

HT-KJ20 Series Mini Capsule Packaging Machine

Quick Start Manual





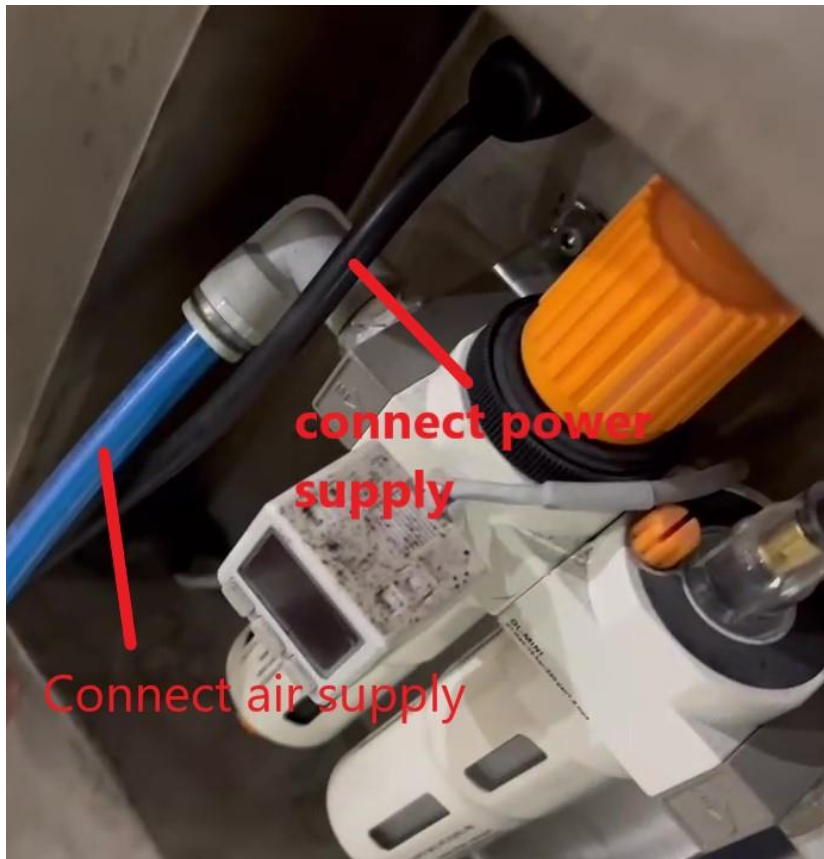
Warnings

PLEASE FIRST READ THE OPERATION MANUAL CAREFULLY AND UNDERSTAND ALL SAFETY MEASUREMENTS OF THE MACHINE AND INSTALL THE MACHINE PROPERTY AS REQUIRED BEFORE USING THIS QUICK START MANUAL.

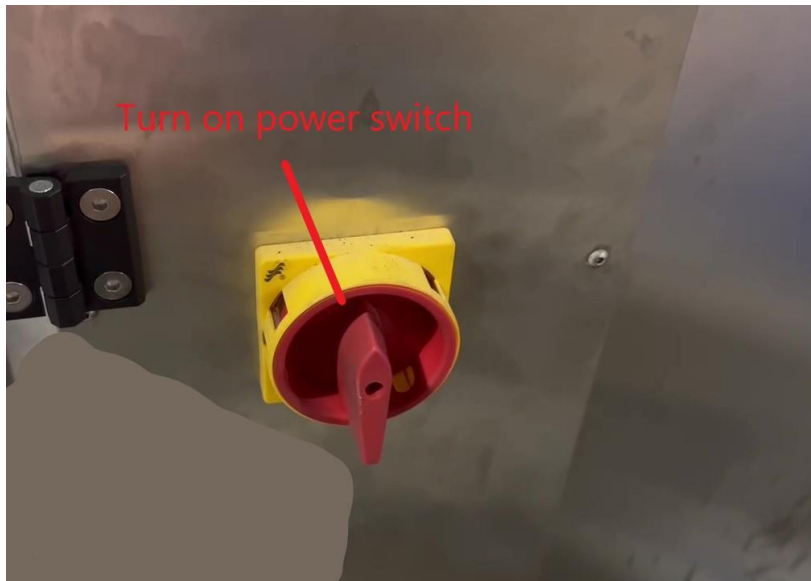
Step 1: Start the machine

Refer to quick start guild video: 1-start machine check up

1. Connect the power supply and air supply as following picture.

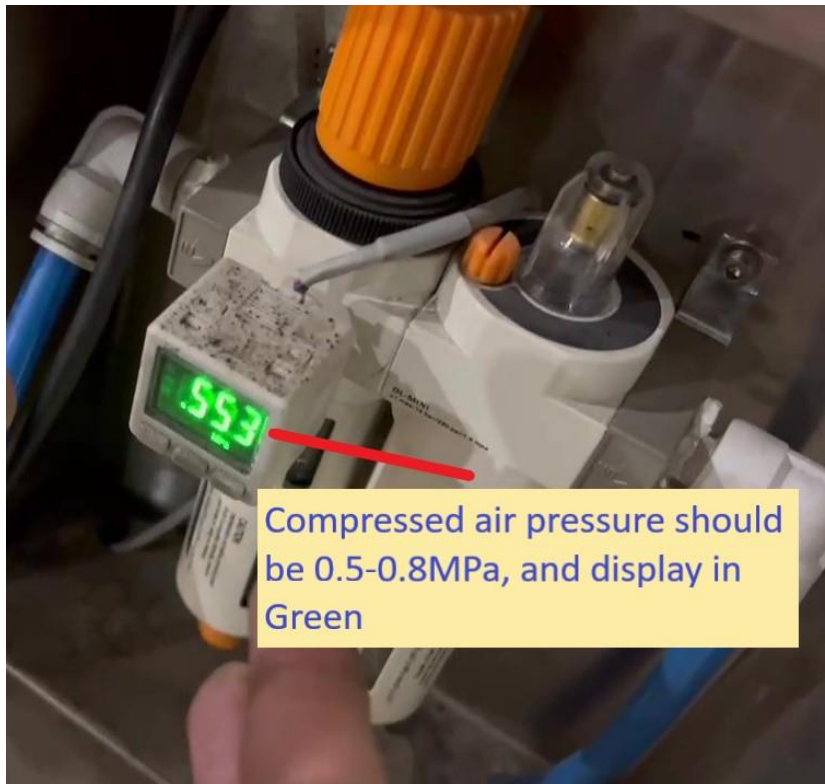


2. Turn on the power switch



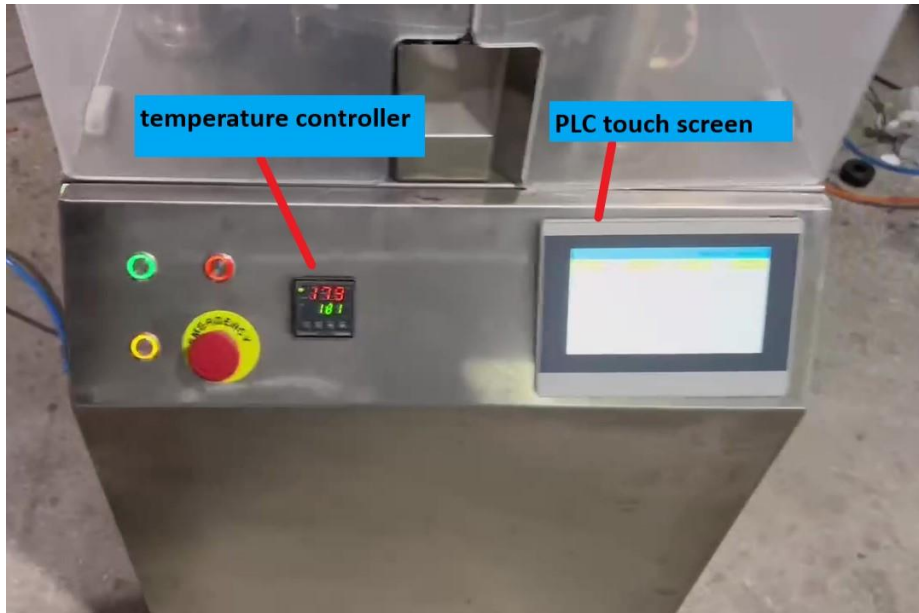
3. Check if the air supply is in normal condition.

Compressed air pressure should be 0.5-0.8MPa, air consumption about 100L/min.

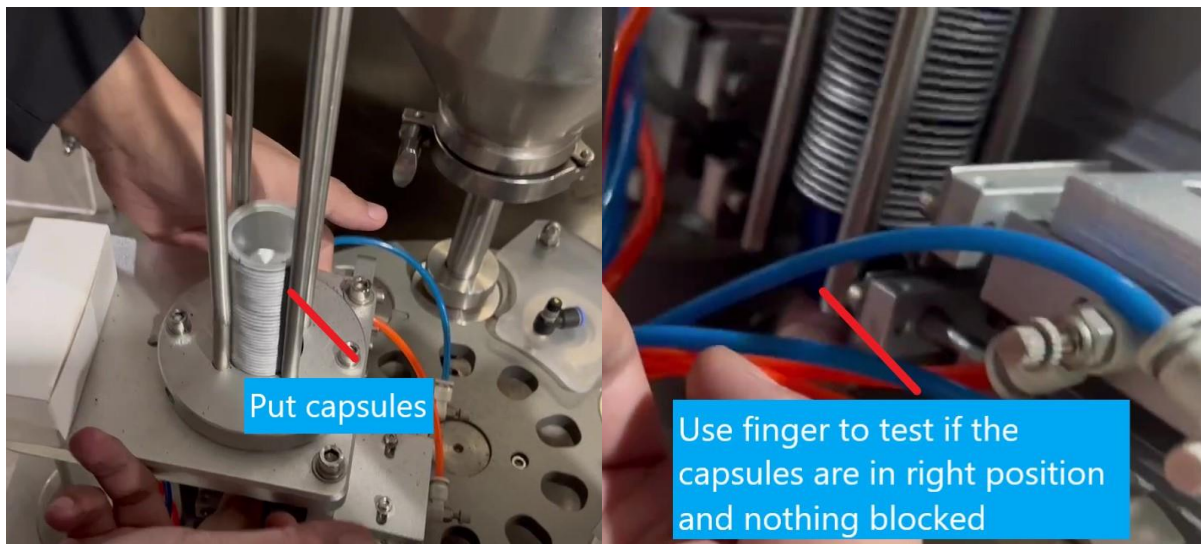


4. Check if the PLC touch screen starts and the temperature controller starts

The temperature controller will start automatically when the power is on, and heat the heater. You can set up the desired temperature (the number in green) on the controller. The actual temperature (the number in red) will increase up to the desired temperature and then stop.



5. Put the capsules



After put the capsules in the silo, use finger to move up the capsules a little to make sure the capsules are in good position and nothing blocked.

6. Put the lids



7. Put coffee



The machine are set up and ready to run.

Step 2: Fine tune each work station and debug problems



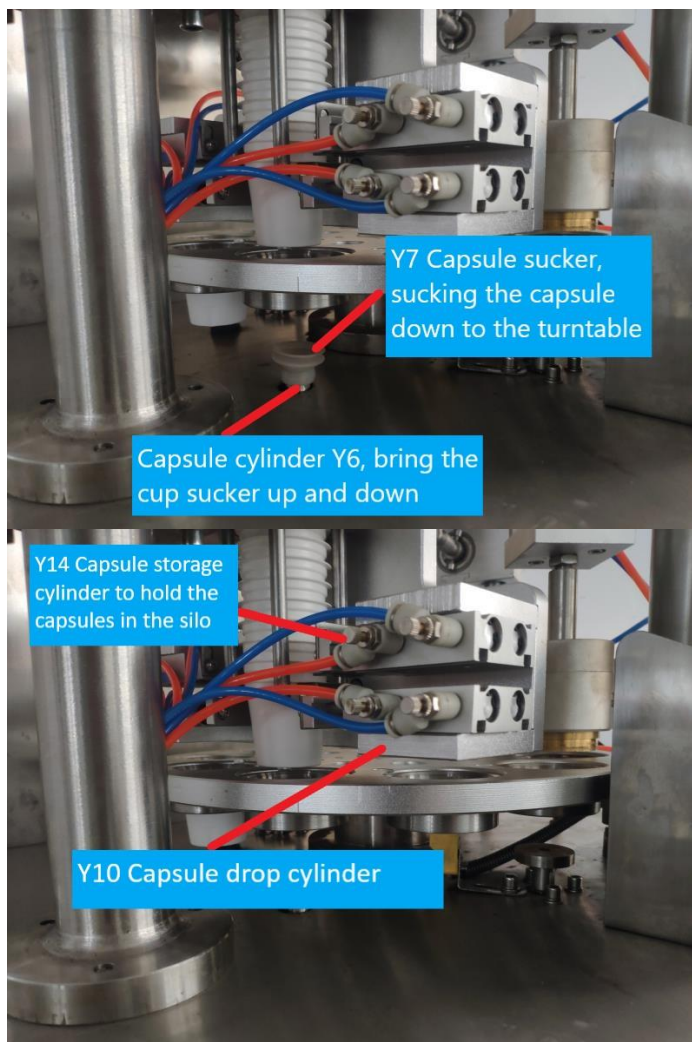
When the machine arrives, we suggest the customer should fine tune each work station before running the machine in Auto Mode. Because it is possible that some setup of the work station loose or offset during the transportation. And also, each time after the machine maintenance or clearance, the customer should fine tune the machine too.

Password for IO interface is: 888888

1. Fine tune the capsule drop

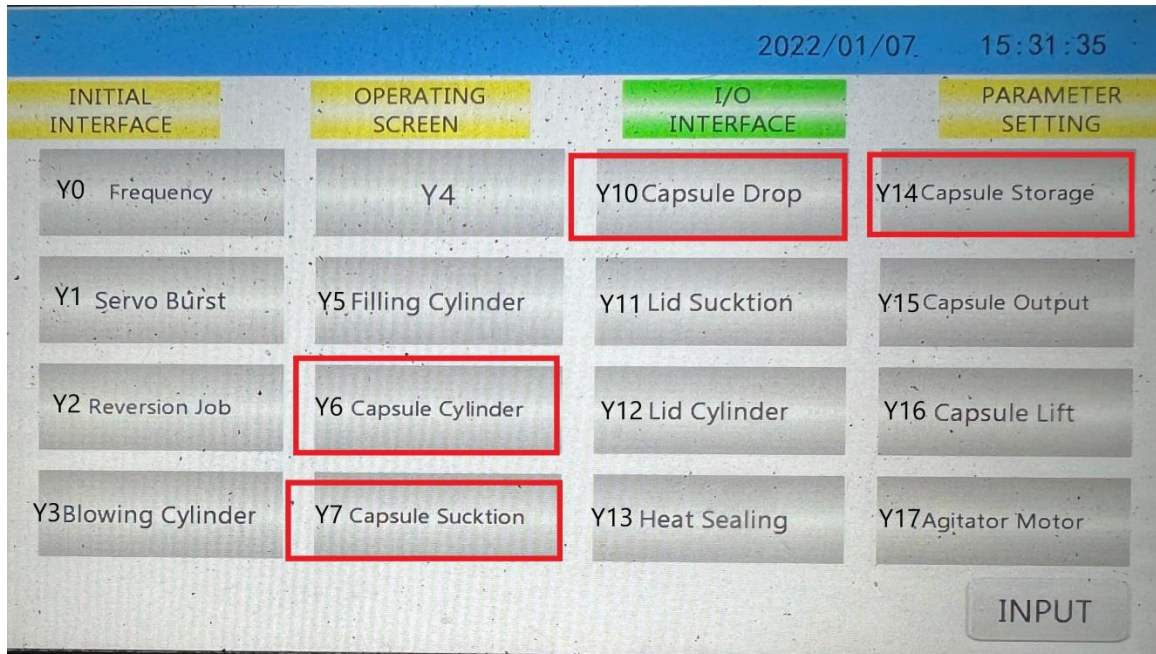
Refer to quick start guild video: 2- Cup drop debug procedure

1-1: There are 8 steps to fine tune the capsule drop process:



In IO interface, follows these procedures to drop one cup:

- Click the Y6 <capsule cylinder> button to push the sucker up.
- Click the Y7 <Capsule suction> button start vacuum sucking the cup.
- Click the Y14 <Capsule storage> button to **close the cup silo holder**.
- Click the Y10 <Capsule drop> button to **open the cup drop holder**.
- Click the Y6 <capsule cylinder> button again to **bring the cup down and place into the turntable** which the vacuum suction is still on.
- Click the Y7 <Capsule suction> button again to cut off the vacuum suction.
- Click the Y10 <Capsule drop> button again to **close the cup drop holder**.
- Click the Y14 <Capsule storage> button again to **open the cup silo holder**. Completing the whole process to place one cup into the turntable.



1-2: Common problems and solutions

A: Problem: The capsule can't fall down

Solution: Check if there are enough capsules in the storage silo and add them in time. Check whether the air pressure is sufficient, normal 0.5-0.8Mpa air pressure.

B: Problem: There is deviation when the capsule falls into the mold

Solution: Adjust the capsule silo, the mold sleeve in the turntable station and the capsule sucker beneath suction again, and make sure they are aligned in the center.

1-3. Fine tune the capsule detection

Make sure the the photoelectric components on the machine lights up when there is a capsule, and also <X11> Capsule detection in the IO interface should be in green.

Common problems and solutions: The photoelectric component on the machine does not light up or X11 does not turn green.

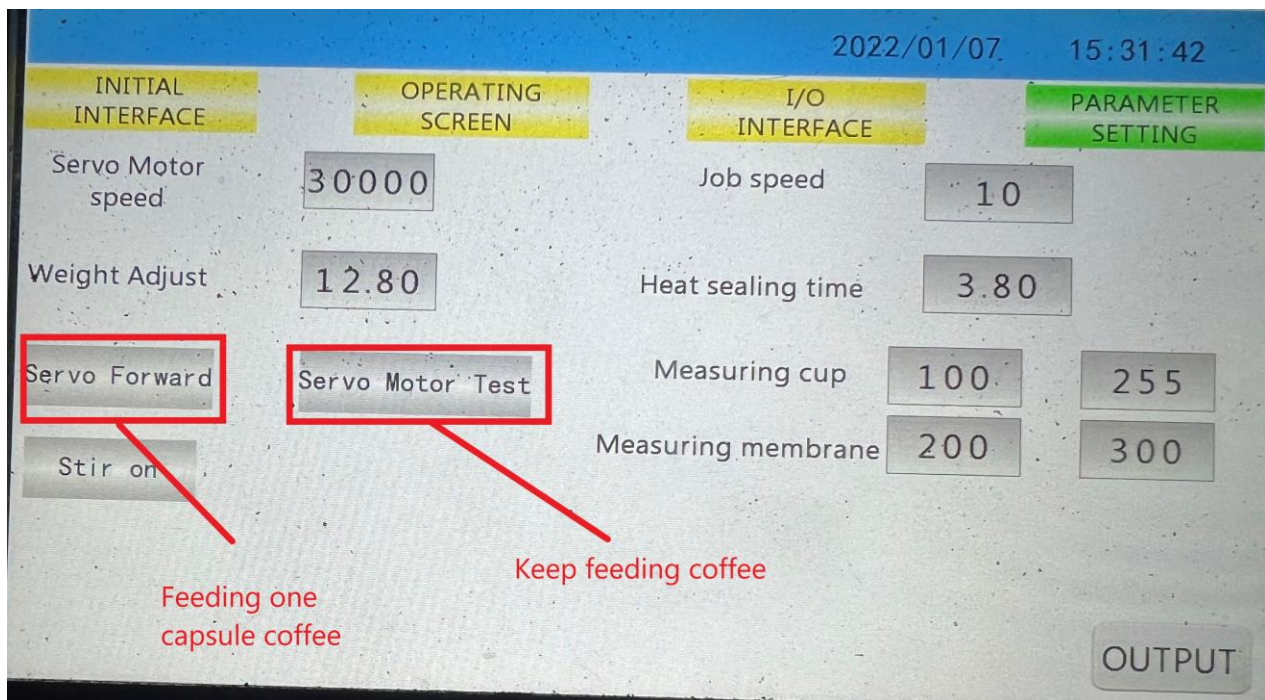
Adjusting the height, distance, position, angle, or sensitivity of the optoelectronic components until it lights up or X11 works normally. If it still does not work, after changing those parameters, then change the photoelectric component.

2. Fine tune the screw position and filling station

2-1 Adjusting the screw position and hopper

Refer to quick start guild video: 3 start machine-check screw-enSub

In manual mode, click the Y5 <filling cylinder> button to let the cylinder push up the cup, and then click <servo forward> button in the parameter page 2 to manually fill one cup of coffee.

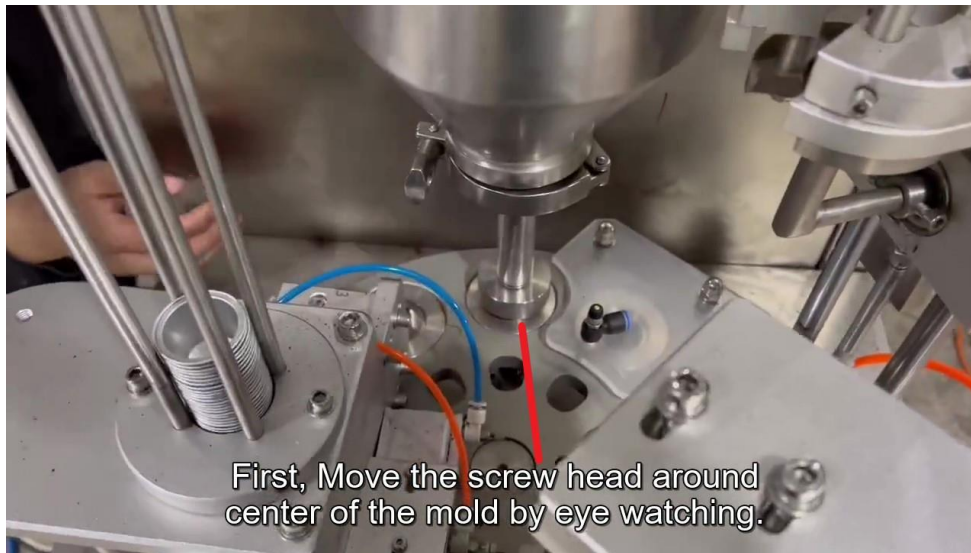


2-2 Adjusting the screw position and hopper after maintenance or transportation

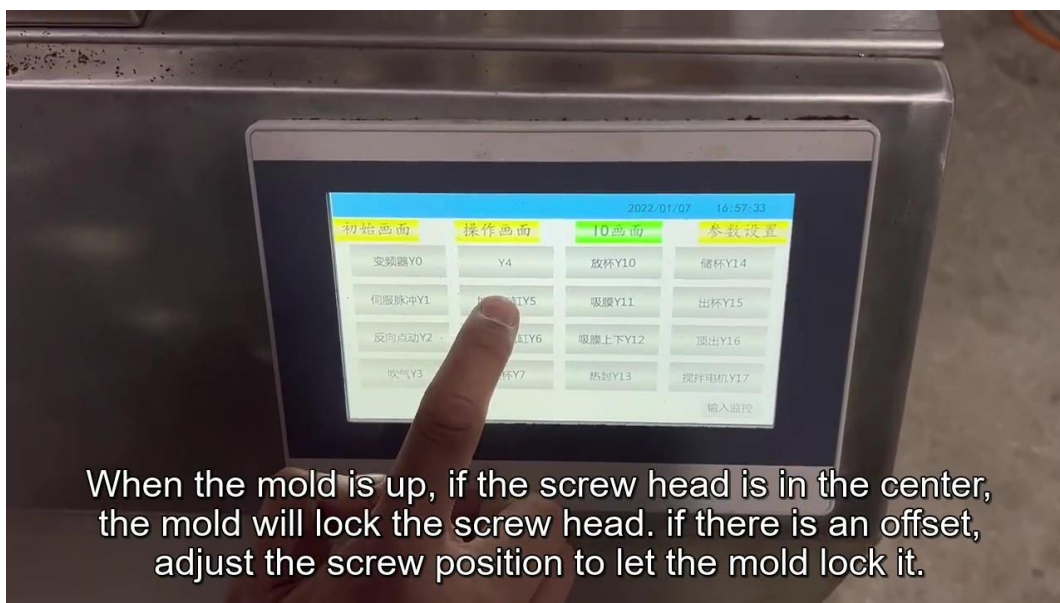
Refer to quick start guild video: 4-adjust+screw+position-Y5

After transportation, or maintenance (for example, empty the residue coffee in the hopper or clean the hopper, etc.), the hopper and screw head will need to be re-centered as following steps:

Step 1: move the screw head to align to the center if the mold by eye watching



Step 2: Click Y5 filling cylinder in IO interface. It will bring up the mold and if the screw is in the center of the mold, the mold will lock the screw head. if it is not, adjust the screw position until the mold lock it.





Step 3: After locking the screw, go to the back of the hopper, lock the two screws tightly to fix the hopper.

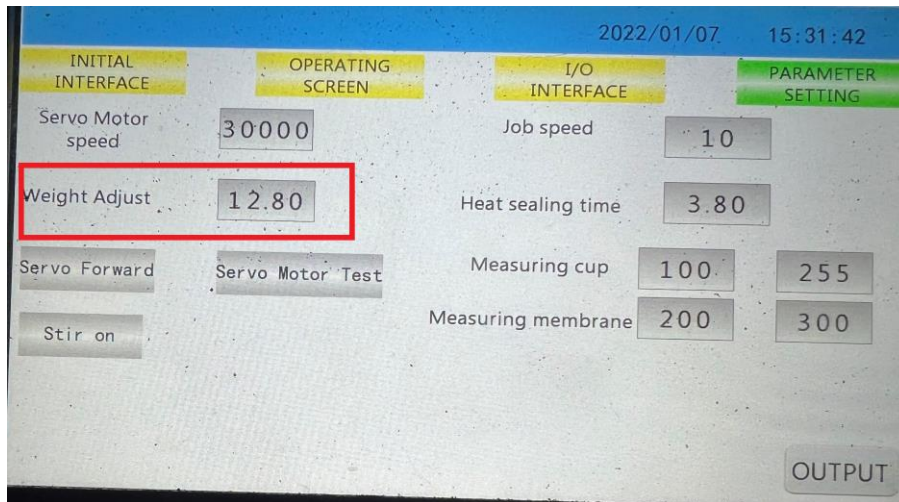


Step 4: Return to the IO interface, push Y5 filling cylinder a few times to make the screw is in the center.

Step 5: After tested the first mold, click Jog, bring the next mold and click Y5 a few times again to make sure the screw is in the centre of this mold too. Repeat this procedure until all molds are tested.

2-3 Adjusting the filling weight

Since we use the screw to fill in the cup, the machine actually only knows the volume, not the weight. It will cause that different blends have different density so that even we need the same desired weight, but we have different volume. That is why we have to configure these number by testing every different blends. Therefore, We have two different ways to adjust the weight, one is by calculation, another one is by continuous testing.



2-3-1: Adjust weight by calculation

First step: for example, in the Parameter page 2, we set up the desired weight is 12.5g. Then we put the number 12.5 into the filling weight. we start the machine and only fill the coffee. As samples in the following chart, we will fill 13 times,

time	1	2	3	4	5	6	7	8	9	10	11	12	13
weight	10.5	10.6	10.2	10.3	10.6	10.2	10.3	10.4	10.4	10.3	10.2	10.1	10

But we then Delete the first 3 cups, 1,2,3., because sometimes when you change the setting, there will be some residue inside the screw, so we need to get rid of the first couple cups to get the precise weight number. Actually, more filling cups, we will have more accuracy. So, I will suggest filling 20 cups and get rid of the first 5 cups.

We add the other 10 values and take the average

$$(10.3+10.6+10.2+10.3+10.4+10.4+10.3+10.2+10.1+10)/10=10.28$$

Second step:

Since the average weight is 10.28g, which cannot reach the desired weight 12.5g, we increase the filling weight and set to 15g, and then Filling 13 time again to get 13 different weights,

Such as

time	1	2	3	4	5	6	7	8	9	10	11	12	13
weight	12	12.1	12.2	12.3	12.4	12.5	12.5	12.4	12.3	12.2	12.1	12	12.1

Delete time number 1,2,3. Add the other 10 values and take the average again.

$$(12.3+12.4+12.5+12.5+12.4+12.3+12.2+12.1+12+12.1)/10=12.28$$

Now on the PLC control screen, we change the weight from 12.5g to 15g, which the change is $15-12.5 = 2.5g$.

And the actual weight changes from 10.28g to 12.28g, which the difference is:

$$12.28g - 10.28 = 2g.$$

The ratio is: $2.5/2 = 1.25g$

Now we want 12.5g, but we get 12.28g when we set up the desired volume to 15g. So,

$$12.5 - 12.28 = 0.22,$$

$0.22 \times 1.25 = 0.275$. Now we change the desired volume in the filling weight area from 15g to 15.275g, we should be able to get the actual filling weight is 12.5g. If now, please repeat the above procedure to get the exact filling weight.

2-3-2: Adjust the weight by continuous testing

If you do not want to do the calculation, you can use the first parameter, filling weight to adjust the weight by continuous testing.

First, we fix the number 12.5g, then we fill 3-5 cups to get the weight, usually, if the coffee is not dark, the actual weight will be less than desired weight 12.5g, for example, we got actual weight at 10.5g.

Second, since the actual weight is less than desired weight, we increase the filling weight and test again and repeat this procedure until we get the target weight.

2-3-3. Q and A

Q1: How to avoid the coffee overflowing the cup.

Sometimes, when the coffee density is too low, the coffee will be very loose. In this case, we can low down the screw head to let the screw head completely cover and touch the cup to press down the coffee inside the cup.

Q2: Our machine filling accuracy should be around $\pm 0.2g$, max should not be over $\pm 0.5g$. So, if we have big tolerances, there could be a couple reasons:

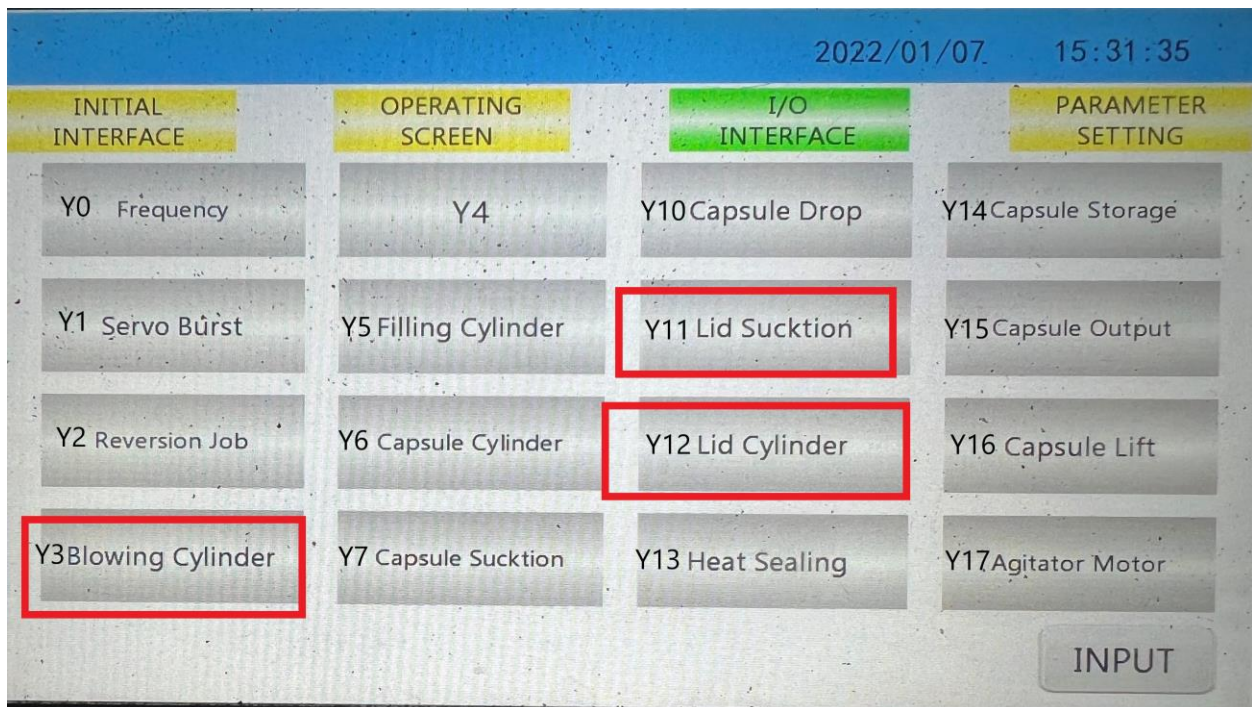
Reason 1: The coffee is too oily or too fine, which are very sticky. In this case, some coffee powder will be stacked on the screw, and then affect the accuracy.

Reason 2: There is too much or too less coffee inside the hopper, so that, the pressure for the screw bring down the coffee either too high or too low.

3. Place Lid on the capsule

Refer to quick start guild video: 5-Y11-Y12-suck+lid

There is a jackscrew on the side of the lid chamber, and the height can be adjusted by loosening the jackscrew. At the first step, you can press the y12 Lid cylinder button to stop the vacuum sucker at the highest position, and adjust the upper and lower height of the lid chamber so that the last piece of lid underneath is just close to the sucker, and the sucker is just in the center of the lid chamber. (When putting the lid, the printing side of the lid is facing down.)



After aligning, turn on Y3 blowing cylinder, and then Y11 lid suction to suck the lid, Y12 lid cylinder to bring down the lid, then Y11 lid again to release the lid on the cup, Y12 again to bring up the sucker for the next lid.

4. Lid detection station

Refer to quick start guild video: 6-sensor-detect+lid

As shown in the video, check if the sensor turns on and X12 lid detection is on when there is a lid on the capsule.

5. Heating sealing station

Refer to quick start guild video: 7-Y13-sealing

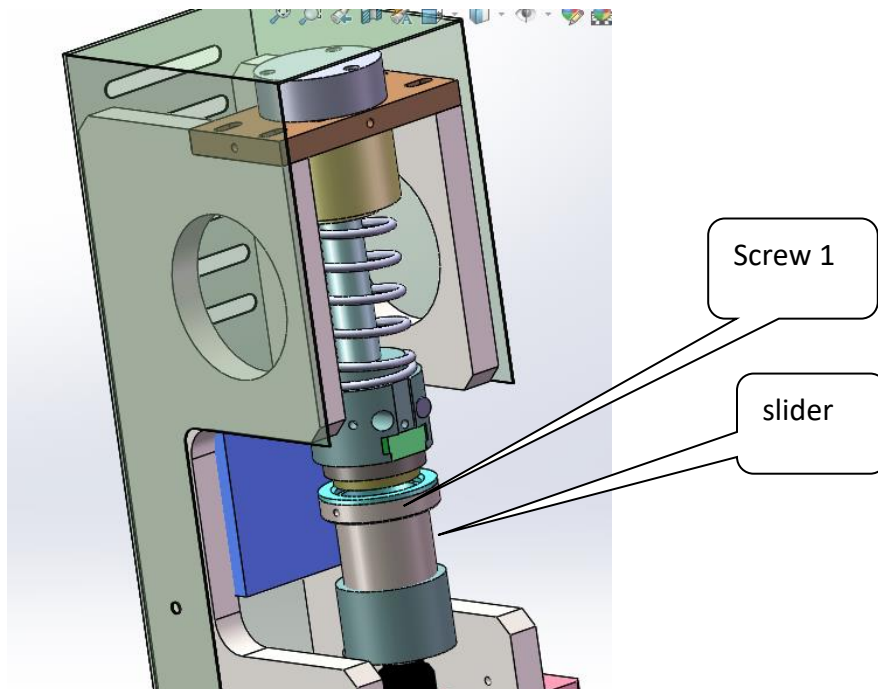
Click the Y13 <Heat Sealing> button, the heat sealing cylinder will be pushed down, pressed copper head on the surface of the cup, and seal it. Push Y13 again to return the cylinder when the sealing is done.

5.1 Pressure adjustment

The pressure regulator of the conjunction cylinder can adjust the sealing pressure on the lid. According to different cup and lid materials, it should be adjusted to the best sealing effect.

8.4.2: Replacement of heating tube

As shown in following picture, there is a jackscrew next to the heating tube, and the heating tube can be taken out by loosening the jackscrew. The operation is simple, convenient and quick. If you need to change the copper head, you can also directly loosen the screw 1 and take out the slider, then take out the copper head.



5.2: Common problems and solutions

Problem 1: The sealing is not strong enough, how to solve this problem?

Solutions:

A: The heating temperature is too low, increased the temperature.

B: The clamping pressure is too low, increase it appropriately.

C: Adjust the cylinder parameters to lengthen the cylinder sealing time.

Problem 2: The edges of the seal are not balanced, some are firmed and some are loosen, how to solve this problem?

Solution:

A: Adjust the heating device so that it is perpendicular to the center of the mold hole.

B: Loosen the upper thread, and then properly rotate the universal block on the heating copper head.

C: Check if the copper head is dirty, or check if the capsule edge has too much dirty.

Problem 3: The sealed lid does not coincide with the outer diameter of the cup, and there is a deviation. How to solve this problem?

Solution:

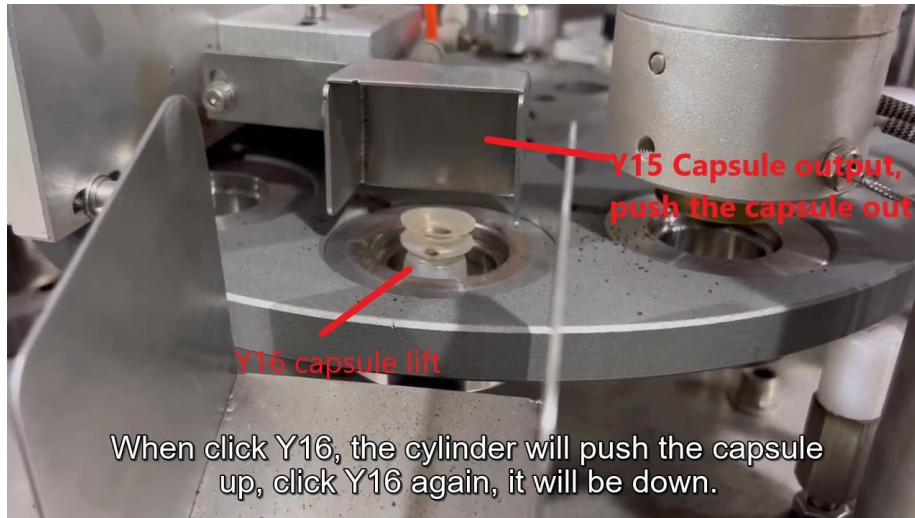
A: Adjust the lid chamber so that it is accurately sucked onto the surface of the cup.

B: Check whether the outer diameter of the lid and the cup match, and whether the diameter size is the same.

6. Discharge Capsules

Refer to quick start guild video: 8-Y15-Y16-cup+exit

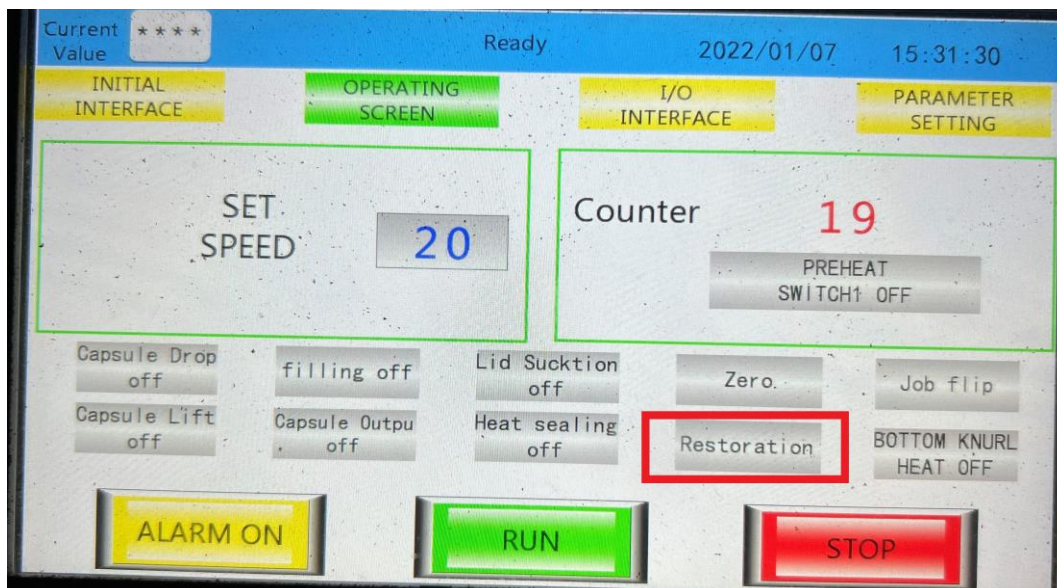
In IO interface manual mode, first click the Y16 <Capsule Lift> button to push up the capsules, and then click Y15 <Capsule Output> button to discharge the capsules; click Y16 again to return the sucker, and Y15 again returns the pusher.



7. Restoration of the machine start point

Refer to quick start guild video: 9-adjust origin position

Now, all procedures are tested, but before running the machine, we also need to restore the machine to the initial start point by **Clicking the button Restoration** on the operation page.



After clicking the restoration, the turntable will turn back to the initial position automatically. But sometimes, it will not arrive at the exact point, there could be a little offset. By Watching the screw head position if it is aligned with the mold to determine if there is an offset.

If there is an offset, push Jog button once to let the turntable adjust itself a little bit, then long press Jog button again to move forward one more station of the turntable to make sure the machine is at initial start point.

8. First run ----- Machine is ready

Refer to quick start guild video: 10-start-first+run

Now we are ready for the first time running of the machine, as the following steps:

- Turn on 6 operation buttons in operation interface
- Double check the temperature controller reaches the pre-setting temperature.
- Click Run button on the machine or on the PLC operation interface
- After 2-3 capsules dropped, turn off the capsule drop, and let the machine finish these 2-3 capsules completely

If these 2-3 capsules are no problem at all, turn on the Capsule drop button again, let the machine pack the capsules automatically.

