User Manual for
Ice Cream Robot Products
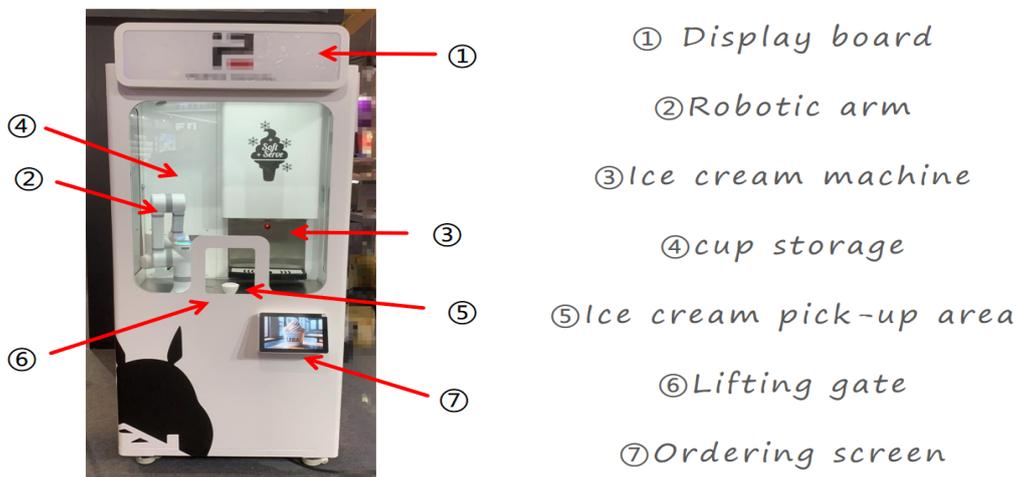
Table of contents

1.   Product profile

This product takes the six-axis cooperative robot as the core, equipped with ice cream machine and peripheral control equipment integration, and serves entertainment places, children's parks, social catering, hotel self-service and other places that need to promote the catering intelligent retail and publicity drainage.

■ 1.1 Product Composition and Functions

① Display board

②Robotic arm

③Ice cream machine

④cup storage

⑤Ice cream pick-up area

⑥Lifting gate

⑦Ordering screen

■ 1.1.1 Composition

The composition of this equipment system is shown in the figure, mainly including workbench, cooperative robot, ice cream machine, control system, point payment system and data management platform, etc.

■ 1.1.2 Product Functions

The product is mainly composed of hardware system, control system, communication system, software interaction system and data management platform, in which the basic functions of each system are as follows:

Hardware system:

Make up the product shape frame and be responsible for the functional implementation

Dispatch control system:

Realize the whole functional process, mainly to complete the scheduling and control of the production process

Communication system:

Mainly through the sensor formed by the local area network and the internal and external communication and prompt function

Software interaction system:

It mainly includes order payment and online debugging systems, which realize order payment and debugging through convenient human-computer interaction

Data management system:

The data management system mainly realizes operation and maintenance and data management

1.2 Specification and parameters

Type	Name	Specification parameters
Essential parameter	model	LB240Z-IRPP-202
	size	W900*D1250*H2100 mm
	floor space	1.5 m²
	Electricity specifications	AC 220V 50Hz
	service rating	2.5 kW
	work efficiency	30s / unit
	The weight of the machine	300kg
Lebai LM3 Six-axis cobot	Robot load	≤3kg
	Robot working radius	638mm
	levels of protection	IP54
Ice cream machine	Material tank volume	9.5L
	Cylinder volume	2L
Equipment function	Paper cup capacity	150
	Dining out testing	Photo sensor
	Order method	Point on the single screen + scan the code for payment
	Query data records	Cloud platform
	Communication mode	Cable network or wireless networks

2. equipment installation

■ 2.2 Precautions before equipment installation

> ⚠️ Please read this user manual before installation
> Please check the accessories in the packing box and keep them well
> The power supply to the equipment must comply with the national grounding standards

This equipment is a metal electrical control equipment. Before power on, the power supply to the equipment meets the grounding protection of national standards. Otherwise, there may be leakage of equipment due to the lack of grounding protection, causing harm to human body. Various safety measures must be taken when installing equipment. Power test can be carried out if there is no power short circuit.

* If there is any abnormality during installation, please contact your supplier in time

■ 2.2.2 Preparation before installation

1) The site space shall not be less than 2 m (length) * 1.5 m (width) * 2.4 m (height)

2) Power supply: AC220V, the bearing power of the cable is not less than 2.5kW

3) Network port (the wired network configuration is the best)

4) Indoor or semi-open scenes, you need to avoid direct sunlight and rain

5) And ensure that the internal operating temperature of the equipment is below 30 degrees Celsius

3. Description of the control system

■ 3.3 Order system

After customers choose the ice cream and the quantity according to their needs, click to confirm "Order", complete the order and show the payment code, and automatically enter the queue. The interface is as follows (WeChat, Alipay is supported)
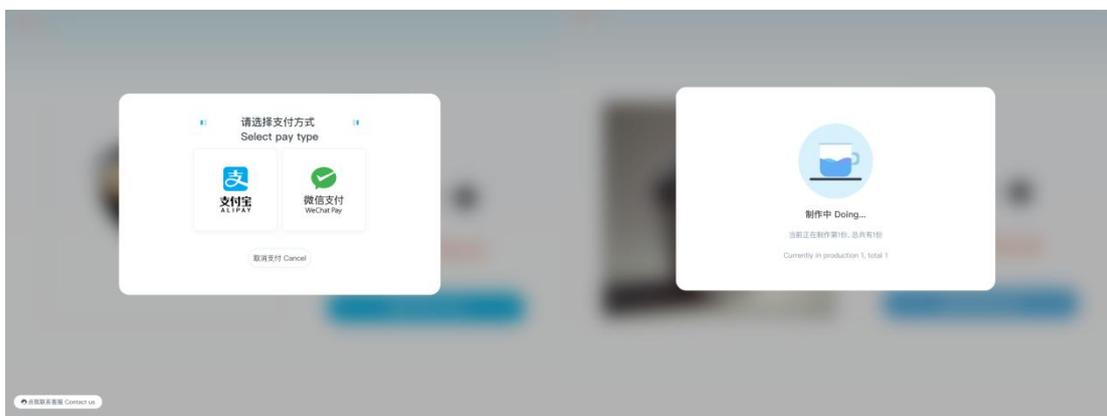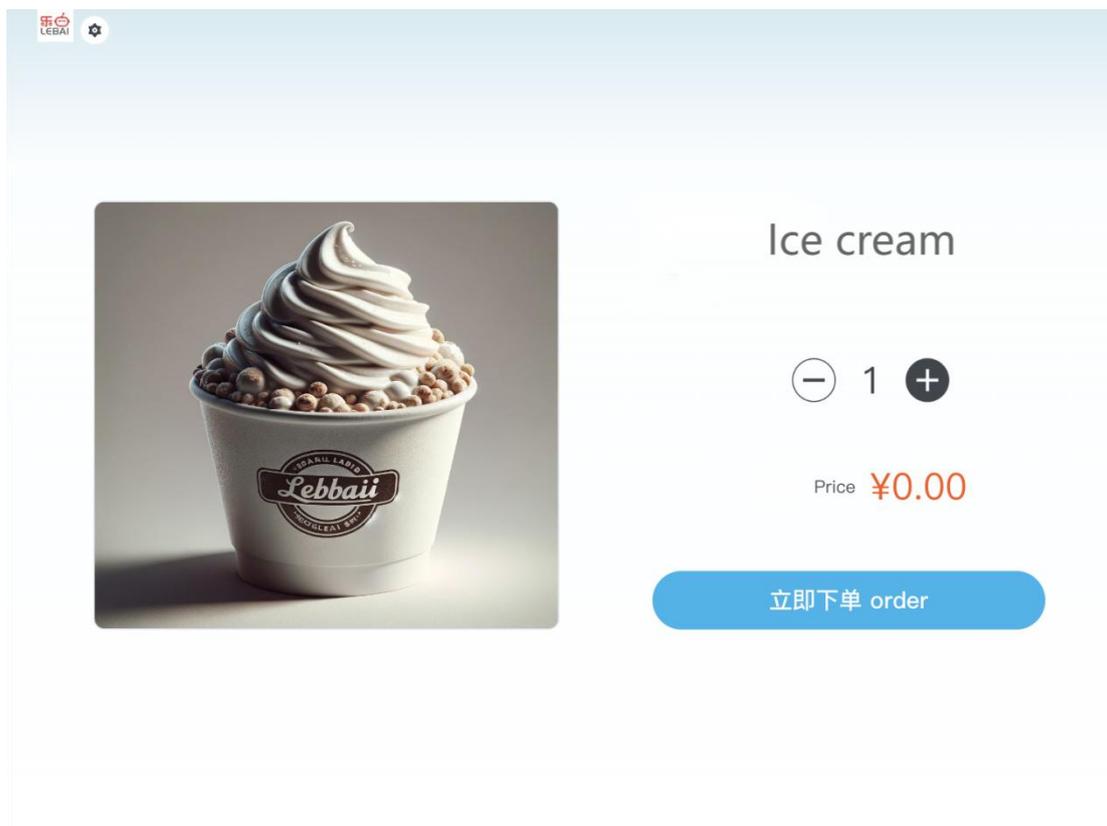
■ 3.4 Commissioning system

This equipment supports operators to debug the status of the equipment (limited to daily maintenance personnel who are familiar with the product). The debugging interface is divided into several parts, as follows:

　　1. Enter the password to enter the maintenance interface. The default password is "1234". After entering the maintenance interface, you can change the password
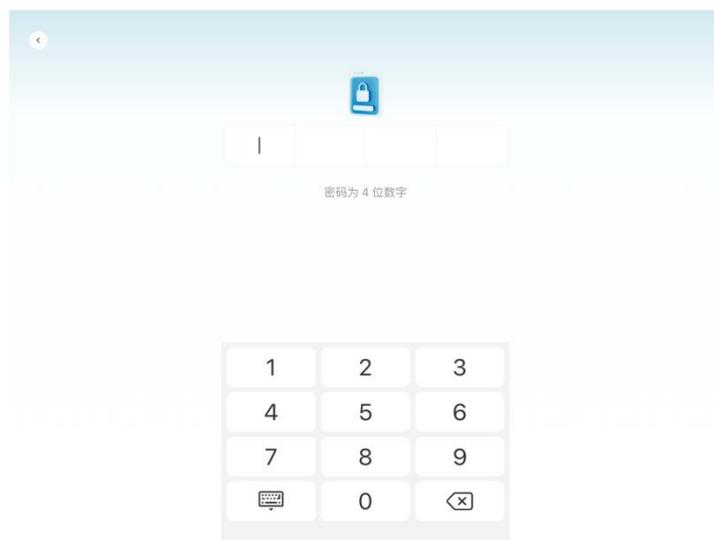
　　2. The maintenance interface is shown as follows below:

(1) Status bar: displays the working status of the mechanical arm, ice cream machine, milk pulp, reserve bucket and cup loader

(2) Debugging button:

① Resume orders:
When the robot is in "out of business for maintenance" or other "abnormal" status and the equipment is unable to receive orders, the ability of the equipment to receive orders is restored.

② Open gate:
Open the lifting gate and test the lifting gate

③ Close gate:
Close the lifting gate and test the lifting gate condition

④ Gate reset:
When the lifting gate position is abnormal, reset the lifting gate

⑤ Discharge port open:
Start the electric push rod and the ice cream machine starts to discharge (notice milk leakage during the equipment operation)
Turn on the water supply during cleaning, and be sure to keep it closed (the plunger is at the bottom) when pouring in mix or clean water.

⑥ Discharge port close:
Turn off the electric push rod, and the ice cream machine stops discharging

⑦ Cobot back to the origin position:
Command and control the robotic arm to go back to the initial point

⑧ Falling cup:
The command controls the cup loader to perform a cup loader once

⑨ Rotary cup bucket:
The command controls the cup dropper to execute a cup dropper transfer instruction. When there is a paper cup in the front cup bucket, misuse of this function will cause the paper cup to be pinched and deformed.

⑩ Urgent stop robot:
Stop the robot urgently

⑪ Start the robot:
Restore the robot

⑫ Out of business for maintenance:
Put the equipment into a closed maintenance state for equipment maintenance

(3) Device control

① Mode switching:
Single item, for single ice cream (default)

② Change password:
Modify the device maintenance mode password

③ Commissioning page:
Equipment parameters debugging, mechanical arm control and calibration

④ Ultraviolet lamp:
Set the opening and closing time of ultraviolet lamp (take careful not to shine directly on the human body)

⑤ Exit application:
Normal does not require any use

⑥ restart Pad:
Normal does not require any use

⑦ shut down Pad:
Normal does not require any use

3. Debugging interface

参数设置		控制	
延时开电缸: 1 s	刮刀运行: 5 s	延时摆动: 1.7 s
出料时长: 4.5 s	冰淇淋半径: 0.025 m	冰淇淋节距: 0.006 m
顶托补偿: 0.015 m	圈数: 16 圈	加速度: 1 m/s²
速度: 0.6 m/s	夹爪幅度: 25 %	夹爪力度: 25 %
重 置		保 存	

The interface is mainly for parameter debugging when no other mobile device is connected to the robot for scene debugging. The main purpose is to be used for the flower shape debugging and position debugging: the ice cream flower shape debugging and the robot position point can be adjusted according to the material and the site status.

Ice cream shape debugging:

Adjust the action position of the mechanical arm and the ice cream pitch after reaching the ice cream discharge point.

Position adjustment:

Adjust the end position of the mechanical arm in the control interface, and the adjustment point can be selected on the right side of the interface:

Description of the right-side interface button:

1. Move to point:

After confirming the target point, order the end of the robotic arm to move to the point

2. Update point:

Update the position data of the target point. The updated data is the actual point information of the current robot arm.

3. Back to the beginning:

Bring the robotic arm back to the initialization point

4. Reset the default point position:

Reset the default point point data

Description of the left-side interface button:

1. Test product is run:

Command the robotic arm to run the full scene process directly once

2. Move up / down:

Control the end of the robotic arm up and down along the Z axis

3. Front and back left and right:

The end of the control mechanical arm moves in the X, Y-axis plane

4. Emergency stop:

Urgent stop robot

5. Start up:

Start the recovery robot

6. Teaching mode:

Start the robot teaching mode, used for manual debugging

7. Cancel the teaching mode:

Cancel the teaching mode

■ 3.5 Data Management (Lebai Cloud Service Management Platform)

Lebai cloud service management platform website:

https: / / shop.lebai.ltd/

The account number is provided by the Lebai Robot Company.

Cloud platform can operate data analysis, collection account Settings, commodity definition & price setting, customer refund operation and warning information (shortage information, robot and ice cream machine fault information) push, and other functions, facilitate operational maintenance, users can apply for open management account, as shown in the figure below, the menu has a variety of scenarios and Settings.(Warning information can be queried through the cloud platform or added to receive and push in real time to facilitate remote management)
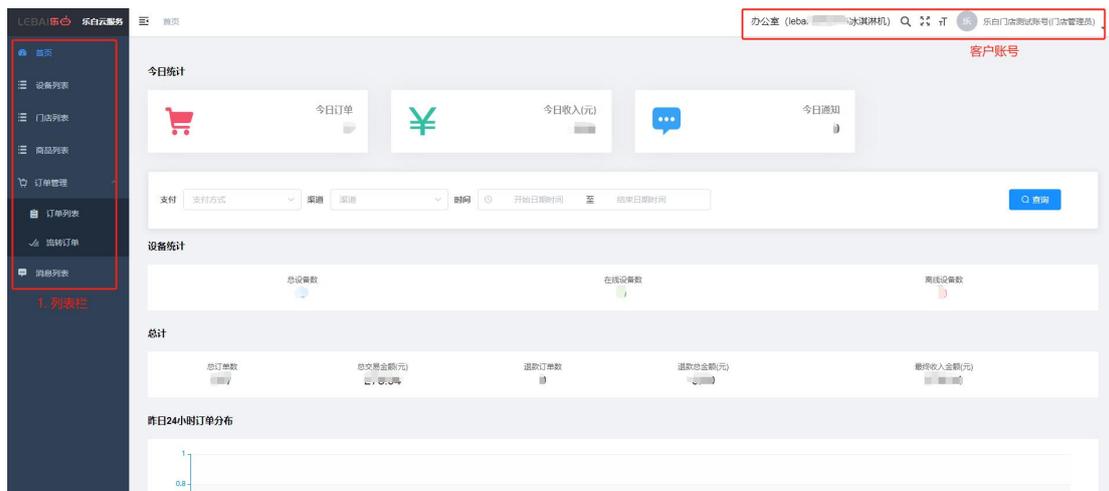
1. Home page: Dashboard of website

2. List of equipment: Confirm the equipment information and confirm the equipment status in real time

3. List of stores: Display and change the store settings

4. List of goods: Confirm and modify the store related product information, pictures, etc

5. Order list: Display store order information, and conduct data analysis and export according to different payment methods and channels

6. Message list: Equipment return feedback, fault information alarm

■ 3.6 Introduction of ice cream machine equipment and interface functions

Safety precautions

◆ Please read and understand the safety precautions carefully before use.

◆ Please comply with the safety-related contents described below.

◆ The meaning of the logo is stated as follows.

Notes: The equipment should use the power lines of more than 4 square meters. Pls entrust the electrician to connect the ground wire in advance, otherwise it is easy to cause the electricity leakage and electric shock hazard of personnel. **Ground**	It is recommended to install the air switch if the rated power supply is 220V. Please connect 16A high-power socket if the plug is needed. The blue line N is zero line for 380V. Red, white and black L-lines are live lines. The yellow-green colorlines are ground wire. **Caution**
Do not damage the power line, or process, stretch, bundle and bend it, otherwise it may cause electric shock or fire accident. **Forbidden**	Do not connect the live line and the zero line in a wrong way, otherwise, it will burn out the equipment main board or transformer. If three live lines are connected incorrectly, the screen will display "Phase Error" alarm. You need to change the position of each two wires. (Suitable for 380V model) **Forbidden**

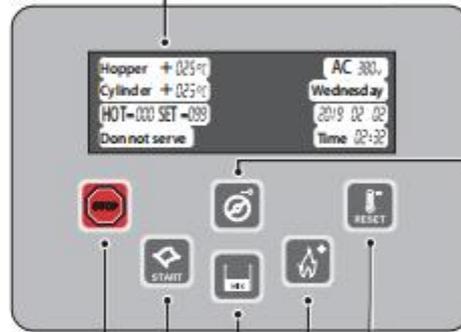|	
Danger! Electric shock!	It is easy to cause electrical shock hazards if you fail to follow the circuit connection in the instructions.
No disassembly!	The disassembly of equipment by non-professionals may lead to equipment damage.
Grounding	The equipment must be grounded, otherwise it will easily lead to static electricity.

Equipment parts (Gravity model)

Hopper cover

Air tube

Agitator blade

Piston reset ring

Side piston

Clip scraper

Discharge door O ring

Piston O-ring

Handle

Beater

Beater shaft

Tray-drip cover

Discharge door

Nut

Tray-drip

Introduction for the control panel

Display screen

For detailed digital explanation,
please refer to page 6

【Wash button】

Short press this button, the
main motor works only, which
is only for cleaning. When the
machine is under [Cleaning]
mode,the air pump stops
working when first short press
this button. The main motor
stops working when short
press this button for the
second time.
Press this button long to
activate the function of [Screen
Lock]; press this button long
again to unlock.

```
Hopper  +025°C      AC 380v
Cylinder +025°C     Wednesday
HOT=000 SET=099     2019 02 02
Don not serve       Time 02:32
```

【Stop button】

Press this button for 5 seconds to
stop the current working mode and
enter into standby state.

【Refrigeration button】

Press this button to enter into the
refrigeration mode. The screen displays
[Do not serve!];when the screen displays
[Product is ready!], you can make ice cream.
When making the first batch of ice cream,
do not touch the photoelectric sensor switch,
otherwise the refrigeration will stop and the
operation will be resumed automatically after
your hand moves out from the sensor switch.

【Mix low alarm】

If the signal light is on, mixture level the hopper
is too low , and the temperature will be kept
between 1~5 °C. The actual preservation period
will depend on the real material property used.

【RESET Pre-cooling】

Press this button, the machine
enters into pre-cooling mode,
and the temperature of the
unused raw materials left
inside the hopper will be kept
between 1-5 °C . The
preservation period will be
different for the different
mixture,it depends on the
actual situation.Under
refrigeration mode, short
press this button to decrease
the hardness.

【Heating button】

Short press this button to
start Heat mode, the machine
will stop automatically after
the cylinder temperature
reach 10 °C. Press this button
long to start [Pasteurization].
Under normal circumstances,
the duration of no-wash can
be extended. Under
refrigeration mode, short press
this button to increase the
hardness.

Display screen content explanation

Digital displays (status display) ⟶

Display	Contents
「Temperature」 **Hopper +025℃**	It indicates the current temperature of hopper.
「Temperature」 **Cylinder +023℃**	It indicates the current temperature of the cylinder.
「Hardness」 **HOT=000 SET=099**	It indicates that the machine is in refrigeration mode. HOT indicates the current hardness value , and SET indicates the setting hardness value .
「Working mode」 **Don't serve**	It indicates that the current hardness value has not reached the setting hardness value. When the HOT value rises to the setting hardness value, the screen will display "Product ready" and the ice cream can be made.
「Voltage」 **AC 380v**	It indicates the current voltage. If the voltage is too low or too high, the machine protection program will be triggered and the machine will be stopped automatically.
「Date」 **Wednesday** 「Calender」 **2019/02/02** 「Time」 **时钟 02:32**	It indicates the current time.

Adjusting method of the hardness value

Each raw material has an optimum hardness value corresponding to itself. It is recommended to set the hardness value to 100. The hardness value should not be set too high, otherwise it may cause Frozen Cylinder. Please strictly follow the instructions below.

!

Note
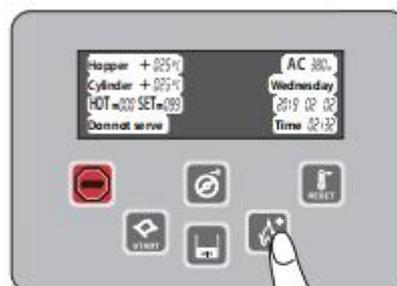
1 In refrigeration mode, press [ ] [ ] this button to adjust the hardness value.Now SET=092

$$SET = 092$$

⇩

2 Press [ ] this button to increase the current hardness value, each time it will be increased by the value "1". SET=093
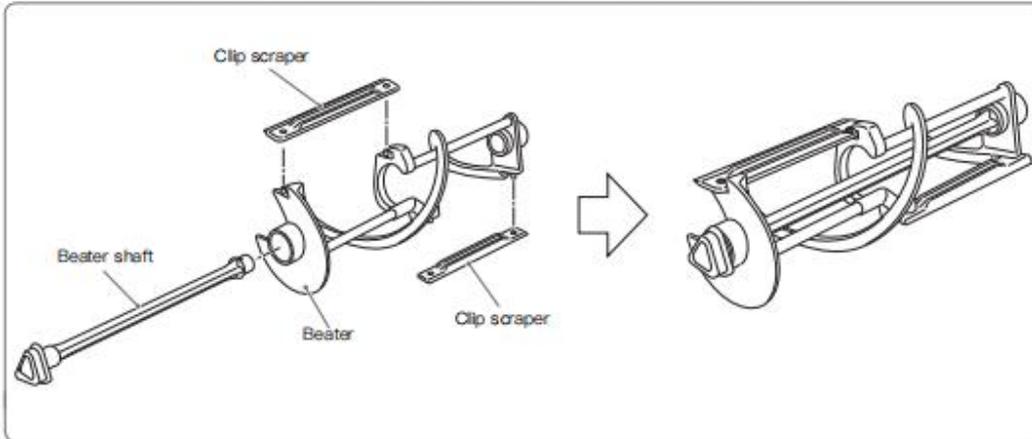
$$SET = 093$$

⇩

3 Press [ ] this button to decrease the current hardness value, each time it will be decreased by the value "1". SET=092

$$SET = 092$$

Assembly method of key parts

1 Assembly of beater

Please install the clip scraper and beater shaft on the beater according to the method below.
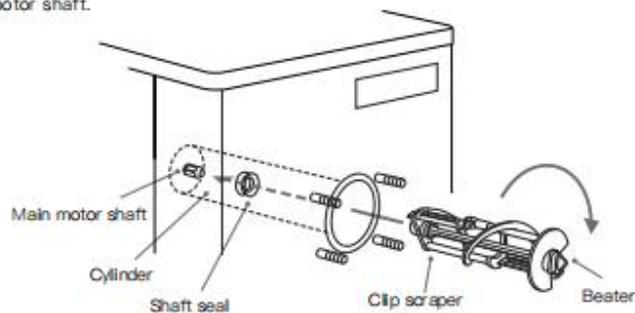

User notes

- The clip scraper has two sides. The side with alphabet is facing upward and fixed through two fixed holes on the blade.

- The clip scraper has a sharp cutting edge. Please be careful during installation. Don't install it in the reversed direction. Otherwise, it may lead to poor taste and forzen cylinder.

2 Beater installation (* Note: Make sure the power switch is off before installation)

Please insert the beater into the cylinder. Slowly rotate with hand while inserting it to the beater motor shaft.

The direction of the beater shaft is ◁ when inserted. (vertex of a triangle upwards) .

Please apply proper amount of lubricating oil on the inner surface of the shaft seal and install it on the main motor shaft.

4 Discharge door installation

① Make the four fixed holes on the discharge door align with the bolts on the machine and install the discharge door carefully

② Install fixed nuts and tighten the four nuts diagonally.

Nut

Screw bolt   Discharge door
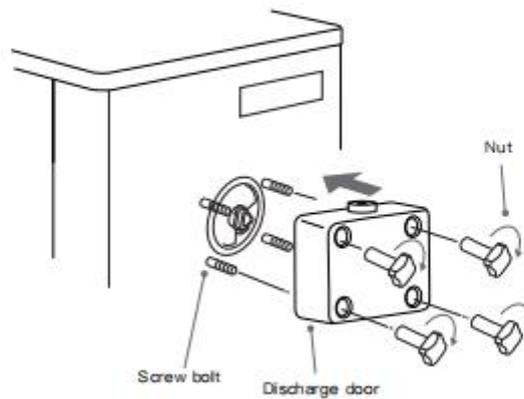
User notes

1. Tighten the nuts diagonally, otherwise it may lead to poor sealing of the discharge door.

2. Poor sealing may lead to ice cream leakage from the crack.

5 Assembly for the air tube

Please check the O-ring carefully at the bottom of the air tube. The outer air tube hole where the protruding part of the inner air tube located is the hole currently used.
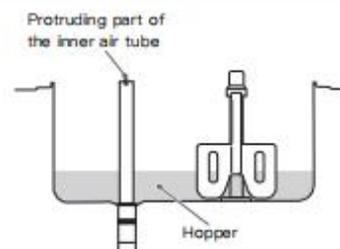
When the mixture level is higher than the bottom hole, you can identify the hole used by checking the top outer air tube hole position where the protruding part located.

* Notes: Do not install this accessory before pouring into the mixture. Otherwise, the raw material may not flow into the cylinder completely.

Hole position

Outer air tube

Inner air tube

Air tube o-ring
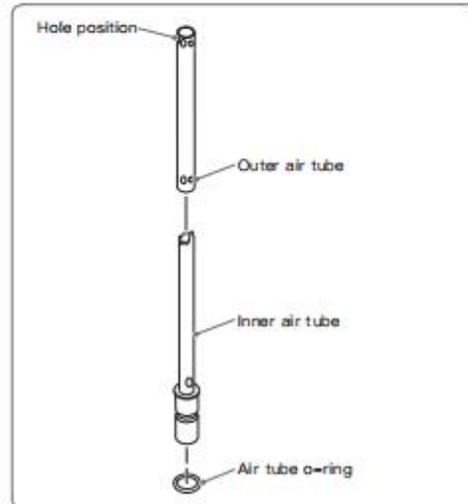
6 Operation for air tube

● Air tube is able to transport raw materials to refrigeration cylinder stably and continuously, to maintain the stability and continuity of ice cream discharging. hole position the air tube can be adjusted according to the business conditions. (The adjustment method is as follows.)

● The hole used can be identified according to the outer air tube hole position where the inner protruding part located.

Protruding part of the inner air tube

Hopper

Hole position		Usage condition
Close	Protruding part	● Raw materials pouring into the equipment to start the ice cream making of the first cylinder. ● Pre-cooling function of raw materials.
Small hole		● Occasions for normal sales. ● It is usually used when starting business in the morning with small passenger flow.
Medium hole		● Occasions for normal sales. ● The raw material supplement can follow the amount of ice cream discharging out under the normal traffic.
Big hole		● Occasions for normal sales. ● A large number of raw materials are needed to added to the refrigeration cylinder with large passenger flow. Big holes are needed to ensure that the thick material of poor fluidity can be added into the cylinder.

Users notes

● Please disinfect hands or put on gloves before touching the air tube.

● We need to choose the appropriate hole size of the air tube hole according to the sales volume. Otherwise, the ice cream will become too soft or too hard to be produced normally.

● Please adjust the hole size to the maximum size or pull it out when cylinder gives out abnormal noise.

Ice cream making process
(* Applicable to gravity model)

1 Prepare 5L raw materials

Caution: Do not pour anything other than water or raw materials, otherwise, it will cause failure for the equipment. Make sure that the hopper does not have any water remaining before pouring the material.

① Before pouring the material, make sure that the storage hopper does not have any water remaining.

② If the raw material contains particles such as non-meltable fibers, please contact with PASMO.
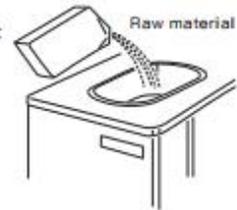
Raw material

2 Pour the raw materials into the hopper , ensure that the raw material level exceeds the level meter

Precaution
Do not fill the cylinder with material completely. Install the air tube when there is no bubbles coming from the blanking hole any more to ensure that the ice cream produced has a stable expansion rate.
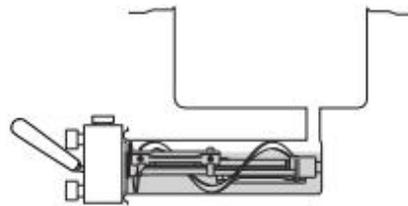
3 Air tube installation

① The air tube should be in the status of closed hole. Stop the material from flowing into the cylinder through the feed downpipe so as to ensure that mixture quantity in the refrigeration cylinder is fixed.

② Place the hopper cover to prevent foreign objects from falling into the hopper. The mix low alarm on the screen will stop flashing when the material level higher than the level meter

③ If the raw material is thick, adjust the air tube to the medium or large hole.

Hopper cover
Close hole
Air tube
Blanking hole
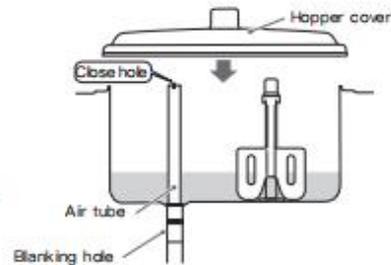
4 Making ice cream

Press START button to make ice cream. When screen shows 'PRODUCT IS READY',it means the ice cream is ready and you can discharge the ice cream.Please adjust the air tube to small or medium hole,or adjust the hole position according to the passenger flow.

START
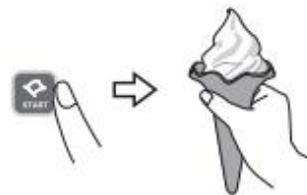
Daily operation (* Applicable to gravity model)

Washing of equipment accessory
- Sterilize and wash three times a week.

Installation of equipment accessorie
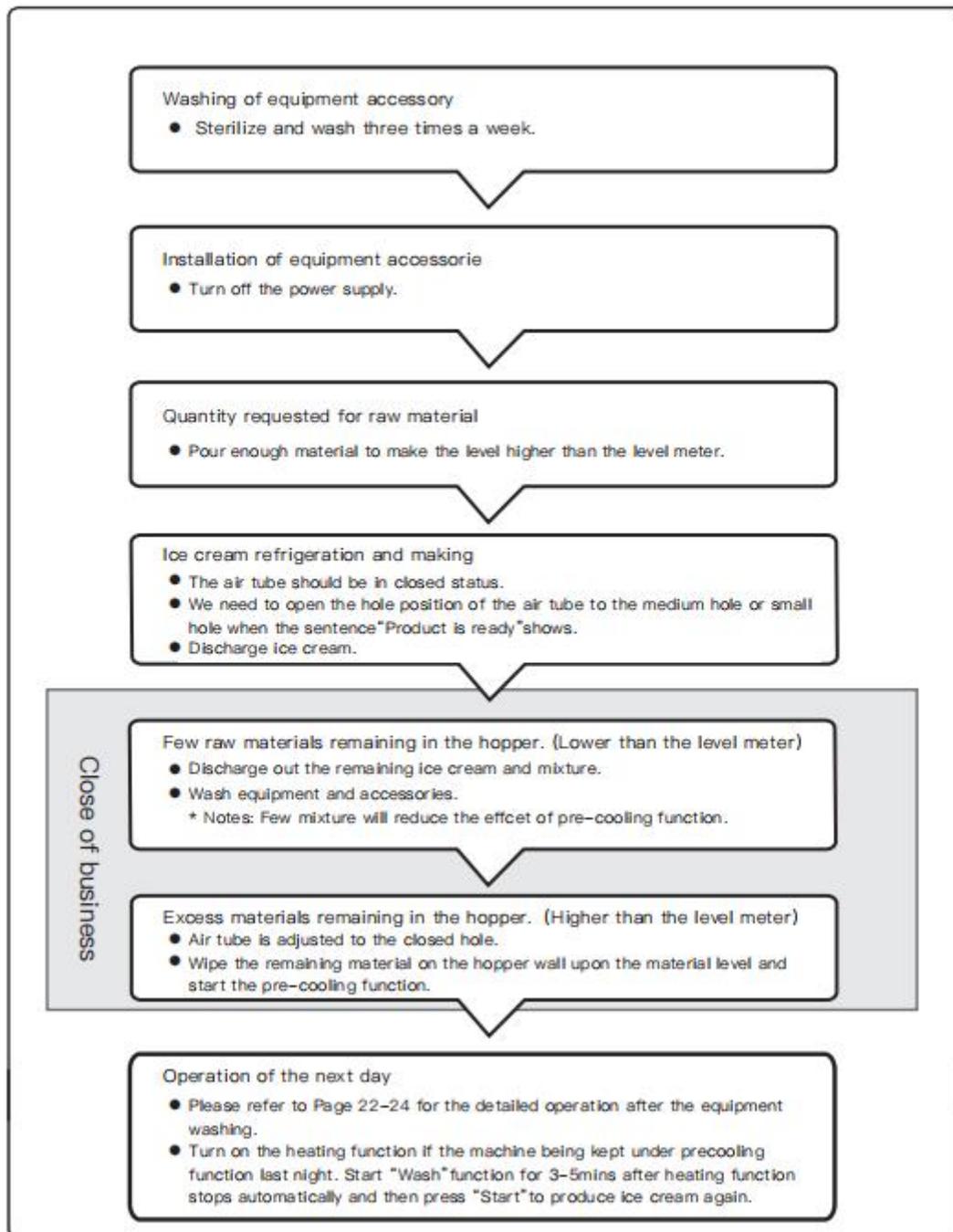- Turn off the power supply.

Quantity requested for raw material
- Pour enough material to make the level higher than the level meter.

Ice cream refrigeration and making
- The air tube should be in closed status.
- We need to open the hole position of the air tube to the medium hole or small hole when the sentence "Product is ready" shows.
- Discharge ice cream.

Close of business

Few raw materials remaining in the hopper. (Lower than the level meter)
- Discharge out the remaining ice cream and mixture.
- Wash equipment and accessories.
  * Notes: Few mixture will reduce the effcet of pre-cooling function.

Excess materials remaining in the hopper. (Higher than the level meter)
- Air tube is adjusted to the closed hole.
- Wipe the remaining material on the hopper wall upon the material level and start the pre-cooling function.

Operation of the next day
- Please refer to Page 22-24 for the detailed operation after the equipment washing.
- Turn on the heating function if the machine being kept under precooling function last night. Start "Wash" function for 3-5mins after heating function stops automatically and then press "Start" to produce ice cream again.

4. Maintenance and maintenance

Maintenance is one of the most important ways to ensure whether an equipment can operate normally and persistently. Maintenance work includes cleaning and daily function inspection of the equipment to ensure that the equipment system operates without failure and prevent premature wear of the equipment The special equipment is operated under manned duty, and the site personnel are responsible for the management of operation safety and food and health.

> Safety tip: ensure that all power supply of the equipment must be disconnected before maintaining the cover of the equipment
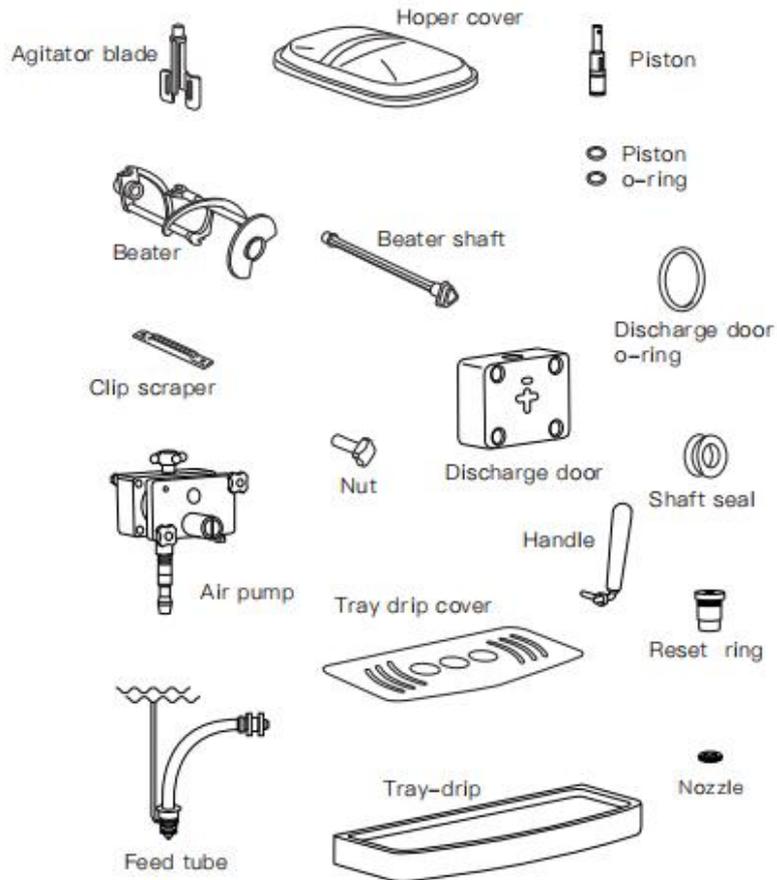
■ 4.1 Maintenance of equipment (cleaning + cleaning)

Ice cream machines require regular cleaning and maintenance, usually deep cleaning twice a week. For specific cleaning and maintenance, please see the ice cream machine maintenance video; other ancillary equipment should be cleaned as needed. In particular, wear disposable gloves for cones adding and milk mix refills, and keep the countertop and glass of cleanliness.

The nozzle cap needs to be cleaned daily (equipped with a cross removal tool)

The routine cleaning operation process is as follows, including instructions for cleaning accessories, suggestions for using cleaning brushes, and cleaning procedures:

Washing parts (* Applicable to air pump model)

Agitator blade

Hoper cover

Piston

Piston
o-ring

Beater

Beater shaft

Discharge door
o-ring

Clip scraper

Nut

Discharge door

Shaft seal

Handle

Air pump

Tray drip cover

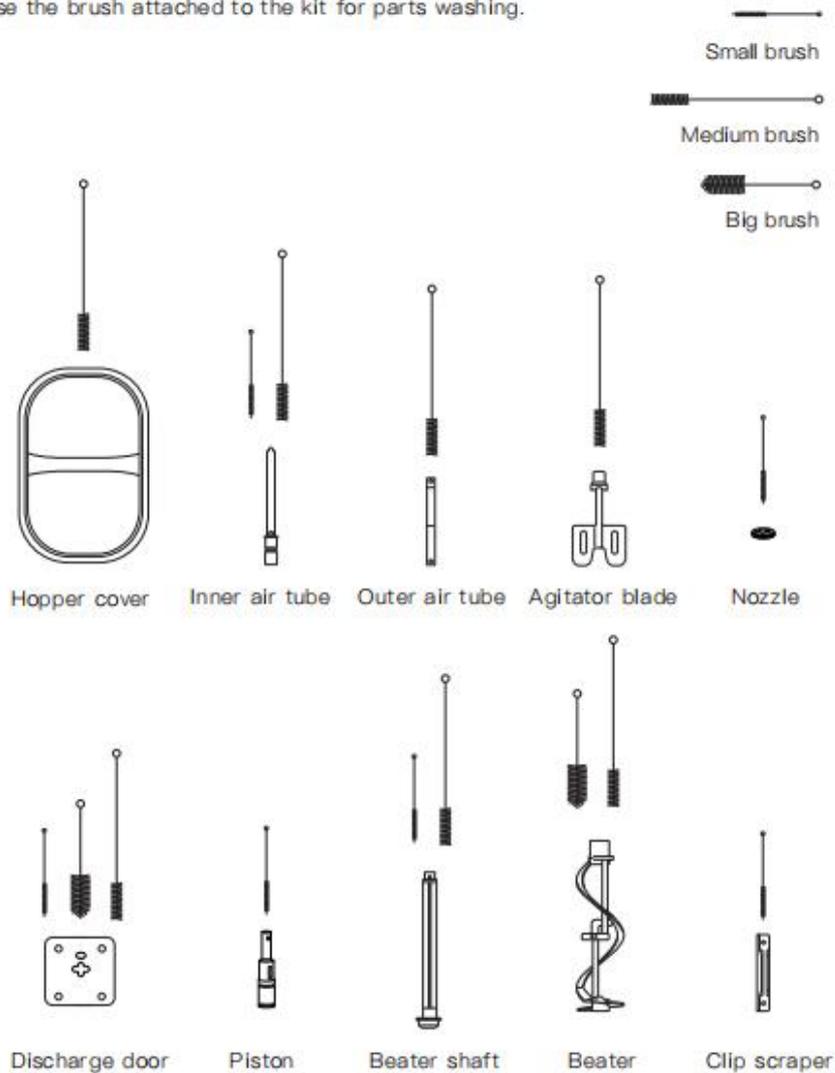Reset ring

Feed tube

Tray-drip

Nozzle

User notes

● Please handle the parts gently and contact the manufacturers for timely replacement if it is damaged or lost.

● Do not wash parts with hot water above 40℃ to prevent parts from deforming.

● Do not immerse parts in sterile water for more than 30 minutes.

Brush usage
recommendation (* Applicable to gravity model)

Please use the brush attached to the kit for parts washing.

Small brush

Medium brush

Big brush

Hopper cover   Inner air tube   Outer air tube   Agitator blade   Nozzle

Discharge door   Piston   Beater shaft   Beater   Clip scraper

User notes

● Please wash the parts which are connected with the raw materials carefully.
● Pls be careful when washing the clip scrapers because the cutting edge is sharp. It is recommended as well to use special disinfectant powder for washing the equipment.
● The inside of the agitator blade needs to be washed carefully.

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Washing process

1 Ratio of food-grade disinfectant powder for machine washing and disinfection.
The ratio is 1:9.5L (1 bag of sanitizer and 9.5L water).
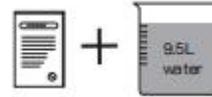
2 Install the agitator blade back into the hopper.

3 Turn on the power switch. Do not press the WASH button if there is no water or raw materials in the cylinder to prevent the clip scrapers from wearing.

4 Pour 5L disinfectant water in total into the hopper. Press the WASH key to start the device.

Press the STOP button to stop after working for 1-2 minutes.

WASH   Press STOP after 1-2 mins   STOP
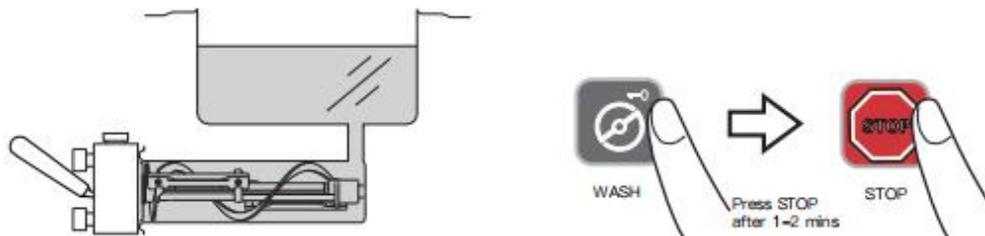
5 Please wash the hopper with the brush and disinfectant water for 2-3 times.

- Please clean the blanking hole with big brush carefully.
- Please wash the level meter with medium brush.
- Please wash the agitator shaft with small brush.

Big brush   Medium brush

Small brush

Blanking hole   Hopper   Agitator shaft
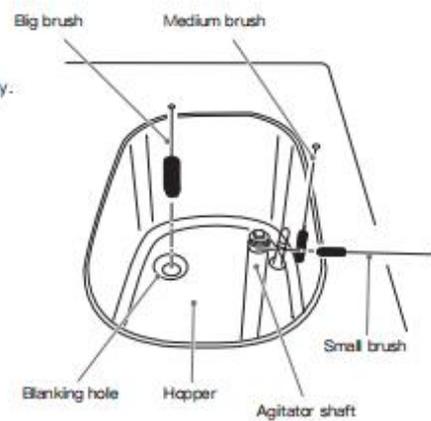
6 Please discharge the remaining disinfectant water in the equipment by using the drainage box.

- Fix the contraction band of the drainage box onthe top two nuts of the discharge door.

- Press the handle down to discharge the disinfectant water.

Drainage box

PASMO PASCAL

2M drain pipe

The pipe directly connects to the sewer
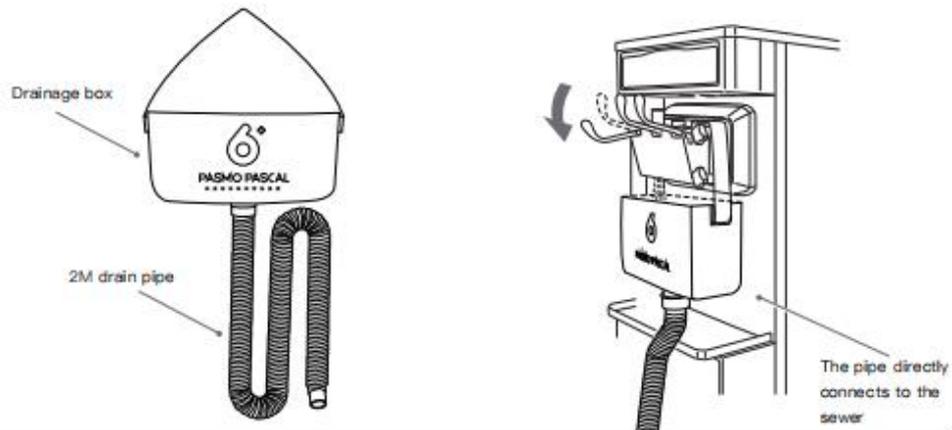
7 Please pour a proper amount of clean water into the hopper after the discharge of disinfectant water and repeat the above steps for 2 to 3 times.

8 Please disassemble the drainage box after drainage and wipe inner drainage box clean with a towel and keep it in a cool place.
Please wipe the refrigeration cylinder and hopper with a clean towel.

9 Make sure to turn off the power supply to avoid unnecessary safety hazards for the part washing.

- Please remove the piston O-ring by using stainless steel fin in the accessory kits.

- Pleas wash the piston groove with a small brush.

Stainless steel fin

Piston o-ring

Small brush
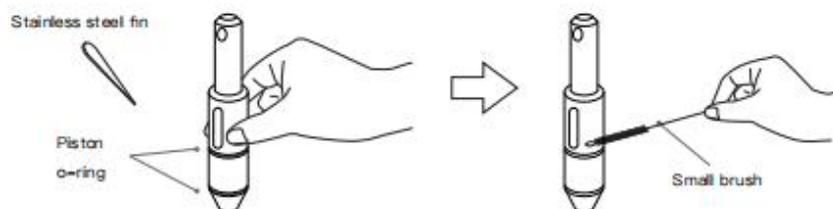
■ 4.2 Raw material supplement (milk milk + cone / paper cup)

Pay attention to the hygiene of milk ingredients supplement, need to wear disposable gloves, milk supplement to shake well (must close the discharge valve when pouring in); check the integrity of the cone and whether there is adhesion when filling, if you need to select, otherwise affect the ice cream production.

5. Fault analysis and handling

This product is equipped with user manuals and video guidance as well as paper instructions for the accompanying ice cream machine. Please be sure to read them carefully. If there is an abnormality in the equipment, first self-check according to the following tips. If it is invalid, contact our company's professional technical personnel for support.

Fault phenomenon	Possible cause	Treatment measure
Can't order	At the table, the ice cream was not taken away	Take ice cream
	Out out sensor failed	Wipe down or replace the sensor
	The ice cream maker was not ready	Wait to be ready to operate
Egg tube problem	The cone is inherently damaged	Stop equipment processing or remaking
	Claw holding broken	Check the finger grip force and opening
	The cone automatically falls off	Too many too much or feed vertical impact cause Cato fatigue, replace Cato
	Egg barrel adhesion	Cgo sorting to reduce clamping strength
Payment after no production or a production failure	Network system problems	Check the network connection and signal problems
	Ice cream is in bad shape	Re-play or background refund operation
Mixer failure	Voltage or current is too high	Shut down, wait for 5-10 minutes to restart

Fault phenomenon	Possible cause	Treatment measure
The robot to stop	Multiple cones trigger an emergency stop at a time	Start at the lower right corner of the system debugging interface and return to the origin
The lifting door was not closed	No reset	Select the reset lifting door at the equipment maintenance screen
Ice cream is in fresh mode	No stop key is pressed	Press stop for 5 seconds, then press start to cool
The ice cream is too soft or too strong	The ice cream is not adjusted	Increase or decrease the hardness of ice cream (recommended range 95-100)
The residual raw materials can not be released when cleaning	The ice cream is still in a semi-solid state	Press the heat button or wait for a while to melt before releasing it