Craft Beer Brewing Equipment
Installation and Operation Manual

Catalogue

Chapter 1: Equipment Installation..... 1

Chapter 2: Equipment cleaning..... 6

Chapter 3: Raw material management..... 8

Chapter 4: Saccharification..... 9

Chapter 5: Fermentation..... 13

Chapter 6: Discharge Yeast..... 14

Chapter 7: Filling..... 15

Chapter 8: Quantity of material..... 15

Attachment:..... 16

1. Jingde Equipment Common problems and solutions..... 16

2. Jingde craft beer brewing process..... 16

3. Heating tube wiring connection..... 16

4. Brewhouse diagram..... 16

5. Butterfly valve and 3-way valve operation..... 16

Chapter 1: Equipment Installation

1.Safety

1.1 Electrical safety

1.1.1 The cable can bear more load than the full load of the whole machine.

1.1.2 Wort pot install grounding wire, the main power install leakage protection.

1.1.3 The heating tube terminal is fastened without looseness or exposure and reaches the minimum contact resistance (copper nose or gasket). It must be checked before adding water.

1.1.4 No damage to the cable, Reinforce the point that easy to wear and tear.

1.1.5 No water flushing for all electrical appliances.

1.1.6 Use an electric pen to measure the equipment when using electricity to prevent electric leakage and hurting people.

1.1.7 All wire joints shall be free from exposure and protected by insulation.

1.1.8 When the phase sequence of external three-phase power supply is changed, the phase line sequence of three-phase motor needs to be adjusted to ensure the pump is in positive rotation.

1.2 Heating safety

1.2.1 Electric heating is adopted in this equipment, and the whole temperature after feeding is more than 50℃. When observing mash, a glove is needed when move the feeding mouth cover.

1.2.2 Place your hand on the side of the barrel to prevent the steam from hurting your hand when you return the 95℃ clear wort to the pot.

1.2.3 When wort temperature rises to 99℃, a phase line should be turned off to allow a heating tube to work to prevent wort overflow the pot. “1 phase+2 phase”---three-phase switch is required.

1.2.4 When sterilize the wort pipe,control the three-way valve in one-third open state, the pipe head should above the liquid level, sterilization should last for 5mins, adjust to the internal circulation state first, then close the pump.

1.3 Personnel and machinery Safety

1.3.1 When operation, pay attention to the surrounding hard objects that's easily encountered, get up before looking up and down and then get up to prevent injury.

1.3.2 Before use mill, first try the hand disk shaft, see whether work smooth, if smooth then it can begin to work, when working is not allowed to touch the motor shaft.

1.4 Pressure vessel safety

1.4.1 Negative pressure in fermenter.Do not use cold water to wash fermenter after the tank is washed by hot waer or alkaline. After washed by hot water, empty the hot water in the ferment tank, block the upper and lower valve mouth by 75% alcohol cotton, and open the upper and lower valves.

1.4.2 When Fermentation tank is over pressure, ensure that the automatic exhaust valve work normally, For the non-mechanical automatic exhaust valve, It need manually exhaust when power failure, to prevent the tank over-pressure and broken the tank.

1.4.3 The collision of carbon dioxide tanks is forbidden. When the fermentation tank is in reserve pressure, the main valve of the gas tank is fully open. The auxiliary valve is adjusted until the pressure gauge indicating 0.20mpa, then the backup pressure is applied to the fermentation tank, which is no more than 0.2mpa

2.The Equipment position

2.1 Mill position

2.1.1 Position close to the vent, easy to remove dust.

2.1.2 Anti-vibration pad is needed for the mill.

2.1.3 It need install spring pad to the three fastening screws of mill hopper to prevent screw loose into the disc and make damage.

2.1.4 After install the mill, clean up the feed roller of the grinding disc, to clean up the residual iron scraps and other debris, and then adjust the clearance of the grinding disc. The order of adjustment, first adjust from the large clearance to the

ideal gap, the ideal gap is the crushed malt "broken skin but not broken core".

2.1.5 Before mill, check whether there is moldy foreign body in the grinding disc, and then use the motor shaft to feel the sound of grinding disc whether there is wear sound, if smooth then it can start mill.

2.2 Saccharification tank

2.2.1 The installation position of the saccharification pot should not be more than 2 meters away from the floor, and the floor drain height should not be higher than the installation surface of the saccharification equipment.

2.2.2 The location of the mixing hole at the upper end of the filter tank is not less than 1 meter from the roof.

2.2.3 The position of feeding outlet is not less than 1 meter from the wall position.

2.2.4 1 ton tank outlet location is not less than 2 meters from the wall.

2.2.5 Exhaust fan shall be installed on the wall above the feeding hole.The installation position of exhaust fan is better higher than lower.

2.2.6 Install the pipe and pump of the Mash kettle（According to instructions in attachment 4 ）

First step: Check whether the sealing ring is missing during installation, prohibit brute installation, and ensure flexible installation

Second step:Install middle and lower horizontal pipes and middle and upper horizontal pipes

Third step:Install middle and lower horizontal pipes

Fourth step:Install pump (when installing the pump, first adjust the pump's four horizontal screws to the shortest position and place rubber pads to prevent vibration. Adjust the screws to overlap the pump inlet center and the lower horizontal pipe center, and install the pump)

Fifth step:Install lower vertical pipe

Sixth step:Install the upper vertical pipe and the upper horizontal pipe

Seventh step:After the pipe is installed, carefully adjust the four adjustment screws

of the pump, finally tighten the sight mirror and quickly connect the clamp

Eighth step:Test the leakage of pipe

2.2.7 Cleaning mash kettle and pipes

2.2.7.1 Polish raised point on the upper and lower inner surface of the mash kettle, welding spots, etc., with coarse emery cloth, and then use fine emery cloth to polish smooth.

2.2.7.2 Then rinse the surface of the kettle with water

2.2.8 Installation of heating pipe

2.2.8.1 Wipe the surface of the heating tube with a towel

2.2.8.2 Smooth the burrs of the heating tube base with a round file

2.2.8.3 When installing the heating pipe screw, tighten the upper and lower screws evenly. Do not tighten one port and then another port.

2.2.9 Install temp. sensor

2.2.9.1 Same installation method as fermenter temperature control meter

2.2.10 Clean the internal surface of equipment and pump

2.2.10.1 First use the water gun to clean the surface of the filter tank, then use the water gun to clean the surface of the Mash kettle, and connect the water pipe to flush the pipe and pump

2.2.10.2 The flushing sequence is: upper horizontal pipe, middle upper horizontal pipe, upper vertical pipe, middle lower horizontal pipe, lower vertical pipe, pump, lower horizontal pipe

2.2.11 Heating tube power line connection diagram (Attachment 3)

Special attention: three-phase electrical wiring should ensure that each phase line appears twice at the end of the heating pipe, and the same heating pipe cannot be connected with the same phase line.

2.2.12 Connect the pump power according to the circuit diagram. After connecting the pump power, add water to inundate the first heating pipe, inching the pump to check its positive or negative rotation. If it is negative, adjust the position of any

two phase lines at the lower end of the switch.

2.2.13 Add water to 2cm above the third heating pipe, turn on the power of the heating pipe to check whether there is leakage in heating and sealing. If there is leakage, turn off the power and tighten the screw of the heating pipe

2.2.14 The distribution box is installed on the wall in front of the feeding mouth, 1m away from the feeding mouth, so as to cut off the power at any time according to the production situation (see the attachment).

2.3 Fermenter installation

2.3.1 The pressure gauge at the top of the fermenter is no less than 50 cm from the roof.

2.3.2 Fermentation tank installation area to ensure the ground level.

2.3.3 When install the head of the fermentation tank, clean up the head of the wine first, and wrap the raw material in the opposite direction according to the upper tap, and it is better to wrap it with wide surface, and stop when the upper tap is hard, remove the ring inner wire adjusting the front of the foam, and then adjust the position of the tap and tighten it

2.3.4 When install the pressure gauge and elbow on the top of the fermenter, clean up the internal of the elbow and valve, cut off the leather plug on the upper part of the pressure gauge, install the corresponding sealing ring, and then tighten it. The pressure gauge dial is placed at a position convenient for operators to observe.

2.3.5 Thermometer installation. Straighten the sensor wire and insert the probe into the casing. The probe must be inserted to the bottom. Then fix the sensor wire and seal the end of the sleeve with tape.

2.4 Install hose

2.4.1 Black hose only as sewage, white food hose use for wort, alkali, hot water, yeast discharge.

2.4.2 When install, first cut the pipe head flat, then wrap the raw material belt on the hose joint, the winding method is the same as the fermentation tank head raw

material belt winding method, the pipe hoop must be stuck in the hose joint groove, and must be tightened

Chapter 2: Equipment cleaning

Equipment cleaning including powder with basin cleaning, mill cleaning, mash kettle cleaning, filter tank cleaning ferment cleaning, measuring device cleaning and so on.

1. Cleaning requirement

No	Equipment	Cleaning process
1	Basin for mixing materials	Wash by clean water
2	Malt mill	Brush clean, no residue
3	Mash kettle	Wash by clean water, until without smell
4	Filter tank	
5	Fermenter	Alkaline wash process
6	Food hose（white pipe）	Alkaline wash process
7	Gas pipe for Co2	Sterilize with 75% alcohol
8	Beer vessel	50ppmchlorine dioxide or above 80℃ hot water for disinfection
9	Union valve + exhaust valve	75% Alcohol foam disinfection or above 80℃ hot water

2.Cleaning process

2.1 Fermentation tank alkaline washing process:

Step 1: Clean the inside of the fermenter with water (Until no foam.)

Step 2: Empty the tank of water (Remove the clean pipe that connecting the upper valve and open the valve to let it flow out naturally)

Step 3: Drain the carbon dioxide in the tank

Step 4: Soaking method: inject alkaline water above 80°C from the bottom of the fermentation tank, and soak for more than 30 mins ;

Circulation method: inject alkaline water above 80°C from the upper of the fermenter, and connect the lower part that enters the saccharification kettle with a hose, use the pump to cycle and scrub for more than 30 minutes. When using this method, remember to observe that the pressure of the fermentation tank should not exceed 0.15MPa, and the hose joints should be tightened to prevent the pipe from smashing and hurting people.

Step 5: The beer tap is cleaned during the soaking process or in the circulation process. The cleaning sequence of the beer tap is that when the three valves of the beer tap are fully opened, the three valves are opened and closed 10 times from the inside to the outside in sequence.

Step 6: After the hot alkali in the tank is discharged, the upper and lower valves are fully opened to drain the residual alkali liquid in the fermentation tank.

Step 7: The hot water is injected from the top of the fermentation tank, and the hot water discharged from the bottom valve of the tank is neutral (It is not slippery, the PH is less than 8), close the bottom valve, flushing for 1-3 minutes, and clean the beer tap under pressure, the cleaning method is the same as the third step of the beer tap cleaning method.

Step 8: Drain the hot water in the tank, open the upper and lower valves and plug the alcohol cotton (75%). The alcohol cotton is required to be tightly plugged.

Step 9: Close the upper and lower valves after the washed fermenter drops to room temperature. The washed tank can be used within 24 hours, and it needs to be re-sterilized with hot water above 80°C for more than 24 hours.

2.2 Food white hose alkaline washing

In the process of cleaning the fermenter, the corresponding alkaline washing effect is achieved

2.3 Alcohol sterilization

After cold wort and prepared pressure of fermentation tank, it is necessary to sterilize both inside and outside of the pipe joint and valve, use 75% alcohol cotton to wipe and sterilize, use 75% alcohol to soak and sterilize those that cannot be wiped, or burn and sterilize with alcohol cotton.But want to make sure the object inside and outside that needs disinfection before alcohol disinfection is clean, ability is disinfected later.

2.4 Hydrogen peroxide disinfection

The concentration of hydrogen peroxide disinfection is in accordance with the instructions for use, the beer container of the subject is disinfected, and the operator's hands are disinfected.

2.5 Various parameters needed for cleaning and disinfection

Cleaning and disinfecting medium	Temp.	Concentration	Time	Remark
Alkali Water	Above 80°C	1-2%	30min	Disinfection object: fermenter
Hot water	80-85°C		15min	Disinfection object: fermenter
Alcohol		75%	5 second	Disinfection object:pipe head、valves、gas pipe of Co2
Hydrogen peroxide		50mg/L	15 min	Disinfection object: filling vessel, hand disinfection
Hot wort	100°C		5min	Disinfection object: food grade pipe for Wort

Chapter 3: Raw material management

Raw material for raw beer is: water, malt, special malt,hops and yeast.

1. Requirement for raw materials

1.1 Brewing water

Brewing water ph value is 6.5-7， without smell (Iron fishy smell, musty smell, oil smell) Residual alkalinity and hardness meet drinking water requirements.

1.2 Malt

1.2.1 The malted barley has been stored for more than 1 month and all the indexes have reached the international A-level standard

1.2.2 There is obvious wheat flavor, taste sweet, malt cross - sectional powder, loose inside

1.3 Special malt

Malt flavor is prominent and rich, with inclusion less than 0.5%.

1.4 Hops

Hop aroma is obvious, without other miscellaneous flavor.

1.5 Yeast

Yeast without caking, no swelling bag, no damage, yeast flavor is obvious, no other miscellaneous taste such as mildew.

2. Storage of raw materials

2.1 Brewing water must first drain all the remaining water in the pipe, taste no odor before use.

2.2 The storage places of barley malt and special malt should be moisture-proof, insect-proof and rat-proof, and the bag should be sealed.Do not mix with other peculiar smell products.

2.3 Yeast and hops must be stored in a separate isolated location at 2-4°C. Hops bags must not be damaged. The remaining hops must be drained and sealed with adhesive tape.

Chapter 4: Saccharification

The saccharification process is divided into five steps: raw material grinding, feeding raw material, saccharification, filtration, boiling, whirlpool, cooling, adding

yeast, deliver wort to fermenter.

1. Raw material grinding:

1.1 Barley malt and special malt are weighed according to the amount of malt added to the wort.

1.2 Apply 1 kg 50-55°C water to 20 kg of malt, mix evenly, and bite with teeth,tough skin.

1.3 Use a little malt to adjust the clearance of the mill before powder, to ensure that the skin break without breaking cores.

1.4 Check the effect of powder in the process. Do not block the outlet!

1.5 After powder, tied feed mouth, ready to feed.

2. Feeding

2.1 According to he ratio of water:raw material 1:4.5-5 add the water (For example 100kg raw material add water 450kg-500kg)

2.2 Feeding water rise to 52°C then feeding（Feeding with pump working）

3. Saccharification

3.1 Saccharification process: 50-55°C（keep still for 20min）------Rise up to 62-64°C（keep still for 50min）-----Rise up to 67-70°C（keep still for 30min）-------Rise up to 78°C for filtration

3.2 Note: In the heating stage, start the pump for 1-3 minutes, then turn on the heating, stop heating after the temperature rises to the process requirements, stop the pump after 60 seconds, add the coke-flavored malt at 62°C up to 68°C, and saccharify at 68°C Finally, remove the wort surface crust and check whether the wort liquid level is clear. If it is clear and the temperature rises normally, continue to keep warm, or perform an "iodine reaction" test. Specifically, use a stainless steel rod to insert the wort into the lees and drop the wort on the white. Drop 0.2% iodine solution on the porcelain dish. If it turns blue, it means that the saccharification is not complete and needs to be kept warm. If it is the color of the iodine solution, it means that the saccharification is complete and the temperature can be raised

normally.

4. Filtration

4.1 Stop the saccharification of mash into the filter tank, clean the pipeline, pump and the saccharification pot, start backflow, after the backflow clear, filter to the saccharification pot, the flow rate is controlled at two-fifths of the full capacity of the pot every hour, when the whole submerged heating tube two centimeters up, can start heating and rise temp.

4.2 When the grain layer was exposed, the water was 20-25% of the original wort

4.3 Stir with a rake after adding the dishwater. Mix the water and the grain well.

4.4 After standing for 10 minutes, it will start to reflux, the reflux is clear and start to filter, filter until the pot is full, stop the filter

5. Boiling

5.1 When the boiling temperature (actual temperature) reaches 99°C, close a phase line to prevent overflow.Or in order to prevent wort overflow pot, the lid can be used to partially block the feeding mouth, but to set aside the observation port, the operator pay close attention to the boiling situation, cut off the heating switch at any time when need.

5.2 Liquid boiled in the pot, add corresponding bitter flowers, add the amount of fragrant flowers required by the process 5 minutes before the end of boiling..

5.3 10 minutes before the end of boiling, connect the food pipe to the elbow connected to the 13# valve, put the other end into the feeding port, and above the liquid level, open the 5#, 12# and 13# butterfly valves, and then adjust the 3# The three-way valve closes the upper pipe, and the 7# three-way valve is adjusted to the 4 o'clock position to allow the hot wort to sterilize the cooling coil and the food pipeline for 5 minutes. When sterilizing, hold the food pipe with one hand to prevent the pipe head from coming out..

5.4 After sterilizing the food pipes, adjust the 3# three-way valve, close the upper vertical pipe, then close the pump.

5.5 After emptying the wort inside the food pipe, plug the pipe head with alcohol cotton, and sterilize the sealing ring thread (clamp) on the inner surface of the inlet and outlet valves at the bottom of the fermentation tank with 75% alcohol from the inside to the outside, and then plug the absorbent cotton One side pipe is connected to the bottom valve of the tank. (Remove the absorbent cotton before connecting, ignite the alcohol cotton to burn the connecting surface and install it)

5.6 In the boiling process to prevent wort boiling and overflow, use lid to cover the feeding mouth.

6. Whirlpool

6.1 After the wort is boiled, turn off the heating tube.

6.2 Adjust the 7# three-way valve to close the middle horizontal pipe and open the 11# butterfly valve.

6.3 After confirming that the valve is correct, turn on the pump, to pump the wort into the filter layer at a high speed for whirlpooling.

6.4 After the wort is pumped, first turn off the pump and then the 11# butterfly valve, and finally adjust the 7# three-way valve to close the upper vertical pipe.

6.5 Clean the lower boiling pot, remember to close the 1# drain valve after the water is drained to avoid the wort being drained.

7. Cooling

7.1 After 20 minutes of whirlpooling, open the 10# butterfly valve to allow the clear wort to flow to the lower layer, and at the same time open the 5# butterfly valve and adjust the 3# three-way valve to close the upper vertical pipe. Connect the external cooling water inlet and outlet pipes, cover the material opening cover, and place a 75% alcohol-sterilized towel on the material opening cover to ensure that the towel covers all the material opening.

7.2 Slowly open the cooling water valve (the initial opening degree should not exceed 1/4), and when the wort temperature drops below 80°C, start the wort pump for circulating cooling.

7.3 When the wort temperature drops below 35°C, turn off the wort pump, then turn off the cooling water and coil valves.

8. Add yeast

8.1 Use 75% alcohol cotton to wipe and disinfect the yeast cup from inside out, and disinfect the table top of the balance, scissors, yeast bag, tray, and operator's hand with 75%

7.2 Weigh the required amount of yeast in a cup, open the pump, open a small mouth, evenly add yeast into the cold wort, close the mouth, cover with sterilizing towel.

9. Deliver wort into the fermenter

9.1 Open the bottom valve of the fermentation tank, adjust the 7# three-way valve to the position of closing the middle horizontal pipe, and pump the wort into the fermentation tank. When the wort pump sounds emptied, it means that the wort has been emptied. Adjust 7# three-way Turn the valve to the position of closing the vertical pipe, turn off the pump, and close the upper and lower valves of the fermentation tank.

9.2 Clean the bottom valve of the fermentation tank, and use alcohol to sterilize and plug the alcohol cotton, disinfect the upper valve of the fermentation tank with alcohol, and plug the alcohol cotton. The tightness is required to be appropriate, and the valve is opened 50% to ensure smooth exhaust of the valve.

9.3 After the wort is transferred to the fermentation tank, clean the saccharification tank and the pipeline.

Chapter 5: Fermentation

1. Fermenter temperature control

1.1 Set the fermentation temperature according to the process requirements.

2. Cool down the fermenter

2.1 Two method to cooling down Fermenter temperature

A、According to the measured sugar content, the temperature can be lowered when the sugar content falls to the range of the appearance sugar content corresponding to the original wort as shown in the following table.

Orginal wort concentration	Sugar Appearance（°P）	
10	2.6	2.9
11	2.7	3
12	2.7	3.2
13	3.3	3.6
14	3.5	3.8

When measuring sugar, first discharge wine head liquor 200 ml (500 liter ferment tank), with two 1 liter plastic measuring cup to take turns to pour 40 times, degassing after the measurement of sugar, first clean the sugar meter.

B、Taste, drainage 200 ml of fermented liquid, then taste fermented liquor, if no sweet taste, and no sweet aftertaste, then can cool, and if no sweet taste, with a slightly sweet aftertaste can be cool, if no sweet taste, a little sweet aftertaste can also be cool, if have obvious sweet taste should be cooled to about 10 °C, stay 5-12 hours, and then cooled to 2 °C

C、On the other hand, if the client likes thick and slightly sweet beer, the sugar level can be increased to 0.3°P, or fermented in a fermentation tank for 3 days. If the taste is not sweet, the aftertaste can be sweet before cooling down.But after staying at 10°C for an hour, the temperature drops to 2°C.

Chapter 6: Discharge Yeast

6.1. The ferment tank was reduced to 2°C and began to discharge yeast.

6.2. Discharge yeast should according to rules: "many times slow discharging, each time less discharging". The 500L fermentation tank shall not be less than 3 times (once a day), and 1000L shall not be less than 6 times!(every 2 days) until

yeast is almost gone.

Chapter 7: Filling

1.If directly drinking, you can directly use the clean cup to fill beer.

2.If the takeout is packed in barrels, the barrels need to be sterilized with hot water or soaked in hydrogen peroxide, then rinse the container with sterile water, and then fill it with a sterilized dispenser or a sterile tap.

3.Tap disinfection with alcohol, connect the valve at bottom of the fermentation tank to the distributor filling, first of all disinfect the internal and external surface of the valve and distributor pipeline , and then sterilized with sterile water, can also sterilize the valve and distributor pipeline with hot water.

Chapter 8: Quantity of material

12°P yellow beer Quantity of raw material

Brewhouse（L）	Malt（kg）	Light/dark caramel Malt（kg）	Feeding water（kg）	Wash stillage water（kg）	Hops（g）	Yeast（g）
50	10	0.3/0.15	45	12.5	3/20	10
100	20	0.6/0.3	90	25	5/35	20
300	54	1.8/0.9	270	75	18/105	100-90
500	90	3/1.5	450	125	30/175	175-140
1000	180	6/3	900	250	60/350	300-250

12°Black beer Quantity of raw material

Brewhouse（L）	Malt（kg）	dark caramel Malt（kg）	Black Malt（kg）	Feeding water（kg）	Wash stillage water（kg）	Hops（g）	Yeast（g）
50	9.6	0.5	0.8	45	12.5	3/20	10
100	19.2	1	1.6	90	25	5/35	20

300	51.5	3	5	270	75	18/105	100-90
500	86	5	8	450	125	30/175	175-140
1000	172	10	16	900	250	60/350	300-250

The raw material quantity for other concentration= Concentration needed×Raw material quantity/12degree (This formula suitable for malt quantity, for the quantity of rest raw materials such as burnt malt, water, bitter hops, yeast don’t need to change.)

Attachment:

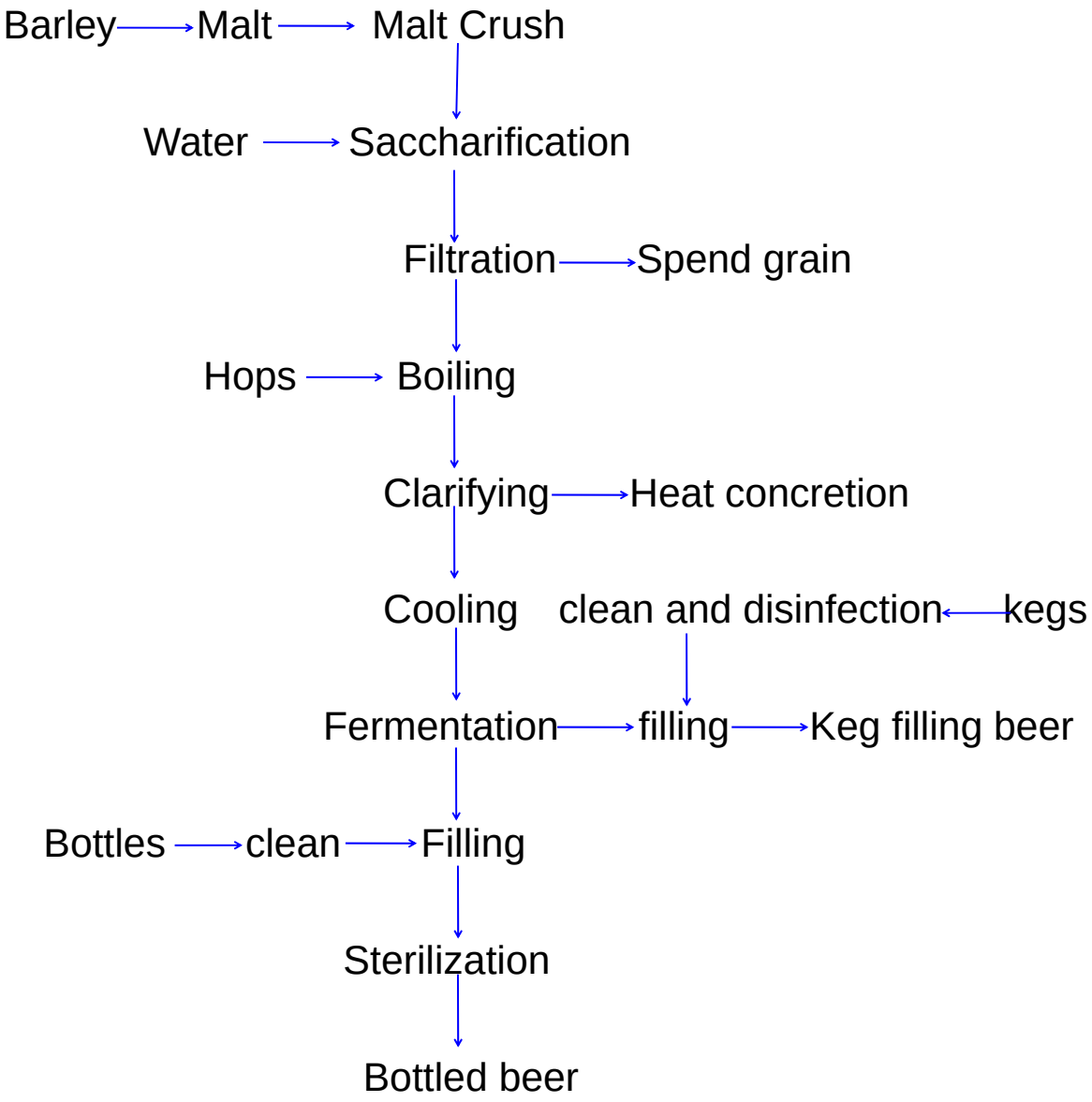
1. Jingde Equipment Common problems and solutions
2. Jingde craft beer brewing process
3. Heating tube wiring connection
4. Brewhouse diagram
5. Butterfly valve and 3-way valve operation
6. Brewhouse installation diagram
7. Operation Safety Manual

Attachment 1:Jingde Equipment Common problems and solutions

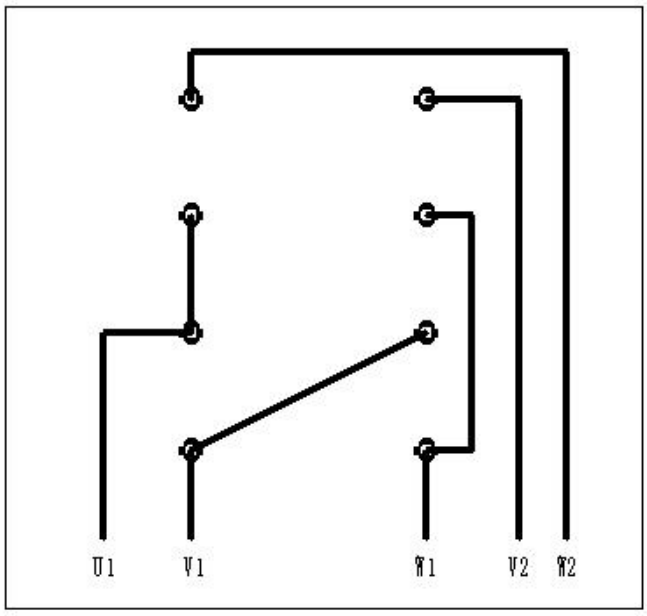
Brewhouse Problem	Problem Reasons	Solutions
Water or raw materials can't stirred	1. Valve didn't open smoothly 2. Motor reversal	1. Make valve smoothly 2. Change motor's phase wire
Water pump is leaking	Seal gasket is broken	Change seal
Pipe fitting leaking	Seal gasket is loosen	Fasten the seal gasket
Motor with abnormal noise	Default phase	Immediately stop and check the 3 phase wire
Heating doesn't work	1. Heating tube is wrong 2. Power supply break	1. Change the heating tube 2. Check the power supply

Fermenter Problem	Problem Reasons	Solutions
Press leakage	1. Vavle is loosen 2. Valve is leaking	1. Fasten valve 2. Change valve
Wort temp. can't go down	1. Compressor is broken 2. Fan motor broken 3. Refrigerator is leaking	1. Change compressor 2. Change fan motor 3. Add refrigerator
Temp. Meter didn't disply temp.	Temp. Meter broken	Change temp. meter

Attachment 2: Jingde craft beer brewing process

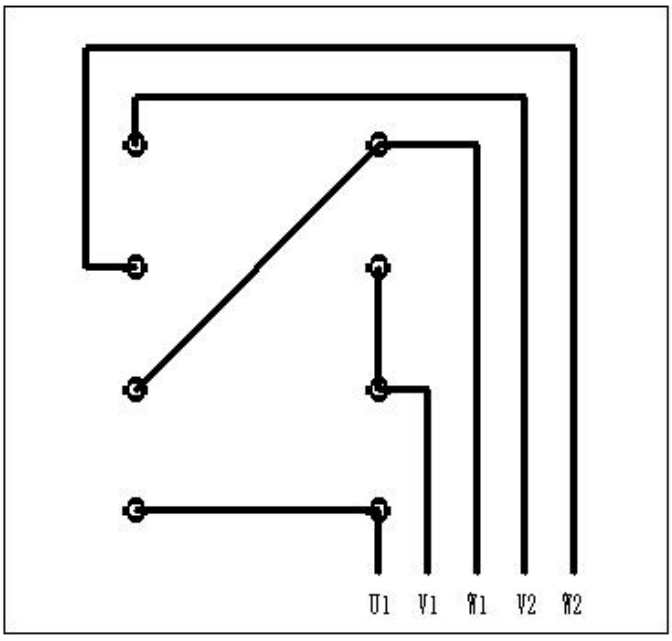


Attachment 3: Heating tube wiring connection



环形加热管接线方法

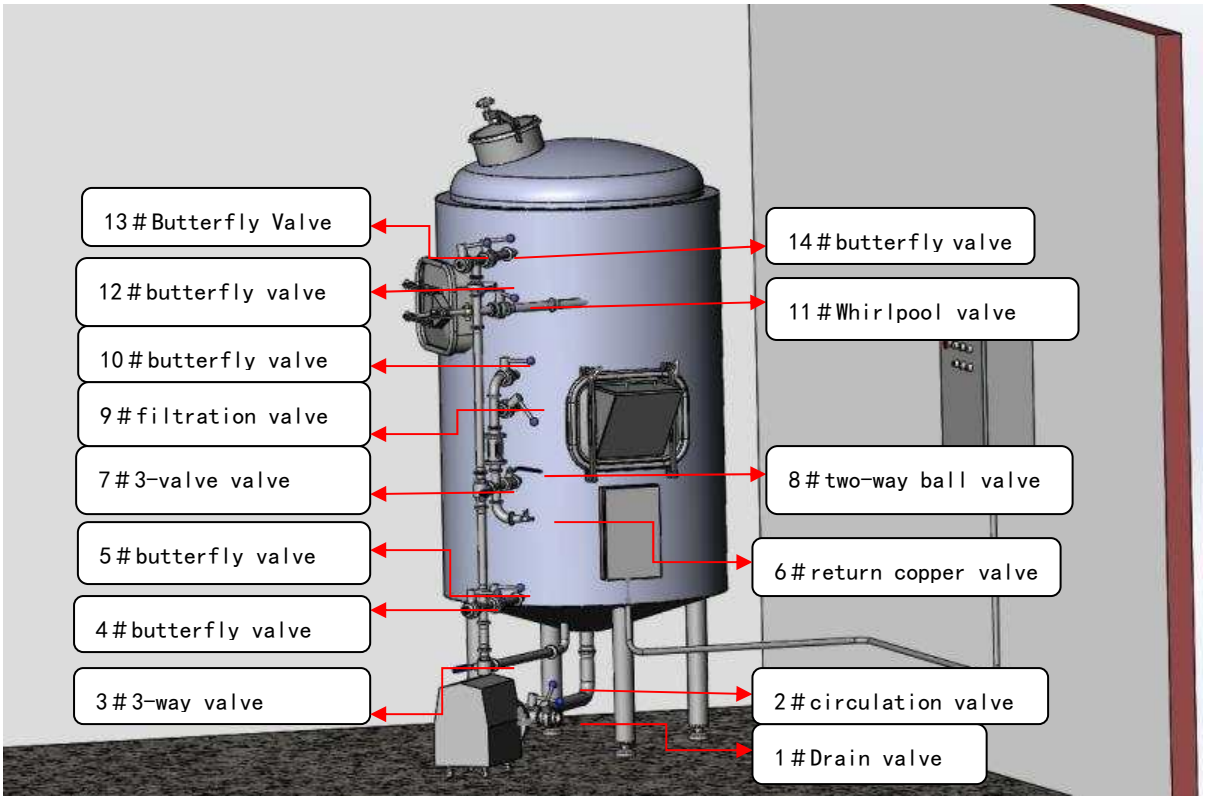
Circular heating tubes wiring connection



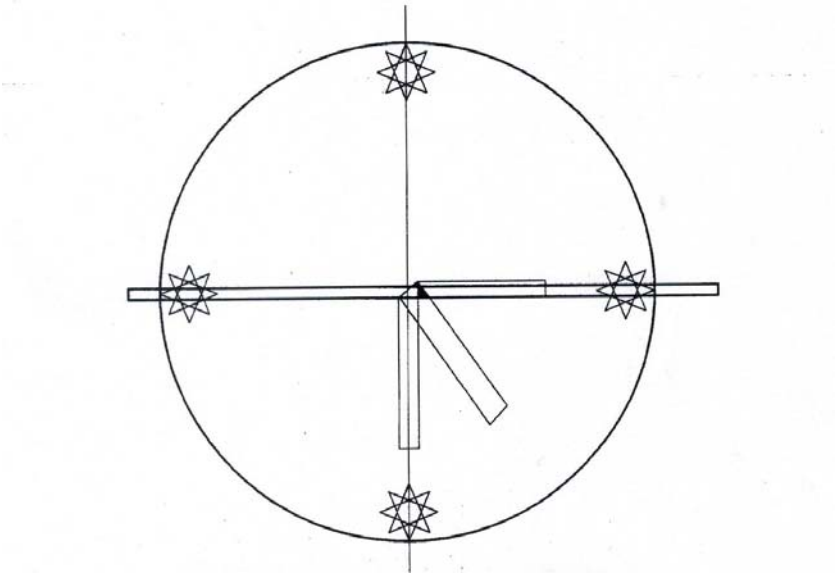
弧形加热管接线方法

Cambered heating tubes wiring connection

Attachment 4:



Attachment 5:



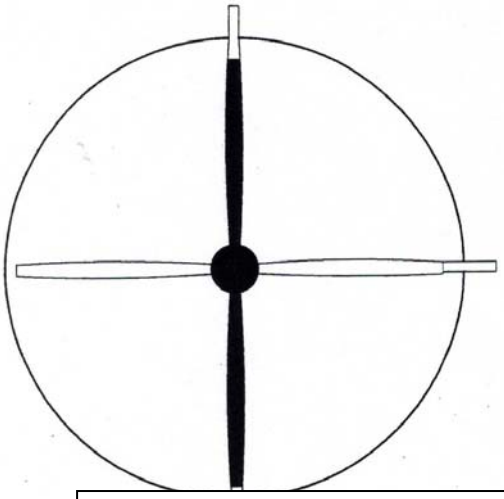
3-way valve (when grip handle by right hand, the thumb pointing):

Point 9:00 position, the 3:00 6:00 and 12:00 is all through

Point 12:00 position, the 3:00 and 6:00 is through

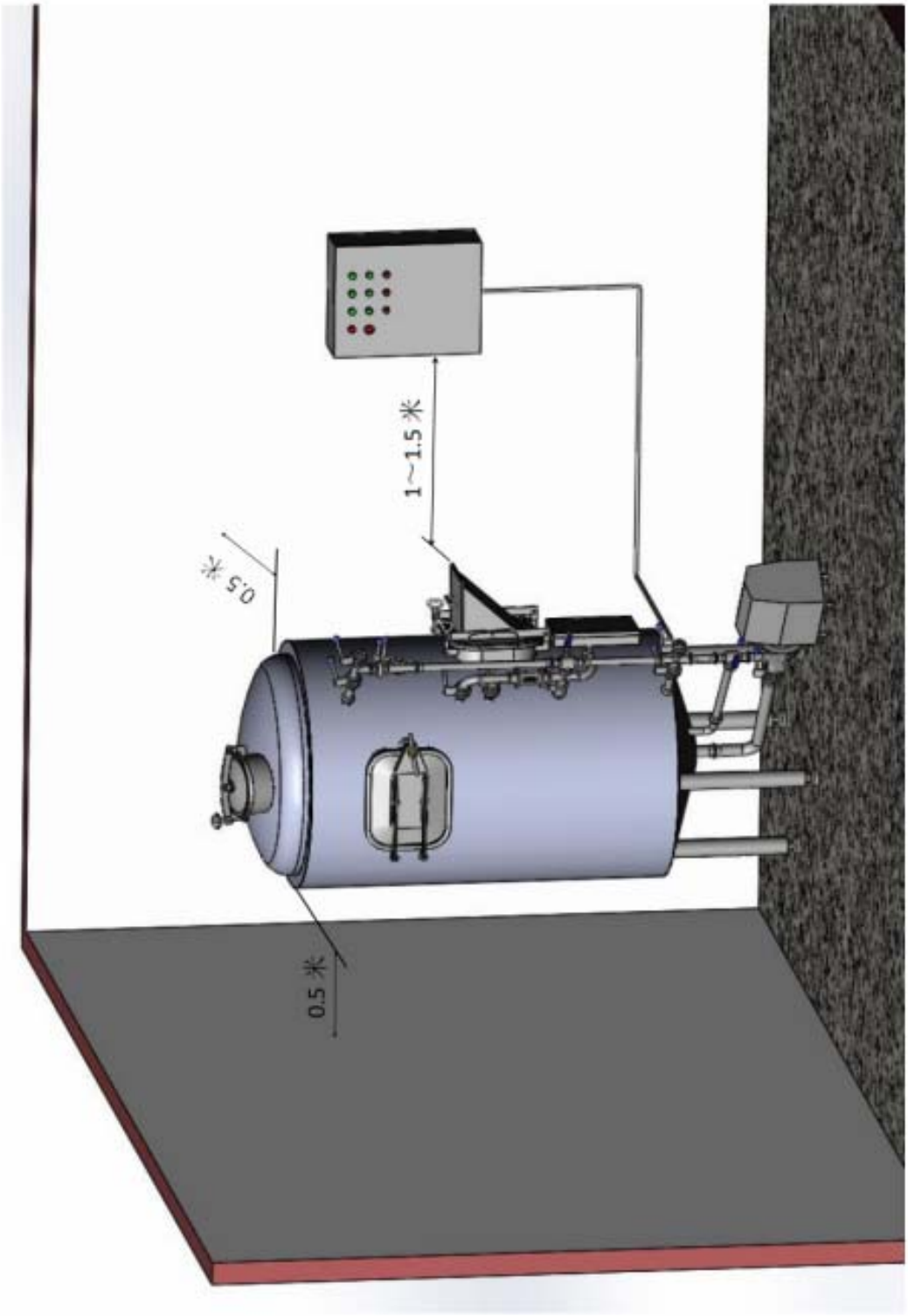
Point 6:00 position, the 3:00 and 12:00 is through

Point 10:00 and 12:00, all pipe get through, but only partly



1# lower horizontal pipe butterfly valve

Attached 6: Brewhouse installation diagram



Attached 7: Operation Safety Manual

1. After the equipment is installed, each equipment must be grounded to ensure that the grounding is intact.

2. When wiring the heating tube terminal, it must be connected with a wire nose to ensure the connection is firm.

3. The moment the miller starts, people must be away from the equipment.

4. When the hose is connected to the connector, the clamp must be stuck in the slot of the connector to ensure that the connection is tight.

5. The clamps at the equipment pipe joints should be checked regularly, and any loose ones should be tightened in time to prevent them from falling off during operation.

6. The terminal of the heating pipe should be checked frequently to prevent the risk of electric shock caused by water leakage.

7. Before using the filter tube, check whether the tube wall is intact to avoid the rupture caused by the damage caused by the external force and the liquid splashing.

8. Check whether the pipeline valve is in the correct open and closed state every time before turning on the pump, to avoid the pipeline blockage, the system pressure is too high and the hose is blocked.

9. When the valve is opened, the outlet must not face people to prevent the spray of mash or hot alkali from splashing on people.

10. When boiling, the operator should pay close attention to avoid overflow of wort.

11. When cleaning the equipment, it is strictly forbidden to pour caustic soda into hot water above 40 degrees to avoid the lye splashing.

12. Don't get up quickly when the fermentation tank is squatting down, and avoid touching the wine head at all times.

13. When turning on the heating, you must first observe whether the liquid level

completely covers the heating tube to avoid damage to the heating tube by dry heating.

14. The heating tube terminal screws should be checked regularly for looseness. If they are loose, they should be tightened in time to avoid danger due to poor contact and ignition.

15. During operation, check whether the connecting wire of the heating pipe is overheated. If it is overheated, cut off the power and replace the wire set.

16. In case of sudden power failure, all pipeline valves and electric switches should be closed to prevent accidental injury caused by sudden power.

17. When the mechanical seal of the water pump leaks, it should be replaced in time to avoid splashing of lye or wort on people.

18. Before cleaning the turnover barrel, be sure to vent the pressure in the barrel before unloading the vinegrass to avoid excessive pressure in the barrel causing the vinegrass to bounce and endanger personal safety.