

RHX-F02 Single Pump Filling Machine User Manual

Ver 6.0

REHEART

2024/10/06

WENLY REHEART INDUSTRIAL LIMITED

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1 Product Introduction

1.1 Overview

The RHX-F02 filling machine is a high-precision single-pump filling equipment suitable for liquids. It can be used for weight-based dispensing of gel polish or other liquids. The filling machine mainly consists of the following parts:

- Controller
- Peristaltic pump
- High-precision scale



1.2 Main Functional Components

1.2.1 Controller

- STM32 high-speed CPU
- 5-inch high-definition LCD screen
- 1 control knob/button




1.2.2 Peristaltic Pump




- Three-roller gear pump
- After calibration, it can achieve fast filling without weighing based on rotation angle

1.2.3 High-precision Scale

- Weighing range: 0-3 kg or 0-10kg
- Accuracy: 0.1 gram
- Main purpose: Accurate measurement and calibration of filling quantity

2 Packing Information

No.	Item	Unit	Qty	Picture
1	Filling Machine	pc	1	
2	Silicone tube (Φ8X13mm)	meter	5	
3	70° Heater	pc	1	
4	Nuzzle and connector (5mm)	pc	4	
5	Nuzzle and connector (8.4mm)	pc	2	
6	Nuzzle and connector (12mm)	pc	4	
7	Film	pc	2	
8	Clamp used to clamp the pipe	pc	1	
9	20g weight, used for calibration	pc	1	
10	AC Power supply cord	pc	1	
11	Clamp cuff	pc	2	
12	Silicone gasket	pc	4	
13	Pagoda Joint	pc	2	
14	Funnel	pc	1	
15	Funnel cap	pc	1	
16	Funnel support	pc	1	

17	Container support	pc	1	
18	Jar support	pc	1	
19	Screw driver	pc	1	
20	Wrench (8mm/10mm)	pc	1	
21	Wrench (13mm/15mm)	pc	1	
22	Socket wrench (16mm/18mm)	pc	1	
23	Hex wrench (3mm)	pc	1	
24	Hex wrench (4mm)	pc	1	
25	Hex wrench (5mm)	pc	1	
26	Hex wrench (8mm)	pc	1	

3 Hardware Installation Guide

3.1 Installing the Hopper Support

This machine supports two types of hoppers supports:

- Funnel support (left image)
- Container support (right image)

Install the appropriate support according to the corresponding screw holes, and select the corresponding filling option in the software.



3.2 Installing the Silicone Tube

Choose the appropriate accessories and tools as shown in the diagram. The silicone tube has a uniform specification of 9mm inner diameter, 13mm outer diameter, and 30cm length.



3.3 Installing the Tube Cleaning Circuit

4 Controller Menu Introduction

4.1 Understanding the Control Knob

Below the screen, there's a round control knob. You can use it in these ways:




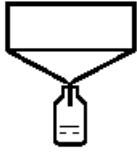

- Click: Press and release quickly (like a left mouse click)
- Long press: Press for 2 seconds before releasing
- Turn left: Rotate to the left (like moving a mouse up or left)
- Turn right: Rotate to the right (like moving a mouse down or right)

4.2 Home Menu




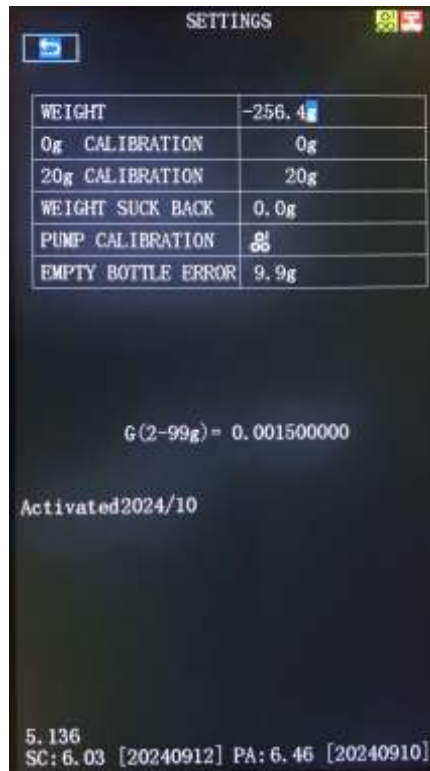
4.3 Button Description

Button	Function and Description
	<p>Counter Reset</p> <p>Click this button to turn its background yellow, click again to reset the counter, or rotate left or right to cancel the reset operation. Note: This operation will reset both the Accumulated Bottles and Power-on Time.</p>
	<p>Speed Adjustment</p> <p>Click this button to turn its background yellow, click again to exit, or rotate left to decrease speed, or right to increase speed. After setting the speed, click again to exit.</p>
	<p>Tare</p> <p>Click to tare the scale. After successful taring, the weight reading will be 0.0 grams.</p>


	<p>Target Weight Setting Click this button to turn its background yellow, click again to exit, or rotate left to decrease target weight, or right to increase target weight. After setting the target weight, click again to exit.</p>		
	<p>Tube Cleaning Click this button to turn its background yellow, click again to start the tube cleaning operation, or rotate left or right to cancel tube cleaning.</p> <p>When tube cleaning is activated, the pump head will repeatedly perform 5 forward rotations followed by 5 reverse rotations. To stop tube cleaning, click this button again.</p>		
	<p>Full Filling (Top-up) Click this button to start filling to the target weight. Note: Before clicking this button, make sure there is a bottle under the nozzle and that you have performed an empty bottle tare operation.</p>		
	<p>Funnel Filling Mode This button does not support clicking</p>		<p>Container Filling Mode This button does not support clicking</p>

4.4 System Settings

Move the cursor to , then long-press the knob to enter the system settings menu.



4.5 System Settings Button Description

Button	Function and Description
	Return Click to return to the home menu
0g CALIBRATION	Empty scale calibration
20g CALIBRATION	20g weight calibration, using 3kg sensor
200 CALIBRATION	200g weight calibration, using 10kg sensor
5kg CALIBRATION	5kg weight calibration, using 50kg sensor
WEIGHT SUCK BACK	Set the retraction weight after each filling stop to prevent overweight
PUMP CALIBRATION	Pump Zero Position Click to turn the background yellow, pump head enters calibration mode, rotate the knob to move the pump head slightly; click again to exit calibration mode
EMPTY BOTTLE ERROR	Set the weight error between empty bottles

5 Filling Guide

5.1 Preparing for Filling

This filling machine supports two filling modes: Funnel mode and Container mode. Please choose based on the packaging of the liquid to be filled. The following instructions use Container mode as an example.


5.1.1 Loading Gel

1. Use hemostatic forceps to clamp the silicone tube above the nozzle to prevent gel polish leakage
2. Open the container and insert the silicone tube into the container

5.1.2 Power On

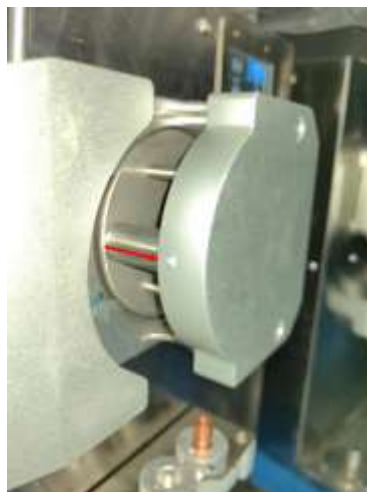
Plug the filling machine's power cord into the power socket, then turn on the filling machine's power switch.

5.1.3 Check the Scale

1. Click  on the home menu
2. Place a 20g (or 200g) weight on the bottle clamp and check if the screen displays 20g (or 200g). If the weight is inaccurate, please refer to "6.3 How to calibrate the scale?"


5.1.4 Check the Pump Zero Point

After powering on, the pump's parking position must be as shown in the figure below. That is, the center line of one roller should align with the white triangle mark on the pump's cover plate. If not aligned, please refer to "6.4 How to calibrate the pump zero position?" to perform pump zero position calibration.




5.2 Start Filling


5.2.1 Get Empty Bottle Weight

1. Insert an empty bottle from bottom to top into the bottle clamp
2. Click 
3. Remove the empty bottle



5.2.2 Set Filling Weight

Click  , then rotate left or right to set the target filling weight, click again to confirm and exit

5.2.3 Set Filling Speed

Click  , rotate left or right to set the speed, then click to confirm and exit

5.2.4 Start Filling

1. Remove the hemostatic forceps from the silicone tube (if present)
2. Choose the appropriate icon based on the hopper type
For funnel, move the cursor to 
For container, move the cursor to 
3. Insert an empty bottle from bottom to top into the bottle clamp. This action will immediately start the pump. When the filling amount reaches the set target, the pump will stop pumping
4. When the pump stops pumping, remove the bottle
5. Repeat steps 3~4 for the next bottle filling

5.2.5 End Filling

1. Use hemostatic forceps to clamp the outlet end of the silicone tube
2. Remove the silicone tube from the container
3. Remove the hemostatic forceps from the silicone tube
4. Close the container lid
5. Clean the silicone tube
6. Power off

6 Questions and Answers

6.1 How does Funnel mode differ from Container mode?


This machine supports two different filling modes:

1. Funnel mode
2. Container mode

The differences between the two modes are shown in the table below:

Item	Funnel	Container
Package of raw material	Plastic bag	Container
Place of raw material	Funnel	On the table or on the support
Filling speed	Fast	Moderate
Filling accuracy	High	Acceptable
Weighing method	Fill first, then weigh	Weigh while filling
Pump zero calibration	Required	Not required

6.2 How to enter the system settings menu?

When there is no filling task, rotate the knob to move the cursor to the , then press and hold this button for more than 2 seconds before releasing to enter the system settings menu.

6.3 How to calibrate the scale?

6.3.1 Preparation

- End the current filling task (if any);
- Do not place a bottle at the nozzle
- Prepare a 20g weight


6.3.2 Calibration Steps

Step 1: Enter the system settings interface

Step 2: Rotate the knob to move the cursor to the "0g" position, do not place the weight, then press and hold this button for more than 2 seconds before releasing. The background of "0g" will turn yellow and display the current weight in real-time. Click again to complete the 0g calibration.

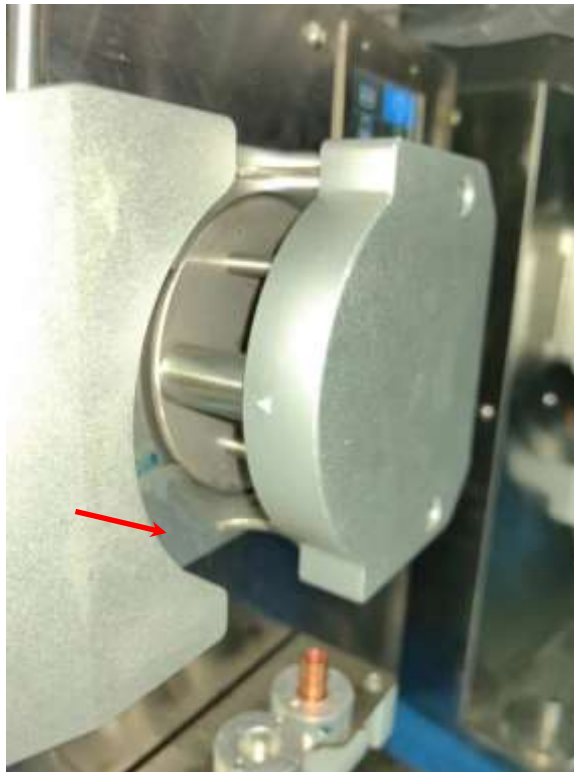
Step 3: Rotate the knob to move the cursor to the "20g" position, place the 20g weight on the scale pan, then press and hold this button for more

than 2 seconds before releasing. The background of "20g" will turn yellow and display the current weight in real-time. Click again to complete the 20g calibration.



Step 4: Rotate the knob to move the cursor to , then click to return to the home menu.


6.4 How to calibrate the pump zero position?


After powering on, the stopping position of the pump must be as shown in the figure below. That is, the center line of a certain roller is aligned with the white triangle mark on the pump cover plate. If it's not aligned, you need to perform pump zero calibration operation.



Step 1: Enter the system settings interface

Step 2: Rotate the knob to move the cursor to  on the right side of "PUMP CALIBRATION", then click this icon. The background of  will turn yellow

Step 3: Rotate the knob left or right one notch, the pump will slowly reverse or forward rotate one notch. When the roller's center line aligns with the cover plate's white triangle, click  to end calibration.

Step 4: Rotate the knob to move the cursor to , then click to return to the home menu

Step 5: Power off and on this machine again, then check if the pump position is correct. If not correct, repeat the above steps.

6.5 How to correctly set the “Weight Suck Back”?

Because the gel polish is more viscous than water, it will continue to flow into the bottle after the pump stops. To solve this problem, this machine has a retraction function. When the pump stops rotating, it will continue to reverse rotate to suck back the gel polish around the nozzle, thus avoiding too much gel polish flowing into the bottle.

The “Weight Suck Back” value should be set differently for different gel polishes. You need to try different values during actual filling to achieve the best filling effect.

6.6 How to correctly set the Empty Bottle Error?

To ensure that the same type of bottle is used for each filling and avoid bottle mix-ups, this machine has an error prevention system to ensure the same type of bottle is used each time.

Due to inevitable small errors in the production process, bottles that look very similar may have slightly different weights. The "Empty Bottle Error" parameter is set for this purpose. It can be adjusted between 0.5 grams and 9.9 grams. Please set this value according to the actual weight difference between bottles.

The method to obtain this value is: Randomly take 5 bottles from the same batch, weigh them separately. Find the heaviest and lightest bottles, the weight difference between these two bottles is the "Empty Bottle Error".

6.7 How to check the software and hardware versions?

Enter the system settings menu, look at the bottom line of the screen, for example:

SC: 6.03 [20220608] PA: 6.46 [20230110]


The main board software is 6.03, hardware version is 20220608

The pump software is 6.46, hardware version is 20230110

6.8 Will the machine go to sleep if not used for a long time?

Yes. If there is no motor action and no menu operation for 30 minutes, this device will enter power-saving sleep mode and pop up an alert dialog box indicating that the device has entered sleep mode.

When the system is in sleep mode, the motor will switch to low power mode.

To exit sleep mode, please click  on the screen, and the system will immediately exit sleep mode.



6.9 Will the counter automatically reset?

Yes. The system will reset the "Power-on Time" and "Accumulated Bottles" counters to zero when either of these conditions is met:

- Total Power-on Time \geq 100 hours
- Total Accumulated Bottles $>$ 99,999

6.10 What do the icons in the upper right corner of the system settings interface mean?

When entering the system settings interface, there will be three small icons in the upper right corner, their meanings are as follows:

Icon	Represents	Background Color Meaning
	Pump	Green: Online Yellow: Running Red: Offline
	Scale	Green: Online Pink: Faulty Red: Offline

6.11 Does a higher filling speed setting mean faster filling?

Not necessarily.

What's certain is that a higher filling speed setting means faster pump rotation. However, the filling speed may not necessarily be faster.

Different viscosity liquids have different characteristics. To achieve the fastest filling speed, different filling speed settings are needed. The following table can be used as a reference:

Gel polish	Speed
Base and top	4 or 5
Solid color	3 or 4
Glitter	1 or 2
other	1

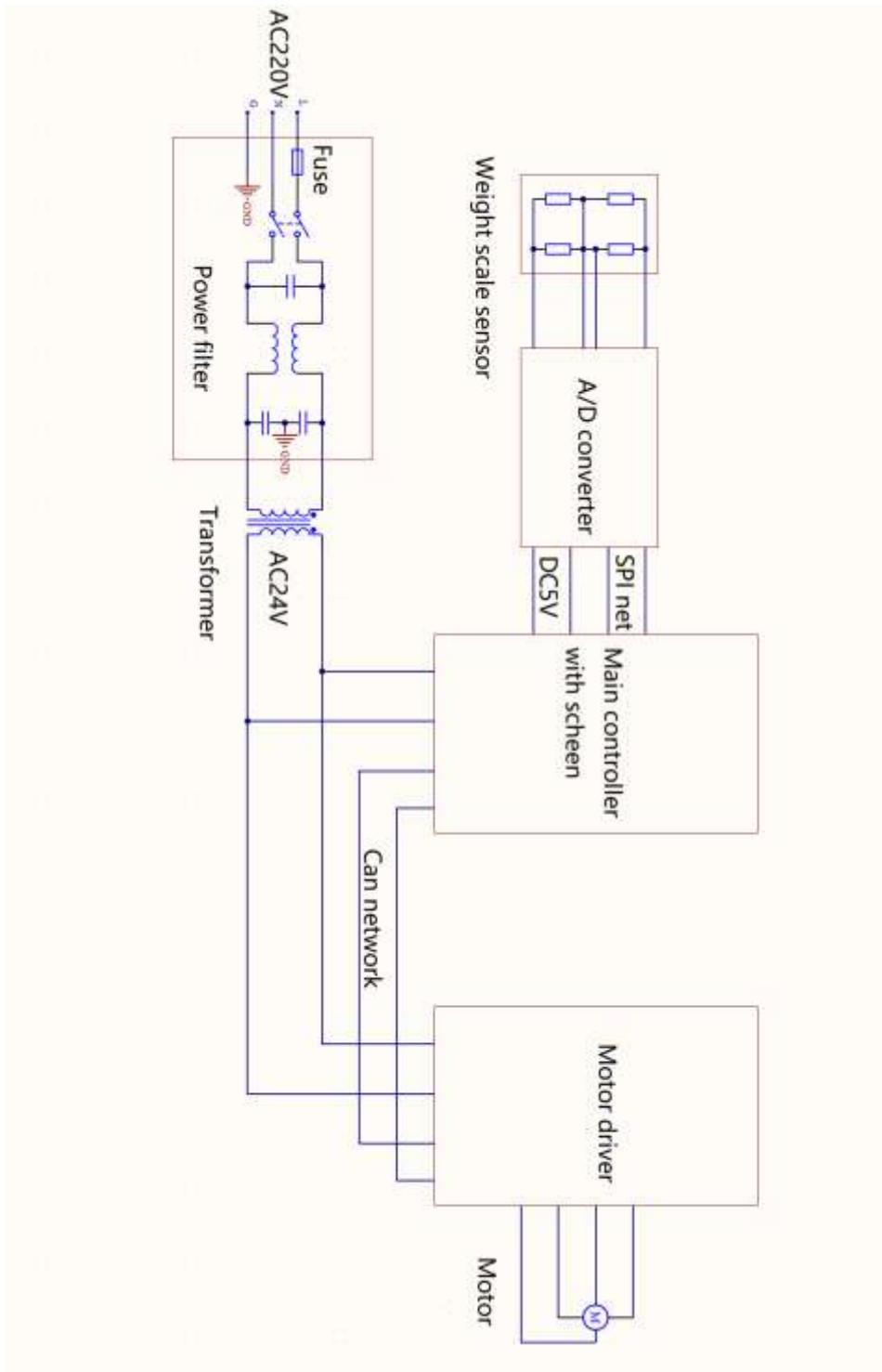
6.12 Why does it prompt "Clean bottle holder Slits"?

There is viscous liquid in the bottle holder slits, affecting weighing accuracy. Use a brush and alcohol solvent to carefully clean the scale head. Recalibrate the scale after cleaning.

7 Technical Specifications

Voltage	AC 110V or AC 220V, setup by factory
Power	100W
Package dimension	X X Xmm
Net dimension	XXXmm
Package weight	Xxkg
Net weight	xxkg
Accuracy	+/-0.2g, Funnel mode

8 Electrical Schematic



9 Mechanical Schematic

