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**Shanghai Sunton**

**Industry Co., Ltd**

**HC-400 Technical**

**Specifications**

上海旭同实业有限公司

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This equipment is an intelligent storage cabinet designed for solder paste management in the SMT industry. It comprehensively solves the quality problems of solder paste caused by poor management by implementing automated functions such as solder paste reservation, refrigerated storage, and temperature regeneration management. Additionally, it can be connected to MES/ERP systems for more efficient solder paste management.

## **Equipment Overview**

### **1.1 Scope of application**

1. Usage area: The line/warehouse controls the operation of refrigeration, thawing, stirring and receiving of solder paste.

### **1.2 Device features**

1. Multi-functional integration: The intelligent solder paste management cabinet integrates functions such as automatic disorderly refrigeration, automatic thawing, automatic stirring, and data traceability. This makes the management of solder paste more convenient and efficient, reducing manual operation and improving work efficiency.

2. System docking: The solder paste cabinet can be connected with MES, ERP and other systems to achieve real-time data interaction. By integrating with these systems, comprehensive management and monitoring of solder paste can be achieved, and the level of informatization of production management can be improved.

3. Real-time monitoring: It has a 24-hour monitoring function 365 days a year, which can grasp the storage status and usage of solder paste in real time. The low inventory warning function can promptly remind operators to replenish solder paste to avoid affecting production due to solder paste shortages.

4. Data management: Support real-time inventory and full traceability, and data can be managed in the cloud. This allows the use of solder paste to be recorded and analyzed in detail, helping to optimize production processes and improve management efficiency.

### 1.3 Hardware basic design requirements

1. Failure rate:  $\leq 0.3\%$  (excluding human factors).

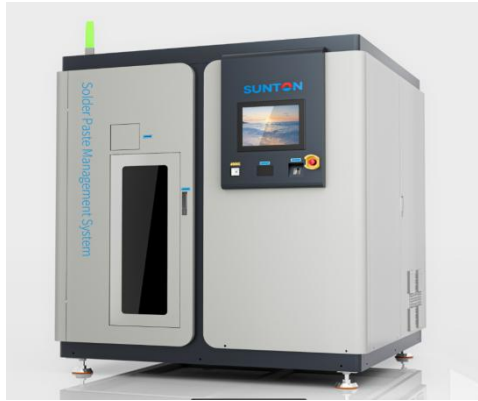


Figure 2 Appearance of the solder paste cabinet

#### 2. Specific requirements:

- Equipment Dimensions: L1800\*D1700\*H2000 (excluding three-color lamp height)
- Equipment weight: 1500KG

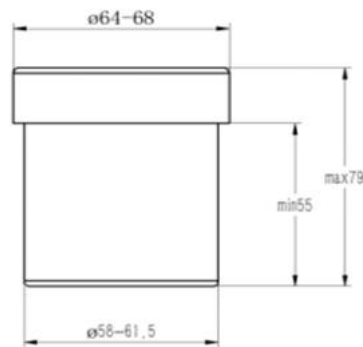


Fig.3 Solder paste bottle

size

- Solder Paste Bottle Size Range: Bottle Size:
- Equipment environment requirements: There is a certain maintenance space around the equipment, and the distance of the heat dissipation hole of the equipment ( $\geq 1\text{m}$ )
- Refrigeration capacity: 430 bottles of refrigeration that meet the size range of solder paste bottles;

- Refrigeration temperature: 1 ° C~10 ° C can be set;
- Refrigeration method: imported inverter compressor, automatic frost;
- Feeding quantity: 70 bottles that meet the size range of solder paste bottles;
- Number of thawing: 50 bottles that meet the size range of solder paste bottles;
- Thawing temperature: 18 ° C~28 ° C (room temperature  $\pm 2$  ° C);
- Temperature monitoring: refrigeration (upper, middle, lower), temperature return area, high and low temperature alarm prompt;
- Thawing time: >4 hours at room temperature; The thawing time can be set separately according to the part number;
- Thawing method: automatic thawing/manual reservation;
- Thawing and foolproof: automatically return to the refrigerated area after the temperature recuperation time (can be set according to the control setting), and give priority to the use conditions;
- Stirring quantity: 1/2 bottle, stir with a counterweight when 1 bottle;
- Stirring speed: 500 rpm for revolution, 400 rpm for autonomy; The speed can be set, up to 1000 rpm in a single revolution;
- Stirring time: 1~10 minutes (can be set according to the model);
- Feeding method: manual feeding, automatic induction feeding at the storage position;
- Code reading method: automatic code scanning (side or top scanning);
- Barcode type: 1D code or 2D code (choose one of the two);
- Solder paste collection: permission verification collection;
- Confirm after use: cancel the code to receive the overtime alarm, and the time can be set;
- Solder paste storage: the number of times the custom part number is put into storage;
- Discharge principle: first-in, first-out (first-out according to production or expiration date), second-in-storage solder paste first-out;

- Operational permissions: Level 3 permissions
- Level 1: Administrator, can set all functions;
- Level 2: Can be configured, such as: warehousing and reservation;
- Level 3: Can be configured, such as: leading;
- Permission recognition: IC card + password (fingerprint recognition optional);
- Abnormal alarm style: three-color alarm light + beep + information prompt;
- Servo module: bus type design, absolute value encoder, stable and easy to protect;
- Control mode: motion control card + upper computer;
- Operation mode: Touchable PC operation;

#### 1.4 Data and MES

- Information traceability: scan the code to query, two-way traceability.
- Inventory Alert: Minimum Inventory Alert (Expiration or Expiry Warning)
- Data report: record query, temperature query
- MES system: standard MES docking
- Log logs: L0g log storage functions can query the running status and exceptions

#### 1.5 Other:

- Power Supply Requirements: AC220V
- The design must consider easy cleaning and maintenance, safety door protection, and dust-proof components;
- Workshop temperature:  $\leq 28^{\circ}\text{C}$
- The power supply inlet end of the equipment must be equipped with a switch, and it cannot be equipped with only a terminal or contactor as a power access point.

#### 1.6 Error prevention and fool-proof requirements:

- It is necessary to have a secure access control and interlock shutdown mechanism;
- When maintaining equipment, it is necessary to consider the control and foolproof of mechanical operation and electrical status of the equipment;
- The electrical circuit of safety components such as emergency stop and access control is independent of the control circuit;

### **General requirements for equipment**

#### 1.7 Device operating mode

##### 1. Device operating mode

1) Provide automatic and manual operation modes, and permission requirements are required to switch between operating modes.

2) Provide perfect fault diagnosis function, when the equipment fails, the control panel can prompt the fault type, occurrence location, and provide specific treatment methods if necessary.

2. Equipment status display, storage and usable quantity statistics.

3. Equipment status information (such as normal operation, equipment failure, etc.) needs to be collected and displayed.

4. Statistics are collected and abnormal information is displayed. For example: inventory warning, overdue warning.

#### 1.8 Equipment safety requirements

1. The equipment meets the national safety standards for mechanical and electrical equipment.
2. Safeguards must be in place to protect personnel from possible harm from intentional or unintentional entry into the hazardous area.
3. All open connections should be sealed and protected when the device is shipped.
4. The appearance and structure of equipment protection devices should be checked one by one during the design review. Post-processing and installation should not cause mechanical interference, inconvenient maintenance and related safety problems.

#### 1.9 General guidelines for mechanical structure design

- 1) Reliability should be fully considered when designing components, including mechanical strength, assembly methods, etc., to ensure that the long-term operation of the equipment will not interfere with other accessories due to deformation, fatigue and other problems, resulting in collision and friction to produce pollutants;
- 2) Equipment vents (e.g., from fans, motors, cylinders, and valves) should not be directed towards the inside of the equipment or at least not towards the surface of the product;
- 3) Mechanical parts must be removed from burrs and welding slag to prevent burrs and welding slag from falling off under the action of external force during equipment assembly and use;
- 4) Equipment parts need to be reliably treated with anti-corrosion to ensure that the equipment does not rust during use;
- 5) Parts should avoid pits, grooves, slits, steps to prevent dust accumulation, screw fixing should be selected under the parts as much as possible, and if it cannot be designed below, it must be made into a sinking hole design and sealed to eliminate steps or grooves;

### 1.10 Random delivery of goods

1. The seller provides consumable equipment and spare parts for the annual use of this equipment
2. The seller is required to provide documentation related to the equipment, including but not limited to the following list:

serial number	name	quantity	description	remark
1	Operating instructions	1	Electronic file	Including 1. Operation instructions; 2. Common fault handling, etc
2	Equipment maintenance manual	1	Electronic file	Including 1. Maintenance specifications and operation instructions; 2. Description of common vulnerable maintenance items in the equipment maintenance cycle;
3	List of wearing parts	1	Electronic file	Wearing part name, quantity, specification, model, or part number
4	Production inspection report	1	Electronic file	equipment, refrigerator

### 1.11 Main parameters of the equipment

serial number	Project name	Technical specifications:
1	Device Dimensions (LxWxH)	L1800*D1700*H2000mm
2	Device weight	Approx. 1550kg
3	Equipment power	Single-phase AC 220V
4	Equipment air source	0.5-0.7MPa (built-in air compressor)
5	Refrigerated quantity	430 bottles of solder paste
6	Thawing quantity/single feeding	70 bottles of solder paste
7	Quantity of single feeding	50 bottles of solder paste
8	Refrigeration temperature range	1°C-10°C can be set, and the uniformity is $\pm 3^{\circ}\text{C}$
9	Thawing temperature range	18°C-28°C ( $\pm 2$ of room temperature)
10	Arm gripping accuracy	$\pm 0.2\text{mm}$
11	Stir in the solder paste	Supports half can stirring
12	Solder paste grabbing method	Robotic arm
13	How it works	touch screen
14	Operating noise	$\leq 70$ decibels

15	Control system	Host machine
16	Device power	2700W
17	Security system	Door opening equipment pause and emergency stop switch

### 1.12 Acceptance criteria

Project acceptance is the process of inspecting, testing, and evaluating software products to determine whether they meet the expected requirements and standards after software development is completed. The purpose of visual acceptance is to ensure that the quality and functionality of the software product meet the requirements and meet the expectations of the user. Through the acceptance process, the delivery quality of software projects can be evaluated, potential problems can be identified and resolved, and software can be operated normally and meet user needs.

#### **Functional acceptance**

Verify that the software features are developed and implemented in accordance with the functional requirements defined in the requirements document.

#### **Performance acceptance**

Evaluate the software's performance under different load conditions, including response time, throughput, concurrency, and other metrics.

#### **Reliability acceptance**

Verify the stability and reliability of the software, including fault handling, error recovery, etc., and be able to operate normally and handle abnormal situations.

#### **Safety acceptance**

Evaluate the security of the software, including user identity authentication, permission control and other security mechanisms.

#### **User interface acceptance**

Check whether the user interface design of the software meets the requirements of user experience and ease of use, and can provide a good user experience.

### 1.13 Installation and commissioning

1. Before the equipment is delivered, Party A's personnel will conduct pre-acceptance according to the acceptance form, and after passing the factory inspection, Party A will notify Party B to enter the installation site, and Party B will prepare the relevant procedures for entering the factory and the confirmation procedures for the arrival of equipment, and train the construction personnel to abide by Party A's relevant specifications.

2. The seller is responsible for the drawing of the equipment positioning line, the installation of the equipment, commissioning and system integration.

3. The seller needs to arrange commuting time according to the buyer's requirements (generally needs to be synchronized with the buyer's production time), and if necessary, arrange evening shift personnel

4. After the installation and commissioning of the project is completed, Party B shall issue a qualification report for installation and commissioning, and the equipment shall enter the probation period; Party A is responsible for coordinating the problems found in the process of coordinating relevant resources to assist in the use, and Party B shall cooperate with the rectification and record the content and results of the rectification during the period. If the equipment itself is abnormal during the trial period and causes significant losses to Party A, Party B is responsible for outputting the rectification report and bearing corresponding responsibilities.

5. If the installation and commissioning are completed, if the relocation operation is required, Party A shall be responsible for the loading and unloading of materials and equipment handling, and Party B shall provide necessary assistance. After the equipment is transferred to the new site, Party B will lead the data migration and redeployment and commissioning efforts, while Party A will provide intermediary coordination support to ensure a smooth process

### 1.14 Project training

During the delivery process, we will train operators and maintenance personnel at the place designated by Party A, including the following aspects:

1. The structure of each unit, the process logic of the system and the system control principle.
2. Conduct on-site use and safety training for operators.
3. Conduct program design and practical experience analysis training for technical personnel.

4. Conduct equipment maintenance training for maintenance personnel such as repair, maintenance, spot inspection, and replacement of wearing parts.
5. Other content that Party A or Party B deems necessary for training.

In the process of product implementation and delivery, we will train Party A's technicians, including module use, troubleshooting, equipment maintenance, etc., to ensure that Party A's technicians basically master the system configuration and equipment maintenance capabilities.

We will provide necessary training materials during training.

If the trainee does not meet the training objectives after training, we may extend the training time and/or increase the number of training sessions until the trainees meet the training objectives.  
(More than 3 trainees)

#### **Training content**

The main content of the training includes the overall business logic of the intelligent warehousing and logistics system, the introduction and practical operation of the system software system function modules, the functional operation of each equipment, the abnormal handling mechanism and method of the equipment, system maintenance and equipment maintenance, etc., to ensure that Party A can operate and maintain the equipment independently.

Party B's technicians will provide free technical training and technical services for basic operation, maintenance and software application for operators on site at Party A. Party A organizes relevant trainees and is responsible for providing training venues, and Party B appoints training lecturers and is responsible for preparing training materials.

#### **Quality assurance and after-sales service**

1. The warranty period of the equipment is 12 months from the date of official acceptance of the equipment, during which the seller is responsible for free repair and maintenance of the equipment (except for wearing parts). If there is any abnormal quality of the equipment, the seller's after-sales service personnel shall arrive at the equipment site within 24 hours after receiving the buyer's notification.
2. After the warranty period expires, the seller shall still be responsible for repairing and maintaining the equipment, but only charge reasonable working hours and reasonable transportation costs, involving the replacement and purchase of equipment-related

accessories, and the seller will only charge the cost of accessories.

3. Technical support responds 24 hours a day, responds immediately after receiving a notification and responds within 2 hours; According to the actual needs, the following handling methods are made: (1) Remote assistance: for general technical consultation or abnormal problems, priority will be provided for online remote assistance processing, and the second plan will be upgraded if it cannot be solved within 2 hours; (2) On-site processing: Abnormalities that cannot be solved remotely, engineers will arrive at the site in 4 hours to deal with it, the above technical response mechanism is based on any majeure factors is effective, if there are force majeure factors (such as war, natural disasters, epidemics, political factors, etc.), the two sides will negotiate the best plan according to the real-time situation.