



KING MACHINERY USA INC

Operation instruction

Small tempering machine

TWJ-025L-V0.0



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1 Important information

1.1 Applicably documents

The operating manual is an integral part of the respective operating instructions.

Documents	Published by
Spare parts list	
Electrical Wiring Diagram	KING MACHINERY USA INC
Motor Manual	Supplier
Compressor instruction	Manufacturer supplied file

1.2 Contact

- If you have any questions, please contact KING MACHINERY USA INC.
- Keep this instruction ready at hand.
- Keep the machine number ready at hand.

1.2.1 Contacting way

Company: KING MACHINERY USA INC

Telephone: NA

Add: 20651 GOLDEN SPRINGS DR STE 339 DIAMOND BAR, CA 91789

1.3 Personal qualifications

1.3.1 Operating

People who operate the production system must be trained and passed the training.

1.3.2 Mechanics

People who work on mechanical equipment must be trained and passed the training.


Non-specialist is forbidden to take apart the machine.

1.3.3 Electrician

People who work on mechanical equipment must be trained and passed the training


1.4 Convention introduce

1.4.1 Warnings explanation

 **DANGER**


Type and source of danger
 The danger WILL result in death or serious injuries.

- Precautionary measures to mitigate the danger.

 **WARNING**

Type and source of danger
 The danger COULD result in death or serious injuries.

- Precautionary measures to mitigate the danger.

 **CAUTION**

Type and source of danger
 The danger MAY result in injuries.

- Precautionary measures to mitigate the danger.

NOTICE

Type and source of danger
 The danger CAN cause material damage.

- Precautionary measures to prevent material damage.

1.5 Technical terms

Term	Meaning
Chocolate	Refer to real chocolate and compound in general.
Real chocolate	Cocoa butter based chocolate; other fat content must lower than 5%.
Compound	Fat based chocolate, but not necessary to only use the cocoa butter, the other fat content cans more than 5%.

2 Safety

2.1 Intend use

This machine is only used to temper chocolate mass.

This machine is not approved for operation in a potentially explosive atmosphere.

- Use the machine only as intended.
- Operate the machine only according to this operating instructions
- Get approval in advance from the machine supplier; if the machine be used exceed the original intention.

2.2 Technical state

Safety, functionality and availability are adversely affected if the production system is operated when in a defective state.

- Operate the production system only when it is in a perfect technical state.
- Comply with maintenance schedules.
- Only use original spare parts listed in the spare parts catalog.
- If the operating behavior of the production system changes, check it for faults.
- Rectify faults immediately.
- Do not make unauthorized conversions or modifications to the machine without approval from manufacturer.

2.3 Personal qualification

No qualified personnel shall not disassemble and maintenance equipment, must keep cover good and fixed well.

2.4 Securing against unexpected start up

If the production system starts up unexpectedly, individuals working on the machines could be injured severely.

- Ensure safety switch of power supply in “0” position and lock.
- Move the key and take where you go.

2.5 Safety device

People are at risk when protective devices are not functioning effectively.

- Ensure that the safety equipment is functioning before operating the production system.

2.6 Safety working environment

Slippery surfaces and tripping hazards may result in serious accidents.

- Wear anti-slip safety shoes.

3 Technical parameters

3.1 Ambient conditions

The same ambient conditions apply to the machine and the switch cabinet.

Description	Value	Unit
Temperature range	+18...+25	°C
Relative humidity, max.	55	%

3.2 Performance parameters

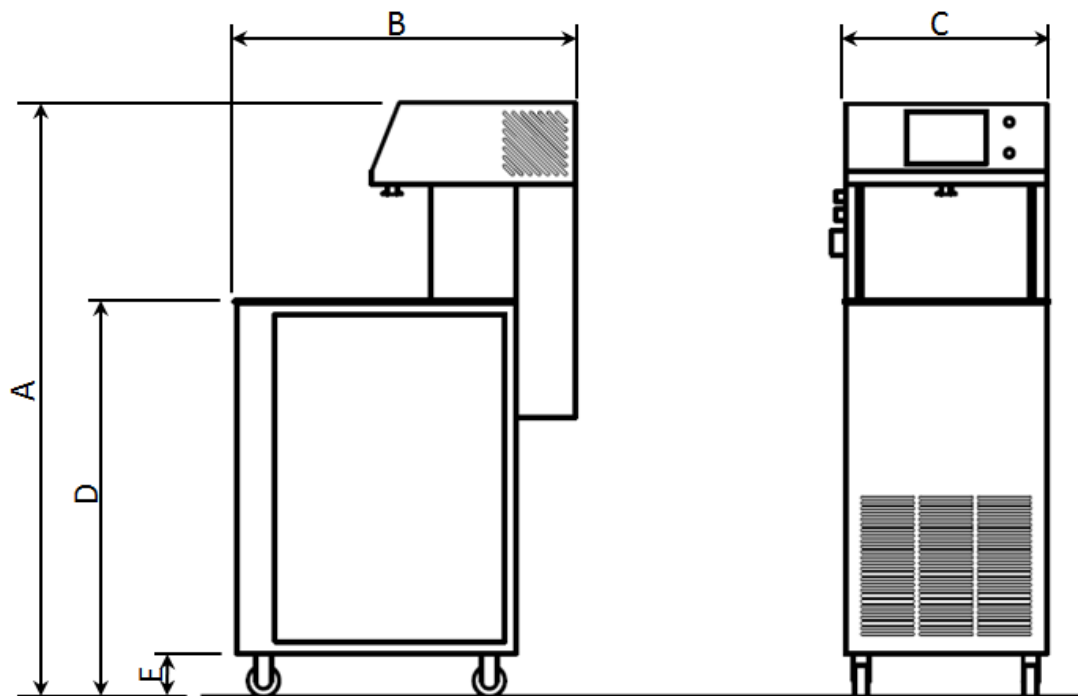
The capacity depends on recipe and actual technology. Capacity below is just for reference according to special recipe.

Descriptions	Value	Unit
Tempering precision	±0.3	°C
Capacity	25	L

3.3 Quantity (weight) information

Description	Value	Unit
Total weight, no valve and parts for choose	175	kg
Depositor (for choose)	3	kg
Vibrating (for choose)	10	kg

3.4 Overall size



Tempering machine	Unit	A	B	C	D	E
25L	mm	1525	875	515	1015	110

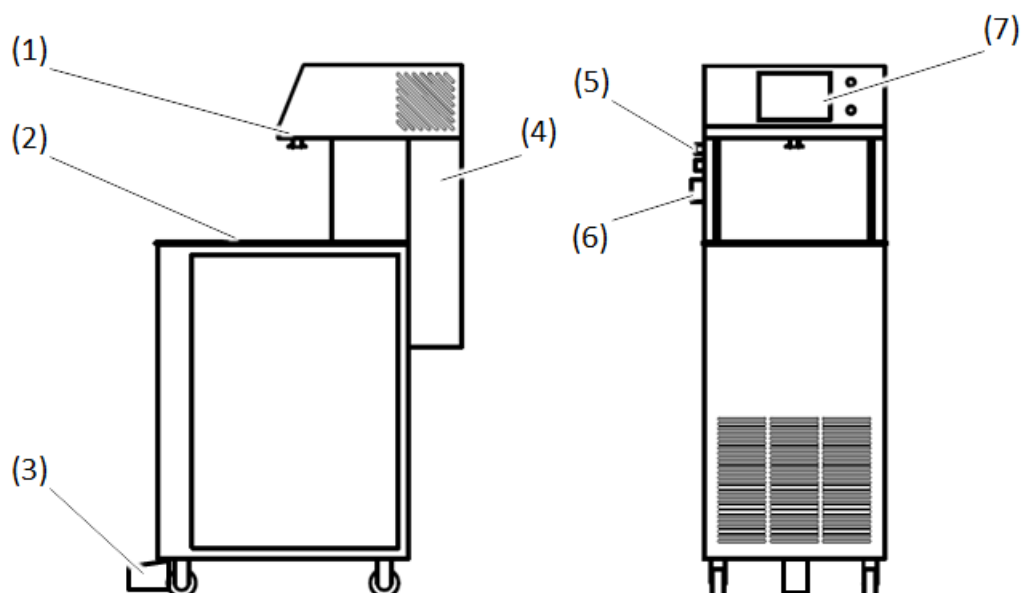
3.5 Power consumption

Description	Value	Unit
Mixing motor (50Hz)	0.18	kW
Pumping motor (50Hz)	0.18	kW
Cooling power (50Hz)	0.75	kW
blower (50Hz)	0.12	kW
Main machine heating power	2	kW
Depositor heating power	0.08	kW
Vibrating heating power	0.05	kW
Vibrating motor (50Hz)	0.03	kW

4 Introduce of machine

4.1 The whole machine

This machine is use to temper chocolate



(1) discharging

(2) mixing tank for feeding

(3) control pedal for discharging

(4) electrical box

(5) connecting for choosing part

(6) power switch

(7) operation panel

4.2 Working theory

Chocolate mass is heated to melt in mixing tank, then temper and crystal through insert cooling system.

4.3 Emergency stop button

The influence of danger can be reduced as little as possible through emergency stop once, risk occur.

All driving device of safe would stop immediately when emergency stop is pressed.

Emergency stop is on control pane.

5 Transportation

5.1 Packing signs



(1)

(1) upper



(2)

(2) Waterproof and moisture-proof



(3)

(3) The center of gravity position



(4)

(4) fragile



(5)

(5) hoisting position

1. Pay attention to packing signs

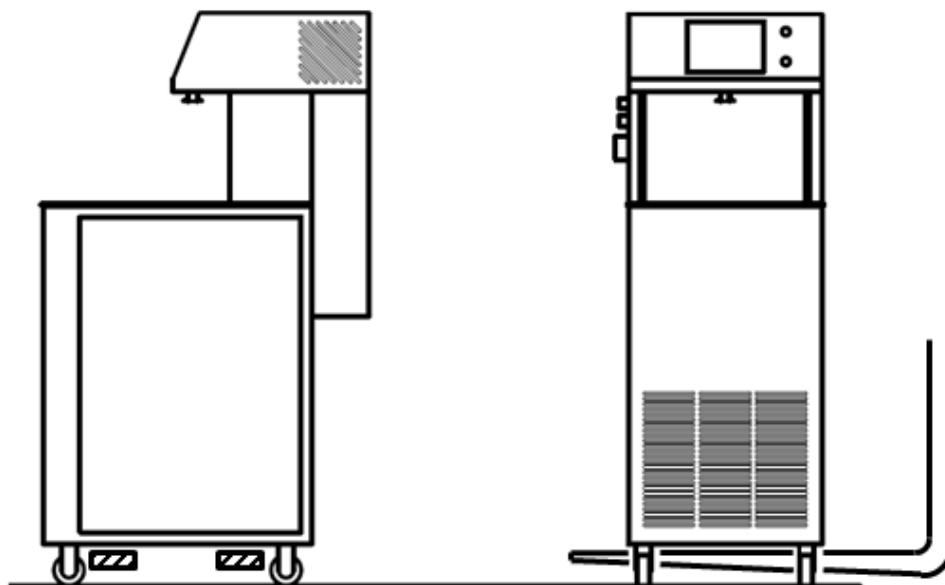
5.2 shipment and receive

- Check if the goods are complex according to BL.
- Please inform shipper if any parts are lost or damaged during transportation. Contact way refer

5.3 Temporary storage

1. Please pay attention to packing signs
2. Please put machine and spare parts in original package before formal installation.
3. Please don't put the machine outside
4. Take protection measures to avoid weather influence.
5. To prevent temperature changes affecting equipment

5.4 Hoisting guide



WARNING

Hoisting heavy will lead to death or serious personnel hurt

1. Please use the enough rated-load lifting device
2. Don't stand or walk through under heavy
3. Ensure no workers in dangerous area.
4. **Make sure lifting is lifted by auxiliary equipment before the machine is fixed on base completely.**

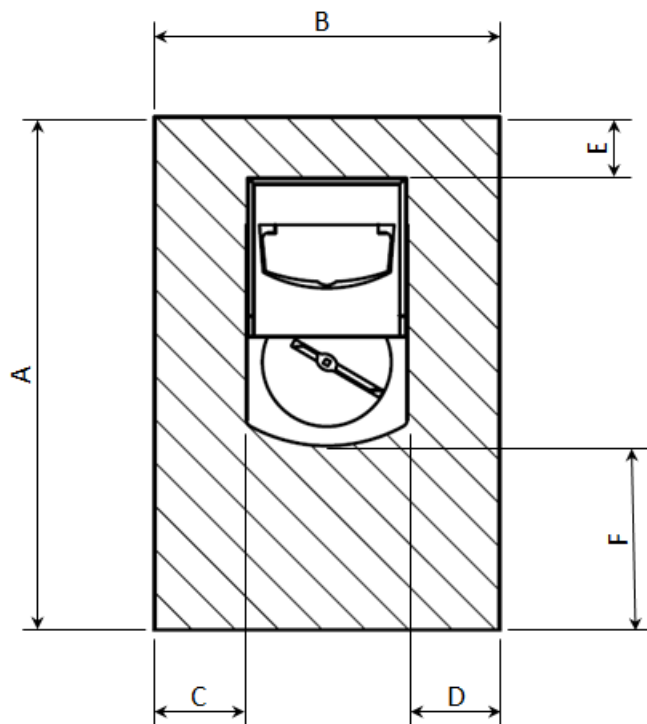
Caution

Overload would make damage to the equipment.

5. **Ensure all balls is taken out before lifting.**

6 Installation

6.1 Prepare installation field.



Tempering machine	Unit	A	B	C	D	E	F
25L	mm	1675	1115	300	300	200	600

- Need more space when connect wires, move equipment to prepared field after finished connecting wires.
- Please keep enough and neat space for easy operation.

6.2 Requirements for ground load

Description	value	Unit
Tempering machine 25L	5	kw/m ²

7 Production operation

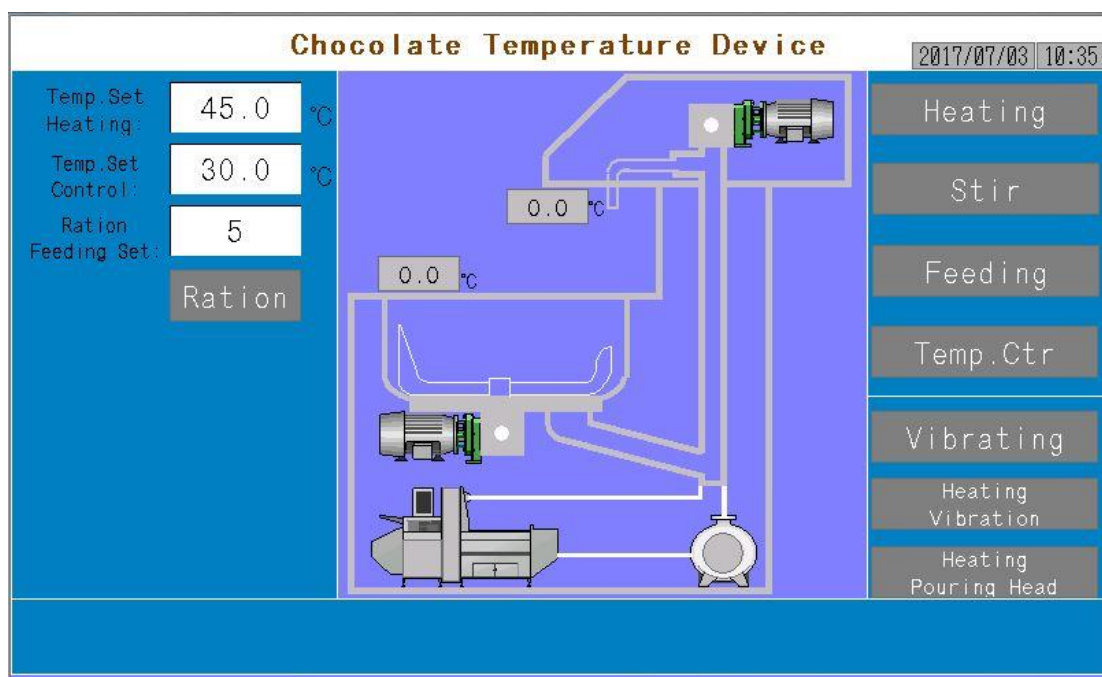
7.1 Tempering summarization

Tempering is a key step in production and it's long and complex process, Tempering has decisive effect to finished chocolate. In simple terms, tempering is to Destroy the unstable crystal through heating, then crystallize in specific temperature and form stable crystal.

Operators should have some chocolate technology and actual operating experience.If operator without relative knowledge and experience, please refer to flowing operation instruction and temper step by step.

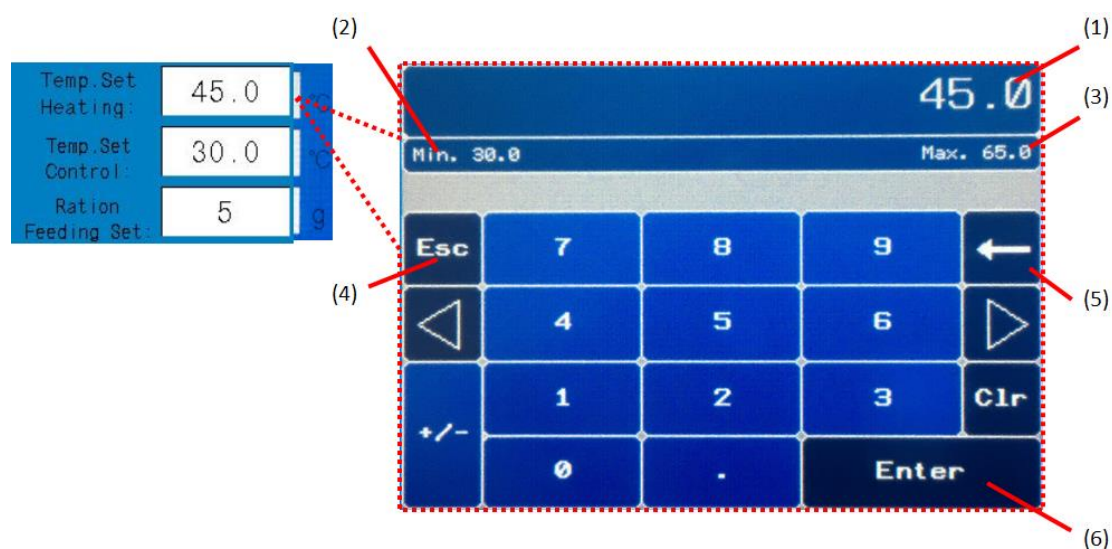
7.2 Operation interface

7.2.1 Main interface



- (1) Parameter setting, click to set parameters (refer to 7.2.2)
- (2) Function on-off interface(white letter with gray back means off, black letter with green back means on.)
- (3) Display of machine's working.

7.2.2 Parameters setting




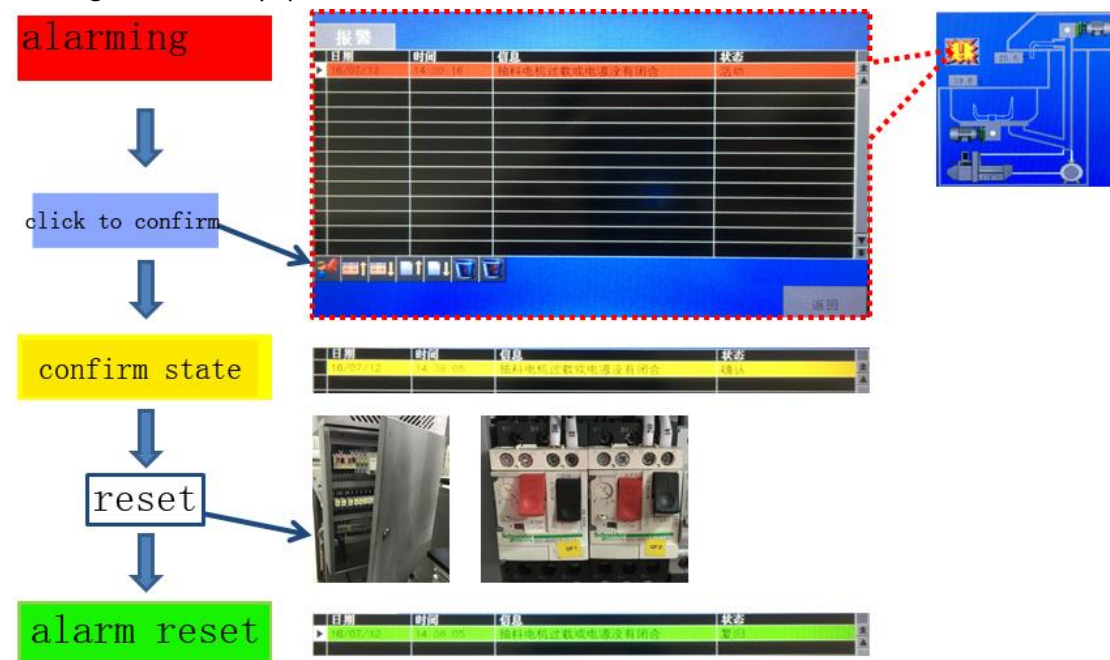
- (1)actual value
- (2)Minimum value can be set
- (3)Maximum value can be set
- (4)exit, quit, back to original value
- (5)backspace, move one value
- (6)enter, save new setting value.

instruction:

- Heating temperature: chocolate melting temperature and warm temperature. It's chocolate temperature in mixing tank.
- Tempering temperature: crystallizing temperature after tempering. It's upper discharging temperature.
- Quantify feeding: it's intermittent discharging(refer to 7.3.6), it's a coefficient which is easy to set parameter according to recipe.

7.2.3 Warning interface and handle

If  sign shows, click and enter to check specific warning information, refer to electrical drawing and handle by specialist.



WARNING

After open covers, it may cause electric shock, impact and other personal injury

- Must operate by people who has relative electric acknowledge.
- Ensure safety switch at “0” position and locked well
- Take the key where you go.

7.3 Equipment operation

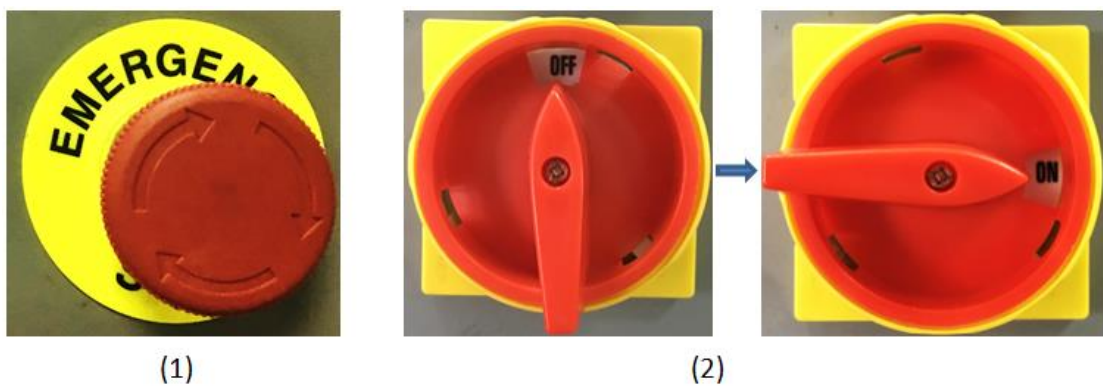
Cautions:

- Check if material abide by local Food safety and health related laws and regulation.
- For the new equipment, suggest to run the machine with chocolate circularly and Destroy the material used firstly.

7.3.1 Normal start

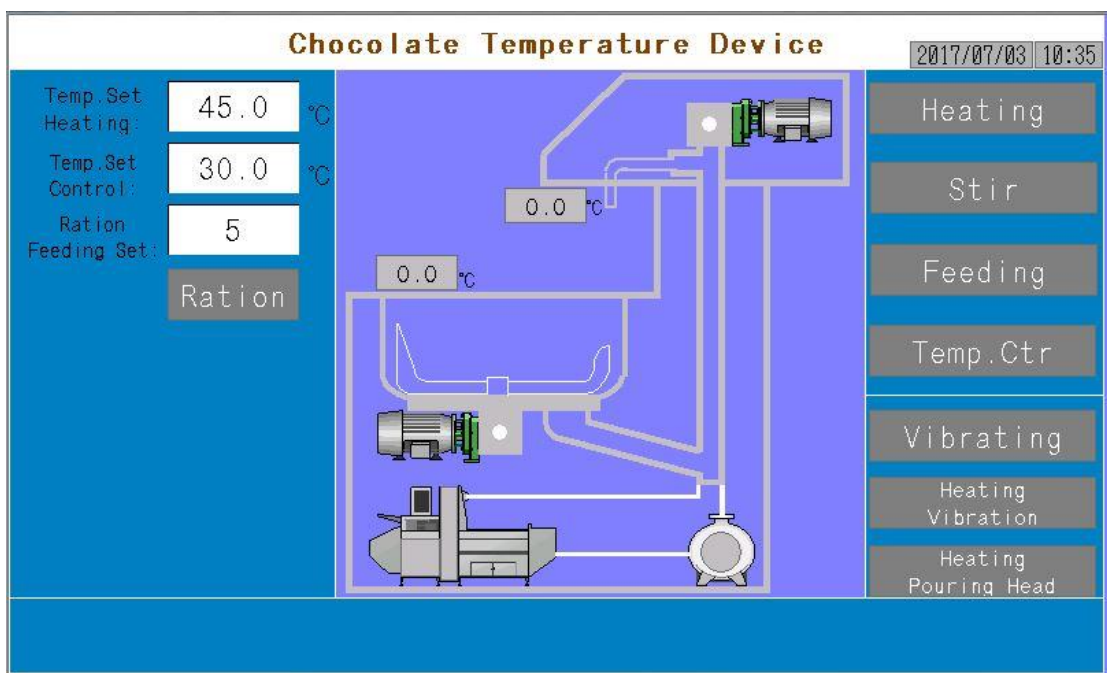
a) Power on:

Let emergency button (1) at reset (pop-up) position, rotate the knob(2) clock-wisely , OFF→ON.



b) Start :

Wait screen open, press button(3) .





(3)

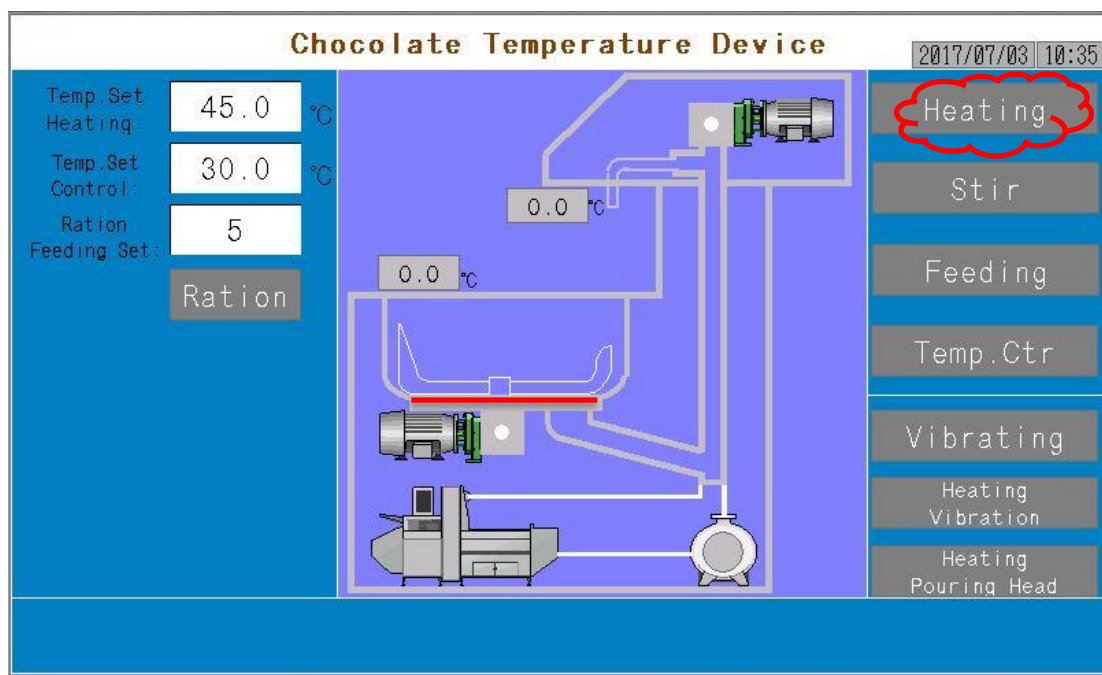
c) **Setting :**

Setting temperatures according to experience(refer 7.2.2 setting interface.). Or setting according to following value and adjusting according to need.

Temperature	Unit	Black chocolate	Milk chocolate	White chocolate
Heating temperature	°C	45	45	45
Tempering temperature	°C	30	28.5	26

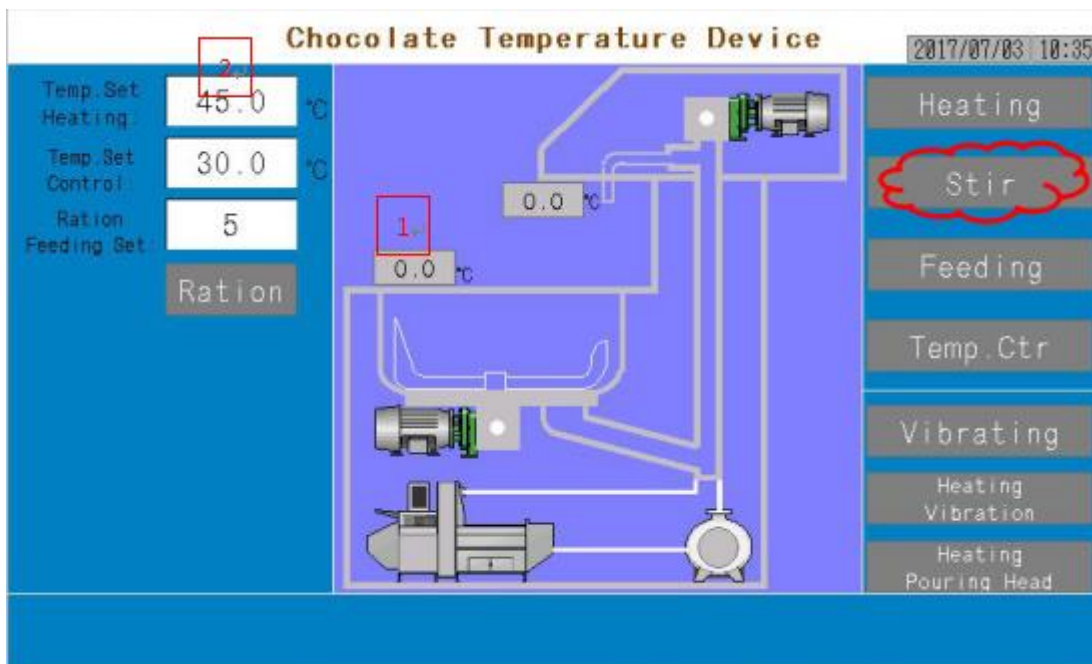
d) **Heating:**

Feeding chocolate according to requirements, note not too full. Press heating button(as following) and start to heat residual and new chocolate



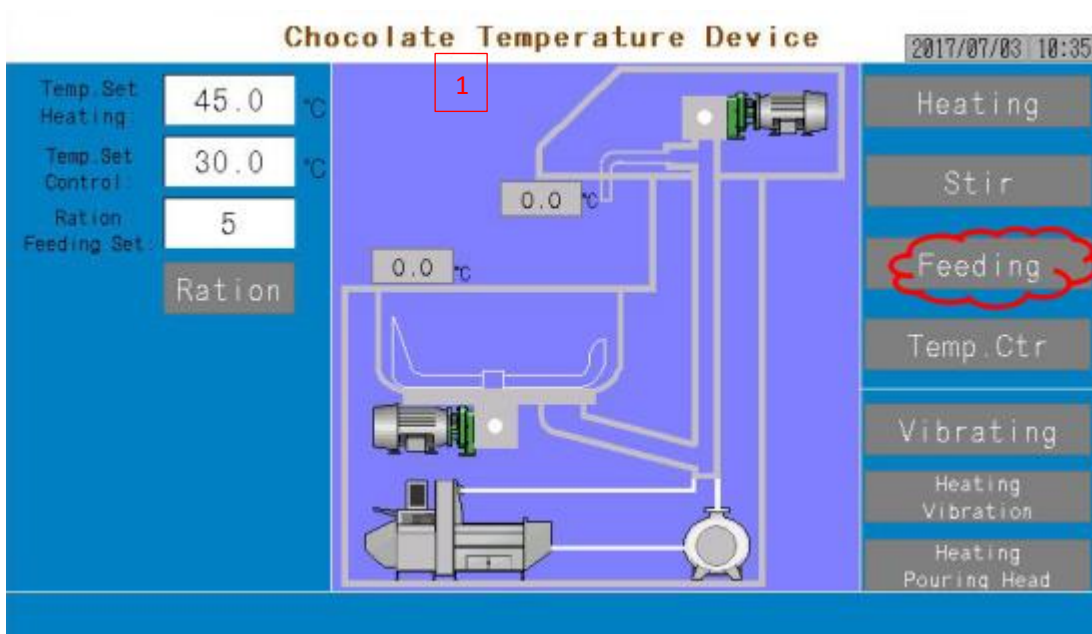
e) **Mixing:**

Open mixing button when temperature ① reach setting value ②, the chocolate in tank would be mixed and heated evenly.



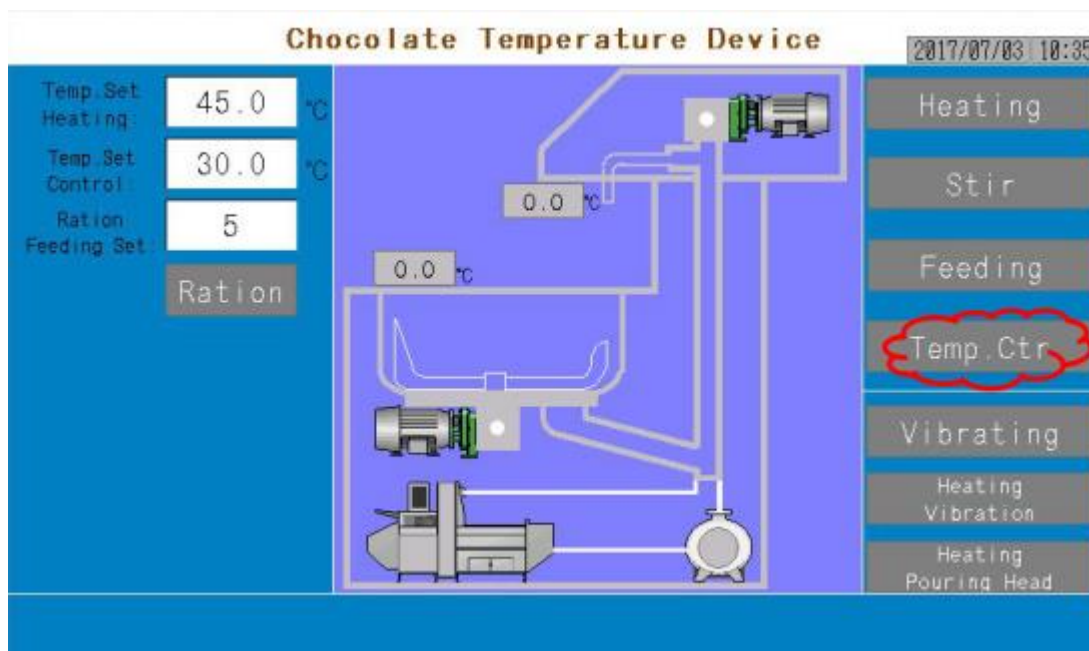
f) **Pumping:**

Open circular button after mixing about 30mins,

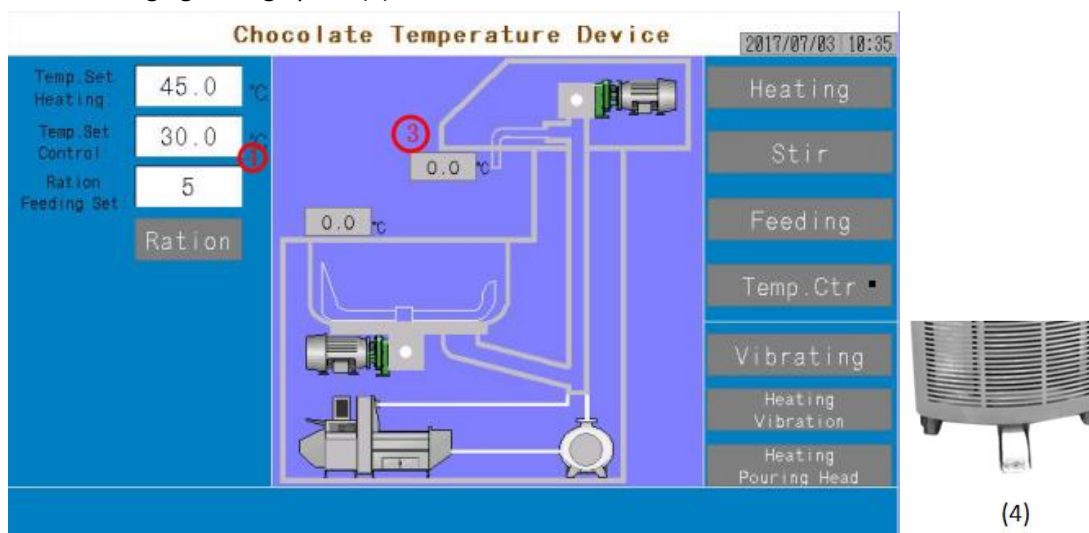


g) **Tempering:**

Open tempering button after chocolate melted well(as following), suggest to pumping circularly about 30min then to start tempering.

h) **Discharging:**

Pay attention to temperature ③, when temperature ③ reach machine's temperature ④ (as following), this means tempering has been finished. Collect chocolate material from discharging through pedal(4).



NOTE: don't add new chocolate in this step, if need to add new chocolate, then have to temper again, refer to 7.3.2.

7.3.2 Adding new chocolate

- Close tempering button, enter circular temperature raises up.
- Start tempering after chocolate melted well and temperature raises well according to

- experience. (refer to 7.3.1, step g) .
- c) Collect chocolate after finishing tempering from discharging part (refer to 7.3.1, step h) .

7.3.3 Start after emergency stop

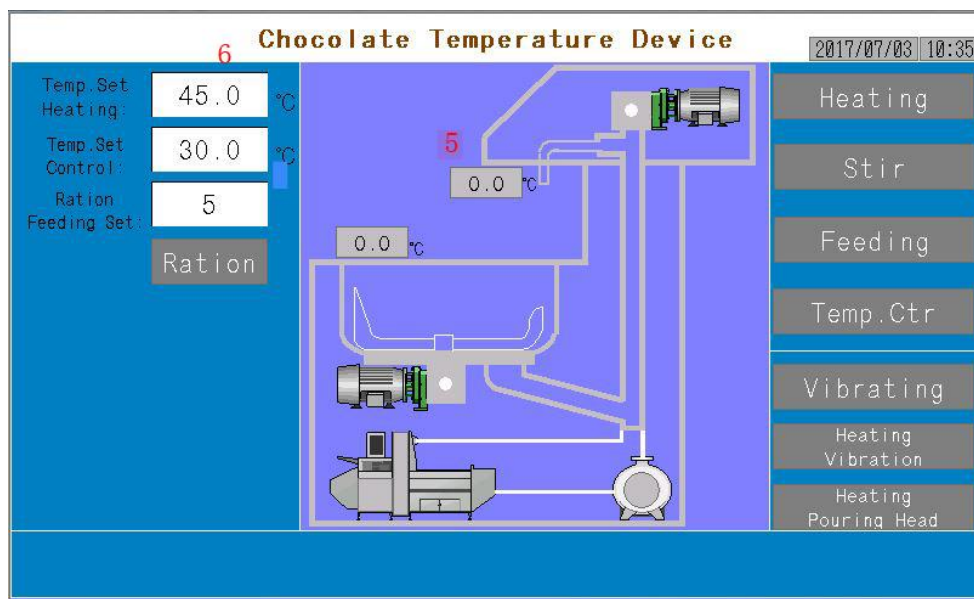
- a) Unlock emergency stop button firstly, rotate clockwise until button pop-up.
Following interface is due to PLC not open. Press start button back to normal state.



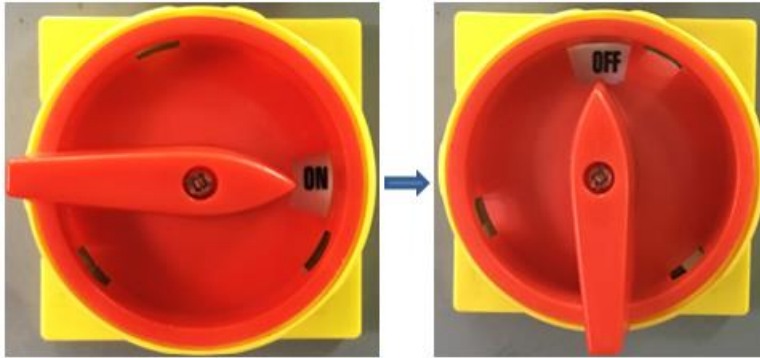
- b) Refer to 7.3.1, step a to f, make chocolate into temperature raise up circularly.
- c) Refer to 7.3.1, step g to h, to get chocolate after tempering.

7.3.4 Start the machine normally

- a) Close tempering button, make chocolate into temperature heating and raising, until temperature ⑤ close to ⑥.



- b) Close circular, mixing and heating step by step.
- c) Cut main main power supply. Rotate know anticlockwise ON→OFF.

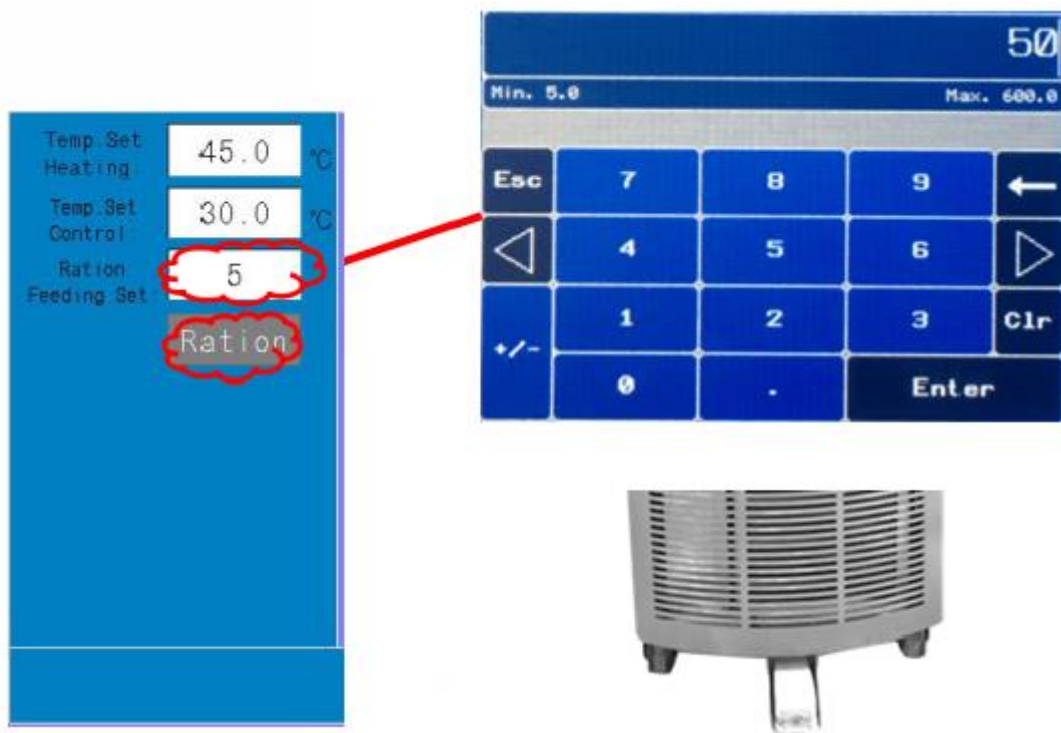


7.3.5 Other main functions

1. Quantitative ration

As following, step on pedal when quantitative ration on, chocolate deposit intermittently. stop 2~3 seconds after each quantitative ration, then deposit again and stop 2~3 seconds, circulate like this way.

When intermittent deposit, not need to step on pedal and deposit quantity each time is same.

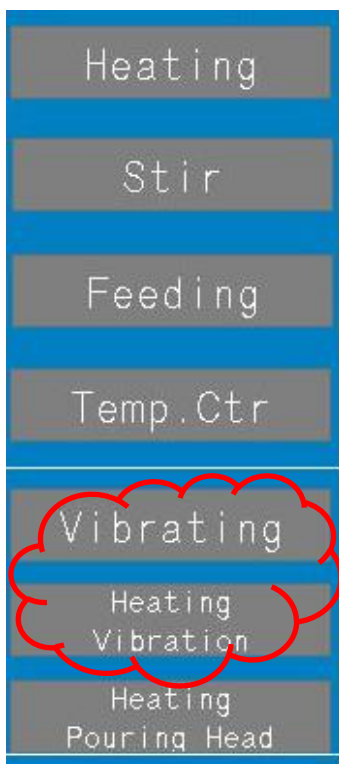


NOTE: quantitative ration value is just a coefficient, need to measure actual depositing quantity and set accordingly.

2. Depositing head heating

This function is used to heat depositor to avoid chocolate solidify.

This depositor is for choose (as following).

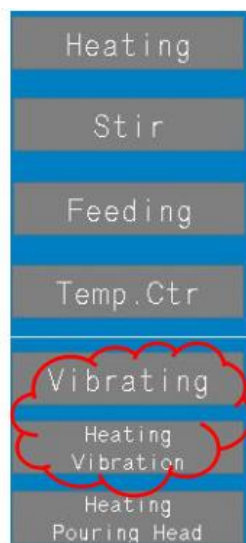


3. Vibrating and heating of vibration table

Vibrating, on can make vibration table vibrate to eliminate bubbles in chocolate.

Vibration heating to heat table to avoid chocolate solidifying.

This vibration table is for choose (as following)



7.4 Stop production

Stop machine according to 7.2.4 and make protection to ensure food hygiene safety.

8 Troubleshooting

8.1 Fault signal

fault	Possible reasons	Solve way
Fault information on touch screen	Faults from the machine	➤ Refer to 7.2.3

8.2 Faults

Faults	Possible reasons	Solutions
can't start the machine	Emergency stop button not reset	➤ Refer to 7.3.3 , start after emergency stop.
	PLC isn't on or loss communication	➤ Refer to 7.3.1, step b, press start button
	Outer power supply is abnormal.	➤ Check outside wires connection.
Can't mix	Without enough heating and chocolate isn't melted.	➤ Refer to 7.3., step d-e, heating longer time
	Motor overload protection.	➤ Refer to 7.2.3, reset alarm
Can't pumping circulate	Without enough heating and chocolate in pipe not melted well.	➤ Refer to 7.3.1, step f, heat longer time
	Motor over load protection	➤ Refer to 7.2.3, reset alarm

9 Equipment maintenance

9.1 Equipment cleaning

WARNING

Unexpected start may cause electric shock, impact and other personnel hurt.

- Ensure safety switch at “0” position and locked well before working.
- Take away the key and carry where you go.

CAUTIONS

Any particles from outside in material may damage inside circular system.

- Ensure the mixing tank and surrounding clean, no particles.
- Please clean the machine with warm water and soft cloth.
- Avoid untreated surface of carbon steel rust.

9.2 Maintenance

Refer to maintenance manual of each main components: motor manual and compressor manual.

10 Equipment scraped

10.1 Shut down

1. Running the machine until empty.
2. Clean residual in machine.
3. Power off and safekeeping.
4. Tear down power connection and pipe connection.
5. Drain liquid in machine
6. Clean the machine and make corrosion protection.

10.2 in store

CAUTION

Frozen liquid may bring injure to people

- Must clear liquid in machine, especially water.
- Don't put machine outdoor.
- Sure the machine weather protected
- Avoid temperature changing sharply, condensed water may etch the equipment.

10.3 Destroy

- Disassemble the equipment according to parts.
- Wash dismantled parts, including balls.
- Classify and make proper treatment to components and parts in accordance with local laws and regulations .