

SME-6200 PCBA In line Cleaning Machine

OPERATION AND MAINTENANCE MANUAL

Model: SME-6300



Version No: V3.6

(The contents of this manual may changed without prior notice)

CONTENTS

1 OVERVIEW

1.1 Instruction Range	5
1.2 Reading Guide	5
1.3 Diagram and Chart	5

2 SAFETY PRECAUTIONS

2.1 General information	6
2.2 Magnetic field	7
2.3 Safety regulations	7-8
2.4 Maintenance	8
2.5 Safety work requirement	9-10
2.6 Safety and protective devices	10-11
2.7 Safety signs	11
2.8 Safety procedure	12-13
2.9 Personnel protection	14
2.10 Danger	14-15
2.11 Personal injury accident	15-16
2.12 Emergency	16-17
2.13 Owner duty	17
2.14 Operator and maintenance staff duty	17
2.15 Design requirement	17
2.16 Maintenance and repair	17
2.17 Machine clean and clean material treat.....	18
2.18 Machine control	18
2.19 Machine structure change	18

3 SYSTEM DESCRIPTION

3.1 Process introduction	19
3.2 Section functions	19-25
3.3 Structure features	25-26
3.4 Electric control features	26
3.5 Spray system features	26-27
3.6 Flow chart and general view	27
3.7 Main features	27-28
3.8 section spec	28
3.9 System construction	29
3.10 Parts introduction	30-34

4 INSTALLATION AND ADJUSTMENT

4.1 Preparations before installation	35-37
4.2 Machine installation steps	37
4.3 Electric control system installation	38
4.4 Machine adjustment	38-40
4.5 Machine clean method and cautions	40-41

5 OPERATION INTRODUCTION

5.1 Operational panel	42-43
5.2 Software introduction	43-52
5.3 Water add	52
5.4 Water drain	53
5.5 Machine start steps	53
5.6 Machine turn off steps	53-54

6 MAINTENANCE

6.1 Precautions on maintenance	55
6.2 Maintenance contents	55-57
6.3 Maintenance sheet	57-58
6.4 Common maintenance method	58-59

7 TROUBLE SHOOTING

7.1 Transaction system	59
7.2 Clean and rinse section	60-61
7.3 Air knives	61
7.4 Hot air dry section	61-62
7.5 Electric control	62

8 PARTS REPLACEMENT

8.1 Vertical pump replacement	63-64
8.2 Horizontal pump replacement	64-65
8.3 Nozzle clean and replacement	65-66
8.4 Air blower replacement	66-67
8.5 Air knife clean	68
8.6 Heater replacement	69
8.7 Motor replacement	69-70
8.8 Bearing replacement	70-71
8.9 Net tension adjustment	71
8.10 Filter net clean	71-72
8.11 Air blower filter replacement	72-73

9 PARTS LIST

9.1 Mechanical parts list	74
9.2 Electric parts list	75-76
9.3 Pipe parts list	76

10 WARRANTY TERMS

10.1 Warranty period 77
10.2 Warranty items 77
10.3 Warranty statement 78

11 SERVICE RANGE 79

12 APPENDIX

12.1 System structure 80
12.2 Circuit diagram 81-84
12.3 Electric control box 85
12.4 Liquid diagram 85-86

CHAPTER 1--OVERVIEW

1.1 Manual range

This manual introduce operation, maintenance, spare parts and electrical diagram of “SME-6300 PCBA In line Cleaning Machine” in details to users. It has 12 chapters and the index of each chapter are lists on the Contents. Other important information such as: s/n no, cleaning process, application range, safety regulations... are also include in this chapter.

1.2 Diagrams and Charts

The standard work direction is from Left to Right. Left to right direction is defined by the direction which operators using the machine to clean PCBA. The Diagrams and charts are drawn by the direction from left to right.

For the machine with work direction is from right to left, these diagrams and charts are also correct, but need visualization by mirror image, In order to better understand these diagrams and charts, the direction is very important.

1.2.1 Diagrams and Charts

Normally, appendix (manual) is put in the electric control box, including:

Machine layout;

Circuit diagrams (main circuit and control diagrams),;

Parts list (electric parts).

We also provide customers with electronic version of manual. ff you needed, we can send it by E-mail.

1.2.2 Chemical liquid

Some chapters may concern chemical liquid. As chemical liquid’s MSDS and its operation instructions are not the contents of this manual, please refer to your chemicals suppliers for further information,such as:

1. Chemical liquid MSDS;
2. Instruction;
3. Analysis process.

1.3 Requirement

1. Any engineer who will operate on this machine, do please read this manual thoroughly before doing any operation and maintenance work on this machine.
2. Maintenance staff must take this manual as instruction and guidance. New maintenance technicians can take this manual as training document.

caution:

In order to keep us update to the new and fast developing cleaning technology and customer requirements, we reserve the right of upgrade and modify this machine without prior notice,such as:Design, SPEC and Parts change...

CHAPTER 2 SAFETY REGULATIONS

2.1 General information

- * This chapter show you the important information of safety operate and maintain “SME-6300 PCBA In line Cleaning Machine” . How to solve the problems or accidents which may happen during operation and maintenance, how to deal with daily operation, you must read this manual thoroughly.
- * All the people who will operate and maintain “SME-6300 PCBA In line Cleaning Machine” must read and understand the safety regulations of this manual thoroughly.
- * All the people who will operate and maintain “SME-6300 PCBA In-line Cleaning Machine” must obey the safety regulations of this manual.
- * Please obey to the local relevant accident protection regulations and safety provisions.

For your safety, Do please read this manual carefully and thoroughly!

Dongguan Shenhua Mechanical and Electrical Equipment Co., Ltd (SME) reminds our customers: Do please read this manual carefully and thoroughly and conduct standard operation on the machine. Especially the contents of “chapter 2--safety regulations”, please pay more attention to it. Our company will have no duty on the loss or damage which caused by people who are not obey to safety regulations of this manual.

This manual has the“SME-6300 PCBA In line Cleaning Machine” information which customers needed. Including :

- * Quick familiar with our machine functions;
- * Properly operate the machine;
- * Safety conduct cleaning work;
- * Maintain and repair the machine;
- * Trouble-shootings.

This manual are made according to our company design standard. The total power is about 110KW. The standard will not change due to some modification on the machine.

“SME-6300 PCBA In-line Cleaning Machine” installation and test work must be conducted by our professional engineers or our authorized technical persons.

After finish installation and testing , customer or agent technical staff must accept theory and real operation training on operation and safety regulations.

It is forbidden to do any operation or parameters setting on the machine before transferring to customers formally.

Cautions:

- * If you can't understand the contents of this manual, please contact our after service engineers, we will

SME-6300 PCBA In line Cleaning Machine

help you to know the machine in details to avoid accident caused by rule-breaking or incorrect operations because of misunderstanding the contents.

*Operators must obey the rules of this manual, if there is anything conflicts between the manual contents and the guidance of our engineers, Our company engineers guidance on site will be the main reference.

2.2 Magnetic field

For most of people, magnetic field is safe. But to people who installed specific medical devices, it will be potential harmful and can't goes into the scope of certain strength magnetic field. For example: individuals who has pace-maker, implanted defibrillator, metal heart valve, inner wound clips (surgery), metal devices or sickle disease. If possible, please consult special advice to health care department before operating the machine.

2.3 Safety precautions

2.3.1 Please install the machine on flat and solid, industrial standard ground in order to ensure the properly and stability operation of the machine.

2.3.2 Please avoid damage to machine out shape or inner parts because of collision in the time of machine transportation or movement.

2.3.3 Please check if the power supply specification match the requirement of the machine to avoid damage to the machine.

2.3.4 Please make sure to connect the machine to the ground with the earth line with "PE" sign before turning on the machine.

2.3.5 There is a safety sign on electric box. This electric box belongs to electric control system, please do not modify or assemble or disassemble the inner circuit if you are not professional persons who has authorized to do it.

2.3.6 Any parts of the machine which has protection signs indicates that it may has certain danger when the machine working, do please understand the meaning of them and do not get close to these parts in order to avoid any unnecessary hurt.

2.3.7 Please do not change inner setting of the machine, if you need to change them, please consult SME engineers to avoid unnecessary damage or personal hurt.

2.3.8 The cleaning liquid temperature or water temperature will be heated and rise to setting degrees in the process of machine running, do not touch it by bare hand. Please do not stand by the side of drain pipes to avoid personal hurt.

2.3.9 Keep the working area tidy and pass lane clear. Dirty and untidy working area is easy to cause accident.

SME-6300 PCBA In line Cleaning Machine

2.3.10 Operators do not have loose clothes, do not have ties, scarfs, rings and bracelets, please put on anti-skid shoes at working area. People who has long hair must tied well and put on hats to keep it.

2.3.11 Concentrate on your work, please stop to operate the machine when you are tired.

2.3.12 Please maintain the machine regularly according to maintenance sheet of this manual and your factory rules to keep it in good function and condition.

2.3.13 Please use professional tools to maintain the machine to avoid bad impact on machine.

2.3.14 Do not use the machine on humid environment and do not expose it in the rain. Working area must be bright and have enough lighting for machine maintain and repair work.

2.3.15 It is forbidden to remove any parts on the machine. Please keep the good habit to check the machine condition before starting it. Check and inspect whether all the parts are in their original positions, whether there is any part loose or drop off. Maintain the machine after the day work finished. Do please turn off the main power and cut off power supply break before starting maintenance.

2.3.16 People who are not trained are forbidden to operate the machine privately; Any pets cannot be taken to working area.

2.3.17 It is forbidden to stand and climb or crawl on the machine, or else machine may fall or power supply may connected by accident and cause personal injury or damage. All the people must keep safety distance away from the machine before turning on the main power of the machine.

2.4 Maintenance

If the machine is kept in good condition and get well maintained and replace the spare parts regularly, the lifespan of the machine will be extend.

2.4.1 The machine must be maintain or repair by professional staff or assigned engineers. If need to replace parts, please use original parts to replace it. The broken parts or protective device must be replaced in time.

2.4.2 Maintain the machine carefully. Check each parts of the machine and erase potential danger in time. Keep your maintenance tools clean and in good condition for better safety and efficient.

2.4.3 Please check the replaced or repaired parts and its devices carefully and judge whether they can work properly or not; Check whether they can reach the expected effect or not; Check whether the transmission parts are adjusted well and firmly installed and solve any factors which will affect the proper running of the machine. Replace the worn or damaged parts in time.

2.4.4 Please pay high attention to the local laws on treatment of waste water and waste gas. Please take are of waste water during maintenance process and protect the environment.

2.5 Safety work requirement

SME-6300 PCBA In line Cleaning Machine

Only the people who are trained, familiar with the machine or authorized can operate the machine, they must be qualified:

2.5.1 Operator's training

Operators must be trained on the following aspects:

- * Potential danger at the time of machine running and have self-protective sense.
- * Machine working process, working theory and properly operate methods.
- * Machine functions and parameter setting.

The one who are trained by SME or our company local agent engineers, read and understand this manual can operate on the machine.



Only the operators over 18 years old adults can operate this machine.

2.5.2 Different operate level on the machine, the operator must have different technical level. Please see the sheet: 2-1

Operate content	Trained technician, (qualified person)	Trained engineers
Assemble and installation	Only SME engineers or SME agent technical staff	
Adjust and operation	Only SME engineers or SME agent technical staff	
Start、operate、stop	√	√
Trouble shooting、repair and maintenance		√
Dissemble	Only SME engineers or SME agent technical staff	√

sheet 2-1

2.5.3 Professional personnel are people who accepted machine technical training; had relevant

SME-6300 PCBA In line Cleaning Machine

technology level and experience; fully understand machine regulations; can evaluate potential danger and can authorized operator to operate the machine.

Manufacturer must guide and inform the operators the following information:

- * Possible and potential danger and the possible result and preventive measures.
- * Take safety measures to the machine in the case of risk.
- * Preventive device for operator.
- * Safety equipment.
- * Safety operation requirement.
- * Troubles and problems which may occur at the process of machine running.
- * Know how to use tools properly.

Anyone who don't have these knowledge or can not properly operate this machine are forbidden to use this machine.

To the customers who have signed maintenance contract with our company or our company agent, only our engineers or our company authorized technical staff can conduct maintenance and repair work.

2.6 Safety and protective devices

Make sure all protective devices are equipped and work properly before starting machine.

Safety protective devices can only be turned off at the following situations:

- * Machine stopped;
- * Make sure machine can not normally start again;
- * For the safe of operators, we will not offer machine parts until customers install protective devices.

The safety protective devices of the machine are:

2.6.1 EMG STOP Button

- * 3 places: operation panel, PCBA input side and output side.
- * Red press button with yellow base.
- * EMG stop button are made according to CE standard or other standard.
- * It can cut off all electric control circuit, pumps, motors immediately.

2.6.2 Current leakage protective breaker

- * Cut off main power supply automatically in the case of electric current leakage, to protect operator and machine safe.
- * Cut off main power supply automatically in the case of person electric shock and machine circuit short.




2.7 Safety signs

There are signs adhered on the machine. Please check all the labels periodically. Replace them when they became indistinct.

The signs on the sheet is safety labels. Operators and technical staff must recognize and understand the

SME-6300 PCBA In line Cleaning Machine

meaning of them.

 <p>No Flame</p>	<p>Inflammable sign: This sign reminds you to keep the machine away from fire. Be careful of fire on storage, transportation and use of inflammable goods</p>
 <p>Wearing your labor-gloves!</p>	<p>Protection sign: This sign reminds you to put on industrial plastic rubber gloves during operating of the machine, especially when touching liquid or water.</p>
 <p>Wearing your goggle before operation!</p>	<p>Protection sign: This sign reminds you to put on industrial goggles before operating the machine, especially add or discharge liquid and water.</p>
 <p>Please read the manual carefully before power on!</p>	<p>Manual sign: This sign reminds you to read this manual thoroughly before operating on the machine</p>
 <p>ELECTRICAL HAZARD 電力危險</p>	<p>Electric shock prevention sign: This sign reminds you be care of electric parts to prevent electric shock when operating on the machine.</p>
	<p>Turn off power supply sign: This sign reminds you to turn off machine power supply before opening the electric box.</p>
 <p>Do not touch hot surfaces</p>	<p>High temperature sign: This sign reminds you not to touch the high temperature parts and area.</p>
 <p>Caution mechanical injury</p>	<p>Clipping hands sign: This sign reminds you no to touch mechanical transmission parts to prevent clipping hands when the machine is running.</p>

2.8 Safety procedure

2.8.1 General summary

This system are manufactured according to the latest technical stand and main stream safety regulations. But it may have safety risk when operating the machine or the third part safety risk. It may have potential damage to the machine so operators and technical staff must obey machine regulations when operating the machine.

This system can only use at the time of the following conditions are satisfied:

- * In the scope of machine design,
- * When all the safety devices are in normal condition,
- * Defects which related to safety are solved immediately,
- * This manual must put near the equipment;
- * Local accident protect and environmental protect rules are also put nearby(not in SME manual);
- * All safety warning sign and characters can be see very clearly .

2.8.2 Normal operation condition

- * Check and make sure no one is in danger area before starting the machine;
- * The machine can only be started when all the safety and protective devices are in proper conditions;
- * Do not operate the machine at the time of protective covers are moved out;
- * Do not install or change safety devices casually;
- * Check and confirm EMG STOP button and visible machine parts are good or abnormal condition at the time of each work shift every day;
- * All the operators must know the positions of EMG STOP button, main power breaker and chemical liquid close valve;
- * Keep your clothing and body away from moving part, for example: Gears, rotary devices...etc;
- * Please put on goggles when working around the machine;
- * Put on protective garments when operate with chemical liquids;
- * The assigned responsible person must confirm all the safety devices, protective devices and ventilation devices are in proper conditions;
- * Do not run the machine under the temperature not right for the machine construct material.

2.8.3 Electric system

Electric system must be kept in good working conditions.

SME-6300 PCBA In line Cleaning Machine

- * Only professional staff can allowed to change and repair the electric system;
- * Engineers must check the electric system periodically and when you find the connector lose or cables are broken, they must be repaired or replaced in time.
- * Electric control box must be kept in lock state, only in particular case, it can be opened.
- * Make sure never leave anything in the electric box, these leaving things may cause electric short.

2.8.4 Chemical liquid

This system must use water-based chemical liquid, so we must obey the following chemical liquid using safety regulations:

- * Make sure to put on suitable protective garments when using chemical liquid.
- * Chemical liquid in the machine must be treated according to relevant safety procedure and regulations;
- * Maintenance staff only can start work after chemical liquid in the liquid tank was drained empty.
- * Maintenance staff can only do maintenance work after no liquid left in the pipes and no liquid pressure on the pipes.
- * At the time of liquid testing or do liquid sample analysis, operators must put on protective garments and stop transmission system and pumps—Machine must be in complete stop condition.
- * Do not mix chemical liquid in the liquid by hand. Some chemical liquid may release a large amount of heat to cause liquid splashed out and may cause damage to your machine and hurt operators.
- * Do not use any liquid that does not comply with the liquid requirements of machine.

2.8.5 Air and vapor

- * If there is no good ventilation system, the air or vapor which released dangerous gas;
- * Please put special personal protective devices to treat the release this kind of dangerous gas and vapor;
- * Check the ventilation system periodically according to regulations.
- * Check each separate ventilation joints are sealed well or not along the pipes when checking ventilation system.

2.8.6 Temperature

- * The temperature of liquid tank and other spare parts may rise and become hot;
- * Operators must avoid to contact the high temperature surface at temperature rise area;
- * Put on protective garments when working at temperature rise area;
- * Pay attention to the high temperature signs.

2.8.7 Special situation

Before opening all the doors or covers of “[SME-6300 PCBA In line Cleaning Machine](#)” or enter into the machine inner side.

- * You must know MSDS of chemical liquid manufacture, before opening the liquid tank lid or entering the inner area of the machine.
- * Obey the recommend treatment from the chemical liquid manufacture.
- * Familiar with the emergency response and handling methods.
- * Shut off mechanical transmission system and cleaning pump
- * Wait for several minutes to let liquid flow back to liquid tank from the cleaning cabinet and pipes.
- * Put on goggles, gloves, apron and respirator...etc.





SME-6300 PCBA In line Cleaning Machine

- * Remove machine doors and covers.
- * Put back covers or close doors.
- * Start the machine again according to operation procedure.

2.9 Personnel protection

Operators must put on qualified safety auxiliary devices such as anti-corrosion gloves, glasses, masks and prepare suitable safety devices.

Here are some common protection devices signs:

	Anti-static clothing can protect static
	Gloves can protect chemical liquid to hurt hands
	Anti-static shoes can protect static
	Mask to protect to breathe dangerous gas

2.10 Danger

2.10.1 Electric danger

Make sure the machine main power is turned off before opening the electric control box and conducting the replacing and repair work of any electric parts. To ensure safe of engineers, please obey the following safety regulations:

- * Turned off the main power of the machine,;
- * Lock it to prevent it turned on by accident; Put on warning signs on electric box;
- * Check whether the power is shut off or not;
- * Cover or isolate electric parts nearby.



If contact the electric parts, the machine working voltage would be fatal, so must forbidden to operate on the machine with electricity or leakage electricity. The electric cable and breaker which connected with the machine must meet the requirements to prevent overload, or else it may cause short circuit or over heat to cause fire.

- * If there is power supply problems happened, please turn off the power immediately.
- * Electric system must be in safe condition at any time and check the electric lines and control parts in regular time. If find parts broke or aging, please report and arrange to replace the parts immediately.
- * Electric box must be keep closed, only the authorized people can conduct maintain and replace work to the electric parts.
- * Electric device must be connected to the earth through earth line and prevent statics.
- * Electric circuit detecting and maintain devices must be isolated and check if they are has electricity leakage problem.
- * Electric devices must be protected according to its usage and position to avoid indirect connection. So

SME-6300 PCBA In line Cleaning Machine

that we can prevent damage caused by partial danger at the time of electric devices broken.

* Electric check auxiliary devices and tools must be isolation, please check whether the isolation of them before using them.

2.10.2 Danger caused by liquid pressure

* Machine must work under its max liquid pressure! Over pressure may cause great damage to the under pressure parts and even cause liquid pressure system broken.

* It will be dangerous that the liquid under over pressure.

* Please turn on liquid control valve to release system pressure before running the liquid pressure system.

* Keep the system installation pass lane clear and with good ventilation. Do not put other parts on the top of the system or around the vent.

* Cleaning liquid is a chemical which may cause allergic reaction.



Please obey the requirements of personal protection sheet when contacting the liquid;

Cleaning liquid or rinse water may heat to 50~60°C, please watch out the hot liquid or water!

Please let the liquid or water cool down before doing any inspect, maintain or repair work on the machine. Do relevant protection actions before liquid leak out and cause environmental pollution problem. Please obey the chemical liquid supplier's MSDS.

2.10.3 Fire danger

* At the time of fire danger, please stop the machine immediately (push down EMG stop and shut off power supply), warning the people nearby, walk out through the emergency exit and call the fire policeman immediately.

* Use the fire-fighting equipment to put on fire.

* Keep safe distance from the fire when putting on fire.

2.11 Personal injury accident

We must try our best to avoid personal injury accident happen at the process of operating the machine. At the time of personal injury accident happens, we must do the following procedures :

- A) Stop the machine immediately;
- B) Do emergency rescue;
- C) Protect injured people and put him on safety place;
- D) If injured severely, please call the rescue agencies like fire bridge or hospital;
- E) Briefly and accurately describe the following content in details:
 - * Your phone number;
 - * Your name;
 - * The sequence of this emergency accident case;
 - * Accident place;

- * The number of injury people;
- * Injury type;
- * Accurate position.

2.11.1 Make sure the rescue staff understand your phone call

- A) Inform the responsible people of your company as soon as possible;
- B) Put on warning signs and start to rescue immediately if needed;
- C) keep the pass lane clear to make the rescue people take rescue actions;
- D) Obey the on site add and rescue rules.

2.11.2 To avoid accident happens, the machine can be only used:

- A) In system specified application;
- B) The machine must be in good working conditions;
- C) Users know clearly the safety precautions and danger of the system;
- D) Shoot the trouble immediately when we find any safety problems.

2.12 Emergencies

2.12.1 EMG general

Emergencies means the abnormal damage to the system or abnormal hurt to the people.

- A) Push down EMG STOP button immediately to stop the machine;
- B) Take medical care and fire-fighting add at the first time if there is anyone got injury;
- C) Estimate Emergencies type and severity;
- D) Correct the factor and find the reason which caused Emergencies;
- E) Turn counter-clockwise to release EMG stop button;
- F) Restart the machine after accident was solved.

2.12.2 Phenomenon1: PCBA jammed

- A) Press down EMG STOP button to stop the machine.;
- B) B) Observe the area which PCBA jammed carefully and try to find the problem;
- C) Put on protective garment or protective device to avoid cleaning liquid spray on to your body;
- D) Move out jammed PCBA and solve the problem;
- E) Check mechanical parts to make sure they are on right position and have good function after solving the problems;
- F) Start the machine again according to relevant procedure;
- G) If there is any chemical liquid run out, please clean the related area.

2.12.3 Operator's clothes or body was caught by machine moving parts.

- A) Push down EMG stop button to stop the machine immediately;
- B) Help the people who are caught by machine according to relevant EMG handling procedure;
- C) Turn off the main breaker of the machine.

2.12.4 People contacted chemical liquid

- A) Push down EMG stop button to stop the machine immediately;
- C) Help the people who contacted chemical liquid to treat according to relevant procedures;
- C) Turn off the main breaker of the machine at the first time after finish step2;
- D) Turn on the main breaker until finish all the maintenance work.

2.13 Owner's duty

The owner of this system has the duty to allow the following people to operate and maintain this machine:

- A) Qualified and accept training people can operate or maintain this machine.
- B) Fully understand safety regulations and safety precautions people.
- C) Read and understood the safety operation chapter content and safety statement.
- D) People who familiar with operation work and safety regulations should be audited regularly.
- E) All the safety devices of the machine must be checked regularly.
- F) Owner should equipped the necessary personal protection device and operation training.

2.14 Operator and maintain staff duty

All operate and maintenance staff must be qualified with the following qualifications at least :

- A) Strictly obey the safety regulations and safety precautions.
- B) Fully understand safety regulations and safety precautions of this manual.

2.15 Design requirement and application range

“SME-6300 PCBA In line Cleaning Machine” is specially designed for PCBA cleaning. It is forbidden to use the machine to clean any other objects beyond its design scope, we will have no duty on any damage to the machine or hurt to the people caused by it.

In addition, the proper usage of this machine also include:

- * Strictly obey the safety regulations and safety precautions.
- * Read and understood the safety operation chapter content and safety statement.

2.16 Maintenance and repair

- A) Maintain ,check and repair the machine according to maintenance sheet timetable,please take the reference of chapter 6;
- B) Before conducting any inspection,maintenance,repair work on the machine, please stop the machine;
- C) Turn off the man power and lock the main power box;
- D) Take off key (if have);
- E) Put on warning signs to prevent other people turn on the machine occasionally;
- F) Inform machine operators;
- G) Please use fork or freight elevator if you want to replace big size or heavy parts;
- H) Check whether the faster' screws loose or not;
- I) Check all the safety and protective device are in good working condition after finish all the maintenance work;

2.17 Clean device and clean material treatment

- A) We recommend to use WD40 or clean room wiper to clean the surface of machine and no water area.
- B) Please use DI water to wash inner clean and rinse room.
- C) All the clean material must be treated according to local relevant rules.
- D) Do not touch electric parts with wet finger or wet wiper.

2.18 Machine control software

- A) Please do not change the system software.
- B) Software are protected by password.
- C) Only the trained engineers or authorized technicians can operate on the soft parameter setting.

2.19 Machine structure change

- A) If you do not bought the machine from our company or our company local agents or vendors, we will have no duty on the parts according to our specified safety regulations.
- B) Please do not change or modify the machine structure including support welding parts unless you get the permission from our company.
- C) All the change must get the formal paper confirmation from our company.
- D) Only the spare parts from our company can be used on the system.

CHAPTER 3 SYSTEM DESCRIPTION

3.1 Process introduction

3.1.1 Cleaning purpose

“SME-6300 PCBA In-line Cleaning machine” is used to clean flux, solder balls, dusts on the surface of PCBA electronic components and pads to prevent PCBA corrosion and electromigration and static damage... This system is an in-line, spray cleaning machine. The PCBA are 100% clean after clean by this machine and waiting for next process.

3.1.2 Process section

* Pre-wash section length:	380mm(15in)
* Wash section length:	560mm(22in)
* Chemical Isolation section length:	360mm(14.1in)
* Pre-rinse section length:	400mm(15.7in)
* Rinse section length:	240mm(9.4in)
* Final rinse section length:	240mm(9.4in)
* Air blow dry section length:	600mm(23.6in)
* Hot air blow dry section 1 length:	570mm(22.4in)
* Hot air blow dry section 2 length:	570mm(22.4in)

3.2 Section function

By using special high pressure multi-section chemical liquid spray wash(clean) and DI water spray rinse process and net conveyor system. The whole process (wash, rinse air blow and hot air dry) are completed in one machine.

“SME-6300 PCBA in-line cleaning machine” has pre-wash, wash, chemical isolation, pre-rinse, rinse, final rise, air blow dry and hot air dry section.

The PCBAs are put on net conveyor from input side, go through pre-wash, wash, chemical isolation, pre-rinse, rinse, final rinse, air blow dry and hot air dry functional section and got out from output side.

It is a new type, high performance and automatic PCBA cleaning system.

MAIN FRAME

“SME-6300 PCBA In line Cleaning machine” is totally made up of SUS304 stainless steel material, no PP or PVC material at all. It is an integration structure. By adopting argon arc welding process, the system has following features:

- * Firm structure;
- * High pressure resistance;
- * High temperature resistance;
- * Acid and alkaline resistance;
- * Attractive appearance.

SME-6300 PCBA In line Cleaning Machine

*No deformation, embrittlement, quick ageing, water leak... defaults for long time use.

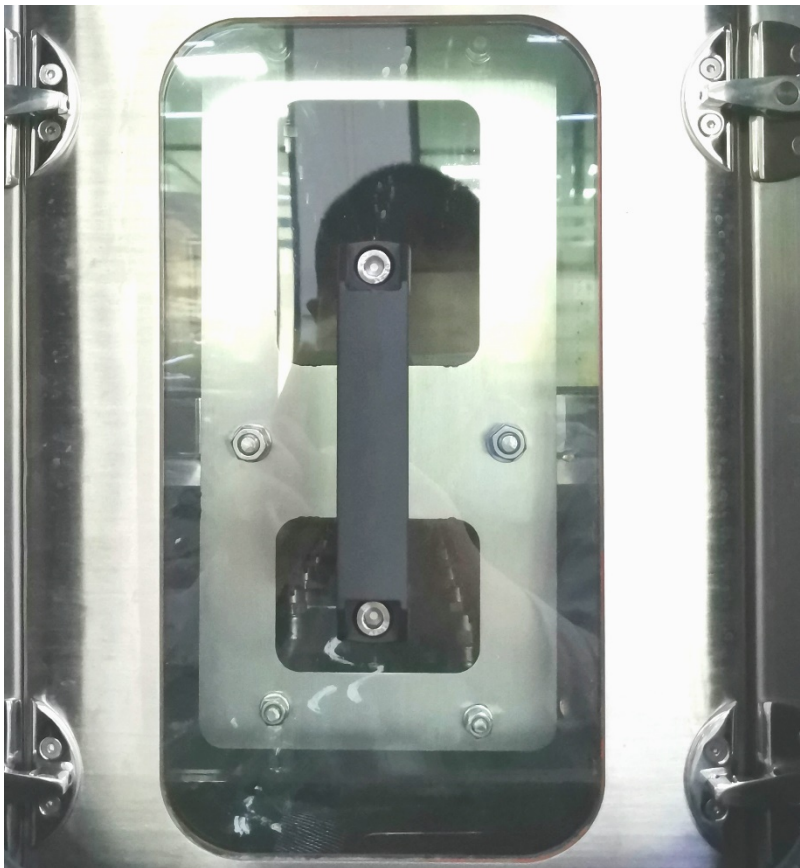
LIQUID PRE-WASH SECTION

This section use water-base cleaning liquid(chemical liquid) to do primary wash to PCBA. The Pre-wash pump absorbs liquid in wash tank and spray to PCBA through spray nozzles on upper and lower spray bars of clean section. The spray nozzles forming a liquid curtain, spray to PCBA to immerse and soften flux and dusts on PCBA. It is intend to decrease the cleaning difficult degree of wash process.

The chemical liquid is re-circulation used through steel filter net and pre-wash filter barrel to keep micro solder balls and other dusts off from cleaning PCBA.

Pre-wash and wash are using one same liquid tank.

2 upper spray bars and 2 lower spray bars; chemical liquid can be heated to increase cleaning ability. liquid temperature, liquid level and liquid spray pressure are shown on touch panel interface or pressure gauges.



LIQUID CLEAN SECTION

This section use liquid to do main, high pressure wash on PCBA. The powerful wash pump absorb liquid in wash liquid tank and spray to PCBA through spray nozzles on upper and lower spray bars. The spray nozzles forming a liquid curtain, spray to pre-washed PCBA to peel flux and dusts off from PCBA. It is

SME-6300 PCBA In line Cleaning Machine

intend to remove all of flux and dusts on PCBA components and pads .

The wash liquid is re-circulation used through steel filter net to keep solder balls and other dusts off from the PCBA.

The wash tank capacity is 240L; It has 6 upper spray bars and 6 lower spray bars; Cleaning water can be heated to certain degree to increase cleaning ability. Liquid temperature, liquid level and liquid spray pressure are shown on touch panel interface or pressure gauges.



CHEMICAL ISOLATION SECTION

This section has 2 upper and 1 lower air knives, 1 high pressure air blower. It is intend to blow wash liquid off from PCBA surface and keep it remain in clean section and flows down to wash liquid tank, also it can save liquid and make wash process cost down. The air pressure are shown on air meters.



DI WATER PRE-RINSE SECTION

This section is use DI water to spray and pre-rinse PCBA to wash off few remain liquid on PCBA surface and keep it in this section and flow down to pre-rinse tank and stop it goes into rinse section. Pre-rinse section has 3 upper and 3 lower spray bars. The pre-rinse pump absorbs DI water in pre-rinse tank and spray to PCBA. The pre-rinse water tank capacity is 60L. DI water are re-circulate used, add from rinse 1 tank and overflows to overflow tank.



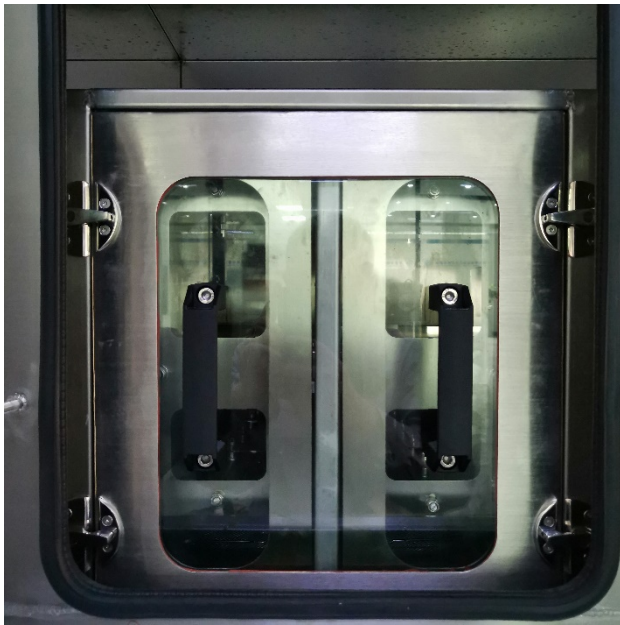
DI WATER RINSE SECTION

This section is main rinse section. It use DI water in Rinse tank to do high flow rinse on PCBA. The powerful Rinse pump absorb DI water in rinse tank and spray to PCBA through spray nozzles on upper and lower spray bars. The spray nozzles forming a water curtain, spray to PCBA to take off dusts and ions from PCBA surface.

Rinse DI water is reused through steel filter net. It add from final rinse spray bars and additional water overflows to pre-rinse tank.

The rinse DI water tank capacity is 40L; It has 1 upper spray bar and 1 lower spray bar; Rinse water can be heated to increase rinse ability. Rinse water temperature, water level and water spray pressure are shown on touch panel interface or pressure gauges.

SME-6300 PCBA In line Cleaning Machine



DI WATER FINAL RINSE

This section use outside fresh DI water (from DI water machine, DI water resistance will up to 10M Ω) to do final rinse and take off residual ions from PCBA surface to make PCBA as clean as customer needed.

Fresh DI water comes from DI water supply port and controlled by a angle valve and maintain some pressure, spray from upper spray bar and low spray bar to form a water curtain and spray on to PCBA. The spray water overflows to rinse tank to replace rinse 1 tank water. Water resistivity meter is equipped in this section to monitor income water quality in time and water flow meter is also used to monitor water amount.

This section has 1 upper spray bar and 1 lower spray bar.



SME-6300 PCBA In line Cleaning Machine

AIR BLOW SECTION

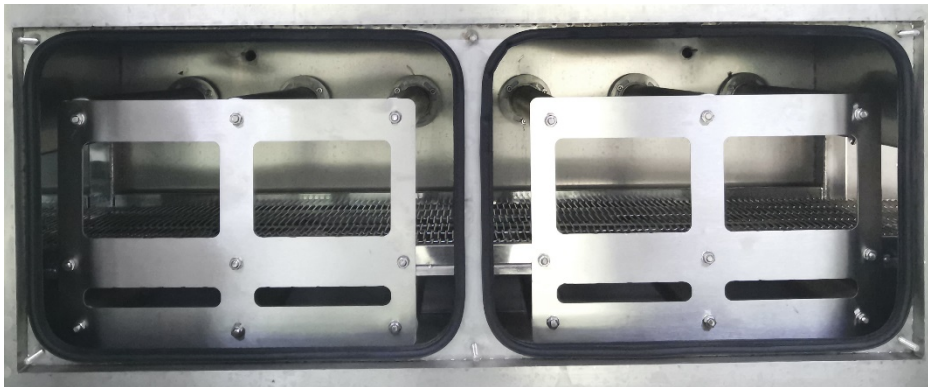
This section use high flow and high pressure air form air blower to blow off water from PCBA surface to make PCBA easier to dry by next hot air dry section. The blow off water flow back to rinse tank.

This section has 2 air blowers and 2 upper and 2 lower air knives. Air pressures are show on pressure meters.

HOT AIR DRY SECTION

This section are divide into hot air blow dry 1 section and hot air blow dry 2 section. It is use air blow high temperature and recirculated hot air to make residual water on PCBA into steam and bake dry.

This section has 1 air blower.2 air heaters and 6 upper air knives and 6 lower air knives. Air temperature and pressures are shown on TP or pressure gauges.



SYSTEM PIPES

All pipes of this system is SUS304 material, no PP or PVC pipes at all. Income DI water pipe, Liquid pipes, Final spray pipe, DI water add pipes, cleaning pipes are 1inch and drain pipes are 2inches.

SME-6300 PCBA In line Cleaning Machine



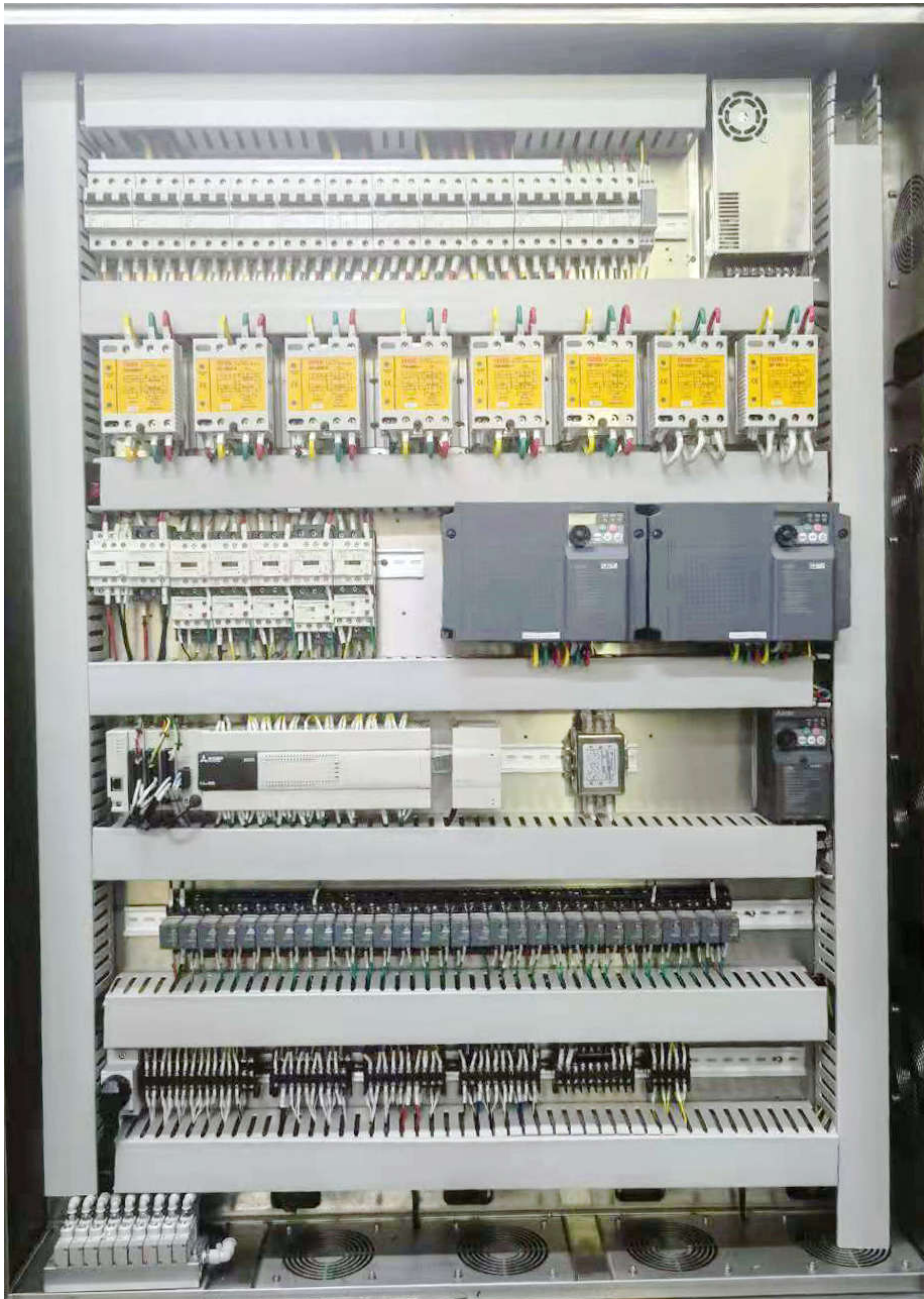
SUS304 NET CONVEYOR

This system use flat steel net as conveyor to transport products from input side to output side in a single pass through the whole system. The net width is 500mm.



ELECTRIC CONTROL BOX

There are 2 electric control box in this system: small box is used to install main air breaker to supply power for the system and big box is used to install all electric control devices.



CONTROL SYSTEM

“SME-6300 PCBA in line cleaning machine” is controlled by PLC procedures and operated by Touch panel and operational panel. Conveyor speed, cleaning pressure, rinse pressure, cleaning water temperature, rinse water temperature, hot air temperature, air pressure ...parameters can be edited according to real situation.

3.3 Structure features

- 1) This system is constructed by SUS304 material, very good acid and alkali resistance, very good cold and hot temperature resistance.
- 2) Flat net conveyor and special net transport mechanism, make it very stable.
- 3) Long wash section, make perfect cleaning effect, more easier to set machine parameters.

SME-6300 PCBA In line Cleaning Machine

- 4) Powerful and high flow air blower, special design air knives, super air blow effect.
- 5) Long heat dry section and SUS316 air heater, special air knives, make it perfect air heat effect.
- 6) Inside and outside doors are installed glasses for the convenience of observation of PCBA transportation and cleaning , rinse ,air blow condition. Good seal strip, make it very good seal result to prevent water and air leakage.
- 7) Several type of nozzles, cover both high immerse and spray pressure requirement.
- 8) Equipped with low noise high performance air blower, to reduce noises and improve environment.
- 9) Equipped with liquid level sensor to protect the system working on normal water level and prevent water level abnormal to protect heaters and pumps.
- 10) Water tank bottom tilted design, so that water can drain off, for the convenience of water tanks maintenance.
- 11) Equipped with water flow meter for the operator to know water consumption.

3.4 Electric control features

Electric control box are set on the right back side of this system for the convenience of check and maintenance.

- 1) Mitsubishi PLC and touch panel, easy for operator to use this system
- 2) 3-color indicator and alarm buzzer design to ensure the operator to know system running state; If there is any abnormal situation happens, the buzzer will give out noises and red light will twinkle.
- 3) There is a light sensors on the entrance section of the system. If no PCBA are put in over setting time, the system will turn off pumps and air blowers to save energy and water. The system will awake when new PCBA are put in again.
- 4) Equipped with cleaning PCBA drop alarm function, monitoring cleaning PCBA in time.
- 5) Heat temperature adopt automatic PID and analog quantity control calculation system to firmly control temperature deviation, make temperature rise more stable.
- 6) Equipped with auto temperature control system and over temperature protection function to avoid damage to the system.
- 7) All pumps, air blowers, heaters are overload protected to avoid damage to them.

SME-6300 PCBA In line Cleaning Machine

8) Current surge protection: all electric devices start every 2 seconds one by one to reduce instant current shock.

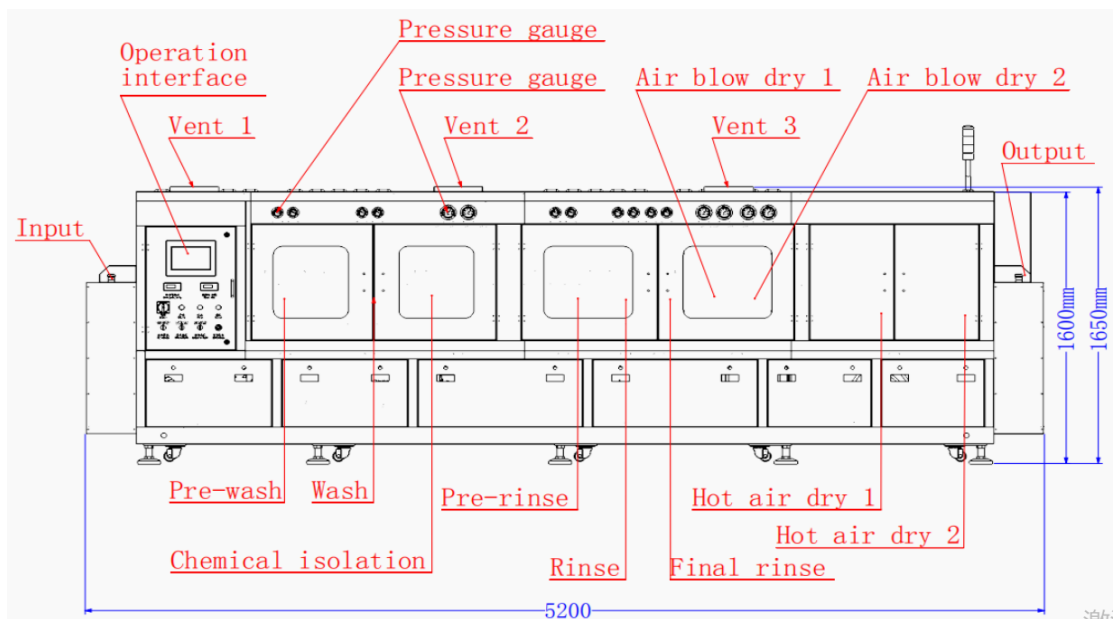
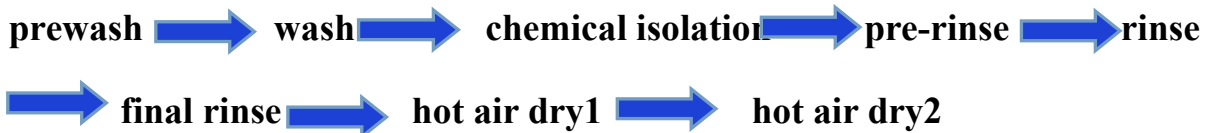
9) Power failure protection: Equipped with UPS system for net conveyor to send out 3D glasses trays at the time of sudden power failure.

10) Alarm when the system is in trouble, trouble information will be shown on touch panel for the convenience of trouble shooting.

3.5 Spray system features

- 1) Nozzles are set vertically on spray bars and nozzles are mismatched on the next spray bars.
- 2) Spray bar quick clamp connection design, easy to disassemble, install and clean.
- 3) Spray meters of spray bars, for the convenience of observe and adjust water spray pressure.
- 4) Wash and rinse section has water knives for BGA cleaning.(option)
- 5) Filter barrel and filter net double filter system to filter dusts in liquid and DI water to prevent them to block nozzles and greatly raise cleaning efficiency of DI water.

3.6 Flow chart and general view



SME-6300 PCBA In line Cleaning Machine

3.7 Main features(SPEC)

SME-6300 PCBA IN LINE CLEANING MACHINE MAIN SPEC	
Max PCBA width	500 mm
Max PCBA Length	400 mm (recommend)
Max PCBA height	100mm (including components height)
Conveyor speed	0.1~1.5m/min adjustable;0.2~0.4m/min(recommend)
Conveyor height	900 ± 25mm
Conveyor width	500 mm
DI water consumption	6~15L/Min
Air exhaust flow	About 36M ³ /Min
Conveyor direction	Left to Right(from window side)
Control method	PLC
Power supply	AC380V,50/60Hz,3P+N+E
Air supply	0.5~0.7Mpa,200~400L/Min
Power	110KW
Machine size	L5200xW1650xH1650mm
Machine weight	About 3000KG

3.8 Section SPEC:

Prewash--wash--chemical isolation section

Section name	prewash	wash	chemical isolation
Water tank capacity(L)	same	240	
Pump power(KW)	1.1	5.5	
Water spray pressure(Bar)	2~5	2~8	
Heater power (KW)	same	36	
Heat temperature (°C)	room temp~80	room temp~80	
Air knives(pcs)			3
Air blower power(KW)			7.5

Rrinse--rinse--final rinse section

SME-6300 PCBA In line Cleaning Machine

Section Name	Prerinse	Rinse	Final rinse
Tank capacity (L)	60	40	
Pump power (KW)	1.1	0.55	
Spray pressure (Bar)	2~5	2~4	1~3
Heater power (KW)	24	12	
Water temp (°C)	room temp~60	room temp~60	
DI water amount(L/Min)	0	0	6~15

Air blow dry--hot air dry1--hot air dry2 section

Section Name	Air blow dry	Hot air dry1	Hot air dry 2
Air pressure(KPA)	5-15	2~3	2~3
Heater power(KW)		7.5	7.5
Heat temperature(°C)	≤60	≤100	≤100
Blower power(KW)	5.5+5.5	0.85	Same as dry 1

3.9 System construction:

S/N	Section	Item	SPEC	Quantity
	Whole machine	Machine Frame	SUS304 steel	1set
		Liquid auto add/drain system	Diaphragm pump	2 sets
		Liquid concentration compensation system	Add concentrated liquid to liquid tank in regularly time and amount	1set
		Inline DI water resistivity monitoring meter	Incoming DI water resistivity	1set
		Compulsory condensor device		1set
		MES function	(option)	1set
1	PCBA input port	conveyor	SUS304 net conveyor and shafts	1set
		Pcba input sensor	Kenyence sensor	1set
		Air vent	φ250mm	1set
		EMG stop		1set
2	Pre-wash (Immersion)	Liquid pump	SUS304,1.1KW	1set
		Spray bars	SUS304	4pcs

SME-6300 PCBA In line Cleaning Machine

	and soften flux on PCBA)	Nozzle	SUS304	24pcs
		Filter net	SUS304	1set
		Filter barrel	1um	1pc
3	Wash (peel and remove flux and dusts on PCBA)	Liquid tank	SUS304,240L	1pc
		Heater	SUS316,36KW	1set
		LS	4 level	2sets
		Temp probe	Roon temp~80°C	2sets
		Liquid pump	SUS304,5.5KW	1set
		Spray bars	SUS304	12pcs
		Nozzle	SUS304	72pcs
		Filter net	SUS304	1set
		Filter barrel	1um	1pc
4	Chemical isolation (separate and take back liquid on PCBA)	Air blower	10HP	1set
		Air knives	SUS304,2up and 1down	3sets
		Air vent	φ250mm	1set
5	Pre-rinse (60L, Spray DI water to take off liquid on PCBA)	Spray bars	3up, 3down	6pcs
		Nozzle	SUS304	36pcs
		Water pump	SUS304,1.1KW	1set
		Heater	SUS316, 24KW	
		LS	2 level	2sets
		Temp probe		2sets
		Filter net	SUS304,	1pcs
6	Rinse 40L (rinse PCBA and take off ions)	Spray bars	SUS304,1up 1 down	2pcs
		Nozzle	SUS304	12cps
		Heater	SUS316,12KW	1set
		Water pump	SUS304,0.55KW	1set
		LS	2 level	2sets
		Temp probe	SUS304	1set
		Filter net	SUS304	1pc
7	Final rinse (fresh DI water to rinse PCBA)	Spray bars	SUS304,1up 1down	2cps
		Nozzle	SUS304	12pcs
		DI water supply	> 10L/min, pressure30~50PSI	
		Water flow meter	35L/min	1set
		Resistivity meter	0~ 18 MΩ·cm	1set
		Water filter net	SUS304	1pc

SME-6300 PCBA In line Cleaning Machine

8	Air blow dry (remove water on PCBA)	Air blower	7.5HP	2sets
		Air knives	1up 1 down	2sets
		Air vent	φ250mm	1set
9	Hot air blow dry1,2	Air blower	1.2HP	1set
		Air heater	7.5+7.5KW	1set
		Temp probe	Room temp~100°C	4sets
10	PCBA output port	Conveyor	SUS304net conveyor and shafts	
		Motor	Panasonic motor	1set
		Pcba output sensor	Kenyence sensor	1set
		EMS STOP		1set

3.10 Parts Introduction:



- 1) Power switch: Turn on and turn off the system power.
- 2) Start, Stop, Reset buttons: Start, stop and reset machine individually.
- 3) EMG stop button: install on entrance side ,exit side and operational panel, press them to stop the machine at emergency cases.
- 4) Running mode: Machine Running mode, Stop mode and Energy saving mode selection turn button.
- 5) Wash liquid tank: Wash tank add liquid, Stop and discharge liquid selection turn button.
- 6) External liquid tank:external tank add liquid, Stop and discharge liquid selection turn button.
- 7) Resistivity meter: monitoring rinse 2 and income DI water in time to keep DI water cleanness.
- 8) Liquid PH meter:monitor liquid PH value.
- 9) 3-color indicator

SME-6300 PCBA In line Cleaning Machine

- A machine start or preparing: Yellow light twinkle
- B machine prepare finished or machine in normal state: Green light twinkle
- C trouble and alarm: Red light twinkle
- 10) Touch panel: control system operation and display operation state.
- 11) Flow meter:

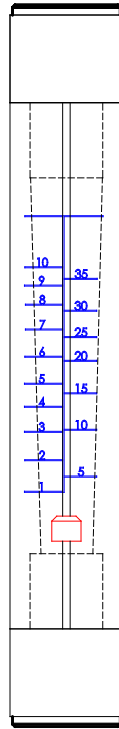


Figure 3-1 flow meter

- 12) Liquid level switch:

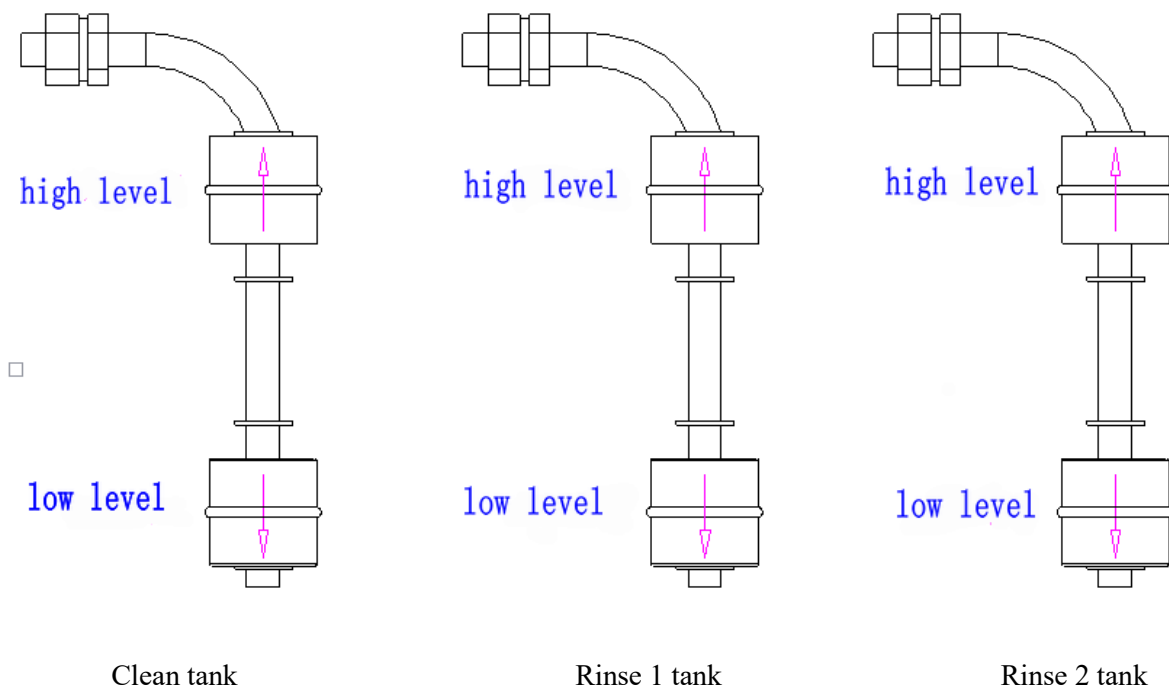
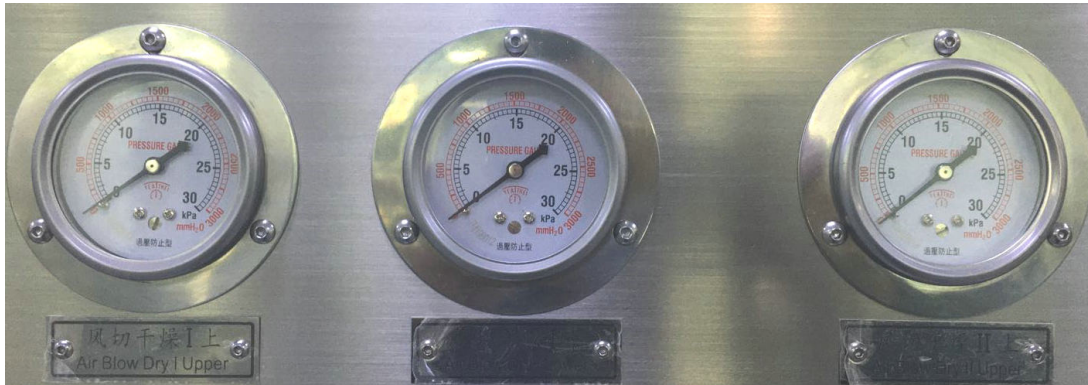


Figure 3-2 Liquid level switch

Explanation: There are 4 check points on LS. The system starts to check water level as soon as power switch turned on. If water level is low, the LS will inform PLC, PLC will inform solenoid valve to make angle valve open to supply DI water from outside. Meanwhile, indicator red light twinkles and buzzer alarm. The alarm will recovery after DI water in water tank arrives at normal water level.

13) Pressure gauges: show upper and lower liquid/water spray pressure or air pressure.



14) Air blower: generate high pressure air force to blow liquid off from PCBA and blow water off from PCBA.

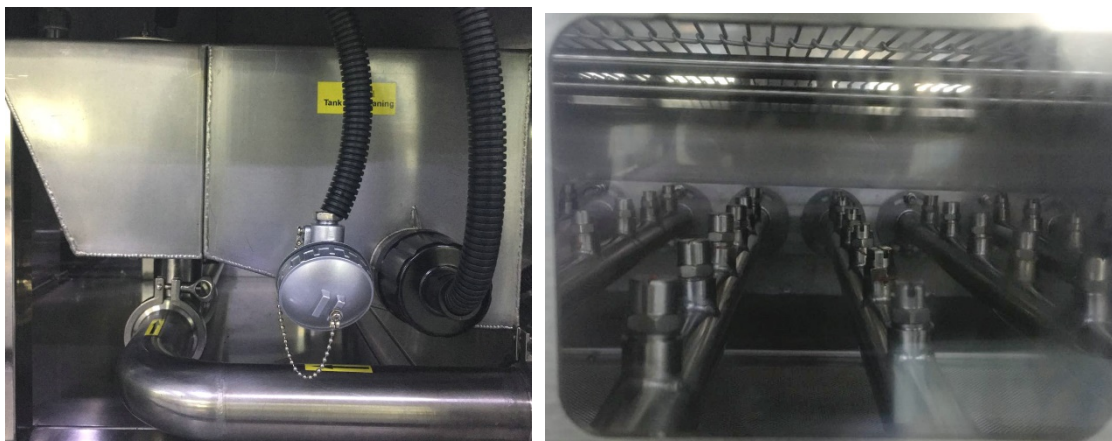
15) Electric pumps: drive liquid from liquid tank and spray to wash PCBA or drive DI water from water tank to spray to rinse PCBA.

16) Filter barrel: stop and hold dusts in filter barrel to make liquid clean.

17) Filter net: stop and hold dusts to keep liquid or water clean.

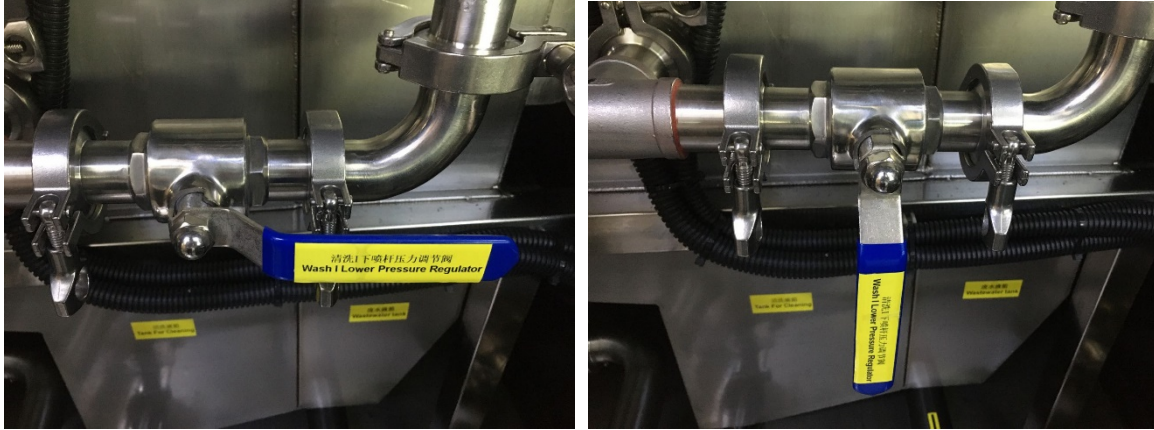
18) Spray bar: which nozzles are install on, spray liquid or water to wash and rinse PCBA.

19) Heaters: Heat liquid or water in liquid or water tanks to raise liquid or water temperature.



SME-6300 PCBA In line Cleaning Machine

- 20) Liquid/ Water tank: use to store liquid/water. There are wash liquid tank, pre-rinse DI water tank, rinse DI water tank, DI water overflow tank and external concentrated liquid tank.
- 21) Air heater: heat air which comes from air blower to certain degree to raise hot air dry speed.
- 22) Air vent: liquid vapor or water mist and hot air vent, need to connect to exhaust pipes.
- 23) Ball valve: manual control liquid or water flow direction.



OPEN

CLOSE

Figure 3-3 Ball valve

- 24) Caster and foot cup: use to move and support the machine.

Chapter 4 Installation and adjustment

4.1 Preparations before installation

Before the machine arrival, we will send out machine installation preparation and adjustment documents, please do the preparation works according the requirements. Machine installation ground should be solid, flat, tidy; convenient for connect DI water supply pipes and air exhaust pipes.

Please leave enough space for production, maintenance and repair work.

Please check if there is any damage on its plywood case. If have, do please take photos and inform us at the first time when the logistic company staff send the machine to your company. We will ask apply punishment and compensation from insurance company.

If the plywood box is good, please move the box onto the ground by using a big fork truck.

Attention: This machine is about 2800KGs, so please use a **big fork truck** who can bear 30000KGs weight.

Attention: The center of gravity of the machine must one the center of the two lift arms of the fork truck. Start to life the machine carefully and put it on the ground slowly.

Never exposure the machine to the hot sunshine and rain. Never put it onto the place of high temperature or high humidity.

Attention: If you want to move the machine to higher floor, please use a **platform crane** to lift it. Never use crane with steel rope to tie and lift the machine, it may damage the machine structure during lift process.

Platform crane picture:



SME-6300 PCBA In line Cleaning Machine

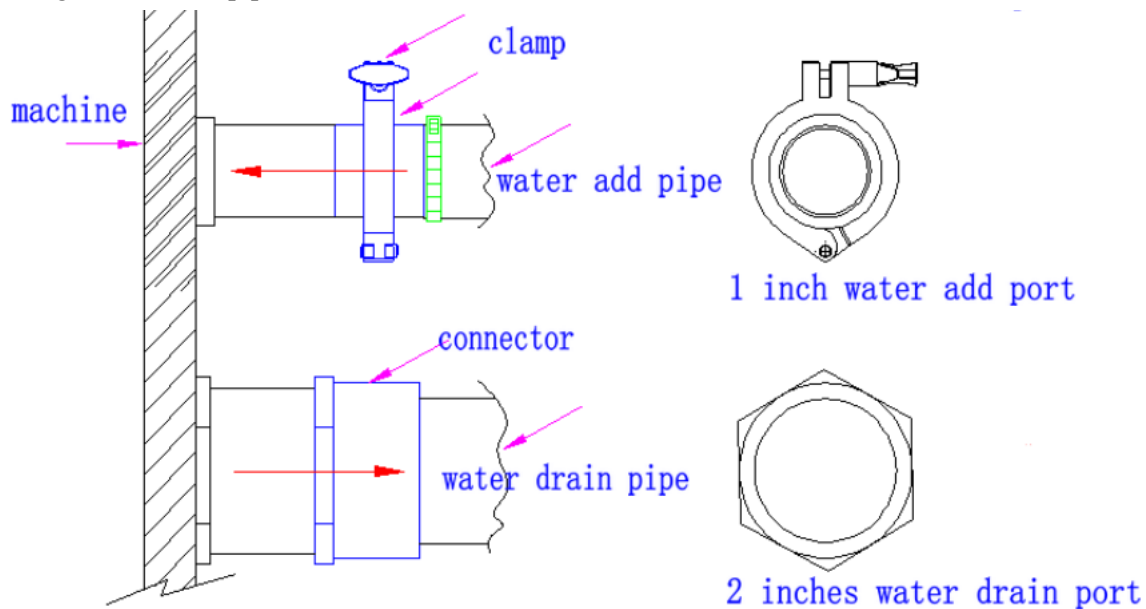
Preparations:

1) Power supply: This machine must supply with 380VAC, 50Hz, 110KW power (3Phases 5 lines, TN-S), must have green cable connect to ground. Power cable lines must be 55mm², Neutral line and Earth line should be 16mm² at least.

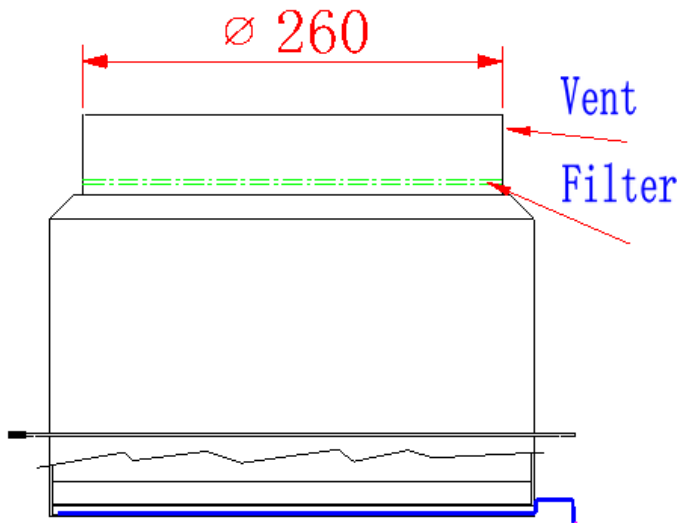
2) Compressed air supply: 0.5~0.7Mpa, dry, clean and free of oil compressed air, air flow rate is 200~400L/Min, ϕ 12mm air hose.

3) DI Water supply requirement and pipe : This machine must connect 1 DI water supply pipe (1 inch female coupling, water flow rate 30~60L/Min, water pressure \leq 0.5Mpa, DI water must have water pressure or it can not add water automatically. (Figure 4-1 DI water supply and drain pipe) .

4) Liquid drain pipe: This machine must connect 2" external drain pipe, bear pressure \leq 0.4Mpa. (Figure 4-1 drain pipe)



5) Air vent : There are 3 ϕ 250mm air vents on the top of machine, please prepare 3 PVC tubes and connect one end to the air vent by using SUS304 clamps and sealed with tin tape. Need to install air exhaust device. It is better to install an air regulator on top of each vent to adjust air exhaust speed. Air exhaust pipe can connect with other ventilation pipes, but never connect them to flammable and explosive solvent pipes.



6) Installation Place: In order to keep operator and machine safe and prevent damage to the machine, it must be installed on the ground or environments listed below:

- A. This machine need an individual room. No other big electric devices around the machine.
- B. The machine weight about 3000kgs, so the machine installation ground must be solid standard industrial ground.
- C. Never exposure the machine to the hot sun and keep it off the fire and heat resources devices such as heat treatment oven
- D. Please install the machine to the environment of 0~30°C、 humidity less than 85% (no dew), no corrosive and flammable gas.
- E. Please do not install the machine on the place with vibration or impact force, or else it may damage the machine.
- F. Good ventilation, dry, clean and dust free surroundings.

7) Space requirement: please leave enough space for the machine installation, spare parts replace and regularly maintenance work. Please leave installation space as below:

Machine size: 5200mm(L)x16500mm(W)x1650mm(H)

Suggested space: 8200mm(L)x3500mm(W)x2500mm(H)

Please leave about 1~1.5m space distance for the front side, rear side, left side and right side.

8) Machine hoisting:

In order to protect the machine, do please use platform crane to move the machine from one place to another place or hoist to upstairs and downstairs. DO PLEASE use 3tons fork truck to carry the machine from fork trunk to floor. Never use steel rope or string to lift the machine. Please use machine casters to move the machine and push it to installation place after it load on floor.

There must be one engineer on site to guide machine hoisting and move.

4.2 Machine installation steps

1) Disassemble machine package and put it on to flat ground, push and move it to install place by using

SME-6300 PCBA In line Cleaning Machine

its casters.

- 2) Adjust all foot cups height to adjust machine level, please make sure each foot cup are strong support the machine.
- 3) Connecting DI water add pipe and drain pipe according to labels on machine. Please use PTFE tape or glue on the joints, make sure they are connected and fixed well, no water leakage. Water pipes must be fixed.
- 4) Connecting vent pipe to the main ventilation pipe of the factory. If outside absorb force is too weak or the pipe is too long , please add exhaust fans. Make sure hose kept firmly, use silver color seal tape on joints to seal it and ensure no air leak out. Air pipes must be fixed.
- 5) Air exhaust and liquid/water drain should obey local laws and protect environment.
- 6) Connect the proper power to machine according to the requirement of this manual and electric circuit diagram. Make sure the electric cables are bigger enough and connect method is correct and firmly, tide the cables and put on signs.
- 7) Check all the important parts of machine because some parts may loose or damage during transport and installation, please pay special attention to the following aspects:
 - A. Check if mechanism transmission device is in good condition or not.
 - B. Check nozzles whether they are on right angles.(5~10 degrees, same angle)
 - C. Check no impurity substance in liquid tank, water tank and cleaning room.
 - D. Check all electric parts and pneumatic parts are fixed well or not.
 - E. Check all pipes connected firmly, not loose.
 - F. Check each screw are tighten or not, especially check and tighten loosed pipe clamps.

4.3 Electric control box installation

Customer must install an electric box with a breaker in it on the wall near the machine, so that electric cables can be lead to the machine.

This machine has two electric control box, one small, one big. The small one has a main breaker which outside electric cable will connect on it. Customers must connect electric cable to the main breaker by themselves. The connecting electric cables must be put in water-proof pipes, recommend to use hard PVC pipe.

Please use the air breaker and earth line according to the power supply requirement. Machine main power supply means the full load electric current and the capacity of main power switch. You can find the full load on machine nameplate.

4.4 Machine adjustment

4.4.1 Inspection work before first time start

We must do the following inspection before the very first time machine start after machine installation work is finished

SME-6300 PCBA In line Cleaning Machine

- 1) Input power spec is comply with or not? Connect method is correct or not?
- 2) Do the DI water add and drain pipes are installed correct or not? How about the seal effect? No water leak out?
- 3) Are there water in DI water add pipe? Does the water pressure in spec range?
- 4) All the water control valves are in correct position?
- 5) Do all the filter net and filter barrel need clean?
- 6) All the covers, lids,plates and glasses are put on well?
- 5) No other parts on conveyor net?
- 6) Does ventilation device working well?

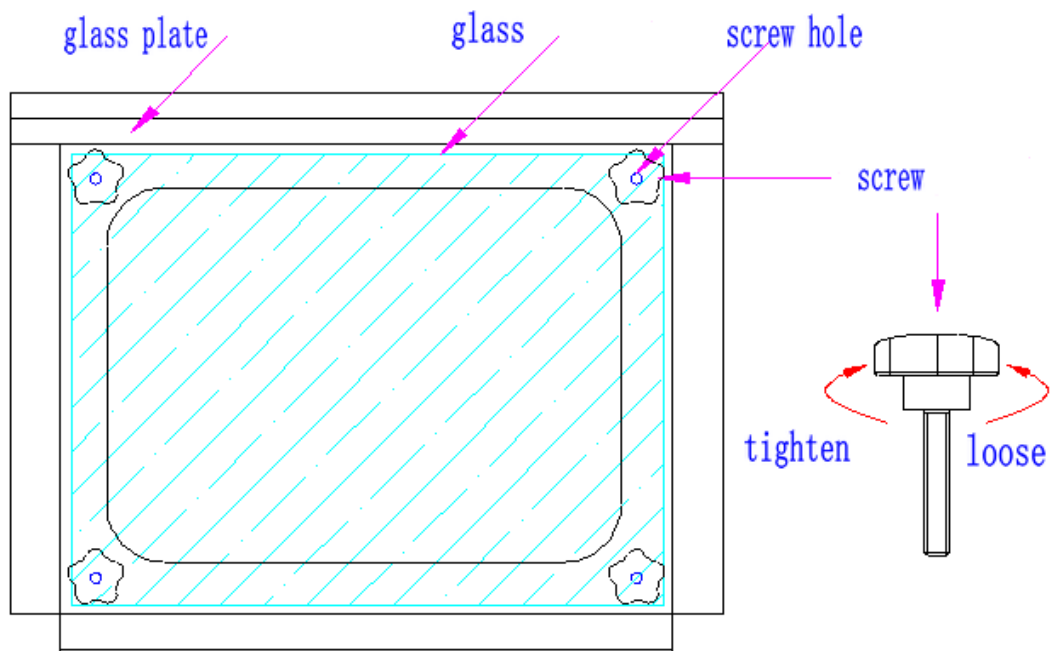


Figure 4-3

4.4.2 Machine start

Start the machine after finishing the inspections;

Notice: Please use clean DI water as clean liquid and start machine to clean the liquid pipes for 2~3 hours before conducting formal cleaning process.

- 1) Turn off the main air breaker in machine electric box and supply electric power to the machine.

SME-6300 PCBA In line Cleaning Machine

- 2) Turn the power switch to ON position on machine front operational panel to supply electric power to all the electric parts of the machine.
- 3) Press “start” on the the touch panel to start PLC control system.
- 4) Please enter into operation software interface to start manual water add function.
- 5) Add DI water to all tanks to normal working level.
- 6) Setting liquid/water heat temperature, input temp values in the cleaning procedure. Liquid/water will heat to setting temperature automatically.
- 7) Make sure all water level switch are OK and air blowers are OK.
- 8) Set all parameters of the whole cleaning process on the interface menu and start relevant switches to ON condition.
- 9) Machine running automatically according to setting program, choose the working type as you want.

4.4.3 Inspections after machine start.

To guarantee proper working, we must carry on the following inspections after the machine is started:

- 1) Touch panel operation interface software is OK or not.
- 2) Conveyor net transportation is OK or not.
- 3) Wash pumps and rinse pumps are working OK or not.
- 4) Pressures on all meters are in normal working value range or not.
- 5) Chemical isolation air blower and air dry blower are working OK or not.
- 6) Hot air dry blower is working OK or not.
- 7) Liquid/ water heaters are working OK or not.
- 8) Air heaters are working OK or not.
- 9) Hot air recirculation is OK or not.
- 10) Liquid pipes are sealed well and not leakage?
- 11) Nozzle spray angles are the same to form a water curtain?
- 12) Ventilation device is OK or not.

SME-6300 PCBA In line Cleaning Machine

4.4.4 Turn off machine

Please do the following steps if you want to turn off the machine:

- 1) Check all the PCBAs are moved out from the machine conveyor net.
- 2) Click Pause key on Touch panel menu to stop the machine, all the machine functions are stopped.
- 3) Turn off the power SW after closing software menu.
- 12) Turn the main air breaker in the electric control box to OFF position after machine is completely closed if you will not use the machine for more than several hours.

4.5 Machine clean method and cautions:

There must be some oil or grease mixed into machine during transportation, installation and testing, please clean oil before using it to wash PCBA according to the following steps:

- 1) Dip into DI water and use moist clean room wipers to clean machine and then use dry wiper to clean again; If there is any dirty dust or rusts, please use WD40 to clean it.
- 2) Add DI water to liquid tank high level and start machine to clean for 60 minutes and then drain the used water.
- 3) Repeat step 2 for 3~5 times and drain the used water;

After finishing these steps, add cleaning liquid and water to each tank and get prepared for formal clean process.

Please pay attentions to the following items during cleaning ;

- 1) Collect the impurity substance in the tanks and cleaning room and tidy them to avoid pollution of new liquid or water.
- 2) Check all the machine units thoroughly to avoid some of residual cleaning liquid not cleaned;
- 3) Please do the upper steps to clean machine thoroughly and do rust prevention treatment when machine is stop and not used for a long time.

CHAPTER 5 OPERATION

5.1 Operational panel: (Figure 5-1)

This part is to introduce machine basic control and operation. The operator control this operational panel to conduct relevant functions.

Notice: Please read this operation instructions thoroughly and familiar with contents of this chapter.



(Figure 5-1 Control panel)

- 1) START button: press this button to start the machine.
- 2) STOP button: Press this button to stop the machine.
- 3) RESET button: Press this button to erase alarm and reset the machine
- 4) Power switch: Turn on and turn off machine power. Please shut off all running electric parts before turn off machine power.
- 5)

SME-6300 PCBA In line Cleaning Machine

- 13) Run mode switch: there are normal working mode, stop mode and energy saving mode.
- 14) EMG stop button: press down to cut off all electricity of all electric devices to protect operators hurt and machine damage. Turn it clockwise to release it after solving problems.
- 15) DI water resistivity meter: detect and show final rinse DI water resistivity value.
- 16) Rinse 2 resistivity meter: detect and show rinse 2 DI water resistivity value.
- 17) Touch panel: control system operation and display operation state.
- 18) Main air breaker: In the small electric control box. Connect outside electric power lines and the big electric control box power lines. Turn it off at the maintenance period or long time no use.



(Figure 5-2 Main air breaker)

5.2 Software introduce

“SME-6300 PCBA In-line Cleaning Machine” controlled by PLC procedures and UPS back up power. The machine is very stable, reliable and has highly disturbance resist ability.

The machine has 2 running mode: normal run mode, energy saving run mode.

Energy saving mode: in setting time , if there is no PCBA put in the machine, pumps, air blowers, heaters will enter dormant state(sleep state or stand-by state) to save electric energy. Once there is new 3D

SME-6300 PCBA In line Cleaning Machine

glasses entered, the machine will awake and recovery to normal running mode.

This machine has UPS to back up net conveyor system, if main electric power shut off, it will support the net conveyor power to let the machine send out cleaning products in the machine.

Software operation:

5.2.1 Software installation

This machine has installed Chinese and English operation software before delivery for customers home and abroad. The operation system developed by our company, we have totally copyright on it, please do not copy it without our permission.

5.2.2 Software operation

1) Turn on machine power, enter“Boot Screen”(refer to figure 5-5).



Figure 5-3

2) Click or , choose Chinese or English operation software.



Figure 5-4

3) Input password to enter Main menu.



Figure 5-5

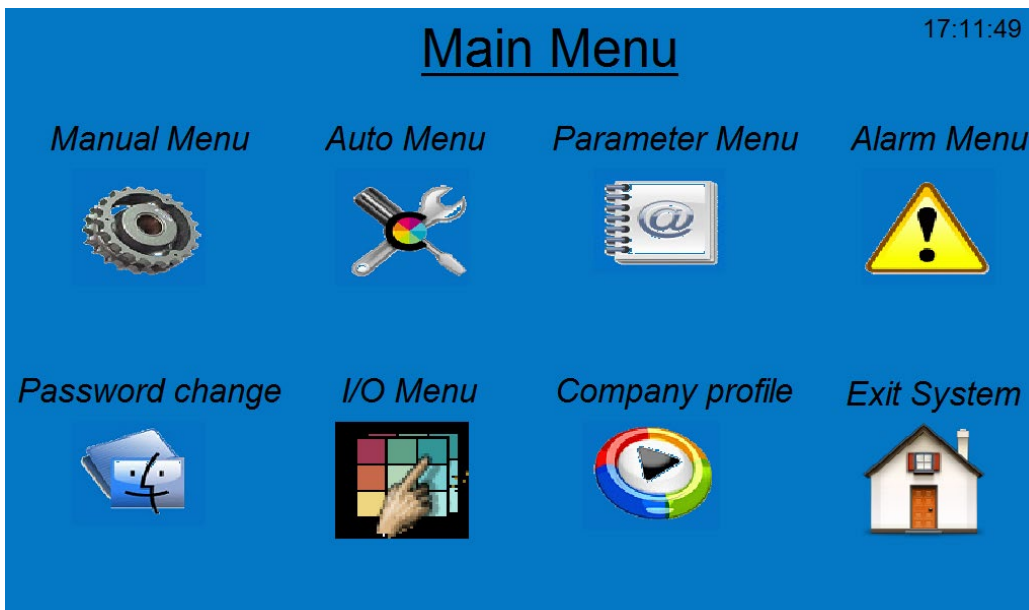


Figure 5-6

Please check communication cable disconnected or broken between PLC and Touch panel if communication error happens.

4) Operator and engineer authority

Operator and engineer has different authority level on software operation due to different work level and the requirement of protecting machine. Authority level are listed as follows:

Operator's level:

Operator's password: 123456

SME-6300 PCBA In line Cleaning Machine

With this password, operator can operate the machine and load procedures.
Can not change parameters.

Engineer's level:

Engineer's password:(our service engineer will inform customer's engineer)

With this password, engineer not only has operator's authority but also have the rights to change parameters and change system configuration.

Notice: Only engineer can enter parameter menu to prevent mis-operation and damage to the machine.

5.2.3 Software introduction

1) Main Menu



Click on main menu to enter "Manual menu"

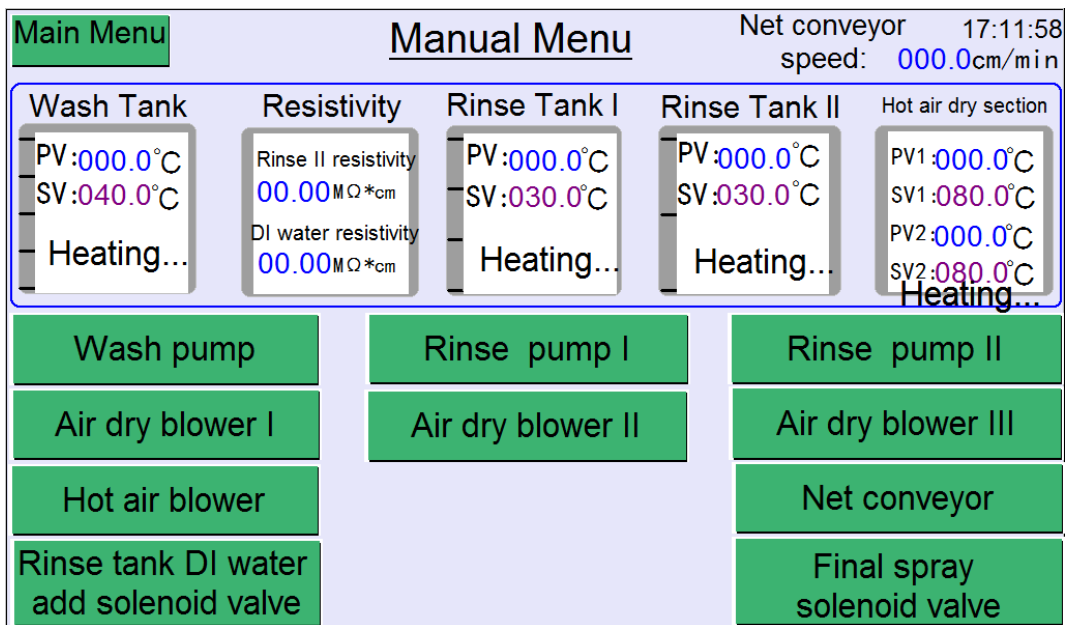


Figure 5-7 Manual menu

Manual menu show the working condition and devices of each section. Please click device to perform its function if its working condition is ok. For example, click **clean pump**, the clean pump bar is light on (from deep green color change to light green color), clean pump starts to spray water.

Click **Main Menu** go back to Main Menu.

2) Auto Menu

SME-6300 PCBA In line Cleaning Machine



Click  to enter "Auto menu"

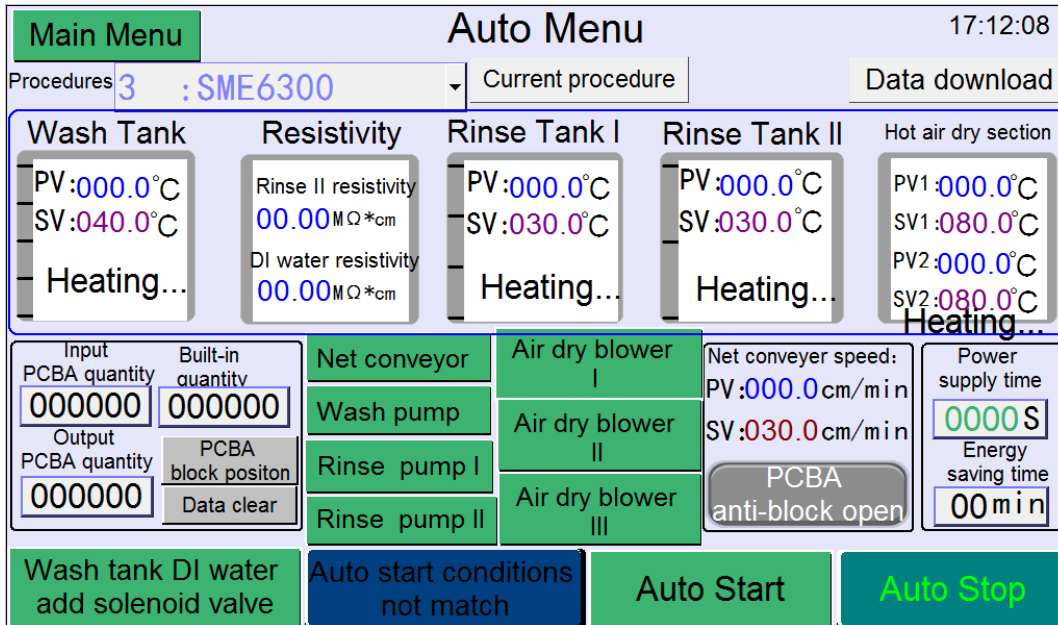


Figure 5-8 auto menu

Auto menu is auto clean perform and auto clean condition display interface.

* Formula: show the current Formula No(machine running formula no).

* Formula Name: Procedure name.

* Data download: Click **Data download** to save the formula no and its parameters to the auto menu.

* Clean tank, Rinse 1 tank, Rinse 2 tank: PV--real water temperature; SV--setting water temperature.

* Resistivity meter: show Rinse 2 section and Final rinse DI water value.

* **Dry tunnel: Dry tunnel 1 and dry tunnel 2: PV--real air temperature; SV--setting air temperature**

* Input quantity: 3D glasses input quantity;

Machine inner quantity: 3D glasses quantity in machine;

Output quantity: 3D glasses output quantity.

3D glasses blocked reset: reset block situation

Date clear: clear data to zero.

* Net conveyor speed: PV--real net conveyor speed; SV--setting net conveyor speed.

* UPS back up time: UPS battery back up time.

* Energy saving time: setting time interval if no cleaning goods put in in this period, the machine enter sleep state.

* Auto start condition not match: click to show not matched conditions. Check and erase these conditions. The machine can not start until those conditions are satisfied.

* Auto start: click to start auto cleaning process.(same function as the auto start button on operation panel)

* Auto stop: click to stop auto cleaning process.(same function as the auto start button on operation panel)

3) Parameter Menu

SME-6300 PCBA In line Cleaning Machine



Click  to enter "Parameter Menu".

Main Menu
Procedures name Parameter Menu

3 : SME6300
3 : SME6300

Data load
Current procedure
Data download

Wash Tank PV:000.0°C SV:040.0°C Heating...	Resistivity Rinse II resistivity 00.00 MΩ*cm DI water resistivity 00.00 MΩ*cm	Rinse Tank I PV:000.0°C SV:030.0°C Heating...	Rinse Tank II PV:000.0°C SV:030.0°C Heating...	Hot air dry section PV1:000.0°C SV1:080.0°C PV2:000.0°C SV2:080.0°C Heating...
--	--	---	--	--

Net conveyor speed:	030.0	Rinse tank II setting temperature	030.0 °C	Rinse II temperature tolerance	10.0 °C
Wash tank setting temperature	040.0 °C	Rinse tank I setting temperature	030.0 °C	Hot air dry section I temperature setting	080.0 °C
Wash tank temperature tolerance	10.0 °C	Rinse I temperature tolerance	30.0 °C	Hot air dry section I temperature tolerance	30.0 °C
DI water add delay time	05.0 S	Input/Output sensor detecting time	03.0 S	Hot air dry section II temperature setting	080.0 °C
Rinse II resistivity	01.00	DI water resistivity	01.00	Hot air dry section II temperature tolerance	10.0 °C

Figure 5-9 parameter menu

Parameter menu show all Formula No contents and its parameter values.

* 3 : SME6300 --show current Formula No and Formula Name.

* 3 : SME6300 --click drop down list to choose Formula No.

* Data load -- Click "Data load" to save parameter values after changing the parameter values of Formula No.

* Data download -- Click "Data download" to replace current Formula No and its parameter values after choose new Formula No.

SME-6300 PCBA In line Cleaning Machine

Net conveyor speed:	030.0 cm/min	Rinse tank II setting temperature	030.0 °C	Rinse II temperature tolerance	10.0 °C
Wash tank setting temperature	040.0 °C	Rinse tank I setting temperature	030.0 °C	Hot air dry section I temperature setting	080.0 °C
Wash tank temperature tolerance	10.0 °C	Rinse I temperature tolerance	30.0 °C	Hot air dry section I temperature tolerance	30.0 °C
DI water add delay time	05.0 S	Input/Output sensor detecting time	03.0 S	Hot air dry section II temperature setting	080.0 °C
Rinse II resistivity	01.00	DI water resistivity	01.00	Hot air dry section II temperature tolerance	10.0 °C

Figure 5-10 parameter values


Show Formula contents and values. Please set proper values according to our training engineer's advice , customer's cleaning process and real cleaning requirement.

Proper parameter value concern with clean process requirements and machine protection requirements.

Only engineer can have the authority to enter parameter menu to change parameter setting values.

4) Alarm Menu



Click  to enter "Alarm Menu", the alarm and trouble message will show on the interface, please solve the problem and click "alarm reset" to release alarm.

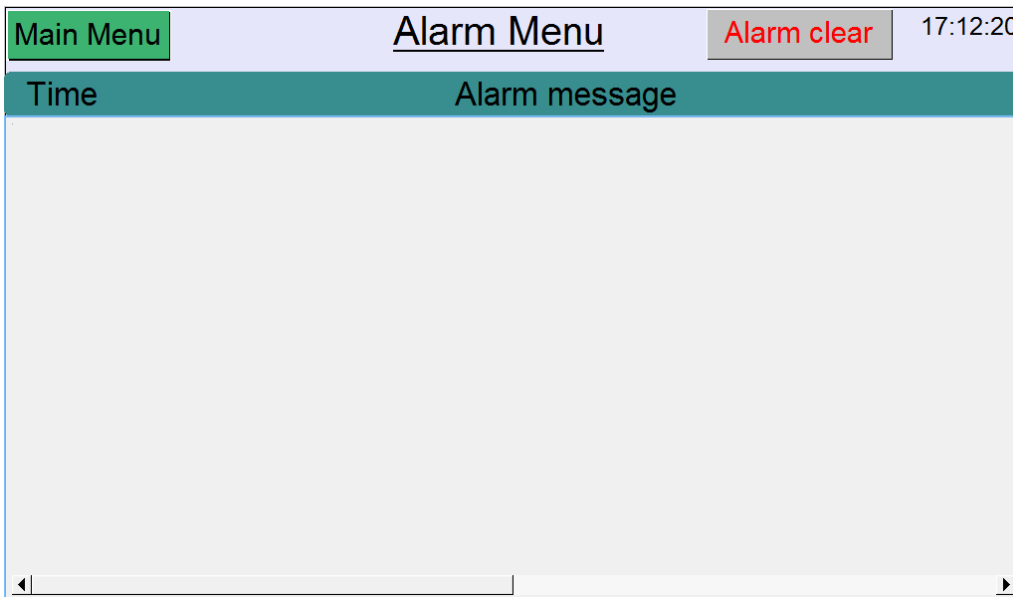


Figure 5-11 alarm menu

5) Password change



Click  to enter "Password change"

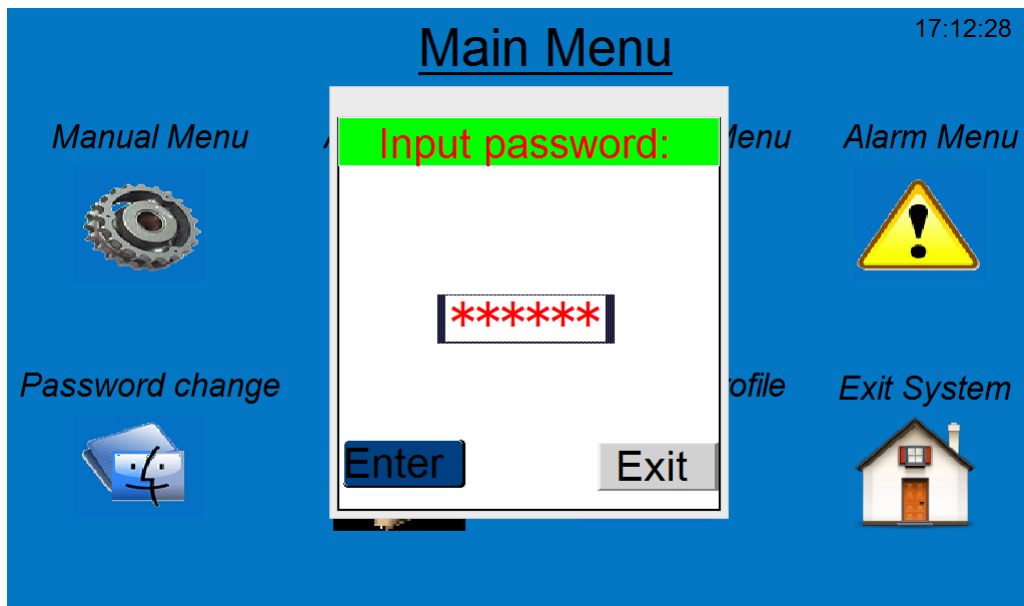


Figure 5-12

Only engineer have the right to change password. Input engineer password to enter

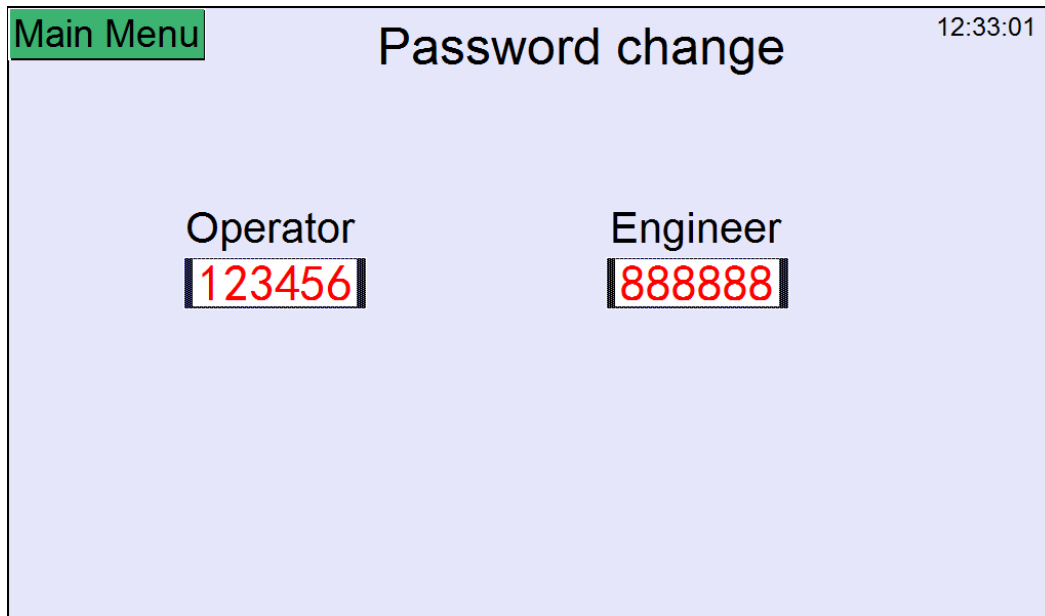


Figure 5-13 password change

Click to change operator and engineer password

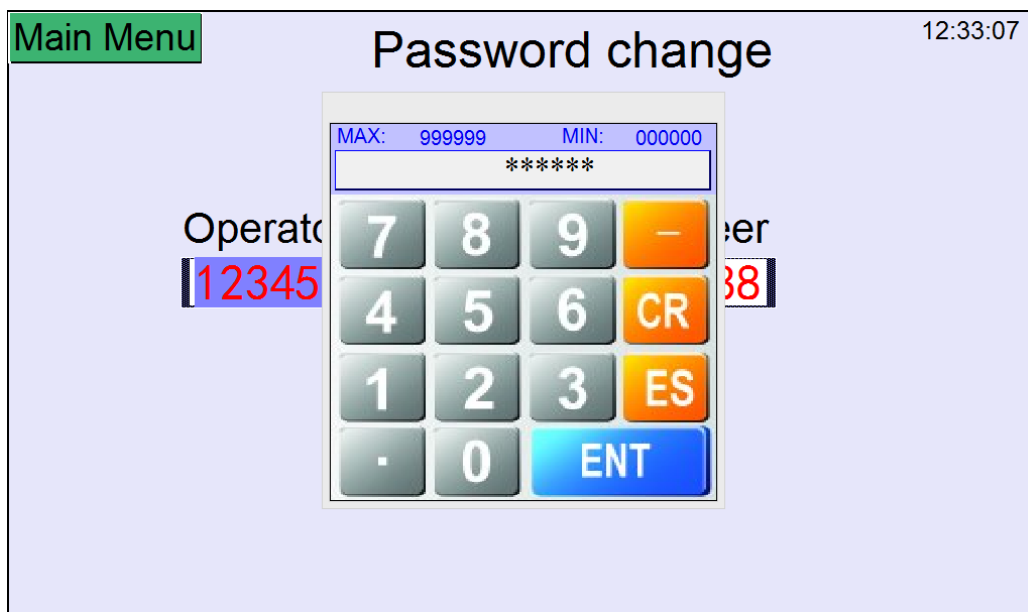
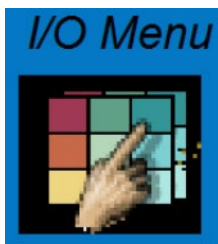


Figure 5-14

Please remember and write down your new password.

6) I/O Menu



Click  to enter I/O Output menu and I/O Input menu

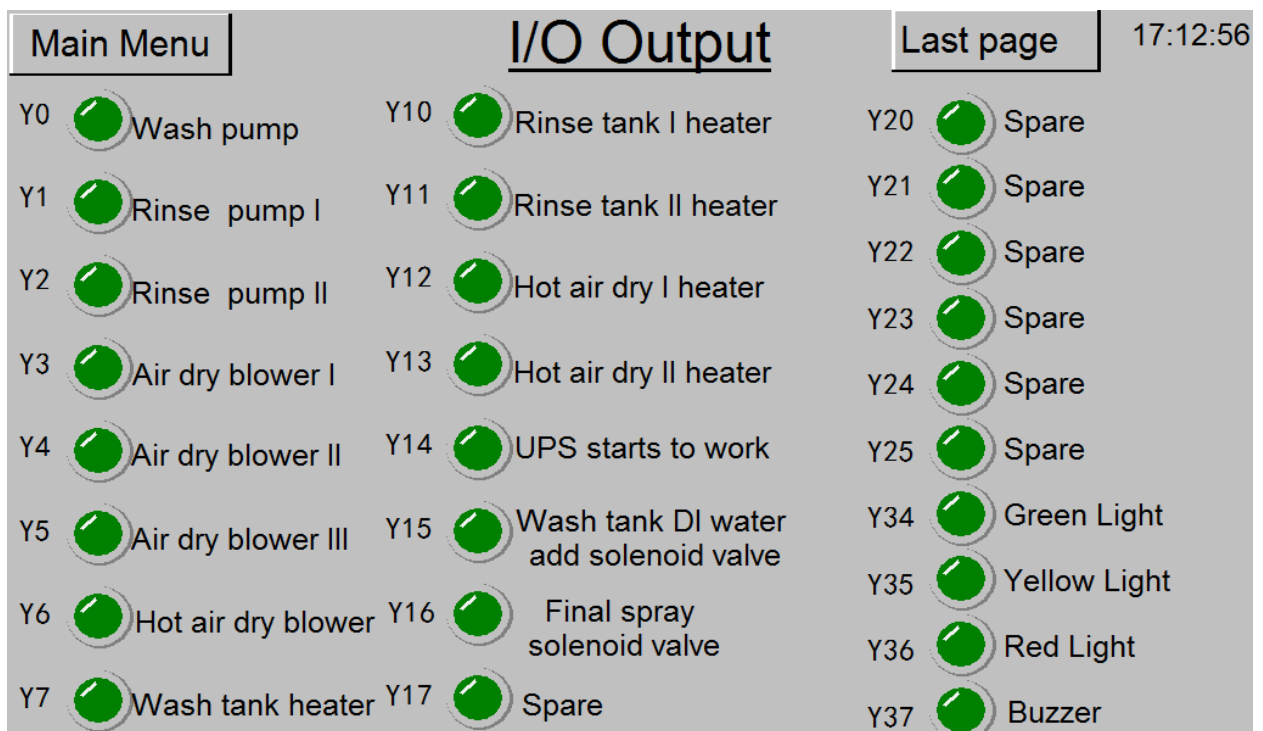


Figure 5-15 I/O output menu

SME-6300 PCBA In line Cleaning Machine


































Main Menu	I/O Input	Next page	17:12:48
X0  Encoder signal	X15  Rinse pump II overload alarm		
X1  Auto running	X16  Air blower dry I overload alarm		
X2  Stop button	X17  Air blower dry II overload alarm		
X3  Alarm reset	X20  Air blower dry III overload alarm		
X4  Standard mode	X21  Hot air dry overload alarm		
X5  Energy saving mode	X22  Net conveyer motor overload alarm		
X6  EMG stop button	X23  Power supply signal		
X7  Air pressure detection Switch	X24  Drainage tank L level	X32  Rinse tank I H level	
X10  Phase sequence protection switch	X25  Drainage tank H level	X33  Rinse tank II L level	
X11  Input sensor switch	X26  Wash tank L level	X34  Rinse tank II H level	
X12  Output sensor switch	X27  Wash tank H level	X35  Spare	
X13  Wash pump overload alarm	X30  Rinse tank I L level	X36  Spare	
X14  Rinse pump I overload alarm	X31  Rinse tank I M level	X37  Spare	

Figure5-16 I/O Input menu

I/O Input menu show machine devices' conditions; I/O Output menu conduct device actions. Very simple and easy to understand.

6) Company profile



Click  to enter "Company profile", this menu show our company profile.

7) Exit System



Click  to exit this main menu

5.3 Water add

Please confirm to put on self-protection tools before adding DI water to machine.

- 1) Confirm machine start conditions and relevant accessories.
- 2) Click water add valve on software menu and wait the machine stops automatically until water add finished.
- 3) When water loss at normal washing period and need to add some. The machine will add water and stop add automatically.

5.4 Water drain (refer to figure 5-14)

Please confirm to put on self-protection tools before draining DI water.

- 1) Confirm the machine is stopped.
- 2) Confirm whether outside container is big enough to hold all drain water.
- 3) Open water drain valves.
- 4) Confirm to turn off water drain valves after water drain out.

5.5 Start machine

- 1) Turn on main air breaker (refer to small electric control box)
- 2) Turn the power switch to ON(control panel) to start machine.
- 3) Check the EMG stop buttons and confirm they are in good condition.
- 4) Start to add DI water.
- 5) Check and confirm water level reach normal working level, then set water temperature and hot air blow dry temperature.
- 6) Turn the run mode switch to normal mode
- 7) 3-color indicator green light on and machine preparation work is done.
- 8) Put in 3D glasses, 3D glasses will go through all sections on net conveyor. Please check all section water and air pressures and confirm machine working condition stable or not.
- 7) Press down EMG stop button if there is any buzzer alarm or emergency situation happens. Release it after solving the abnormal actions.

Notice: For the safe of operators, please ask them do not dress tie, have loose clothes and woolen gloves.

5.6 Turn off machine

- 1) Please turn off clean, rinse water heater and hot air blow dry air heater first after daily clean work finished.
- 2) Let other devices “run” for about 5 minutes and waiting the machine to clean inner pipes by itself.
- 3) Check all 3D glasses has been sent out.

SME-6300 PCBA In line Cleaning Machine

- 4) Click“stop”on touch panel software to stop all devices.
- 5) Exit operation software and back to Main menu.
- 6) Turn power switch to OFF and turn main air breaker to OFF
- 7) Turn off DI water inlet pipe valve.

Notice!!! For operators and machine safe, please do not drain heated water until hot water cool down.

CHAPTER 6 MAINTENANCE

6.1 Precautions on maintenance:

- 1) Please turn off machine main breaker power and put on machine maintenance warning signs.
- 2) Only the trained person can do maintenance work on the machine to avoid machine damage caused by miss operation or incorrect corporation.
- 3) Please wait the hot liquid and water to cool down if the liquid or water is hot.
- 4) All water and air manual valves must be turn back to its original positions after finish maintenance work.
- 5) Please do not adjust or change, loose heaters, temperature detecting probes, liquid level switches when you clean liquid tank or water tank.
- 6) Please report to engineers on duty if you find any problems on electric devices.

6.2 Maintain contents

6.2.1 Daily clean and inspection work

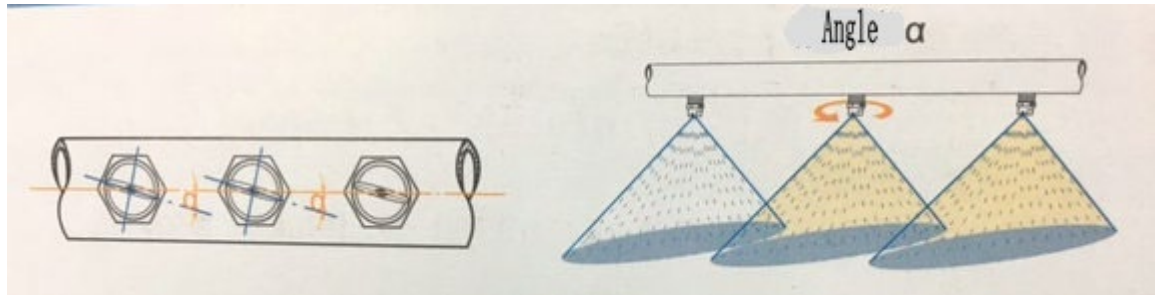
- 1) Please clean the machine surface one time everyday.
- 2) Please check if there is any sundries or impurities on machine. Take them away if you find.
- 3) Please check cooling fan on exit side of the machine and the big electric control box are working well or not, the filters are clean or not. If dirty, clean them.
- 4) Check the compressed air hose is broken or leakage or not.
- 5) Are there any liquid/water leakage on DI water supply pipe ,drain pipes and inner pipes.

6.2.2 Wash section and Rinse section inspection

Please start all pumps to check pressure values on air pressure gauges.If values change, please check if it is caused by nozzle block. Clean nozzles if they are blocked. Nozzles disassemble and assemble action, please see spare parts maintenance or replace on 8-3

- 1) Open the front glass cover and inside cover, turn clamp loose ,take out upper spray bar.
- 2) Turn off nozzles from spray bar and hold the nozzle by hand, please let the compressed air spray to

nozzle holes to clean nozzles by using an air gun. Assembly nozzles back to spray bar, nozzle direction should be 5~10° deviation along the central line.



- 3) Lower spray nozzle disassemble method is the same as upper nozzles.
- 4) Spray bars and nozzles of each section can not be exchange to use casually. Please do maintenance work of each section individually to avoid mixing and confusing spray bars and nozzles, covers and glasses of each section.
- 5) Spray bars must be installed according to their relevant signs; spray bar clamps should be fastened firmly and spray bar nozzle should be vertical to conveyor net.
- 6) Do not loose or change Liquid level switches and temperature probe position.
- 7) Check filter nets, clean them if necessary.
- 8) Start the machine to check all section pumps if there is any noises and whether the fixing screws are loose.

6.2.3 Air knives

- 1) Inspect air blower every week. Check if there is abnormal noises; Check air force of air knives, if weak, please check air blower filter net blocked or not.
- 2) Air blower's filter are steel round net. They may get dirty and blocked after some time, please turn it counterclockwise to disassemble them, blow and clean it with an air gun and put it on again.
- 3) Air knives has been set at best angles, please do not adjust then casually.
- 4) Inspect whether the air hose broken or not. Inspect whether air hose connections to machine and air blowers loose or not, replace with a new one or tighten them.

6.2.4 Liquid/water pipes and tanks

- 1) Inspect whether there are any loose or leakage on each section pipes. Tighten them or replace seal.

SME-6300 PCBA In line Cleaning Machine

- 2) Inspect all pipe valves are in correct position.
- 3) Inspect all tanks whether there is any leakage.
- 4) Inspect heaters,temperature probes, liquid level switches loose or not, if loose, tighten them.
- 5) Clean filters in tanks which connect to pump every week.

6.2.5 Net conveyor

- 1) Check net conveyor tension every month.
- 2) Check motor and coupling if there are loose.
- 3) The bearing of this machine are self lubricated,so no need to add grease.
- 4) The gears on shafts are SUS304 material, no need to worry about rust or struck.

6.2.6 Electric control box(professional electric engineer inspection)

- 1) Inspect the electric devices in the electric control box and check if there is any device aging, broken problem. Please replace them if you find.
- 2) Inspect if there is any lines loose or drop problem.Please tighten them.
- 3) Inspect whether the cooling fans are working well or not.Please replace them if broken.

6.3 Maintenance period sheet

S/N	Section	Maintain items	Maintain period	Quantity
1	The whole machine	Machine outside frame clean	Every day	1
		Sundries on machine clean	Every day	1
		Liquid/water pipes joints, leakage check	Every day	N
		Air blower filter nets clean	Every week	1
		Cooling fans clean	Every week	4
		Concentrate liquid tank clean	Every week	1
2	Pre-wash,wash section	Overflow tank ,liquid tank clean	Every 1~2week	2
		Pre-wash liquid pump and liquid pump check	Every week	2
		Filter elements replace and filter barrel clean	Every 1~2week	2

SME-6300 PCBA In line Cleaning Machine

		Filter net clean	Every week	2
		Filter net in liquid tank clean	Every week	2
		Nozzle clean	Every 1~2week	N
		Heater check	Every 1~2week	3
		Liquid level switch (LS)	Every1~2 week	2
		Temperature probe	Every 1~2week	2
		2 diaphragm pumps check	Every week	2
3	Pre-rinse, rinse and final rise section	Pre-rinse tank, rinse tank clean	Every 1~2week	1
		Pre-rinse pump, rinse pump check	Every week	1
		Filter nets clean	Every week	4
		Filter nets in pre-rinse tank, rinse tank clean	Every week	2
		Nozzles clean	Every week	N
		Heater check	Every 1~2week	3
		Liquid level switch (LS)	Every1~2 week	4
		Temperature probe	Every 1~2week	4
4	Chemical isolation section	Air blower check	Every week	1
		Air pipes check	Every month	N
		Air pressure and air knives check	Every month	N
5	Air blow dry section	Air blower check	Every week	4
		Air pipes check	Every month	N
		Air pressure and air knives check	Every month	N
6	Hot air dry section	Air blower check	Every month	1
		Air pipes check	Every month	N
		Air pressure check	Every month	N
7	Net conveyor	Motor check	Every month	1
		Net tension check	Every month	1
8	Electric control box	Cooling fans check	Every month	8
		Line connection check	Every month	N
		Electric parts aging check	Every month	N

6.4 Common maintenance method

6.4.1 Daily Maintenance

SME-6300 PCBA In line Cleaning Machine

- 1) Filtrate the liquid every shift, about 20min.
- 2) Replace the water in tanks and clean tank inner side every shift
- 3) Clean the filter nets and clean the filter barrel every shift.
- 4) Check each section nozzles to keep them clean.

6.4.2 Weekly maintenance

- 1) Including all daily maintenance contents and more thoroughly.
- 2) Clean air blower's filter every week and replace them every 3~6 months.
- 3) Thoroughly check and clean nozzles to keep them clean(do not use hardware or hard materials to clean nozzle hole)
- 4) Check all water knives and clean them(if have, option)
- 5) Check pumps working condition,check spray pressure of each section.
- 6) Keep machine surface clean.
- 7) Check net conveyor transportation stable or not.
- 8) Check all liquid level switches working well or not.

6.4.3 Monthly maintenance

- 1) Including all daily and weekly maintenance contents and more thoroughly.
- 2) Please use DI water to clean air knives of each section.
- 3) Add new DI water to each tanks and start the machine to spray 1~2hours and drain all waste water, add new DI water again, spray for 30 minutes and drain them out again.
- 4) Check all temperature control accuracy and specially check the over heat protection function
- 5) Wash or replace all filter nets according to PCBA clean process requirement.
- 6) Check the net conveyor system.

Notice: we must maintain the machine sections one by one to avoid mixing each section parts and cause parts broken, machine damage.

CHAPTER 7 TROUBLE SHOOTING

7.1 Net conveyor system

S/N	Abnormal situation	Possible reasons	Trouble shooting
1	Start machine but net conveyor rotation mechanism do not run	Net conveyor rotation mechanism is struck by sundries	Turn off power,take off sundries and turn on power
		Motor broken	Replace motor
		Net tension is too high	Adjust to proper tension
2	Start machine, both motor and net conveyor rotation mechanism do not run	Power supply electric lines connect no correct	Turn off power and check electric lines connection
		Motor broken	Replace motor
		Pump does not in ON condition on software	Click pump to ON condition
3	Abnormal noises when net conveyor rotate	Sundries stuck rotate mechanism	Stop machine, take out sundries and start again
		Bearing broken	Replace bearing
		Motor fixing screws loose	Tighten motor fixing screws
		Net tension is too high	Adjust net to proper tension

7.2 Clean and rinse section

S/N	Abnormal situation	Possible reasons	Trouble shooting
1	Pump starts but spray pressure unstable	Pump filter net on water inlet side is full of dirty sundries	Clean filter net
		Nozzle blocked	Disassemble spray bar and clean nozzles
		Tank water level is not enough	Add water to full level
		Pump broken	Replace pump
		Pressure meter broken	Replace meter
2	Wash/rinse result NG	Liquid is not enough	Check and add liquid
		Liquid in wash tank is too dirty	Replace wash liquid
		Liquid temp is not ok	Adjust and set liquid temp to right valve

SME-6300 PCBA In line Cleaning Machine

		Water in rinse tanks are too dirty	Replace rinse water
		Wash tank are too dirty and polluted liquid	Clean wash tank
		Water temp is not ok	Heat water to setting temperature
		Rinse tanks are too dirty	Clean rinse tanks
		Water pipe valves is off	Turn on valves
		Nozzle or filter blocked	Disassemble spray bar and clean nozzles
		Conveyor net speed is too fast	Adjust transportation to proper speed
		DI water supply quality is NG	Check DI water machine
		DI water supply is too less, no enough water overflow to change water	Increase overflow water or add DI water supply amount
		3	Tanks lack of liquid/water
DI water supply can not supply water	Open DI water supply		
Solenoid valve broken, can not open DI water supply angle valve	Add water manually and then replace the solenoid valve		
4	Pumps stop working	Pump overload	Replace pump
		Overload protection device triggered	Recovery overload protection device and find the reason
		Pump control relay NG	Replace relay
5	Can not reach setting temperature	Setting temperature is too low	Change setting to normal range
		Heater broken	Replace heater
		Overflow rate is too high,temperature can not reach setting values	Adjust overflow rate
		Tank water level is not enough	Add tank water to full level
		SSR broken	Replace SSR

7.3 Air knives

S/N	Abnormal situation	Possible reasons	Trouble shooting
-----	--------------------	------------------	------------------

SME-6300 PCBA In line Cleaning Machine

1	Air blower start but air force is not enough	Air filter is covered with dusts	Clean or replace air filter
		Air pipe broken	Replace air pipe
2	Air blow effect NG	Air knife angle is not good	Do not adjust angle casually,ask service engineer to adjust it
		Net conveyor speed is too fast	Adjust to proper speed
		Blower not start	Check reason and start air blower
3	Air blower stops	Air blower overload	Replace air blower
		Overload protect device triggered	Recovery overload protect device
		Air blower control relay NG	Replace relay

7.4 Hot air dry

S/N	Abnormal situation	Possible reasons	Trouble shooting
1	Hot air blow dry function NG	Setting temperature is low	Change set temperature to normal range
		Temperature probe broken	Replace probe
		Heater broken	Replace heater
		SSR broken	Replace SSR
		Temperature modular data managing wrong	Restart the machine and detecting data again
2	Air blower stops to work	Overload	Replace air blower
		Overload protection device triggered	Press recovery key on device
		Air blower breaker in electric control box is turned off	Turn on air blower breaker

7.5 Electric control

S/N	Abnormal situation	Possible reasons	Trouble shooting
1	Over temperature	Temperature probe broken	Replace probe
		Liquid/water level is low	Add liquid/water to full level
		SSR broken	Replace SSR
2	Heater can not work	Circuit breaker triggered	Recovery circuit breaker
		If can not recovery circuit breaker	Check if there is any leakage or short

SME-6300 PCBA In line Cleaning Machine

		Heater broken	Replace heater
		Liquid/water level low	Add liquid/ water to full level position
3	Can not add liquid/water	Solenoid valve broken	Add water manually and then replace solenoid valve
		Liquid level switch broken	Replace liquid level switch
		Diaphragm pump is broken	Check and replace pumps

CHAPTER 8 SPARE PARTS REPLACEMENT

8.1 Vertical pump replacement

Please replace the vertical pump according to the following steps and refer to figure 8-1

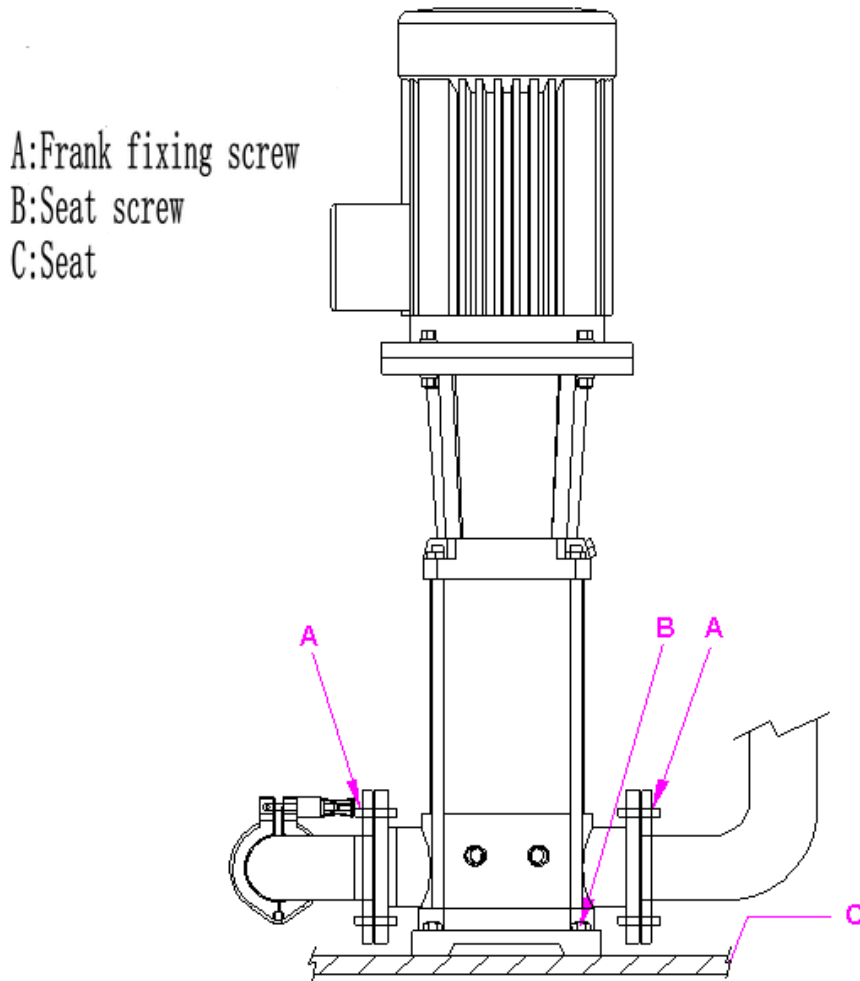


Figure 8-1 vertical pump

- 1) Do please turn off machine power,pull main breaker to “OFF”position before disassemble pump. For maintenance staff safe, please put on warning signs.
- 2) Please ask electrician or electric engineer to disassemble pump’s power lines.
- 3) Turn counterclockwise to loose A frank plate fixing screws and take them out by using an adjustable wrench.
- 4) Turn counterclockwise to loose B seat fixing screws and take them out by using an adjustable wrench.

- 5) Take out pump.
- 6) Put the new pump onto the pump seat B, put back fixing screws and turn clockwise to tighten the screws to fix the pump by using an adjustable wrench.
- 7) Turn clockwise to tighten B seat fixing screws.
- 8) Put back screws onto A frank plates, remember to put on seal ring and turn clockwise to tighten the screws by using an adjustable wrench.
- 9) Connect the power lines by an electric engineer; Put back and fix power line covers on pump.

Pump replacement notice:

- 1) Turn off main power and take safety precautions measures;
- 2) Need at least 2 persons to cooperate to take out old pump and put on new pump because the pump are heavy.
- 3) Choose proper tools can raise replacement efficiency.
- 4) Check all disassemble parts and make sure they connected and fixed well.

8.2 Horizontal pump replacement(if have)

Please replace the horizontal pump according to the following steps and refer to figure 8-2

A:Clamp
B:Pushing
C:Seat screw

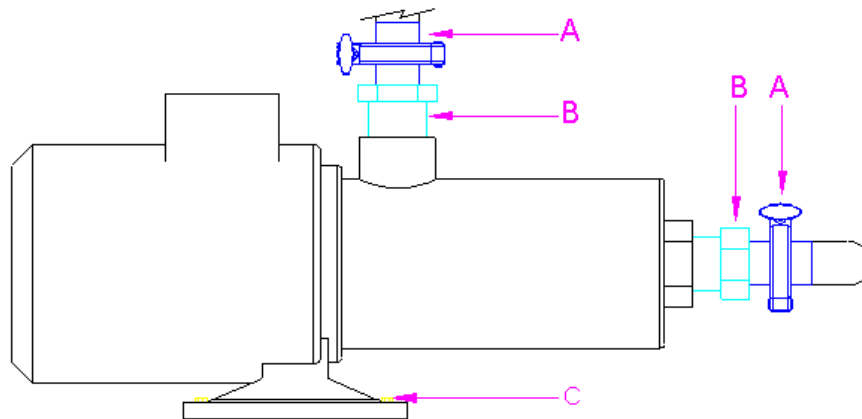


Figure 8-2 Horizontal pump

SME-6300 PCBA In line Cleaning Machine

- 1) Do please turn off machine power, pull main breaker to "OFF" position before disassemble pump. For maintenance staff safe, please put on warning signs.
- 2) Please ask electrician or electric engineer to disassemble pump's power lines.
- 3) Turn counterclockwise to loose the clamp A and take it out.
- 4) Turn counterclockwise to loose seat C fixing screws and take them out by using an adjustable wrench.
- 5) Take out pump and disassemble bushing on it.
- 6) Put the new pump onto the pump seat C and assemble bushing. Please use PTFE tape and twine or wind them firmly to cover 2/3 part of pushing.
- 7) Put back fixing screws of pump seat B and turn clockwise to tighten them to fix the pump by using an adjustable wrench.
- 8) Put back clamp, remember to put on seal ring and turn clockwise to tighten the clamp.
- 9) Connect the power lines by an electric engineer; Put back and fix power line covers on pump.

Pump replacement notice:

- 1) Turn off main power and take safety precautions measures;
- 2) Need at least 2 persons to cooperate to take out old pump and put on new pump because the pump are heavy.
- 3) Choose proper tools can raise replacement efficiency.
- 4) Check all dissemble parts and make sure they connected and fixed well.

8.3 Nozzle clean and replacement

Please clean or replace nozzle according to the following steps and refer to figure 8-3

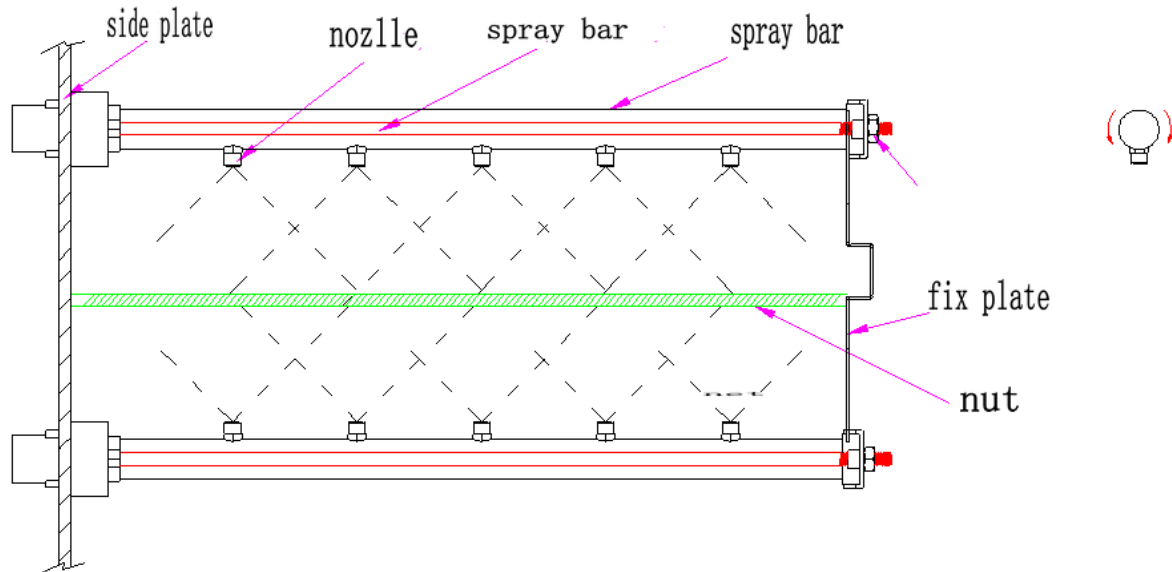


Figure 8-3 Nozzle

- 1) Please turn counterclockwise to loose the front fixing nuts of spray bar
- 2) Please turn counterclockwise to loose the assembly screws on fixing plate
- 3) Grasp spray bar and turn counterclockwise to loose it and take it out, please use a wrench if necessary.
- 4) Turn counterclockwise to loose nozzle by using a wrench and take off nozzles
- 5) Clean the nozzle hole with a air gun or replace nozzle.
- 6) Please use PTFE tape to twine or wind 2/3 part of screw thread.
- 7) Put on nozzle and turn clockwise to tighten it.
- 8) Grasp the spray bar, turn clockwise to the spray bar connecting inner thread hole.
- 9) Put back fixing plate and put back fixing screws and tighten them.
- 10) Put on the front fixing nuts and turn them clockwise to tighten them.
- 11) Check again if the nozzles direction are in 5~10° along the central line of the spray bar. Nozzle tip face the net conveyor.

8.4 Air blower replacement

Please replace air blower according to the following steps and refer to figure 8-4(There are vertical and horizontal air blower in the machine, the replace process is the same).

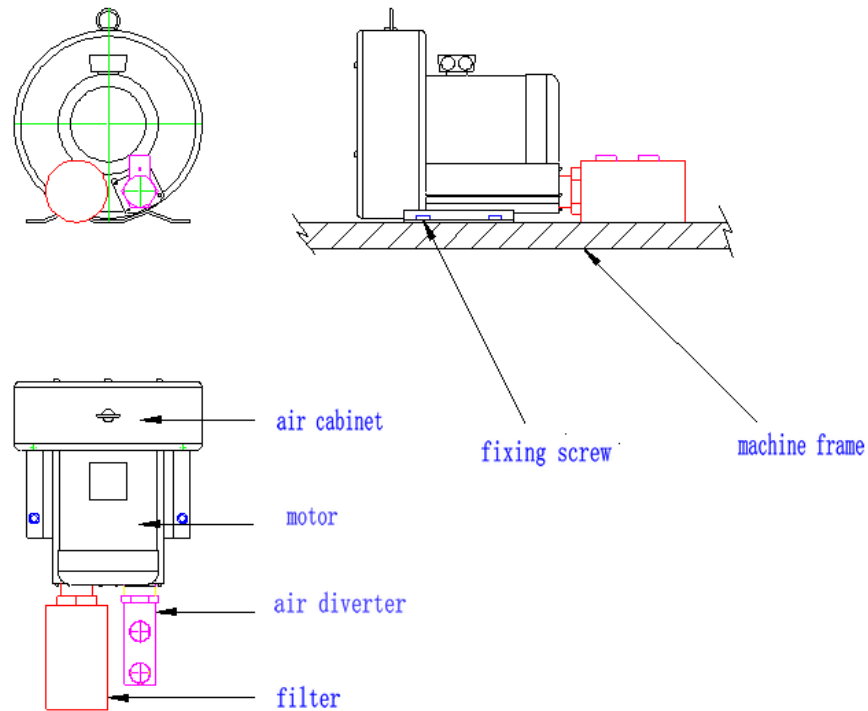


Figure 8-4 air blower

- 1) Do please turn off machine power,pull main breaker to “OFF”position before disassemble air pump. For maintenance staff safe, please put on warning signs. Ask you electric engineer to disassemble the power line of air blower before replacing it.
- 2) Please loose the hose clamp of air outlet, air diverter pipe, and take off air pipes(hoses) by using a slotted screwdriver.
- 3) Turn counterclockwise to loose air filter and air diverter pipe and take them out.
- 4) Turn counterclockwise to loose 4 fixing screws by using an adjustable wrench and take them out.
- 5) Take out the air blower.
- 6) Put on new air blower.
- 7) Put back fixing screws of air blower and turn clockwise to tighten them by using an adjustable wrench.
- 8) Put back air filter and air diverter pipe, remember to put on PTFE tape and turn clockwise to tighten them.
- 9) tighten the hose clamp by using a slotted screwdriver.
- 10) Connect the power lines by an electric engineer; Put back and fix power line covers on pump.

Air blower replacement notice:

- 1) Turn off main power and take safety precautions measures;
- 2) Need at least 2 persons to cooperate to move the air blower because the pump are heavy.
- 3) Choose proper tools can raise replacement efficiency.
- 4) Check all disassemble parts and make sure they connected and fixed well.

8.5 Air knife clean

Please clean air blower according to the following steps and refer to figure 8-5

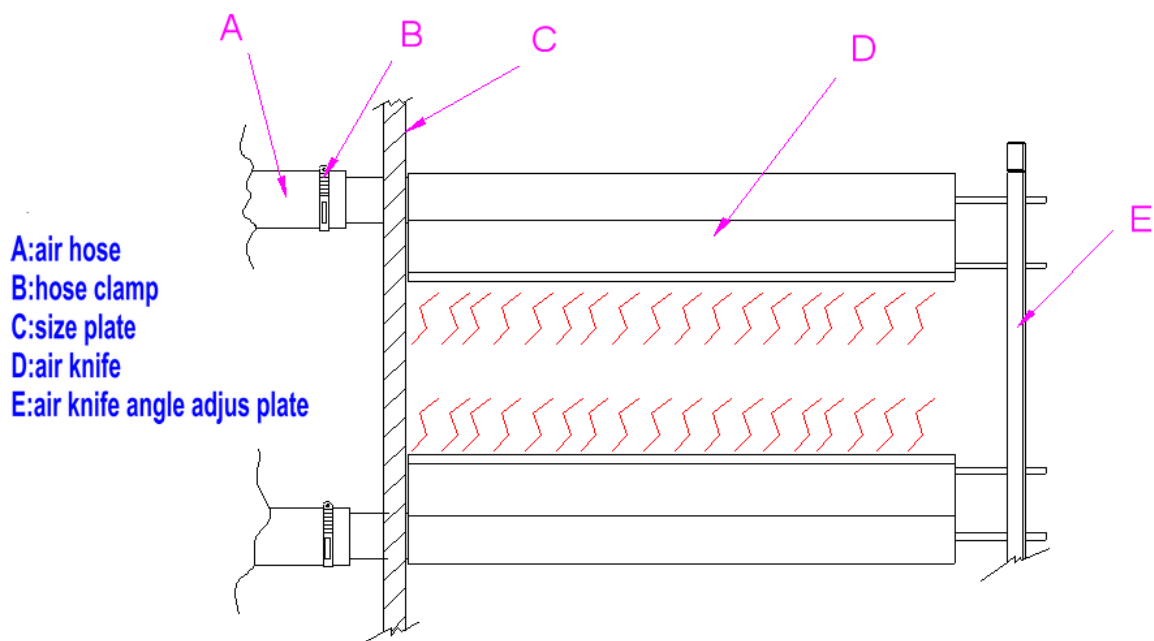


Figure 8-5 air knives

- 1) Turn counterclockwise to loose screws on air knife angle adjustment plate E and take off the plate.
- 2) Turn counterclockwise to loose hose clamp B on air pipe(hose)A,take off air hose.
- 3) Loose clamp of air knife D and take it out.
- 4) Take the knife D and clean the mouth of air knife by using a air gun.
- 5) Put back knife D, tighten clamp, remember to put back TPF E seal ring. Put on angle adjustment plate E and turn clockwise to tighten it.
- 6) Put back air hose A and hose clamp B, Turn clockwise to tighten it by using a slotted screwdriver.
- 7) Check the air mouth face the net conveyor.

8.6 Heater replacement

Please replace the heater according to the following steps, refer to figure 8-6.

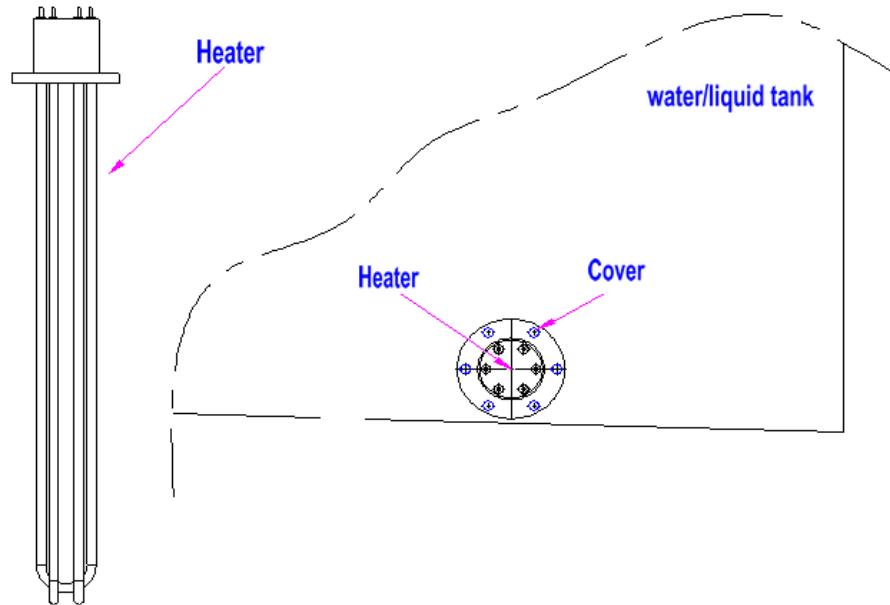


Figure 8-6 Heater

- 1) Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.
- 2) Please ask electrician or electric engineer to disassemble heater’s power lines.
- 3) Drain out all water in tank.
- 5) Turn counterclockwise to loose heater by using an adjustable wrench.Take off old heater.
- 6) Put back new heater.
- 7) Turn clockwise to tighten new heater by using an adjustable wrench.
- 8) Connect the power lines by an electric engineer; Put back and fix power line covers on heater.
- 9) Air heater replace is the same process with the liquid heater, please pay attention to the fixing screws of air heater box.

8.7 Motor replacement

Please replace motor according to the following steps ,refer to figure 8-7.

Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.

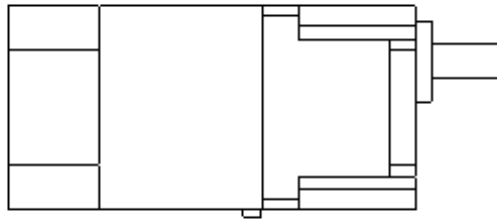


Figure 8-7 Motor

- 1) Take off the cover where motor located.
- 2) Please turn counterclockwise to loose 4 fixing screws of motor.
- 3) Take off motor.

8.8 Bearing replacement

Please replace bearing according to the following steps, refer to figure 8-8.

Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.

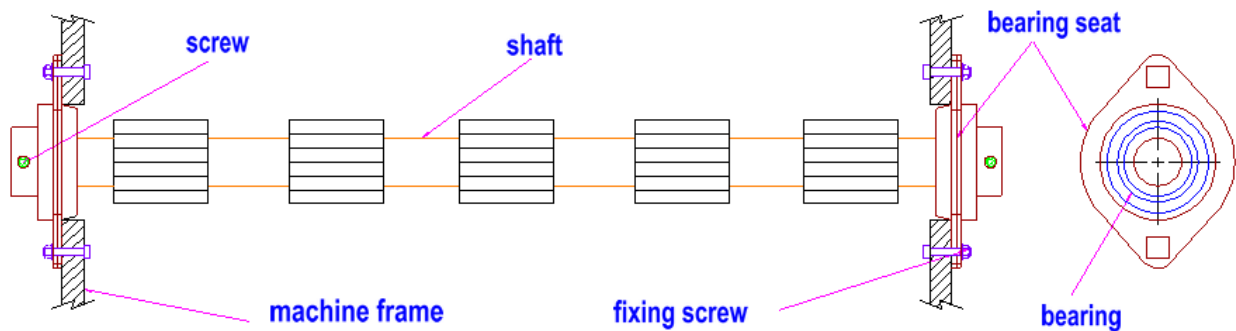


Figure 8-8

- 1) Turn counterclockwise to loose bearing seats and fixing screws both side of net rotation shaft and take them out by using an allen wrench.
- 2) Turn counterclockwise to loose fixing screws of both side of net rotation shaft.
- 3) Hit slightly on the central at one end of the net rotation shaft by using a rubber hammer and take out bearing from the other side.
- 4) Take out the whole rotation shaft, hit slightly to take out the bearing of the other end.
- 5) Replace them with new bearings.

- 6) Hit slightly by using rubber hammer and make the bearing to their original position.
- 7) Put back the rotation shaft.
- 8) install th bearing on the other end in the same.
- 9) Turn clockwise to tighten the fixing screws of bearing seat.
- 10) Check if shaft and bearings are installed well.

8.9 Net tension adjustment

Please adjust net tension according to the following steps, refer to figure 8-10.

Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.

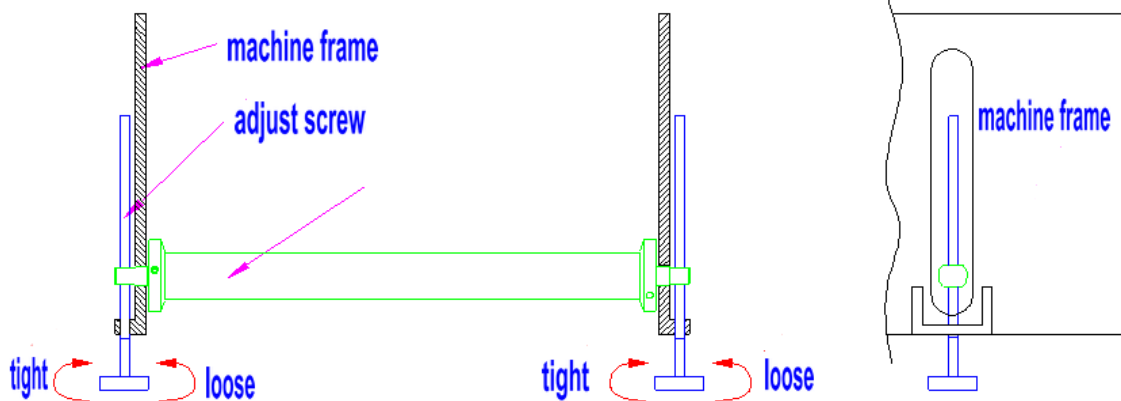


Figure 8-10 net tension adjustment

- 1) Turn counterclockwise to loose the fixing screw of tension adjustment screw.
- 2) Turn the tension adjustment screw clockwise to adjust to a proper tension.
- 3)Turn the fixing screws clockwise to tighten the adjustment screws.

8.10 Filter net replacement

Please clean filter net according to the following steps, refer to figure 8-12.

Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.

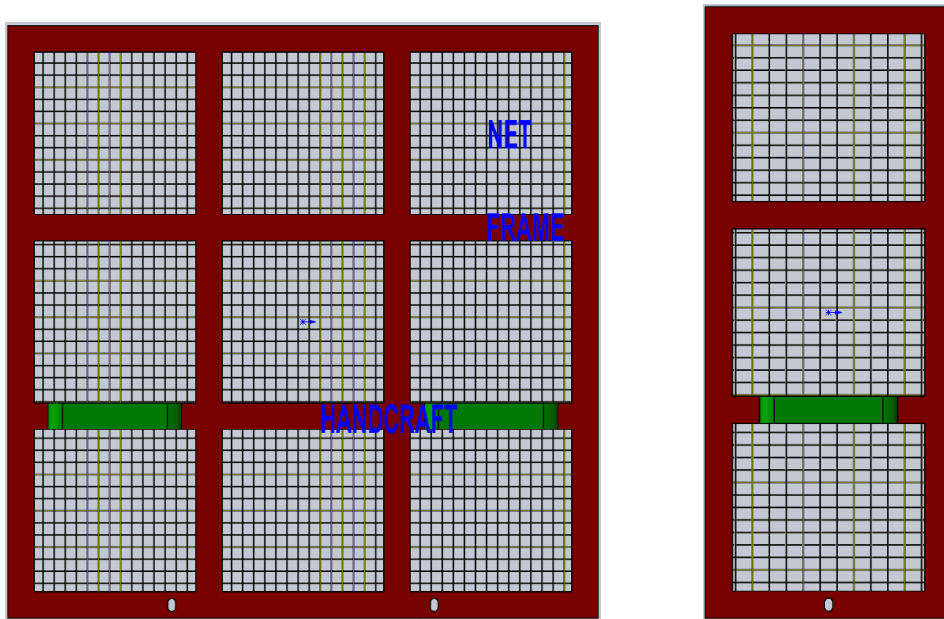


Figure 8-11 Filter net

Filter nets are equipped on clean and rinse section and used to filtrate water. Please clean filter nets every day. Loose the fixing screws, take out screws and pull the filter net out, clean the filter net and put them on.

Notice: Please replace filter net in time if broken. The side with handle on the up side.

8.11 Air blower filter replacement

Please replace air blower filter according to the following steps, refer to figure 8-13.

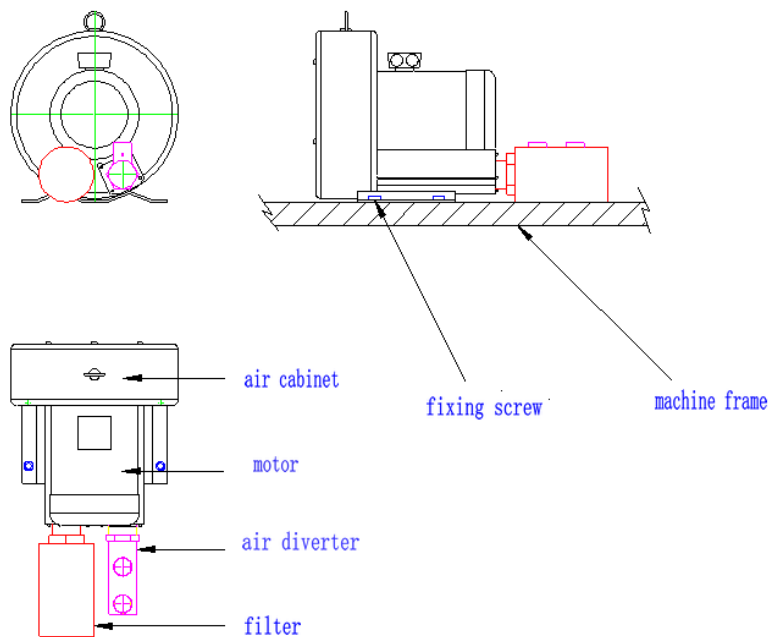


Figure 8-12 air blower

- 1) Do please turn off machine power,pull main breaker to “OFF”position before disassemble heater.For maintenance staff safe, please put on warning signs.
- 2) Turn counterclockwise to loose air filter and take it off.
- 3) Replace new filter.
- 4) Turn clockwise to fix filter.

CHAPTER 9 PARTS LIST

9.1 Main mechanical parts list

S/N	NAME	BRAND	SPEC	QUANTITY	UNIT
1	Machine frame	SME	SME design	1	set
2	Manufacturing parts	SME	SME design	1	set
3	Tempered glass window	SME	SME design	6	pcs
4	Side plate	SME	SME design	N	pcs
5	PC window	SME	SME design	4	pcs
6	Driven shift	SME	SME design	6	pcs
7	Motor support seat	SME	SME design	1	set
8	Fixing seat1	SME	SME design	6	pcs
9	Fixing seat 2	SME	SME design	6	pcs
10	Roller	SME	SME design	7	pcs
11	Roller position plate	SME	SME design	14	pcs
12	Coupling	SME	SME design	1	pcs

SME-6300 PCBA In line Cleaning Machine

13	Screw tighten nut	SME	SME design	32	pcs
14	Adjust screw	SME	SME design	2	pcs
15	Net tension shaft	SME	SME design	1	pcs
16	Bearing seat	SME	SME design	2	pcs
17	Driving shaft	SME	SME design	1	pcs
18	Conveyor net gear	SME	SME design	16	pcs
19	Conveyor net	YAONENG	500mm width	N	meters
20	Air pressure meter	JRL	Φ60 0-30KPa	6	pcs
21	Liquid pressure meter	JRL	Φ40 0-1 MPa	30	pcs
22	Seal strip	JW	F-303	N	meters
23	BearingS6205ZZ		D52-d25-B15	12	pcs
24	BearingS6204ZZ		D47-d20-B14	4	pcs
25	Foot cup		M20	10	pcs
26	3inch Caster		3inch PU	10	pcs
27	Temperature keep cotton		1000mm width	5	pcs
28	Hot air hose		Φ160	N	meters
29	Air blower hose		Φ50	N	meters

9.2 Main electric parts list

S/N	NAME	BRAND	SPEC	QUANTITY	UNIT
1	12KW liquid/ water Heater	SME	SME design	6	pcs
2	2.5KW air heater	SME	SME design	6	pcs
3	External tank LS	SME	SME design	1	pcs
4	Overflow tank LS	SME	SME design	1	pcs
5	Wash tank LS	SME	SME design	2	pcs
6	Pre-rinse tank LS	SME	SME design	2	pcs
7	Rinse tank LS	SME	SME design	2	pcs
8	Temperature detector	SME	SME design	8	pcs
9	Pre-wash pump	Nanfang	1.1KW	1	set
10	Wash pump	Nanfang	5.5KW	1	set
11	Pre-rinse pump	Nanfang	1.1KW	1	set
12	Rinse pump	Nanfang	0.55KW	1	set
13	Diaphragm pump	Shurflo	4258 5GPM	2	set
14	Chemical isolation air blower	Goori	7.5KW	1	set

SME-6300 PCBA In line Cleaning Machine

15	Water air blower	Goori	5.5KW	2	set
16	Hot air blower	Goori	0.85KW	1	set
17	Air blower filter	Goori	MF-20	3	pcs
18	Air blower filter	Goori	MF-16	1	pcs
19	Air inlet meter	SMC	GP46-10-01L5	1	pcs
20	Solenoid valve	CKD	4JA219-06-E2-3	9	pcs
21	Resistivity meter	CRD	CTC-3300E	1	set
22	PH meter	CRD	PH-3500	1	set
23	UPS	Santek	C1KS	1	set
24	Motor	Panasonic	M9MZ90G4YGA	1	set
25	Speed reducer	Panasonic	MY9G750B	1	set
26	Inventor	Mitsubish	FR-D720S-0.2K-CHT	1	pcs
27	Inventor	Mitsubish	FR-D740-7.5K-CHT	1	pcs
28	Inventor	Mitsubish	FR-D740-5.5K-CHT	2	pcs
29	HDMI	Wenview	MT6103IP	1	pcs
30	RS485 modular	Mitsubish	FX3U-485BD	1	pcs
31	AD modular	Mitsubish	FX3U-4AD	1	pcs
32	Temperature modular	Mitsubish	FX3U-4AD-TC-ADP	1	pcs
33	PLC	Mitsubish	FX3U-64MR/ES-A	1	pcs
34	SMPS	Omron	S8FS-C10024	1	pcs
35	Key/Button on panel	IDEC	YW1K/B/L/S series	8	pcs
36	Circuit leakage breaker	Mitsubish	NV200-SV	1	pcs
37	Air circuit breaker	Mitsubish	BH-D6 series	13	pcs
38	Electromagnetic relay	Schneider	LC1D series	8	pcs
39	Overheat relay	Schneider	LRD series	7	pcs
40	Phase protector	Carlo	DPA51CM44	1	pcs
41	Laser sensor	Keyence	FU-70TZ	2	pcs
42	SSR	Fotek	ESR-60DA/100Y	8	pcs
43	Relay	Schneider	RXM2LB2BD	30	pcs
44	Signal tower	Pallite	MG-302BQ-RYG	1	pcs
45	Net modular	Mitsubish		1	pcs

9.3 Main pipe parts list

S/N	NAME	BRAND	SPEC	QUANTITY	UNIT
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SME-6300 PCBA In line Cleaning Machine

1	Spray bar	SME	SME design	26	pcs
2	Spray nozzle	SUS304	CC1/4-SS6504	60	pcs
3	Spray nozzle	SUS304	CC1/4-SS6505	48	pcs
4	Spray nozzle	SUS304	CC1/4-SS6506	24	pcs
5	Spray nozzle	SUS304	CC1/4-SS6508	24	pcs
5	Water flow meter	DG WFL	LZT-2510G	1	pcs
6	Filter barrel	FLT	JYF-0510	1	pcs
7	Filter element		10" 1um	5	pcs
8	Filter net	SME	SME design	N	pcs
9	1inch Angle Valve	KL	KLJZF-25-SS	3	pcs
10	1/2inch Angle Valve	KL	KLJZF-15-SS	7	pcs
11	2inch ball valve	SUS 304		1	pcs
12	1.5inch butterfly valve	SUS 304		3	pcs
13	1.5inch butterfly valve duck mouth	SUS 304		2	pcs
14	1inch ball valve	SUS 304		N	pcs
15	1inch pipe	SUS 304	ø32*1.5mm	N	meter
16	1.5 inch pipe	SUS 304	ø51*1.5mm	N	meter
17	2inch pipe	SUS 304	ø57*2.0mm	N	meter
18	Liquid meter pipe	PE	φ6	N	meter

CHAPTER 10 WARRANTY TERMS

10.1 Warranty terms

- 1) From the installation date on, one year warranty time (some times we take the installation and acceptance date as the first day, so as blow) ;
- 2) If machine arrived at customer's company, not installed due to some customers reason and this situation last for 1 month, one year warranty time will be start calculated from the beginning of the second month.

10.2 Warranty items

- 1) Warranty: Our company will be responsible to repair any parts free of charge if broken in warranty time. Please write down your machine problems and broken parts in details and E-MAIL to rogerliao@dgshenghua.com.cn or call phone no.: (86)-769-85649925 to inform our after-sales service department. Our after-sales department staff will analysis your machine problems' descriptions and offer service in time according to our guarantee permission.
- 2) Parts repair and technical support are free of charge under one year warranty. If you need our engineers to serve on site, please discuss (Consumable parts and parts damage caused by miss operation by operator are not in warranty range.)
- 3) Warranty duty:
Our machine are carefully tested and inspected by our QC department. Our company will not have the duty to those troubles and damage caused by the following reasons. But you can choose incharge service.
 - A. Machine problems or damage caused by incorrect operation;
 - B. Incorrect use or use unqualified spare parts or change electric circuit, pneumatic parts and software;
 - C. Consumable parts are not in the warranty range, for example: filter elements, filter nets, seal strips, customers can buy them from our company;
 - D. Problems not in guarantee range in "maintenance" and "spare parts replacement and repair" chapters of this manual;
 - E. Damage caused by improperly repair and unqualified parts;
 - F. The whole machine are expired warranty time;
 - G. Trouble and damage caused by force majeure (force majeure clauses: not foreseen and the results are unavoidable, insurmountable, such as war, heavy fire disaster, heavy blood, typhoon, earthquake... etc.)

G. Our company will charge on troubles which expiry warranty and not in guarantee range.

10.3 Warranty statement

1) This commitment is only applicable in PRC range, if other country law has other obligations on it, please obey the local country law.

2) Our company is responsible for the losses which caused by our engineers during repairing under warranty time.

3) Our company has the ownership of replaced spare parts in the warranty period.

In Addition: This commitment only has effects on this machine. Other derivative problems are not in this range. If you have any questions, do please contact our company for solutions.

CHAPTER 11 SERVICE RANGE

The selling amount (machine price) of this machine does not include consumable parts and engineers onsite technical support costs. Our company will charge on the following situations even the machine is under warranty time.

1. Technical guidance on assemble, adjustment and trial working of the machine.
2. Regularly maintenance work.
3. Technical guidance and training on operation, process analysis.
4. Technical supports and training on non-standard process.
5. Other charge service which we confirmed.

24 HOURS TECHNICAL SUPPORT !

If you have any technical questions, machine troubles or buy any consumable materials, please feel free to contact us at:

Tel: 86-769-85649925; E-mail: rogerliao@dgshenghua.com.cn

CHAPTER 12 APPENDIX

12.1 System structure

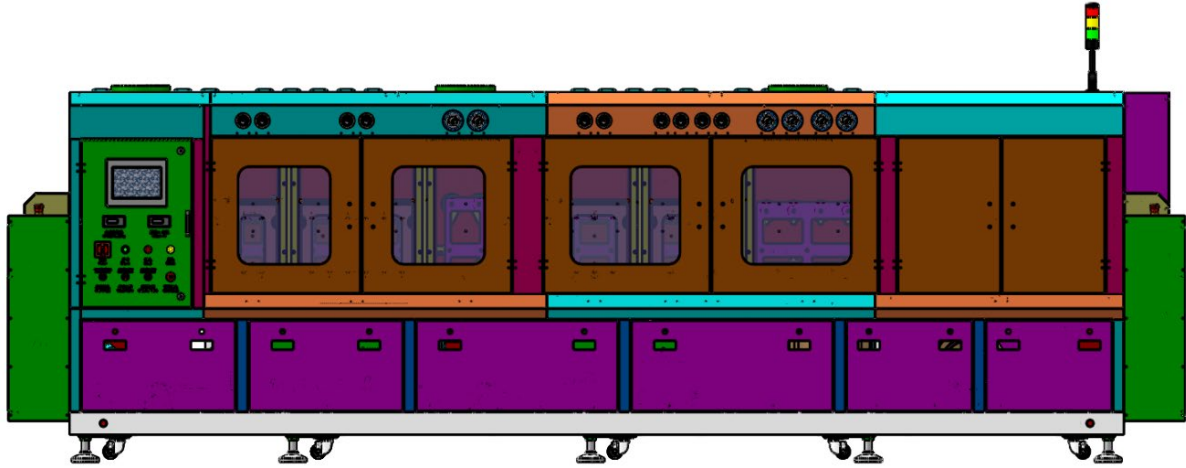


Figure 12-1

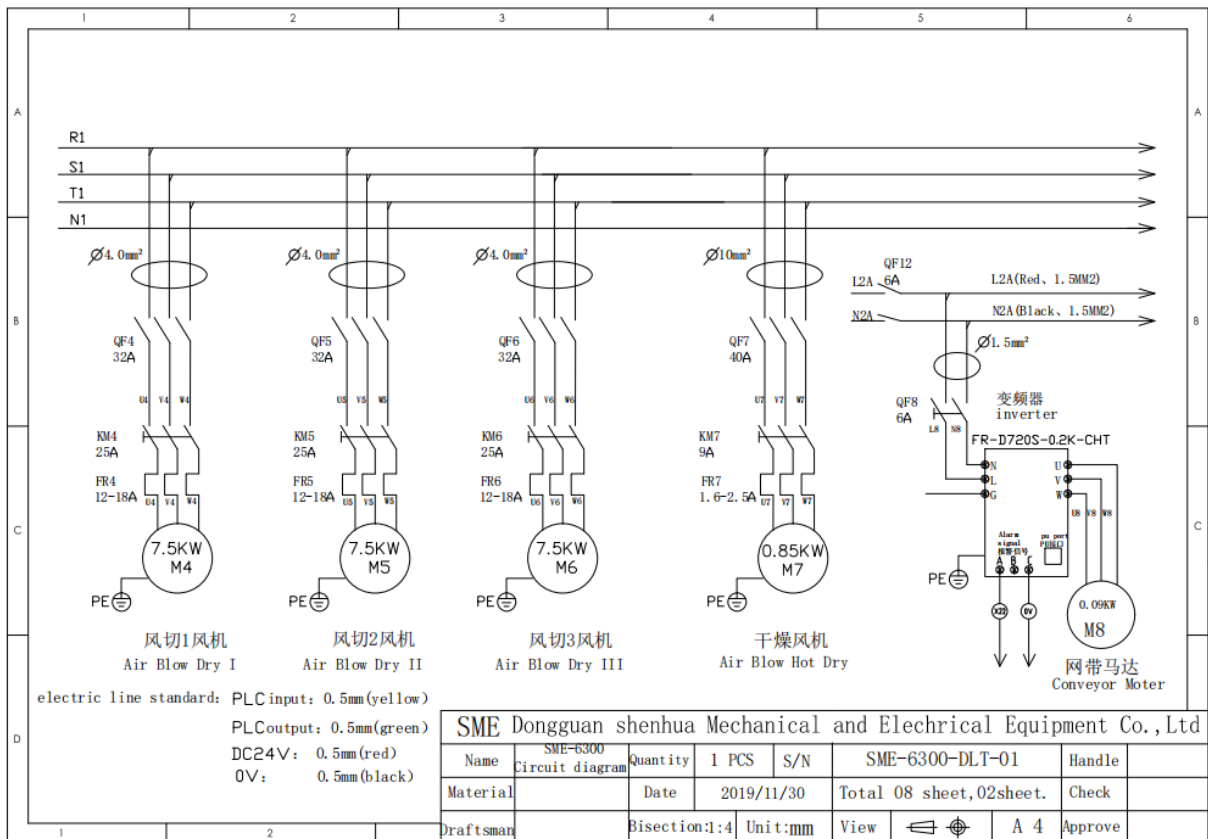
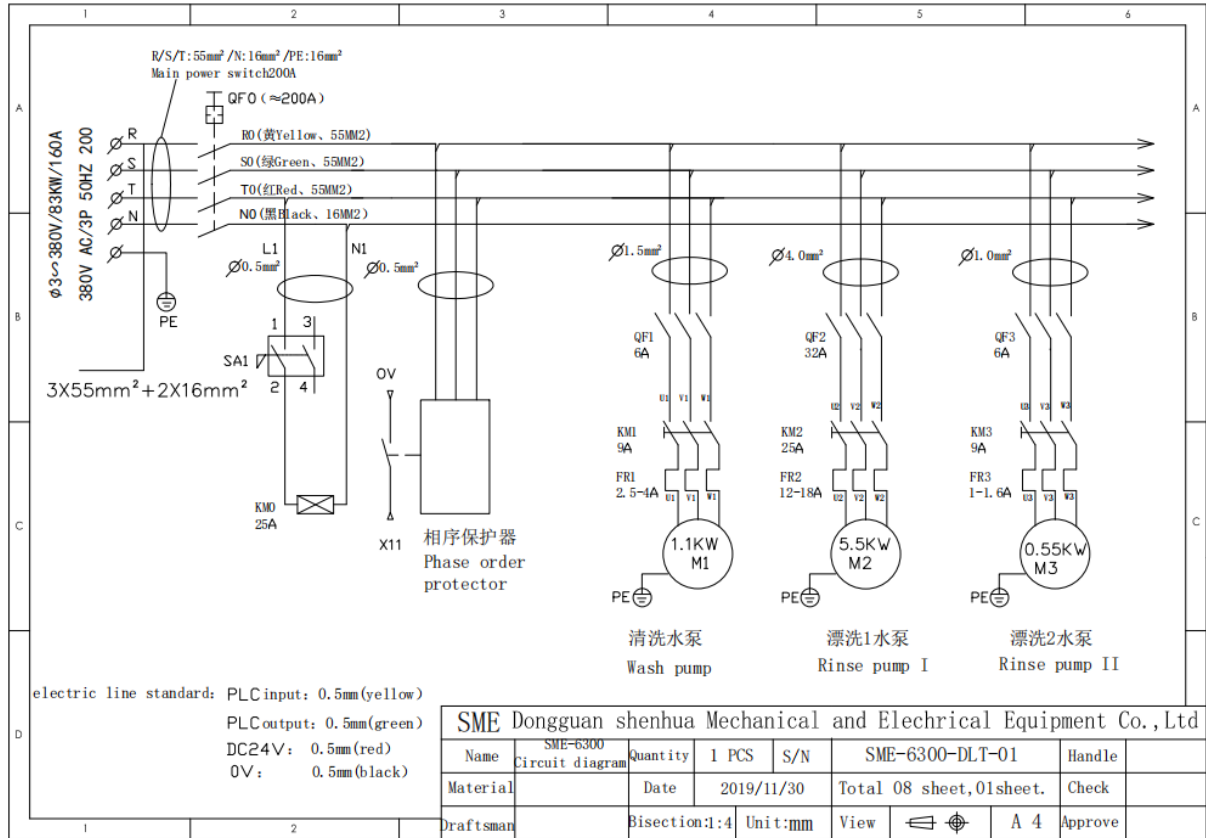


Figure 12-2

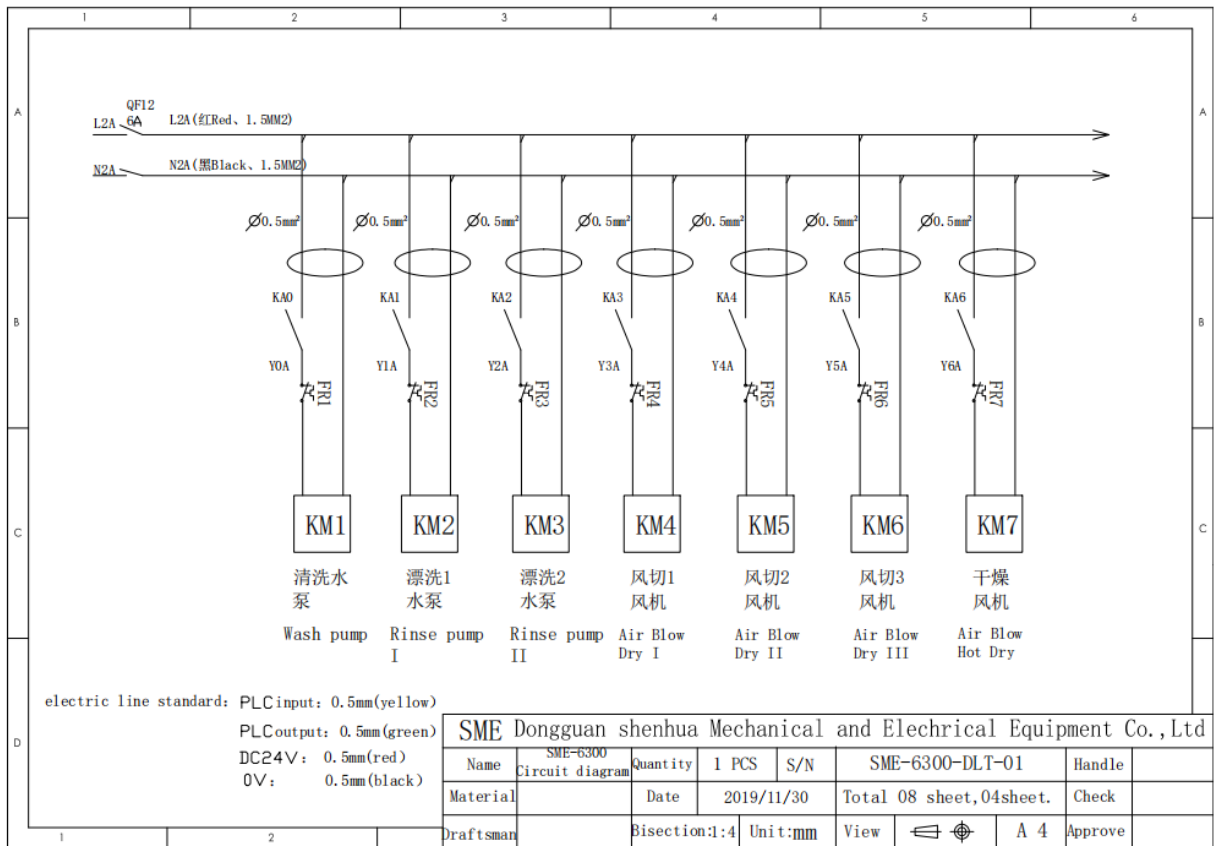
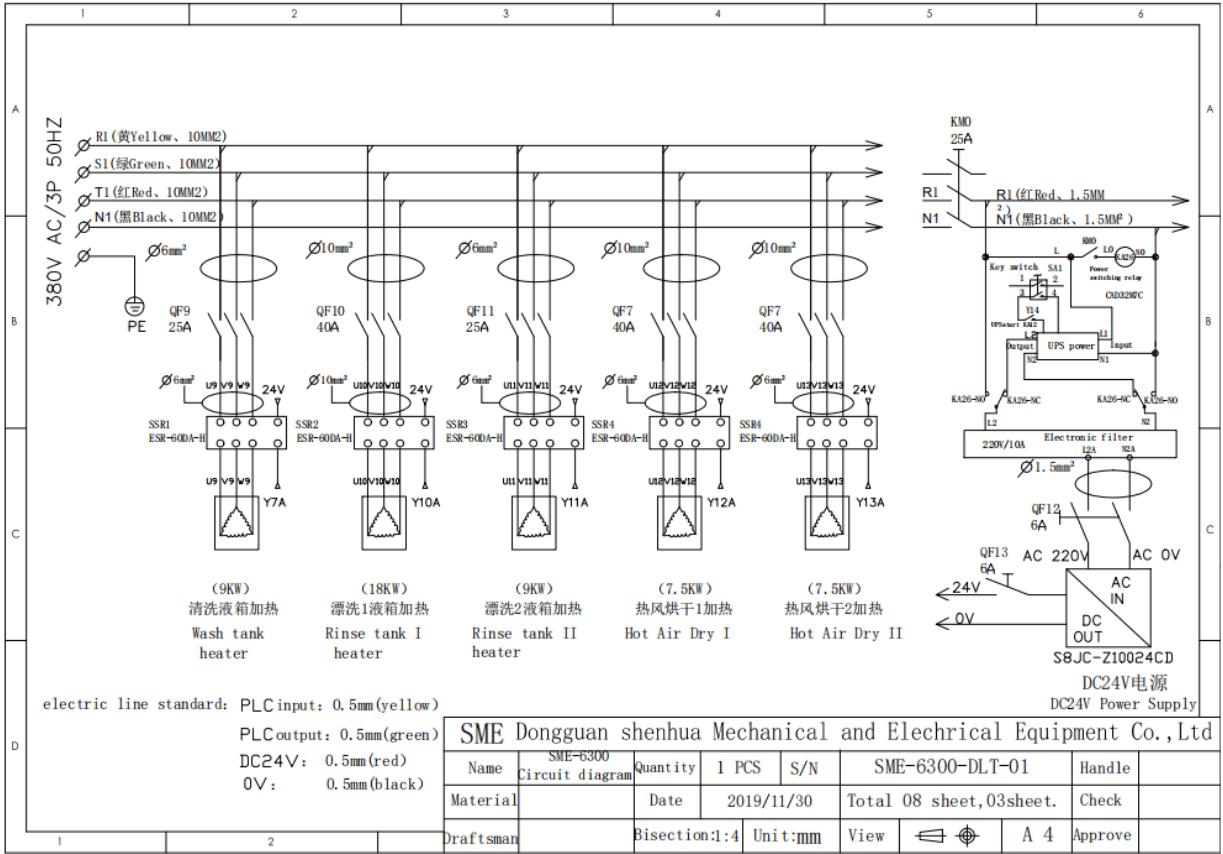
12.2 Electric diagram

1) Electric diagram

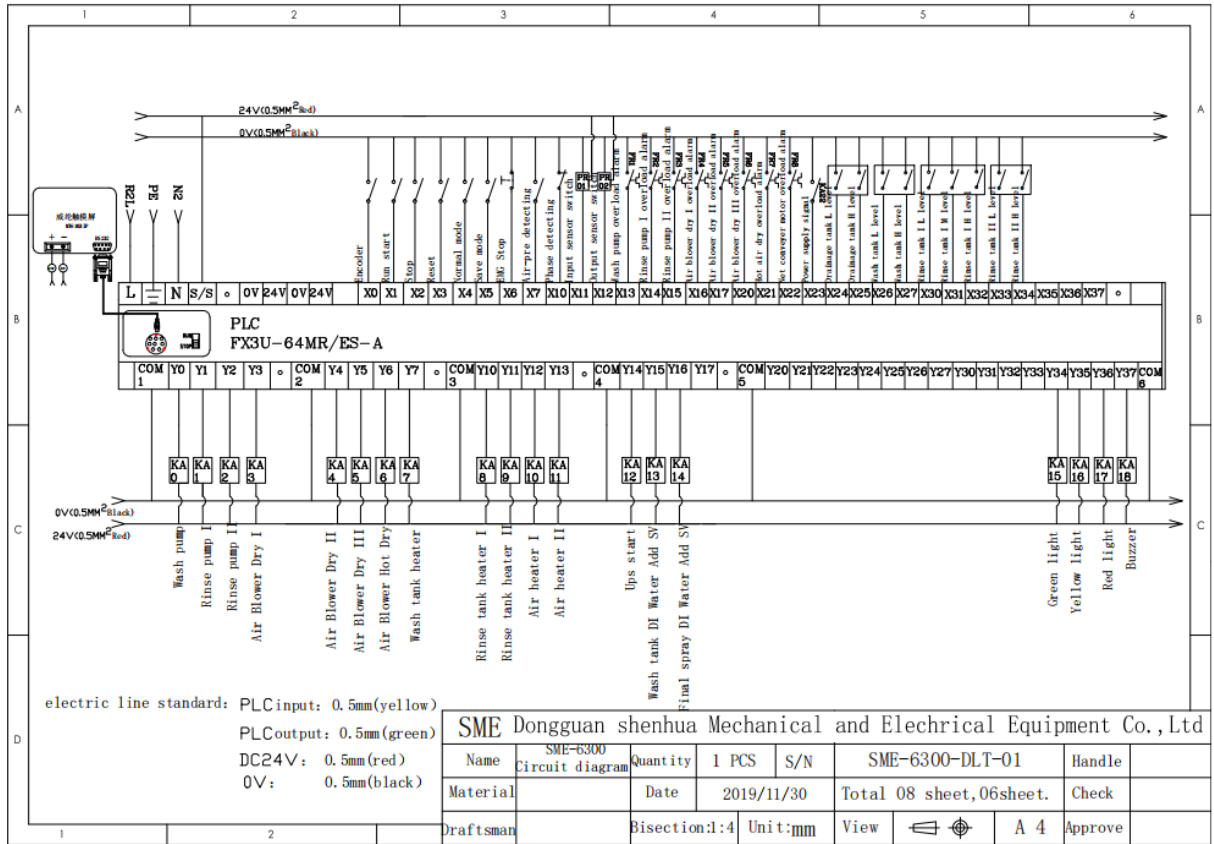
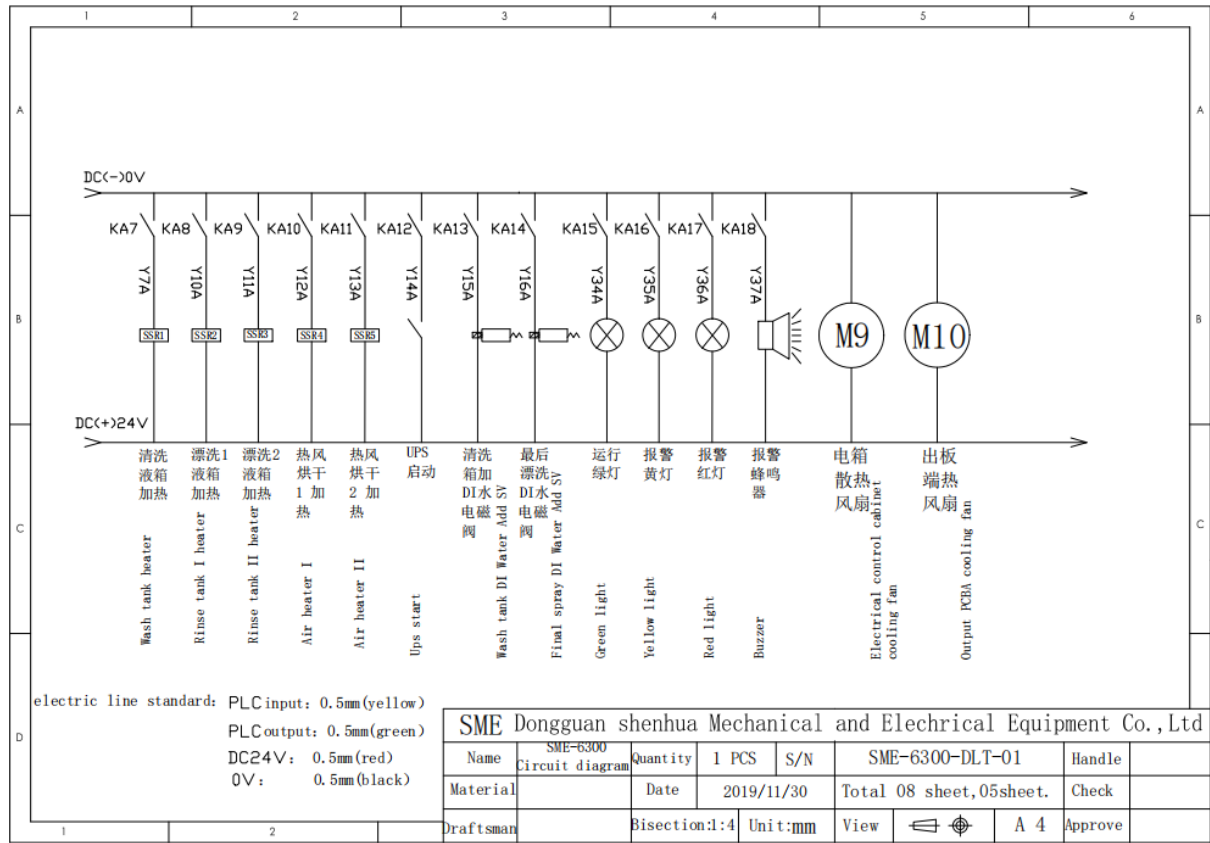
SME-6300 PCBA In line Cleaning Machine



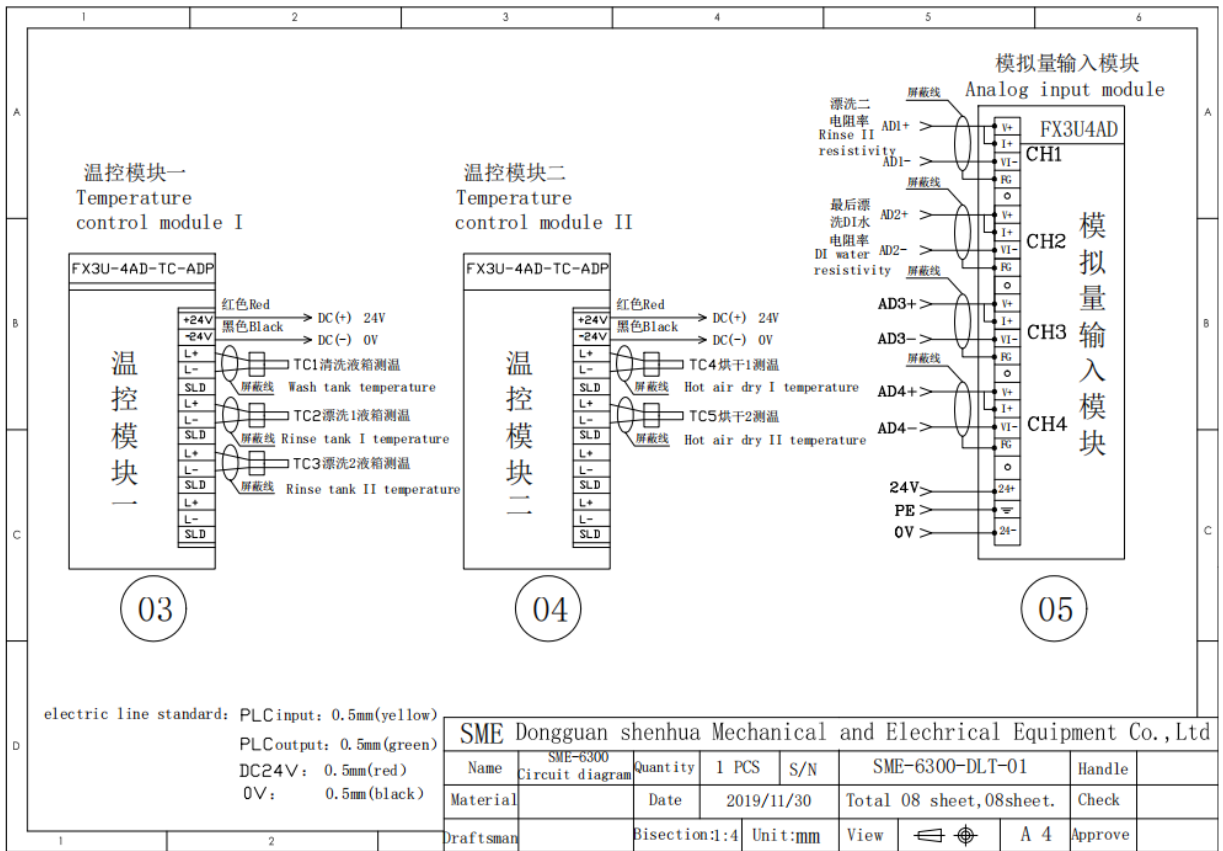
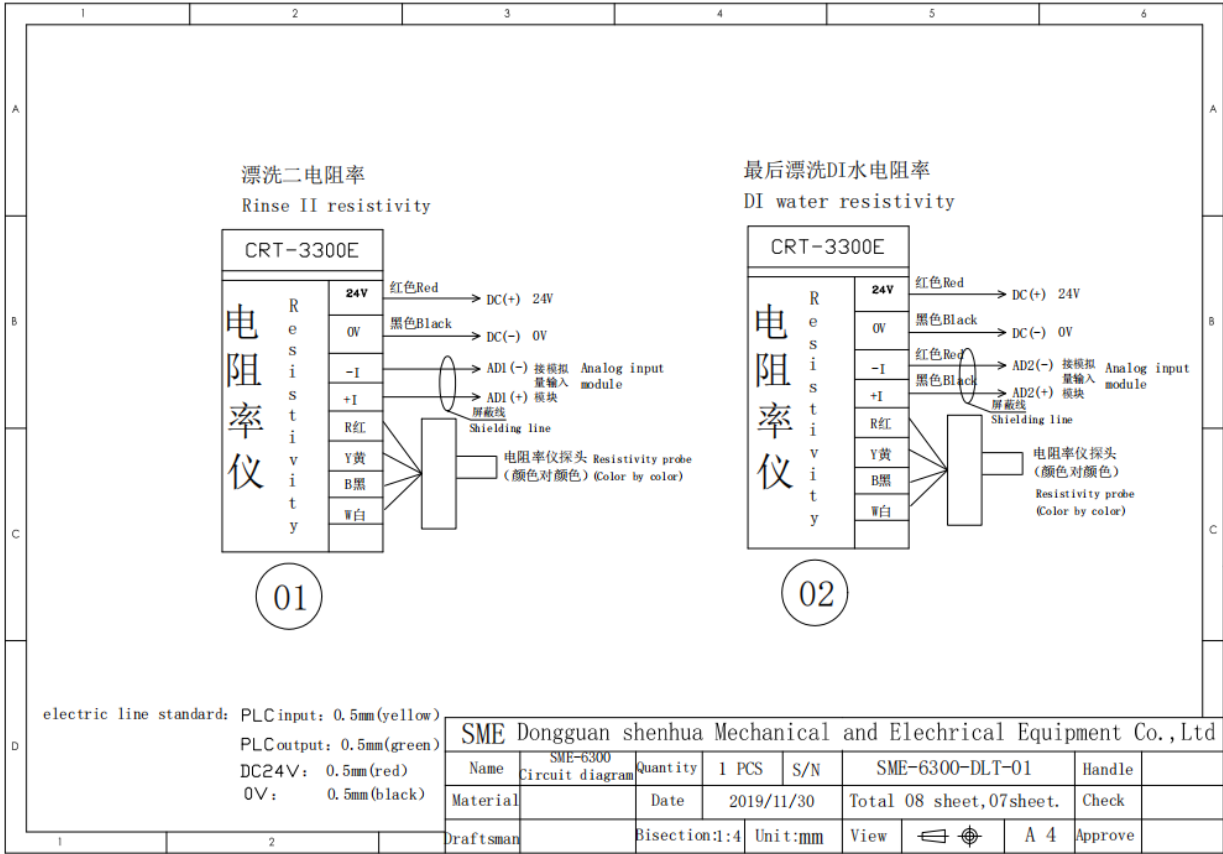
SME-6300 PCBA In line Cleaning Machine



SME-6300 PCBA In line Cleaning Machine



SME-6300 PCBA In line Cleaning Machine

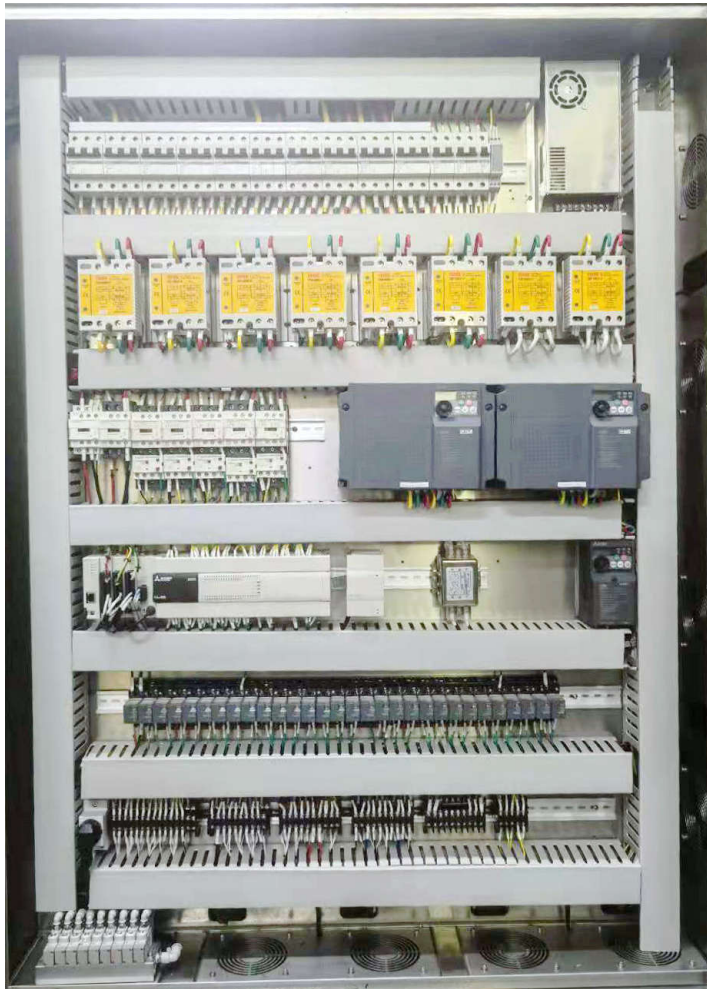


Notice: Some parts on machine may change due to special requirements, but it does not affect the diagram,

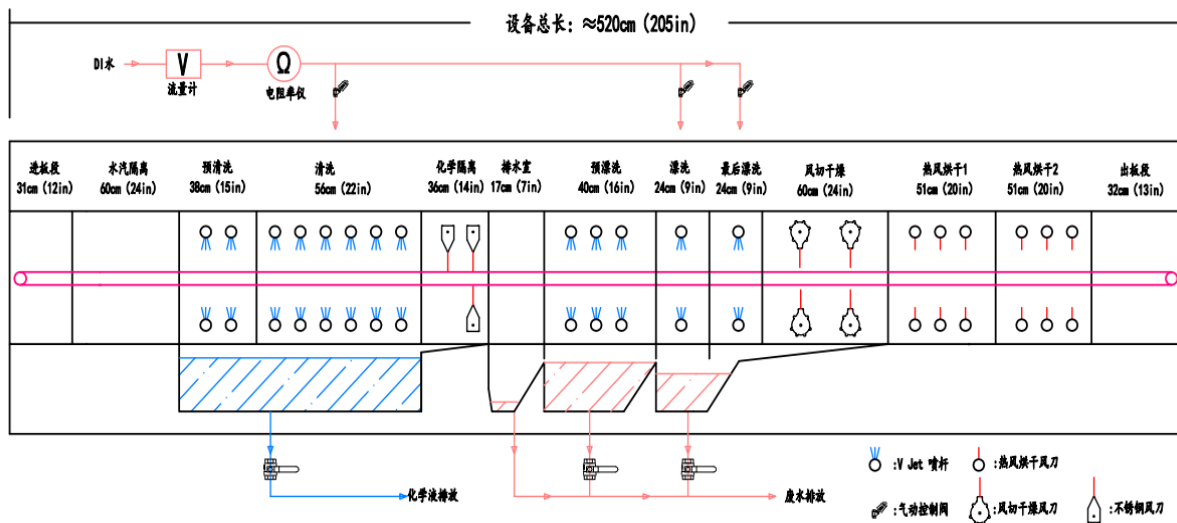
SME-6300 PCBA In line Cleaning Machine

we will not notice one each change.

12.3 Electric control box



12.4 liquid diagram



Any questions on the machine and spare parts, spare materials supply, please

SME-6300 PCBA In line Cleaning Machine

contact our local agent or our company sales staff!