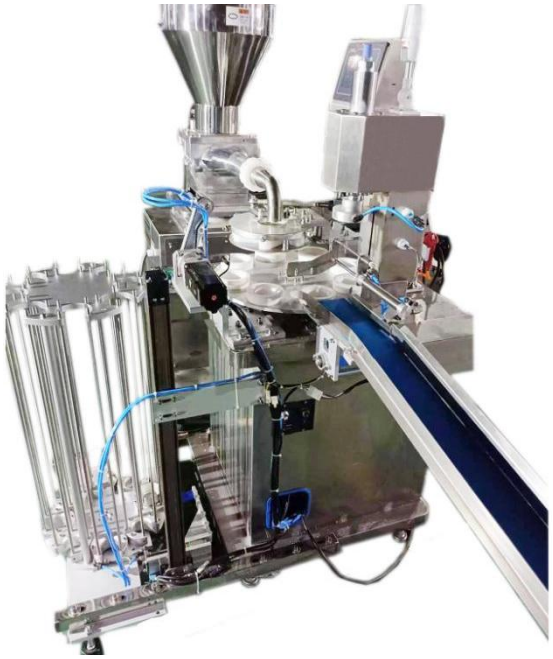
User Manual

Tart Shell Forming Machine

with Automatic Aluminum Cup Feeding System



Contents

Preface

Thank you for choosing **Masbake** automated equipment. Our company is a comprehensive high-tech enterprise integrating **research & development, design, manufacturing, and sales**. Adhering to the development philosophy of *"customer-oriented and quality-driven"*, we have attracted an increasing number of domestic and international clients through **advanced production technology, extensive industry experience, scientific management, and a professional sales team**. Our equipment is widely exported to **Asia, Australia, ASEAN countries, Eastern Europe, Oceania, Africa**, and many other regions around the world. We sincerely welcome both new and existing customers to visit us for guidance and cooperation.

Masbake equipment features **advanced technology, excellent performance, and user-friendly operation**. Before using the equipment for the first time, please carefully read this **Instruction Manual** to familiarize yourself with the machine structure, functions, operating procedures, and company guidelines. Proper operation and regular maintenance will help maximize equipment performance, ensure **safe, efficient, and stable production**, and maintain the long-term value of the machine.

This manual is intended to provide users with guidance on the **operation and maintenance** of our equipment. Please refer to your purchase contract for the exact configuration of the machine you have acquired. If you have any questions regarding the equipment or this document, please feel free to contact our company for assistance.

As **Masbake Automation Equipment Co., Ltd.** continuously improves and upgrades its products, equipment specifications and performance may be subject to change without prior notice.

1. Safety Precautions for Equipment Operation

1) Do not start the machine until the correct operating procedures and safety regulations are fully understood.
2) Personnel who have not received proper training or authorization are strictly prohibited from operating this machine.
3) Before operating the machine, carefully read this manual to fully understand all instructions and guidelines.
4) The machine may only be operated after installation has been completed and all necessary adjustments have been properly carried out.
5) Before starting the machine, ensure that no tools or foreign objects are left on any machine surface or worktable.
6) Do not touch the internal components or electrical parts of the machine unless the power supply has been switched off.
7) During operation, the operator must not leave the machine unattended or step outside the working area.
8) While the machine is running, it is strictly prohibited to touch heated components or moving parts.
9) Inspection or maintenance of the electrical control system must be carried out by qualified electrical technicians.
10) Without authorization from our company, do not modify the machine or install any non-approved devices or auxiliary equipment, as this may cause safety hazards.
11) If any part of this manual is unclear, or if problems arise that cannot be resolved according to the instructions provided, please contact our company or an authorized distributor. Do not attempt to handle the issue independently.
12) Do not operate the machine under environmental conditions other than those specified.

2. Overview

2.1. Purpose and Application Scope

The **Tart Shell Forming Machine with Automatic Aluminum Foil Cup Feeding System** utilizes a **high-precision cam indexing mechanism** for punching and forming. It is suitable for various types of press-forming applications.

The machine exterior and all components that come into contact with dough are made of **high-quality stainless steel**, ensuring a clean appearance and compliance with food hygiene standards.

This equipment is widely used in the food industry, including:

- Western-style restaurants
- Cake shops
- Snack food factories
- Fast food production facilities
- Commercial bakeries

2.2. Main Features

1. The machine body is constructed with **stainless steel sheet metal**, offering a premium and durable structure.
2. Suitable for press-forming a wide range of pastry and dough products.
3. Produces uniformly shaped products with consistent appearance.
4. Made of **food-grade stainless steel**, meeting hygiene requirements for food processing equipment.

2.3. Technical Specifications

1. Overall dimensions (L × W × H): **2050 × 1455 × 1585 mm**
2. Rated total power: **2.5 kW**
3. Power supply: **220V / 50Hz**
4. Total weight: **300 kg**
5. Production capacity: **35 pcs/min**

2.4. Operating Environment

1. Power supply: **220V / 50Hz**
2. Ambient temperature: **1°C – 40°C**
3. Relative humidity: **≤ 90%**

4. Keep away from oil fumes, chemicals, acidic or alkaline substances, explosive or flammable materials.
5. Avoid installing the machine near equipment that generates strong vibration.

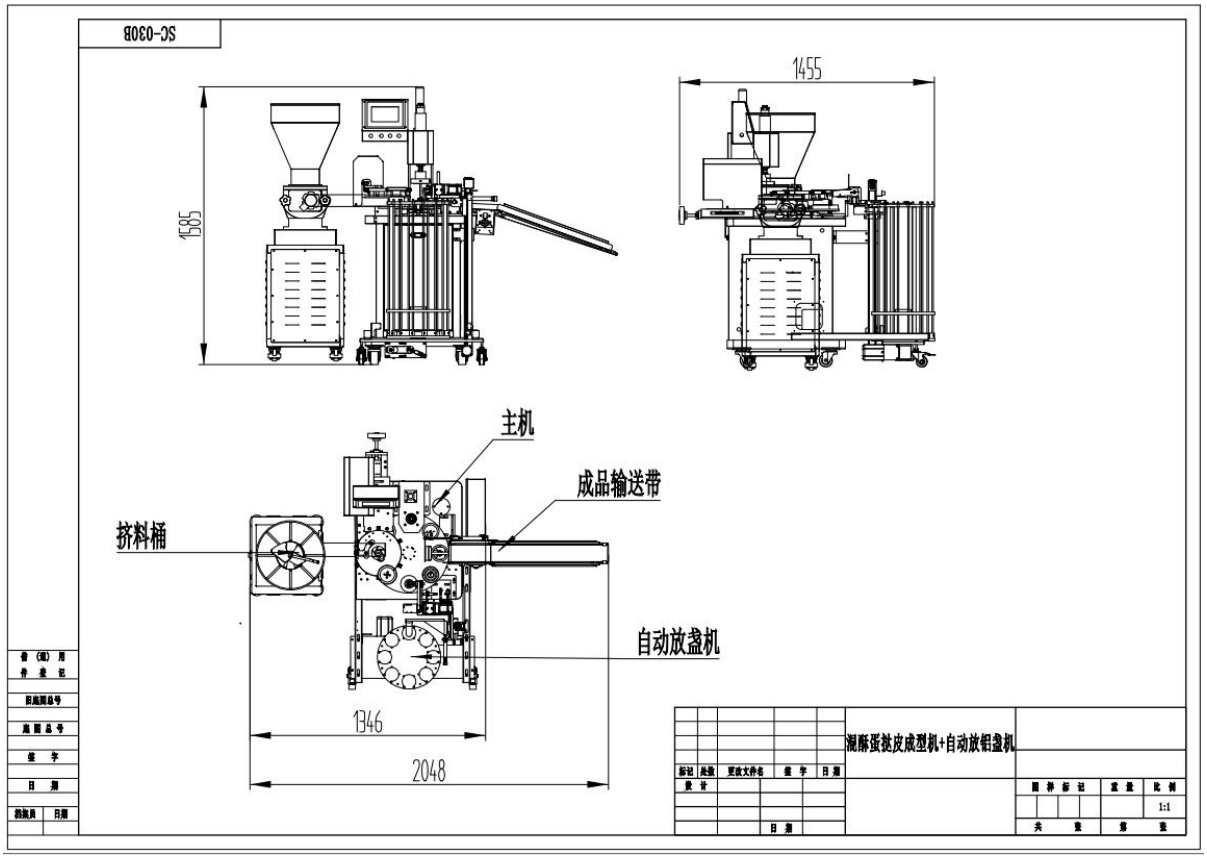
3. Machine Structure

3.1. Overall Structure

The **Tart Shell Forming Machine with Automatic Aluminum Foil Cup Feeding System** mainly consists of the following four parts (see Figure 3.1):

1. Dough feeding hopper
2. Main forming unit (main machine body)
3. Finished product conveyor belt
4. Automatic aluminum foil cup feeding unit

These components work together to achieve continuous and stable tart shell forming and automatic placement of aluminum foil cups.



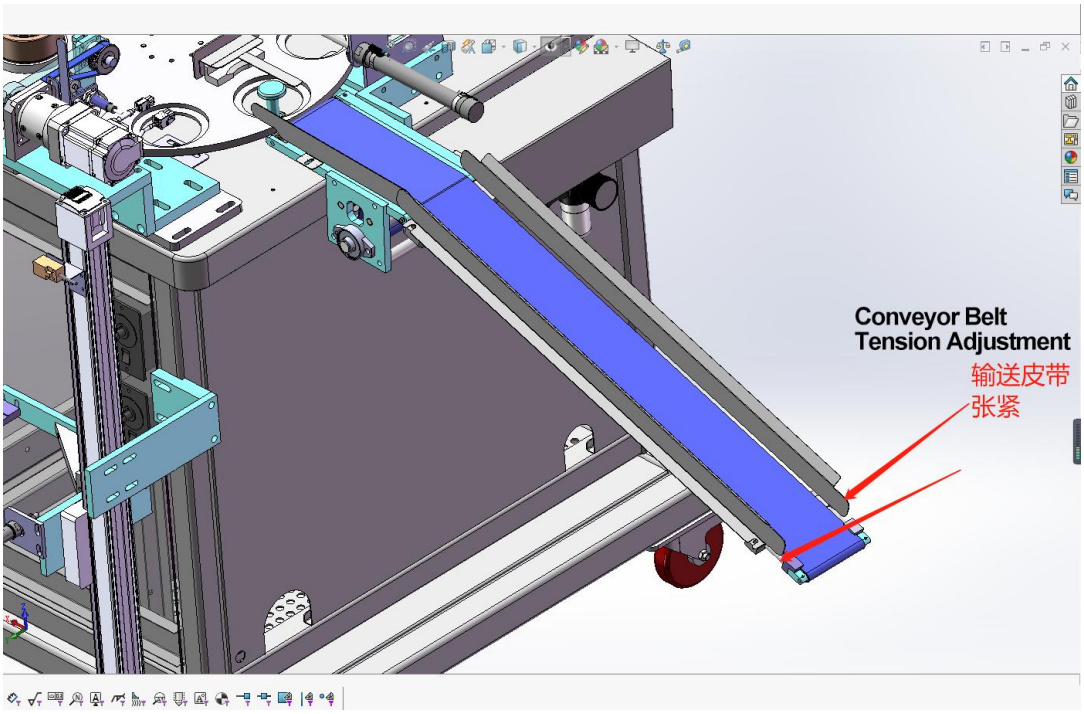
（Figure 3.1)

3.2. Main Adjustment Mechanisms

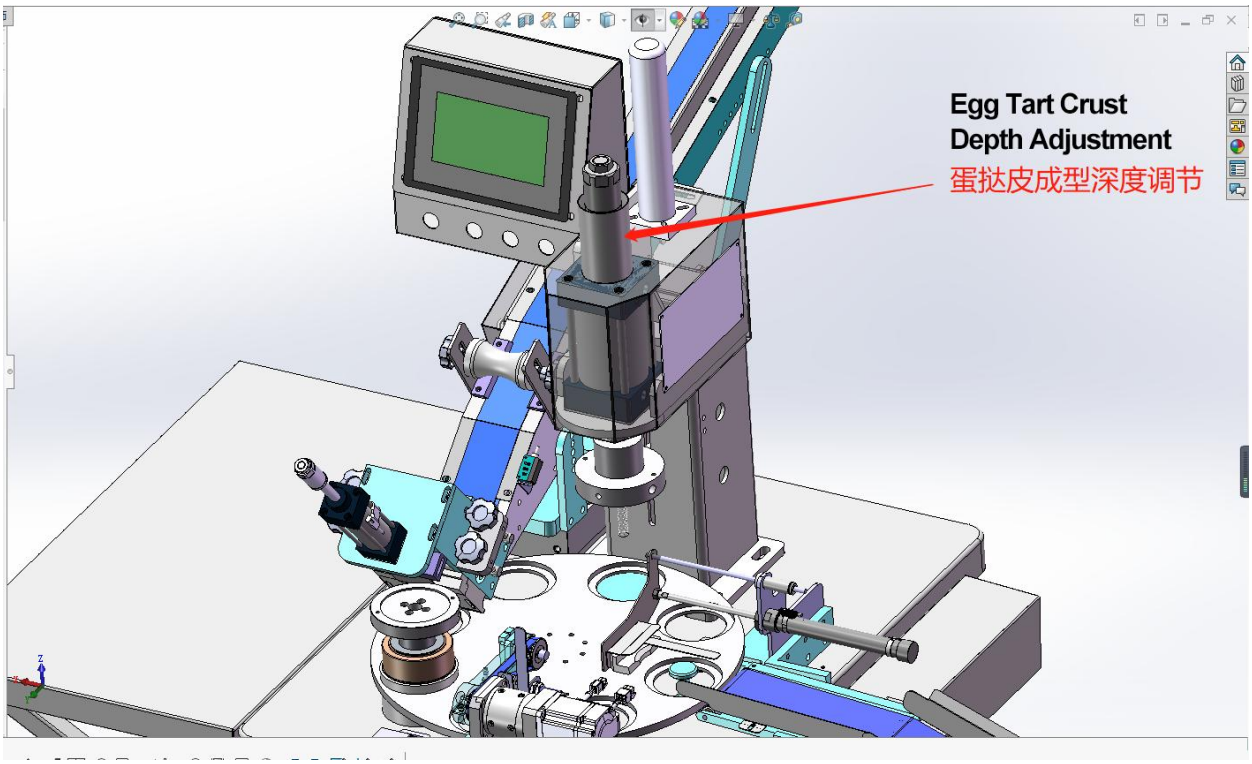
The main adjustment mechanisms include:

- **Conveyor belt tension adjustment**
- **Pressing height adjustment (cutting/forming height adjustment)**
- **Cutting knife adjustment**

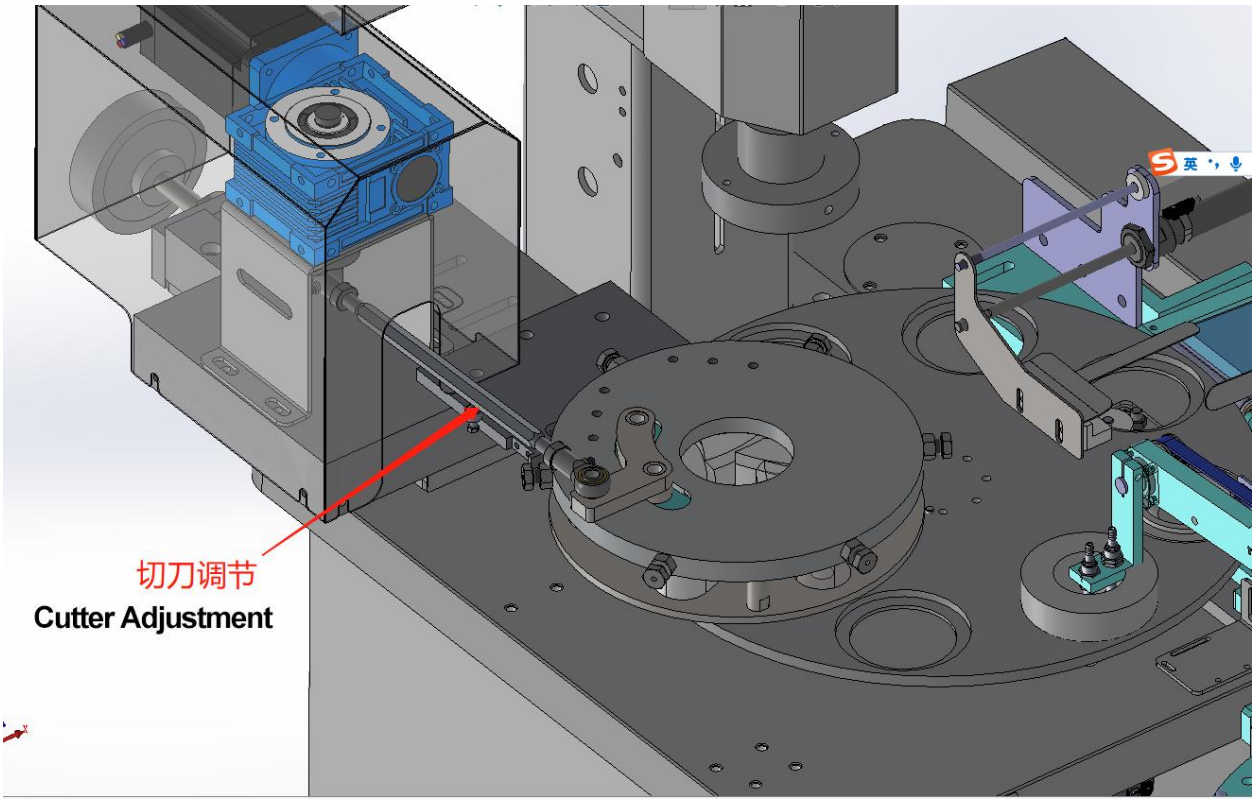
(See figure below)



（Conveyor belt tension adjustment）



（Pressing height adjustment / forming height adjustment）



（Cutting knife adjustment）

3.3. Photoelectric Sensor Adjustment

This machine is equipped with a **SICK photoelectric sensor**.
Adjustment instructions:

- **"+"** : increases the sensing distance (longer detection range)
- **"–"** : decreases the sensing distance (shorter detection range)
- **"L"** : normally open mode (NO)
- **"D"** : normally closed mode (NC)

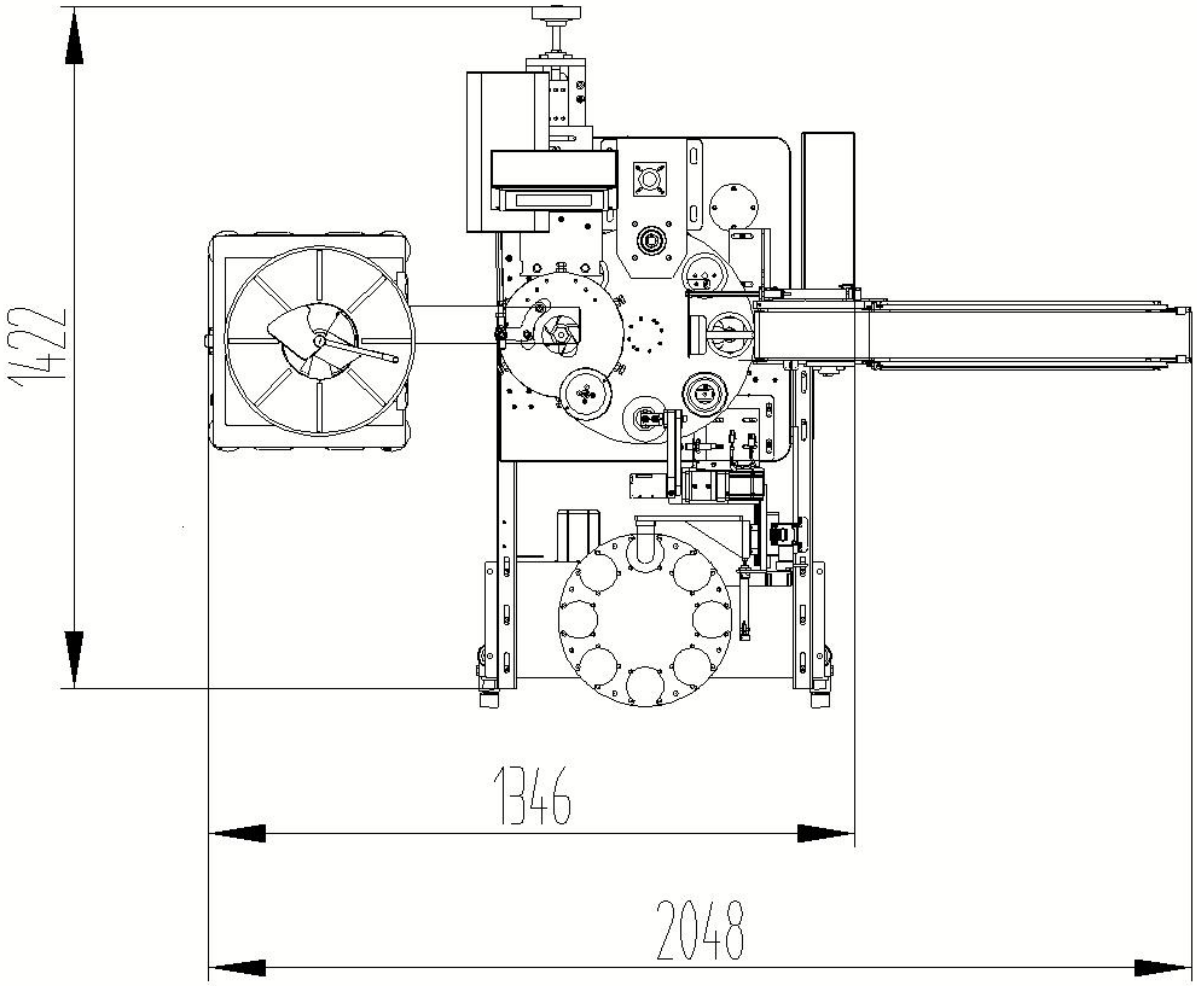
(See Figure 3.3.1)

(Figure 3.3.1)

4. Machine Installation and Commissioning

4.1. Site Requirements

Before installation and commissioning, technicians should inspect the machine for any damage that may have occurred during transportation (as collisions may happen during transit).
The machine should be installed on a **level and solid floor surface**. Sufficient space should be reserved around the machine to allow convenient **operation, inspection, and maintenance** (see Figure 4.1).



(Figure 4.1).

4.2. Installation Steps

Main Machine:
Determine the placement position of the main machine according to Figure 4.1. Using the work platform as a reference, adjust the four leveling feet to ensure the machine is properly leveled and securely positioned.

4.3. Machine Control and Commissioning

1) Control System

This production line is equipped with a **color touchscreen interface (HMI – Human Machine Interface)**, allowing **parameterized settings** for simple, accurate operation.
The control panel includes the following components (see Figure 4.3.1):

- Main touchscreen

- Power ON button
- Power OFF button
- Power indicator light
- Emergency stop (E-Stop)

This setup ensures **safe, efficient, and precise control** of the machine during operation.

(Figure 4.3.1)

2) Machine Interface

A). Operation Screen

The **operation interface** is user-friendly and intuitive, as shown in Figure 4.3.2.

(Figure 4.3.2)

① **Feeding Frequency** – Sets the conveyor feeding speed.
② **Feeding Time** – Sets the duration of each feeding cycle.
③ **Wait Time** – Sets the delay time after feeding before the next operation.
④ **Cutting Knife Speed** – Sets the speed of the cutting blade.
⑤ **Start/Stop Button** – Starts or stops machine operation.
⑥ **Temperature** – Displays the current processing temperature.
⑦ **Temperature Setting** – Sets the desired processing temperature.
⑧ **Production Capacity** – Displays the machine's output per minute.
⑨ **Current Output** – Displays the total products produced by the machine.
⑩ **Reset Output Button** – Resets the total output count to zero.
⑪ **Heating Switch** – Enables or disables the heating function.

B). Manual Operation Screen

(Figure 4.3.3)

① **Tray Lift** – Press to raise the tray.
② **Tray Lower** – Press to lower the tray.
③ **Arm Swing Right** – Press to swing the arm to the right.
④ **Arm Swing Left** – Press to swing the arm to the left.
⑤ **Tray Step** – Press to rotate the tray one step.
⑥ **Conveyor Belt Switch** – Press to turn on the conveyor belt.
⑦ **Tray Bottom Cylinder** – Press to close the tray bottom cylinder.
⑧ **Manual Suction** – Press to activate suction on the arm.
⑨ **Manual Blow** – Press to activate air blow on the arm.
⑩ **Feeding Motor Switch** – Press to activate the feeding motor.
⑪ **Cutting Knife Switch** – Press to activate the cutting knife motor.

C). Parameter Interface

(Figure 4.3.4)

① **Speed** – Sets the automatic swinging speed of the arm.
②**Tray Placement Angle** – Sets the position angle for the arm to place the tray automatically.
③ **Tray Lift Angle** – Sets the position angle for the arm to lift the tray automatically.
④ **Tray Lift Speed** – Sets the speed at which the arm lifts the tray automatically.
⑤ **Tray Pick Angle** – Sets the position angle for the arm to pick up a tray automatically.
⑥ **Dough Stickiness Detection Switch** – Enables or disables the dough stickiness sensor.
⑦ **Residue Detection Switch** – Enables or disables the leftover/residue sensor.
⑧ **Tray Placement Detection Switch** – Enables or disables the tray placement sensor.
⑨ **Audio Alert Switch** – Enables or disables warning sounds.
⑩ **Empty Tray Detection Switch** – Enables or disables the empty tray sensor.

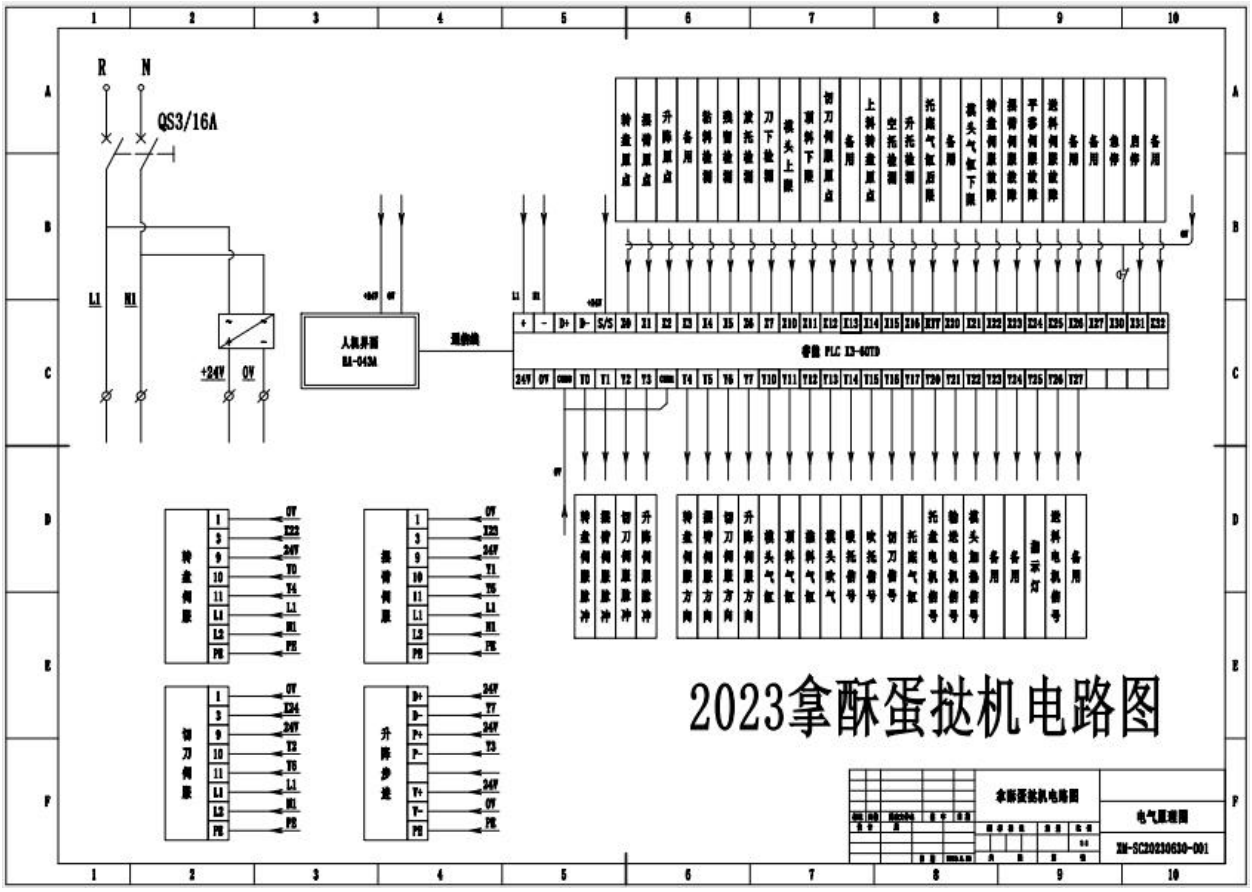
5. Electrical System

5.1. Electrical Schematic Diagram

This section provides the **electrical schematic diagram** of the machine, detailing:

- Power supply connections
- Control circuits for the main forming unit, conveyor, cutting knife, and arm mechanisms
- Sensors, actuators, and emergency stop wiring
- Touchscreen HMI interface wiring

(Refer to Figure 5.1 for the complete electrical schematic.)



(Figure 5.1)

6. Common Issues and Solutions

Fault	Possible Cause	Solution
Machine fails to start	1. Electrical alarm active or emergency stop pressed 2. Sensor malfunction or sensor not returned to reset position	1. Turn off the power, then restart and reset the emergency stop 2. Check each sensor for faults and ensure all sensors have returned to their original positions (indicator lights on)

7. Included Accessories and Wear Parts List

7.1. Included Accessories

Name	Specification	Quantity
Tool Box		1 piece
Hex Key Set		1 set
Adjustable Wrench	12 inch	1 piece
Open-End Wrench	8-10 mm 14-17 mm 17-19 mm	1 piece for each

Phillips Screwdriver		1 piece
Flathead Screwdriver		1 piece
Needle-Nose Pliers		1 piece
Instruction Manual		1 piece

7.2. Wear Parts

Name	Specification / Remarks
Heating Coil	1 piece, as required
Suction Cup	2 pieces, as required
K-Type Thermocouple	1 piece, as required

8. Maintenance and Care

8.1. Shift-Based Cleaning and Maintenance

1) Wipe the machine's worktable and external surfaces with a **clean, slightly damp cloth**.
2) Before cleaning or wiping, **turn off the power** to ensure operator safety.
3) Use **compressed air** to remove debris from the **dough feeding mechanism, stacking mechanism, and brush wheels**.

8.2. Monthly Inspection and Maintenance

1) Lubricate gears and sprockets that are in **intermeshing contact** within the machine's transmission system. Apply a **thin layer of oil**; avoid over-lubrication.
2) **Do not lubricate** the synchronous belts or conveyor flat belts with oil. Lubricate only the **sealed-end bearings** as required.
3) Check the tension of transmission chains and belts, and **adjust if necessary**.
4) Inspect all screws and nuts on machine components; **tighten if loose**.

8.3. Semi-Annual Maintenance and Care

1) Inspect the **transmission belts and conveyor flat belts** for wear; replace if necessary.
2) Check all **wear parts** and replace them promptly as needed.
3) Inspect all **transmission components** for wear and replace if required.
4) Check and tighten all **electrical connections**, and use **compressed air** to clean dust from electrical components.