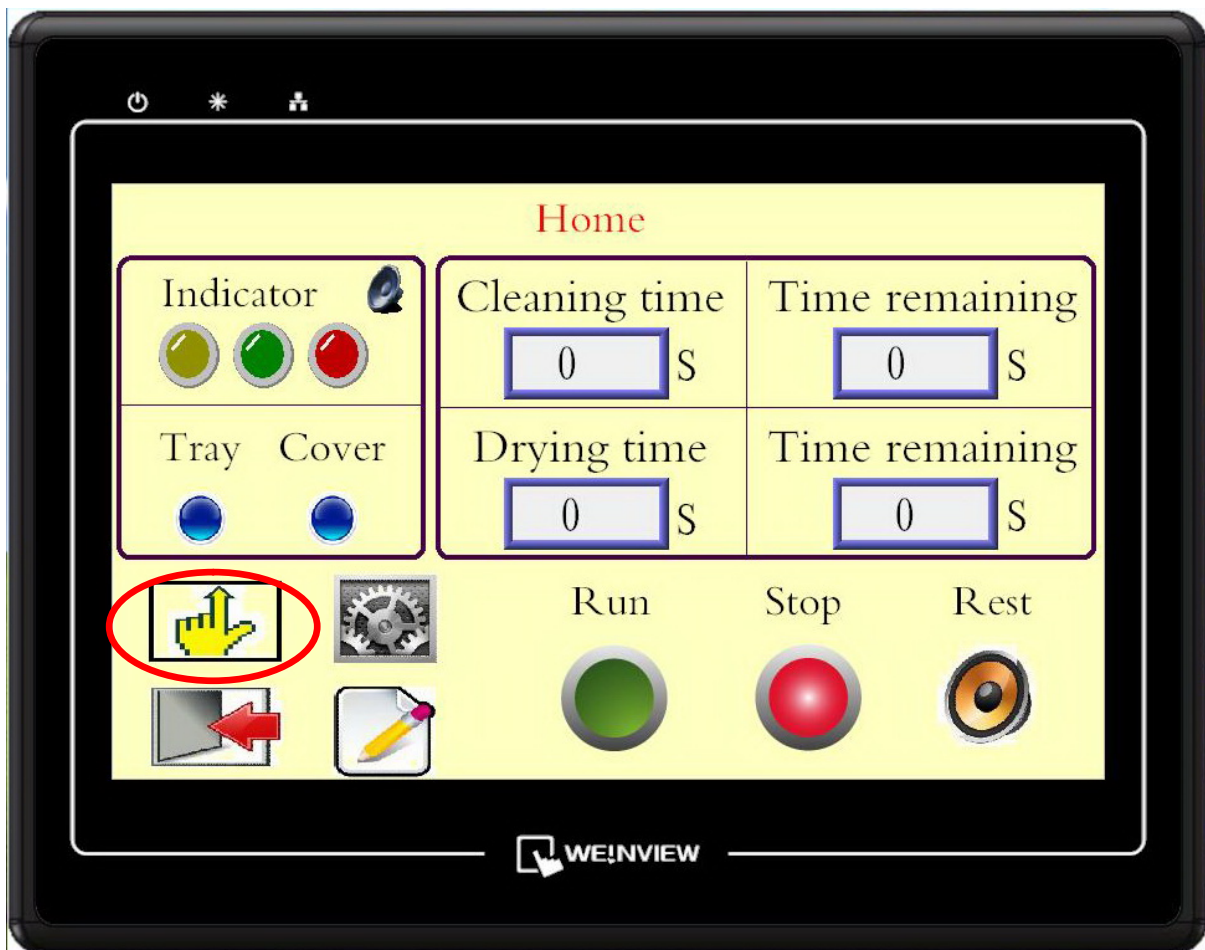
After language is selected, the status menu appears, thus you can see the equipment's current operating status, on/off status and actual values of various parameters etc. If you want to turn on/turn off any item, just press the corresponding button to operate it.

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

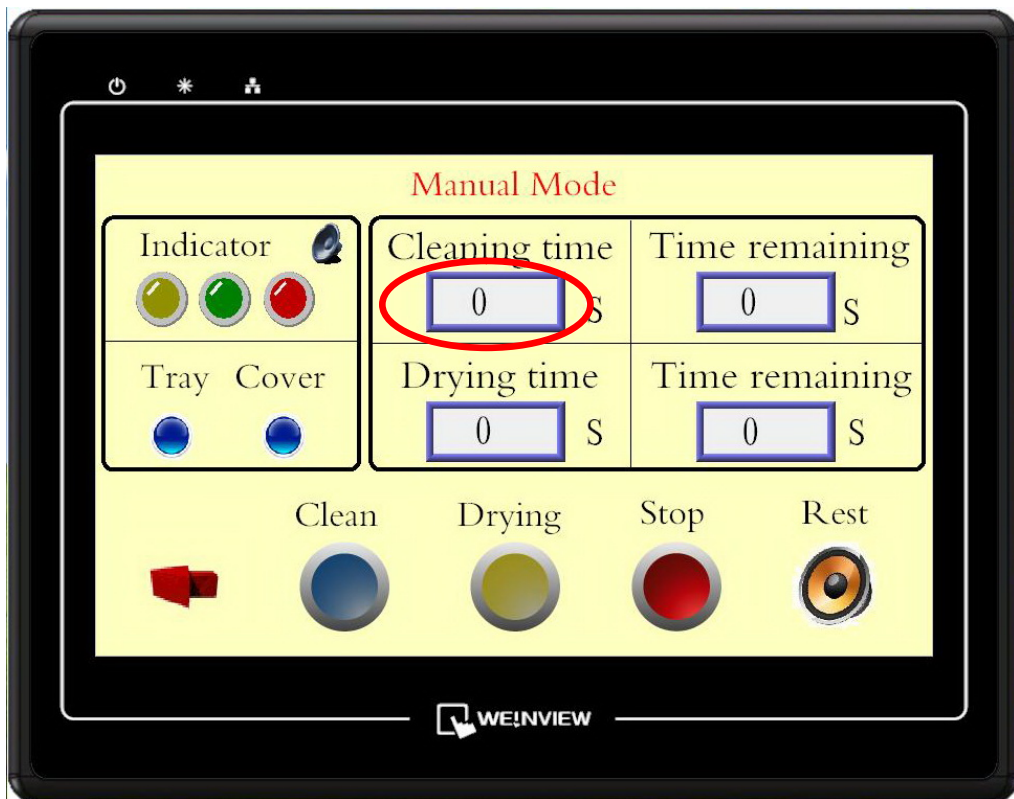
1. After select language, the following Status Display Menu appears (Eg. The following Chinese Display menu)



Operational Interface of the Home Page

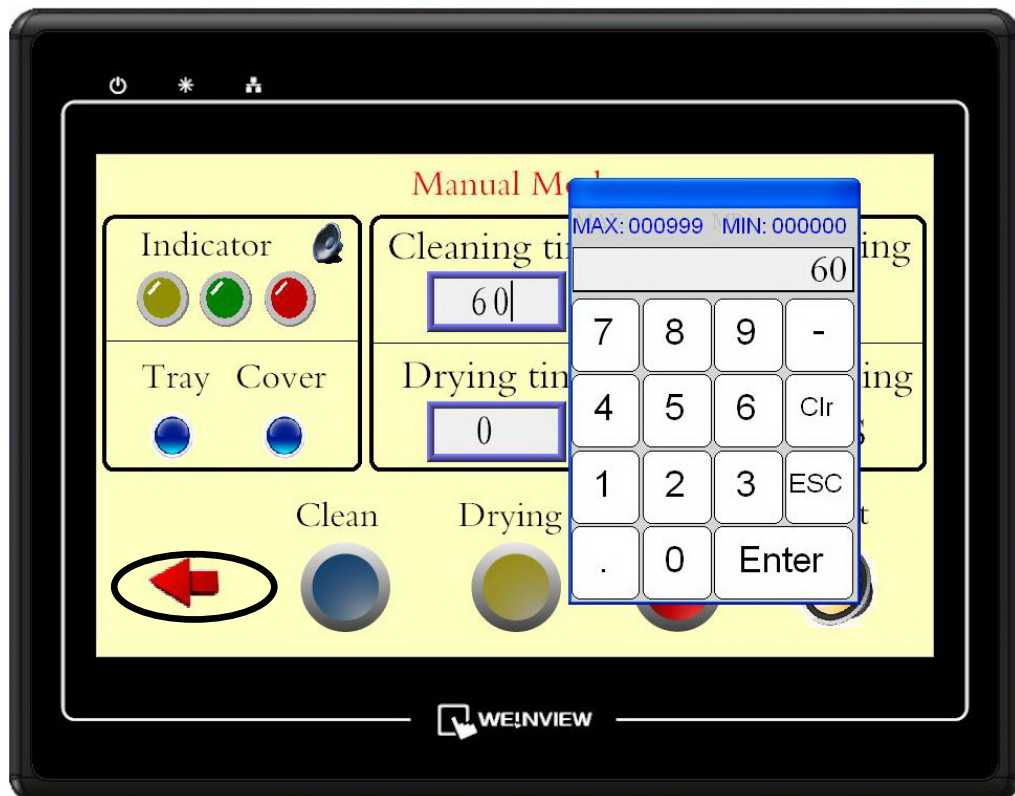
- ★ **Run:** Click it for starting the cleaning time and drying time automatically and completely set by equipment itself, after job is done, it will pop out the dialogue of cleaning completion
- ★ **Stop:** Clip for stopping all actions that the equipment is running
- ★ **Buzzer:** While malfunction occurs, this equipment has sound & light alarming function which can be closed by pressing this button
When emergency button “Stop” is pressed, the machine will stop all operations and will give sound & light alarming; Later on once “Stop” button is rotated, the “Power” button on the control panel must be pressed down before starting the machine.
- ★ **Indicator:** According to equipment’s running situation, it displays equipment’s running status and synchronize with 3-colored light
- ★ **Tray:** Display whether tray is under reposition status (displaying “flicker” status)
- ★ **Cover plate:** Display whether door plate is under reposition status (displaying “flicker” status)
Equipment enters into automatic running status and open doors by force, all operations will stop running and equipment will give alarm (Under manual mode or default status, only red light will flicker, the buzzer will not give alarm)

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



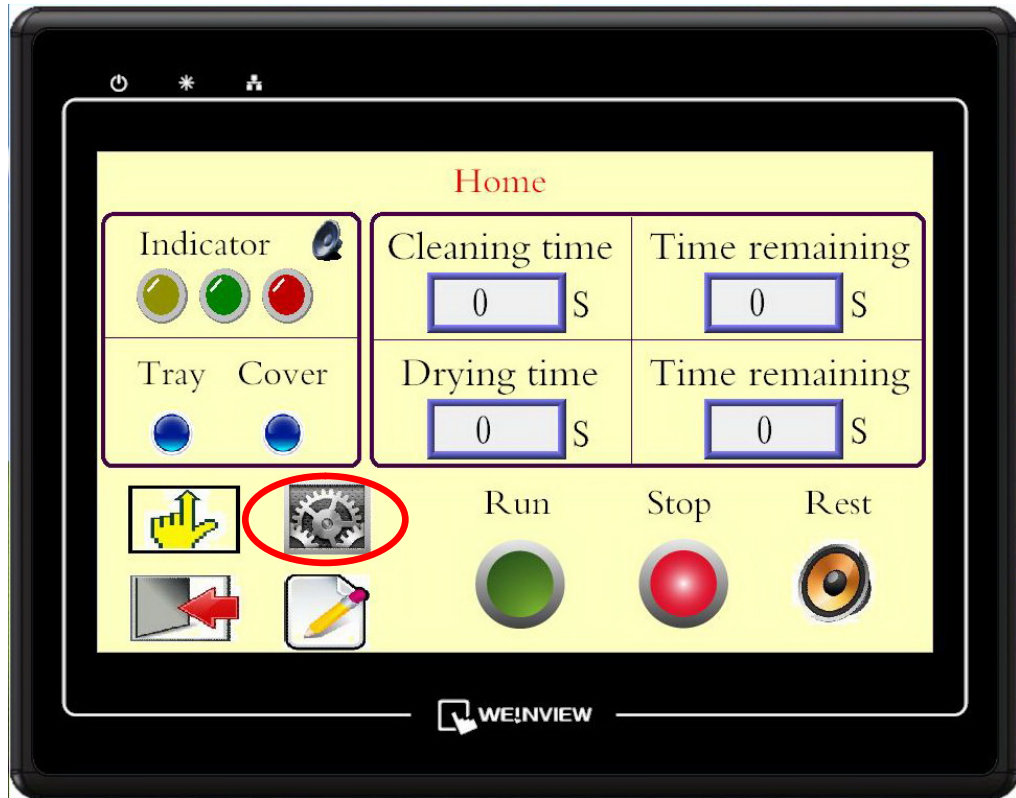
Operation Interface under Manual Mode

3. Click the digital block under cleaning time, a digital keyboard will pop up for setting manual cleaning time and drying time.



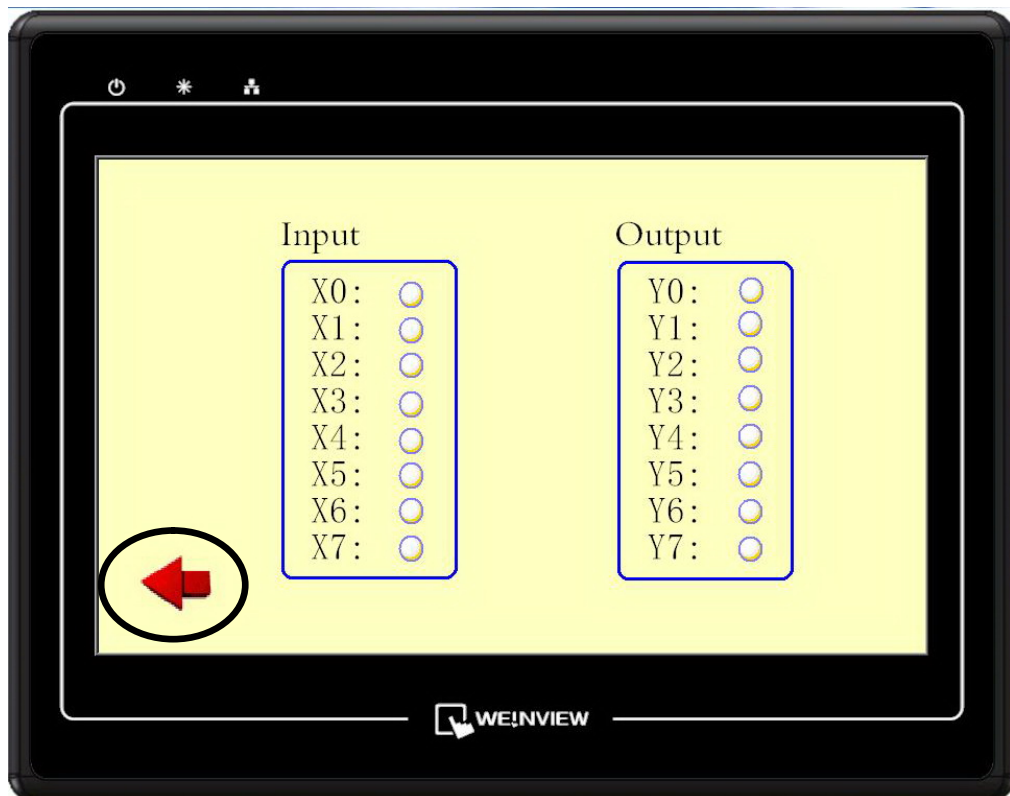
Operation Interface of Manual Cleaning Time Setting

4. Click "exit" button to enter into operating interface of home page



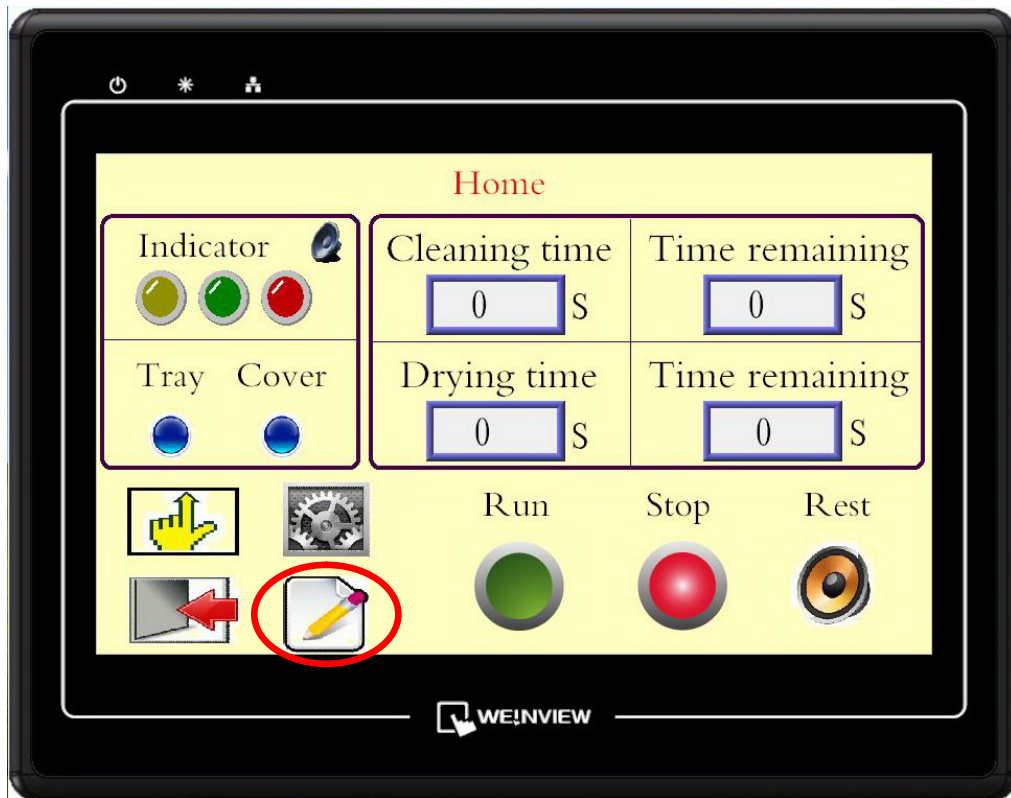
Operating Interface of Home Page

5. Click I/O port to enter into PLC status displaying interface.



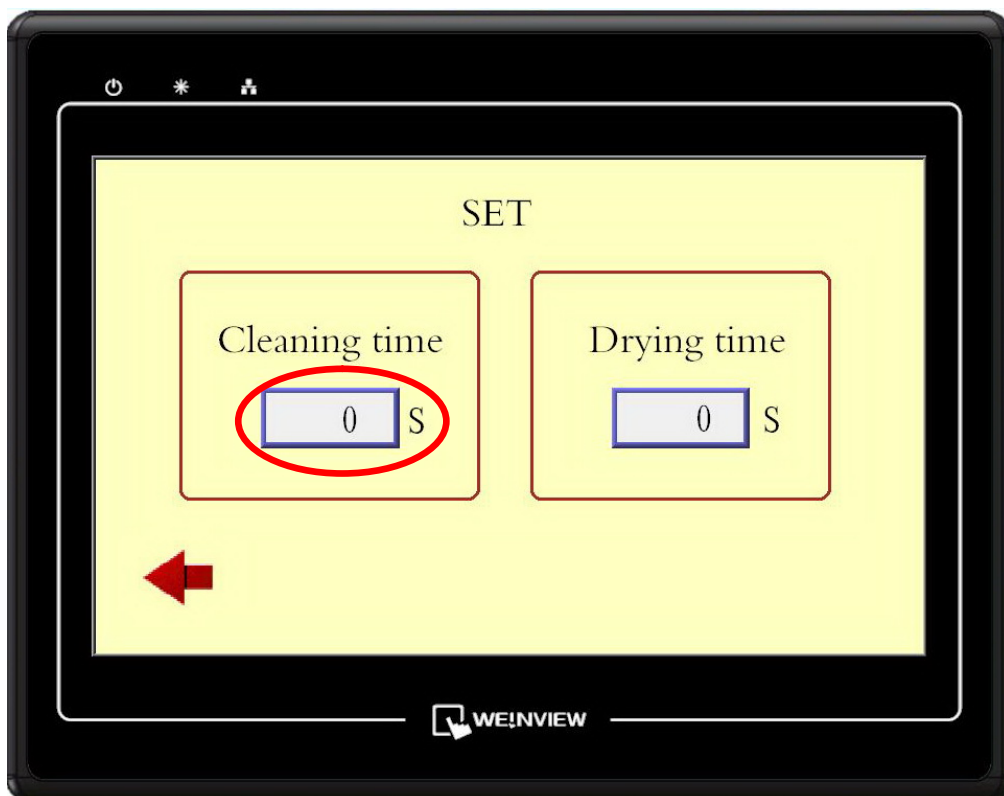
PLC Status Displaying Interface

6. Click “return” button to enter into operating interface of home page



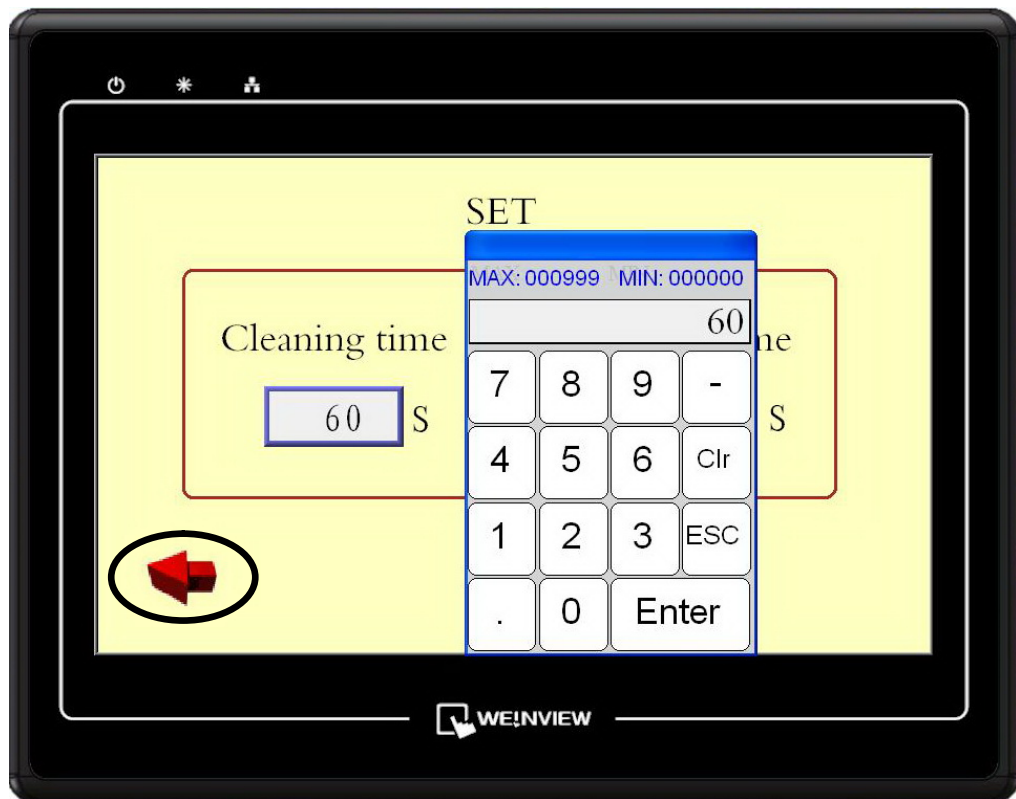
Operating Interface of Homepage

7. Click “Parameter setting” button to enter into the interface of automatic cleaning time setting.



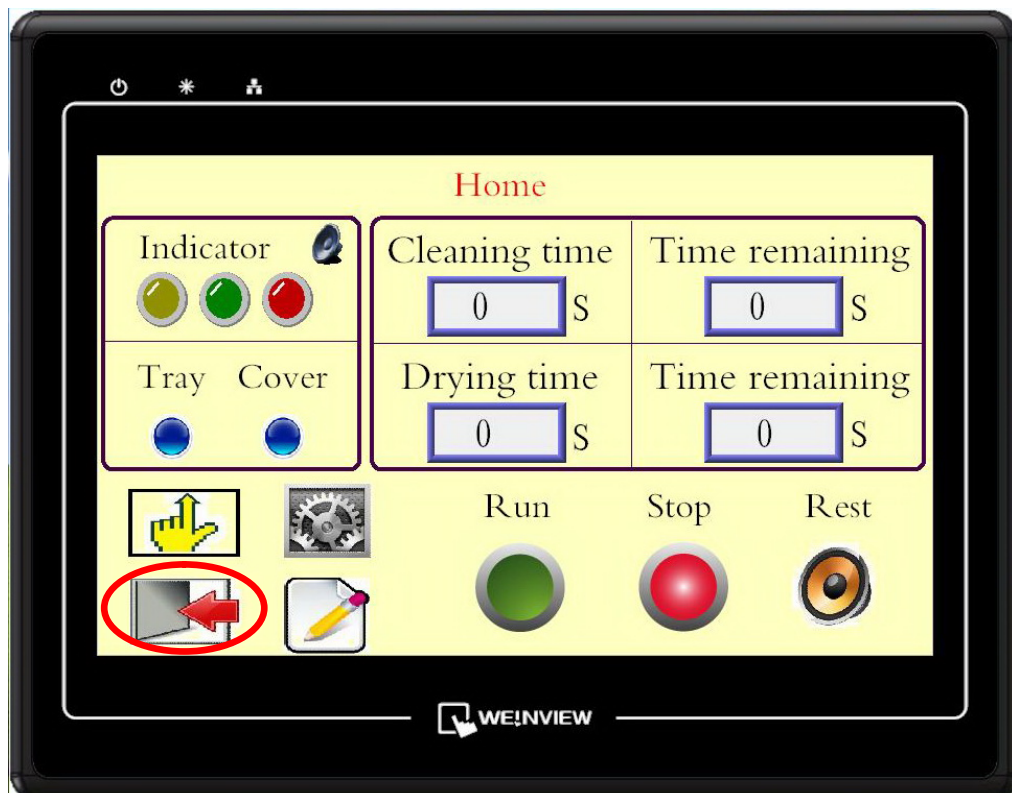
Interface of Time Setting for Automatic Cleaning

8. Click the digital block under the cleaning time may pop out digital keyboard for time setting.



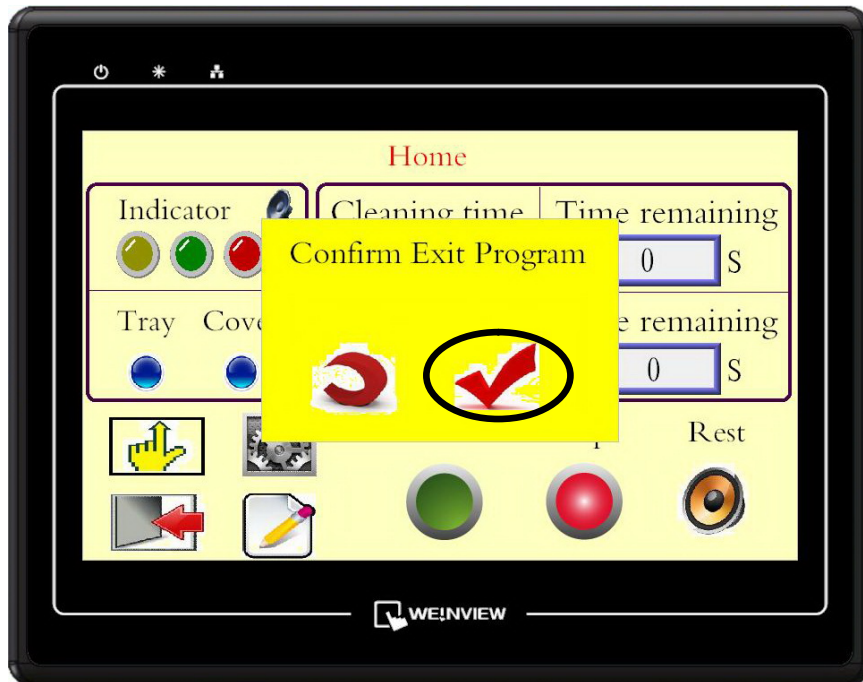
Interface of Time Setting for Automatic Cleaning

9. Click return button to enter into operating interface of homepage. (cleaning time which has been set will be saved automatically)



Operating Interface of Homepage

10. Click “Exit” button, then a dialogue box pops up for confirming “exit” or not,



11. if exit is confirmed, then it will return to the “welcome interface”.



4.3.2 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. 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

5. 2 Error display function of pressure switch

Error name	Error code	Description	Solution
Overcurrent error	Er1	Load current of switch output (OUT1) exceeds 80 mA.	Shut off the power supply. After eliminating the output factor that caused the excess current, turn the power supply back on.
	Er2	Load current of switch output (OUT2) exceeds 80 mA.	
Residual pressure error	Er3	A pressure of $\pm 7\%$ F.S. of atmospheric pressure is applied in the zero-out function. ($\pm 3.5\%$ F.S. or more for ZSE30AF (compound pressure)) The switch will automatically return to measuring mode in 1 second, however. Due to individual product differences, the setting range of the zero-out function varies within $\pm 1\%$ F.S.	Bring the pressure back to atmospheric pressure and try using the zero-out function.
Applied pressure error	HHH	Supply pressure exceeds the maximum set pressure.	Bring the pressure back to within the set pressure range.
	LLL	Supply pressure is below the minimum set pressure.	
System error	Er0	Internal data error	Shut off the power supply. Turn the power supply back on. If the switch will not recover to normal, consult SMC for investigation.
	Er4		
	Er6		
	Er7		
	Er8		
	Er9		

If the switch will not recover to normal even after all of the above-mentioned solutions have been applied, consult SMC for investigation.

6. 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	Air source system	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		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

7. Adjustment of Touch Screen

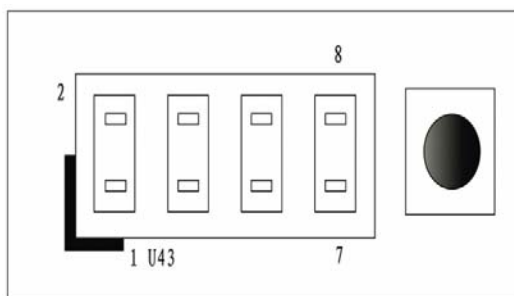


Fig.1



Fig.2

1-2	3-4	5-6	7-8	Mode
Close	Open	Open	Open	Touch screen adjustment mode
Open	Close	Open	Open	Hide HMI system setting column
Open	Open	Close	Open	Bootload mode
Open	Open	Open	Close	normal
Open	Open	Open	Open	normal

- Touch calibration and default password reset mode: Under this mode, when the K6070/8070iH is being electrified, a “+” character will appear on the up left corner of the screen, use a touch control pen or finger to touch the middle of “+”, it will move. It will appear on up left corner, up right corner, down left corner, down right corner, middle of screen in turn. After this 5 position points are well calibrated, the“+”cursor will disappear. Standard parameters will be kept in the TK6070/8070iH system.

8. Notice to users

Warning:

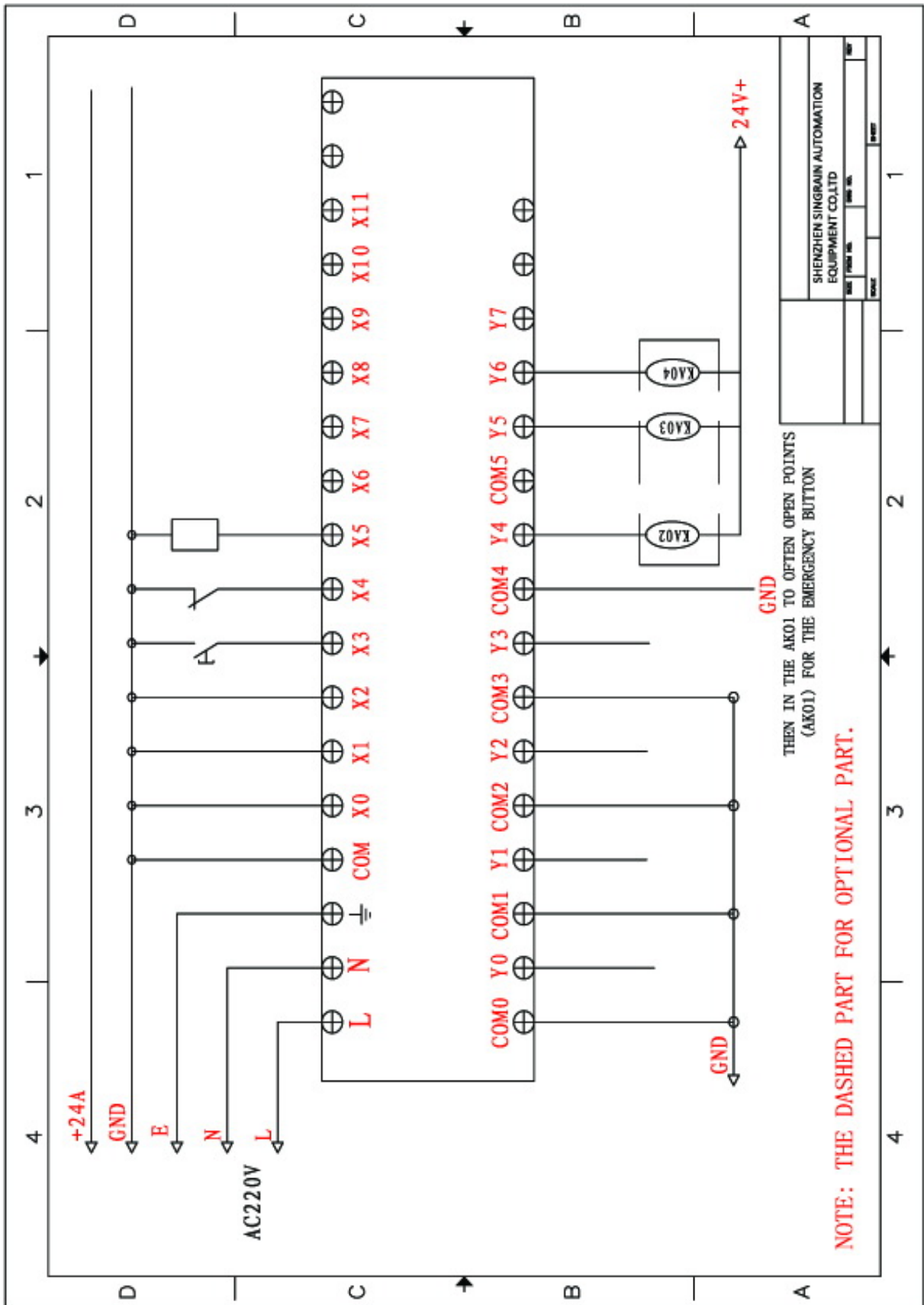
- This device can only be operated by special maintenance staff or trained eligible staff.
- Before switching power, make sure whether the external input power conforms to the rated voltage and current of this equipment ○ While turning off the power of touch screen, do not press it with heavy force;
- 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 our company;

9. Appendix

9. 1 Electricity schematic diagram



THEN IN THE AK01 TO OFTEN OPEN POINTS
(AK01) FOR THE EMERGENCY BUTTON

NOTE: THE DASHED PART FOR OPTIONAL PART.

SHENZHEN SINGRAIN AUTOMATION EQUIPMENT CO.LTD	
Model	Serial No.

