Project No.	6038
Equipment	Emulsifier
Model	VE-750
Series No.	VAN256038

Version History

Version	Issued date	Reason for issue
V 2.0	5-Aug-25	Initial issue

Contents

1.Equipment Safety Matters

1.1 Overview

1. In addition to reading the safety rules, every transportation, loading and unloading, operation and maintenance personnel must read the relevant content in the manual.

2. The manual must be placed in a place commonly used by the relevant personnel, such as in the designated toolbox or tool bag.

3. All work must comply with the terms of the manual.

4. All kinds of safety, danger, operation and protection signs on the machine must be complete and clear.

5. there are any additional safety clauses in the contract, they must also be complied with.

1.2 Use it Correctly

1. It must be used in accordance with the conditions indicated and required by the manual, and the user must have full safety awareness.

2. Any unsafe factors affecting the machine should be corrected immediately.

3.It must be strictly implemented in accordance with the installation, disassembly, use, operation, maintenance and repair instructions formulated by the manufacturer to ensure proper use.

1.3 Homogeneous System Safety

1.The homogenization cutter head rotates at an extremely high speed (up to 3000 rpm). The time without liquid rotation must not exceed 30 seconds to prevent local overheating and damage to the sealing components, which would affect the equipment's sealing performance and service life.

2.After confirming that the rotation direction of the homogenizer shaft is clockwise, the

equipment can be officially operated: Before changing the motor wiring or restarting after a long period of inactivity, a short press should be performed for a trial run to observe that the rotation direction is correct, and then it can be put into normal operation.

3.During the operation of the equipment, it is strictly prohibited to insert hands, tools or other foreign objects into the reaction vessel (homogenizer tank, oil tank, water tank) to prevent accidents such as limb entanglement or cutting; if it is necessary to observe the internal material state, it can only be done by looking through the observation window provided by the equipment.

1.4 Sealing and Vacuum System Safety

1.Before starting the stirring, vacuum extraction or material conveying pump, it is necessary to check the sealing condition between the tank body and the tank cover to ensure that the sealing ring at the tank opening is undamaged, and that the sealing components such as the feeding cover are closed reliably. This is to prevent material leakage or the inability to establish vacuum, and also to avoid secondary risks such as material leakage causing slips or contamination.

2.Before filling the homogenizer with gas, the ball valve below the vacuum gauge should be closed first to prevent high-pressure gas from impacting and damaging the vacuum gauge, affecting the accuracy of pressure monitoring.

3.Before shutting off the vacuum pump, the ball valve in front of the vacuum system should be closed first; before opening the tank cover or feeding cover, it is necessary to confirm that there is no vacuum in the tank. If there is still vacuum in the tank, the vacuum system ball valve and the vacuum pump should be closed first, and then the exhaust valve on the tank cover should be opened to eliminate the vacuum to prevent the tank cover from suddenly popping open, causing material splashing or damage to equipment components.

4.Only when the homogenizer is in a completely sealed state can the vacuum pump be started; in special cases where the vacuum pump is started to exhaust to the atmosphere, the single operation time should not exceed 3 minutes to avoid the vacuum pump overheating and being damaged due to no load running.

1.5 Material Handling Safety

1.When adding raw materials to the oil tank or water tank, it is necessary to ensure that the equipment is in a stopped state and there is no vacuum or pressure in the tank. After adding, promptly close the lid to prevent the materials from spilling out during heating and stirring, or foreign substances from falling into the tank and contaminating the materials.

2.The liquid level of the material in the homogenizer tank should be controlled within the specified working volume (the main tank has a working volume of 750L, and the oil tank and water tank each have 250L). Do not overfill to avoid material overflow during stirring or increase the load on the homogenizer, resulting in overload faults of the motor.

3.Before changing the type of materials, all components in contact with the materials (homogenizer head, tank body, conveying pipeline, etc.) must be thoroughly cleaned to prevent cross-contamination of different materials. This is especially applicable to industries with high hygiene requirements such as food, cosmetics, and medicine.

1.6 Exception Handling Security

During operation, if any abnormal sounds (such as metal friction sounds, strange noises) are detected, increased vibration, leakage, abnormal temperature rise, etc. occur, the emergency stop button should be pressed immediately to cut off the power supply of the equipment and troubleshoot the fault. The equipment shall not be restarted before the fault is eliminated.

In case of material leakage, the equipment operation should be stopped first, the vacuum / pressure inside the boiler should be eliminated, and then the leaked materials should be cleaned. If the leaked materials are high-temperature and corrosive substances, protective equipment (such as heat-resistant gloves and protective glasses) should be worn for handling, to avoid skin contact and injury.

After the equipment alarm (such as insufficient vacuum, overload of the motor, low cooling water flow, etc.) is triggered, the alarm information should be viewed through the touch screen first. Before pressing the "Alarm Reset" button, the corresponding fault must be eliminated (such as checking the seal, cleaning foreign objects, restoring the supply of cooling water), to prevent the fault from extankding.

2.Structure of Equipment

2.1 Main Structure

The VE-750 vacuum homogenization unit consists of the main tank, oil tank, water tank, material conveying system, electrical control system, vacuum system, heating and cooling system, and the frame, etc.

The main tank, oil tank and water tank are composed of homogenization mechanism, stirring mechanism and other components.

No.	Description	Note
1.	Ladder	Used for observation or powder adding.
2.	Platform	User for observation of tanks upper side, operation and add powder for water/oil tank.
3.	Main tank	Production tank, has function of product emulsifying and mixing.

2.2 Structure and Materials

1.Material: The parts in contact with the materials are made of high-quality SUS316 stainless steel, while the outer part of the tank body and non-contact components are made of SUS304 stainless steel, meeting the hygiene and corrosion resistance requirements of the food, cosmetics, and pharmaceutical industries.

2.Internal Wall Design: The internal connection of the tank body adopts smooth arc transition, without sharp edges or dead corners, which avoids material residue, facilitates cleaning, and ensures uniform material mixing.

3.Capacity Specifications: The main tank is designed with a capacity of 1000L and a working volume of 750L; the oil tank and water tank are both designed with a capacity of 300L and a working volume of 250L, suitable for different batch material processing requirements.

4.Data storage function: Data Record and Save function: Before switch on the machine, insert the USB storage into the port beside HMI. The data for main tank, water tank and oil tank will be recored automatically for early 1min. User can take the USB and copy data into computer for review and checking.

3. Working Principle

3.1 Basic Working Principle

1.The material is stirred in the homogenizer tank through the PTFE scraper stirred in the tank (the scraper always caters to the shape of the tank, sweeps the hanging wall adhesive), constantly generates new interfaces, and then cuts, compresses and folds

through the frame agitator, so that it is stirred and mixed and flows down to the homogenizer under the tank body, and the material is then cut in the shear seam and quickly broken into 200nm~2μm particles generated between the rotor and the stator. Because the homogenizer is in a vacuum state, the bubbles generated by the material during the stirring process are pumped away in time.

2.The material can be directly drawn into the homogenizer under vacuum through the conveying pipe. The discharging method is a direct discharge type from the bottom valve of the homogeneous tank. Steam is heated into the sandwich of the tank to heat the material, and the heating temperature is adjusted by the temperature controller setting on the control tankel. Cooling water can be connected to the mezzanine to cool the material. Simple and convenient operation. Homogeneous mixing and paddle mixing can be used separately or at the same time. The length of homogeneous mixing time is controlled by the user according to the different properties of the material. Material micronization, emulsification, mixing, mixing, dispersion, etc. can be completed in a short time. The contact part with the material is made of SUS316 high-quality stainless steel, the inner surface is mirror polished, and the vacuum stirring device is hygienic and clean.

3.2 Principles of Material Mixing and Homogenization

1.Pre-treatment stage: The mixing system first mixes the oil phase, water phase and other raw materials evenly, breaking the initial agglomeration state of the materials and forming a uniform "pre-mixed liquid", to avoid "local excessive shearing" or "insufficient refinement" caused by uneven material components during homogenization;

2.Refinement stage: The pre-mixed liquid continuously flows downward under the action of the mixer to the homogenization mechanism. Through the high-frequency shearing of the homogenization system, it achieves micro-refinement. At the same time, the mixer system continues to act, transporting the homogenized materials upward, forming a "mixing - homogenization - re-mixing" cycle, ensuring that all materials have undergone homogenization treatment;

3.Vacuum environment assistance: The entire mixing and homogenization process is carried out under a vacuum condition (maintained by a 7.5kW vacuum pump), which can promptly remove the bubbles generated during the mixing and homogenization of the materials, avoiding the influence of bubbles on the homogenization shearing effect, and preventing problems such as "segregation" and "degradation" in the finished product due

to residual bubbles, ensuring the stability of the emulsified product.

4.Main Technical Parameter

Description	Parameter
Power Supply Accessory	220V/60Hz/3P+PE+N
Dimensions: length ×width ×height	Fill in according to the actual size
Homogenizer tank design capacity	1000L
Working volume	750L
Stirring power	7.5kW
Stirring speed	10-60rpm/min
Homogeneous power	18.5kW
Homogeneous speed	3000rpm
The design volume of the oil tank	300L
Working volume	250L
Stirring power	1.5kW
Stirring speed	10-60rpm/min
Design volume of the water tank	300L
Working volume	250L
Stirring power	1.5kW
Stirring speed	10-60rpm/min
Homogeneous power	5.5 kW
Homogeneous rotational speed	0-2800rpm/min
Vacuum pump power	7.5kW

4.1 Water Electricity and Gas Technical Parameters

NO.	Type	Project	Parameter
1.	Water	Cooling water inlet pressure	0.2 Mpa (0.2 ~ 0.4Mpa)
2.		Cooling water inlet temperature	25℃ (≤30 ℃)
3.		Cooling water flow rate	120L/min (100L/min)
4.		Cooling water consumption	
5.	Electricity	System power	220V/60Hz/3P+ PE+N
6.		Power of the stirring motor on the main tank	7.5 Kw
7.		Power of the homogenizing motor on the bottom of the main tank	18.5 Kw
8.		Power of the stirring motor on the oil tank	1.5 Kw
9.		Power of the homogenizing motor on the bottom of the oil tank	5.5 Kw
10.		Power of the stirring motor on the water tank	1.5 Kw
11.		Power of the homogenizing motor on the bottom of the water tank	5.5 Kw

12.		Power of the rotor pump motor of the main tank	2.2 Kw
13.		Power of the rotor pump motor of the oil and water tanks	1.5 Kw
14.		Power of the vacuum pump motor	7.5 Kw
15.		Power of the hydraulic motor	2.2 Kw
16.	Gas	Compressed air pressure	0.6 Mpa (0.6 ~ 0.8 Mpa)
17.		Compressed air consumption	100 L/min （0.2Nm³/H）
18.		Limit vacuum degree	-0.087 Mpa
19.		Steam pressure	0.3 Mpa (0.2 ~ 0.3 Mpa)
20.		Steam consumption	100 Kg/h
21.	load cell measuring range	Compressed air	0-1 Mpa
22.		Temperature	-200 ~ 450 ℃
23.		Vacuum	
24.		Vacuum pump water flow rate	0.1-0.6Mpa 20L/min

5. Installation and Test

5.1 Electrical system inspection

1.Power supply compatibility verification: Confirm that the on-site power supply meets the equipment requirements - the power supply is three-phase five-wire AC 220V ± 10%, frequency 60Hz ± 1Hz, with a total power capacity of ≥ 55KW; Use a multimeter to measure the input power voltage to ensure that the voltage fluctuation is within the allowable range, and avoid damage to electrical components such as PLC and frequency converters due to excessively high or low voltage.

2.Cable tightening check: Open the electrical control cabinet and check the wiring terminals of the main power switch, homogenizer motor (18.5kW/5.5kW), stirring motor (main tank 7.5kW, oil tank / water tank 1.5kW), vacuum pump motor (7.5kW) one by one. Confirm that the screws are not loose, the cables are not broken or the insulation layer is not damaged; Focus on checking the wiring of PLC (Siemens S7-1200 CPU 1214C), touch screen (TP1200) and I/O module to ensure that the digital (DC24V) and analog (4~20mA/DC0~10V) signal cables are securely connected without any loose connections.

3.Grounding resistance test: Use a grounding resistance tester to measure the grounding resistance between the equipment protection grounding and the instrument grounding point. The requirement is less than 0.4Ω, in line with national standards, to prevent electric shock accidents or signal transmission interference caused by poor grounding after power-on.

5.2 Equipment Installation

1.Connect the power supply, ensure it is compatible, and make sure the ground wire is reliably grounded. Then, turn on the main power switch. The power indicator light will illuminate.

2.Ensure that all the pipes of the homogenizer tank (including each overflow outlet, drain outlet, and sewage outlet, etc.) and the inlet pipe (with the tap directly connected to the tap water) are properly connected.

3.Before conducting the vacuuming process, it is essential to ensure that the tank is tightly attached to the tank cover, and that the tank mouth, material inlet cover, etc. are properly sealed and reliable. Close all the valve interfaces on the tank cover, then open the vacuum

valve on the tank cover, and start the vacuum pump to perform the vacuuming. Once the required level of vacuum is achieved, turn off the vacuum pump and follow the operation guide for detailed instructions. Also, close the vacuum valve.

5.3 Testing of Equipment

1.Before opening the tank lid and the material inlet cover, it is necessary to do so when there is no vacuum inside the tank. If there is vacuum inside the tank, then the valve on the vacuum extraction interface (and the vacuum pump) should be closed, and the valve on the tank lid should be opened to eliminate the vacuum pressure inside the tank.
2.The vacuum pump can be started and operated only when the homogenizer is in a sealed state. If there is a special need, the pump can be started by venting to the atmosphere. The operation time should not exceed 3 minutes.

6. Operation Guide

6.1 Basic Operation

1.After all the preparations are completed, connect the power supply and then the work can be carried out as required.
2.The operating components include the main tank, oil tank, water tank stirring, homogenization, vacuum pump, rotor pump, heating, and cooling. The control is carried out through the menu on the touch screen, which can control the lighting and extinguishing of the lights, control the operation of the main tank, oil tank, and water tank stirring and homogenization, control the operation of the vacuum pump and rotor pump, and control the operation of heating and cooling.
3.All the controls are carried out on the control tankel of the touch screen.

6.2 Daily Work Operation Guide

Oil and water tank:
Connect the power supply; ② Add ingredients to the oil-water tank; ③ Close the lid of the oil-water tank; ④ Heat and stir the oil-water tank; ⑤ Turn on the discharge switch and release the contents.

Homogenizer:

Connect the power supply; ② Cover the homogenization tank with the lid (preheating can be done first, details are up to the user); ③ Open the vacuum valve on the lid of the tank and close all other valves. Start the vacuum pump to create a vacuum. Once a certain vacuum level is reached, then open the suction valve to draw in the material; ④ (Close the suction valve) Start the homogenization stirring for emulsification (once the emulsification is complete, stop heating); ⑤ (Close the vacuum valve and then close the vacuum pump)

Turn on the discharge switch to release the material ⑥ (Clean and discharge the waste).

6.3 Touchscreen Interface Operation

1.VE-750 Basic parameters requirements for emulsifying machine

Power Supply Voltage (Operation): 3-phase 5-wire AC 220V ± 10%

Power Supply Frequency: 60Hz ± 1Hz

Total Power Supply Capacity: Greater than or equal to 55KW

Grounding Requirements: Less than 0.4 ohms. Provide compliant with national standards protective grounding and instrument grounding points or grounding network.

Compressed Air: Oil-free, clean, dehydrated compressed air with a pressure of 0.6 - 0.8 MPa and a flow rate of 0.2 m3/h

Cooling Water Pressure: 0.2 - 0.4 MPa

Industrial Steam: 0.2 - 0.3 Mpa

2.Control System Overview

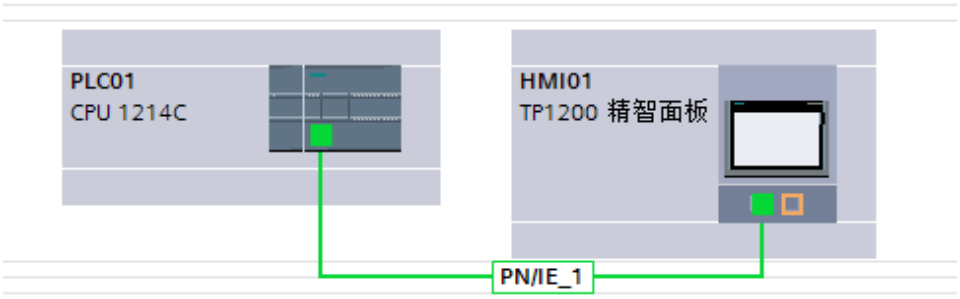
(1). Hardware Configuration

All the PLC control system components are from Siemens SIMATIC products. The basic control system is composed of the CPU 1214C DC/DC/DC from the S7-1200 series of Siemens, equipped with an internal 100 KB working memory; one TP1200 intelligent tankel is configured, with a resolution of 1280×800 pixels, and the front tankel has a protection level of IP65. The touch screen is placed in the system operation room for system operation.

All the user-set parameters input through the tankel will be directly stored in the memory

card of the CPU module, while the formula parameters, historical data, and alarm records will be stored in the SD card of the touch screen to prevent data loss in case of accidental power outage.

All the I/O modules are standard input/output modules from Siemens. The digital input and output are of a working voltage of DC24V safety voltage, and the analog input and output are of the internationally common 4~20mA/DC0~10V signals. Detailed component descriptions can be found in the DE-03 BOM file.



PLC01 is installed in the electrical cabinet.

HMI01 is installed on the control panel and on the operation console of the machine frame.
(2). Software Description

The self-control programming software based on the Windows operating system is SIEMENS TIA PORTAL, an integrated PLC and touch screen editing software. The excellent Windows operation interface and object-oriented programming environment greatly simplify the work of programmers and maintenance personnel, facilitating equipment maintenance. For detailed explanations, please refer to the official documents of Siemens.

Login interface entry

The system powers on and enters this initial screen. Click the "Enter System Screen" button to enter the process screen and perform system operations.

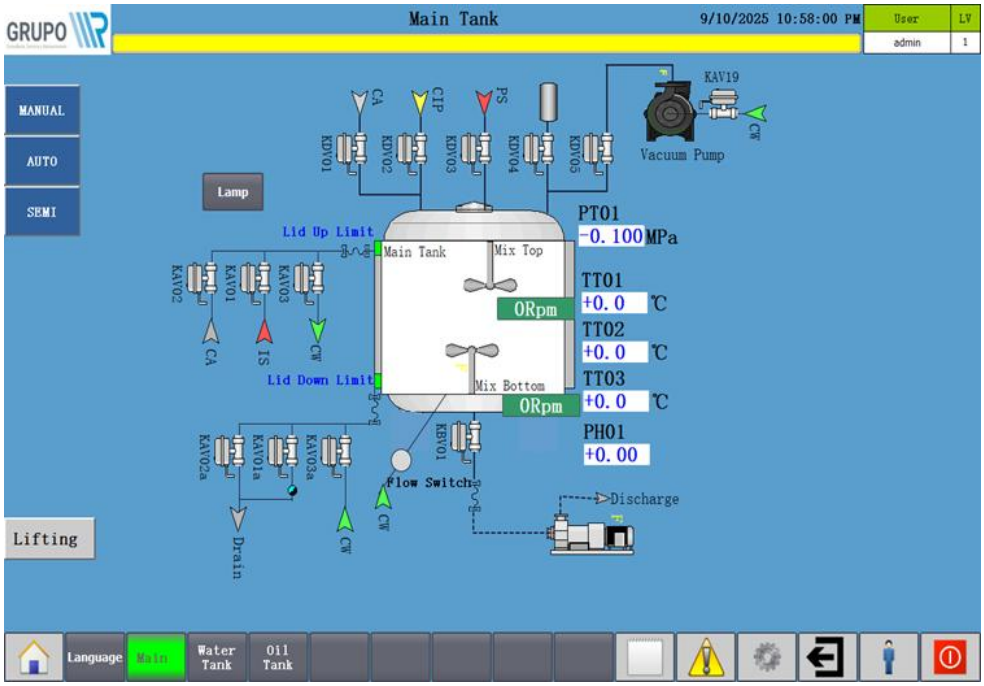
initial screen

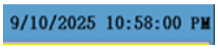
NO.	Refer to picture	Explanation
1.	GRUPO	Manufacturer Information
2.	VE-750 Emulsifier	Item Information
3.	9/10/2025 10:56:57 PM	System Clock
4.	Login	Enter the Process

Item	Operation Description	Level 1	Level 2	Level 3
		Operator	Technology	Administrator
1.	Picture switching	Yes	Yes	Yes
2.	Range parameter setting	No	No	Yes
3.	System operating parameter settings (recipe)	No	Yes	Yes

4.	Manual operation of equipment	Yes	Yes	Yes
5.	System control mode switching	Yes	Yes	Yes
6.	Alarm reset/view	Yes	Yes	Yes
7.	Recipe management	No	Yes	Yes
8.	Recipe invocation	Yes	Yes	Yes
9.	Screen cleaning	Yes	Yes	Yes
10.	Exit the operation of the HMI system	No	No	Yes
11.	Create and manage users	No	No	Yes
12.	Clock setting	No	No	Yes
13.	User logout	Yes	Yes	Yes
User login and password management				
1.	Default settings for login user	--	--	admin
2.	Factory default login password	--	--	999
NOTE: Only the administrator password is provided. The other user accounts and passwords are created by the administrator account.				

All of the above operations require the correct login username and password.



NO.	Refer to picture	Explanation
1.		The "Current Alarm Information" section displays the most recent alarm information in real time.
2.		"The 'View Alarm Information' button is a trigger button. Clicking it will bring you to the current alarm screen. Refer to the Alarm Screen section for details."
3.		The "Main Operation Button" area consists of a system navigation bar with five buttons: 【MANUAL】, 【AUTO】 【SEMI】.
4.		By clicking on 【MAIN】, 【Water Tank】, an【Oil Tank】 in all screens, you can return to the main screen.

5.		Click on【Manual】, and the system will enter the manual operation mode.
6.		Click on【Auto】, and the system will enter the automatic operation mode. Note that this is not the automatic running mode.
7.		【SEMI】Mode is only enabled for clicking after the system enters the automatic operation state. It allows users to freely switch the manual-automatic mode of each device in the automatic mode. When the semi-automatic mode is exited, the system will reset all abnormal operations that occurred in the previous semi-automatic mode.
8.		Click the "Parameter Range Setting" button to enter the system parameter setting interface, where you can set the range of analog parameters and control parameters.
9.		When an alarm occurs in the system, click the "Alarm Information Button" to enter the alarm information interface, where you can view the current alarm.
10.		Information and historical alarm information. The current alarm information. After troubleshooting is completed, click "ALARM RESET" and the alarm information will be eliminated.
11.		Click the "System Maintenance" button to enter the system maintenance interface, where you can perform tasks such as screen cleaning, time setting, and viewing project information.
12.		Click the "Log Out User" button to exit the current user's login. You must re-enter the username and password before you can access the system and perform operations.

13.		Click the "User Management" button to enter the user management interface, where you can perform functions such as adding/deleting users and modifying user passwords.
14.		Click the "Exit" button to log out of the system.

 The【Exit Operating System】button is used to exit the interface normally, completely preserving the historical records. If the exit is not normal or there is an unexpected power failure, it may result in the loss of some historical data. Please be cautious when operating.

Authority Management:

No.	User Level	User name	Password	Explanation									
				Main	Manual	Servo	Servo P.	Parameter	IO	RECIPE	Function	User	Alarm
1	1	Operator	--	√	√	√	√	√	O	√	√	√	O
2	2	Technology	--	√	√	√	X	O	O	X	√	X	O
3	3	Administrator	--	√	√	√	√	√	O	√	√	√	O

Note: Only the administrator password is provided. The other user accounts and passwords are created by the administrator account.

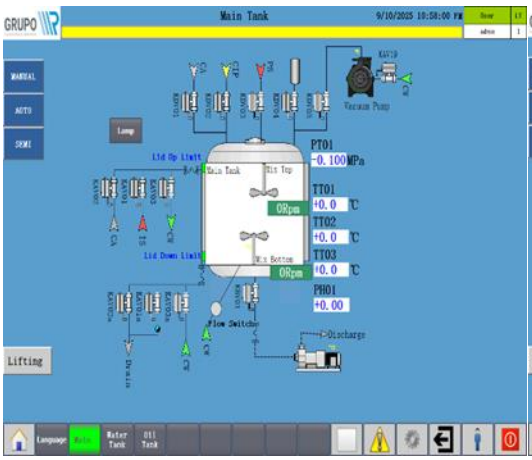
“ √ ” means available to modify.

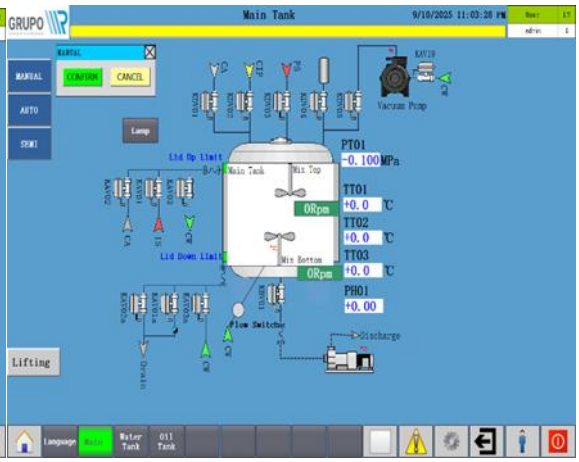
“O” means available to view.

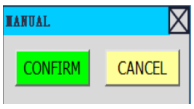
“X” means not available to view or modify.

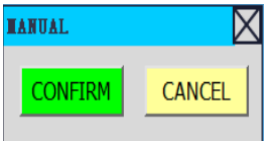
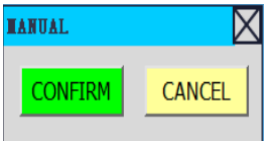
6.4 Manual Operation

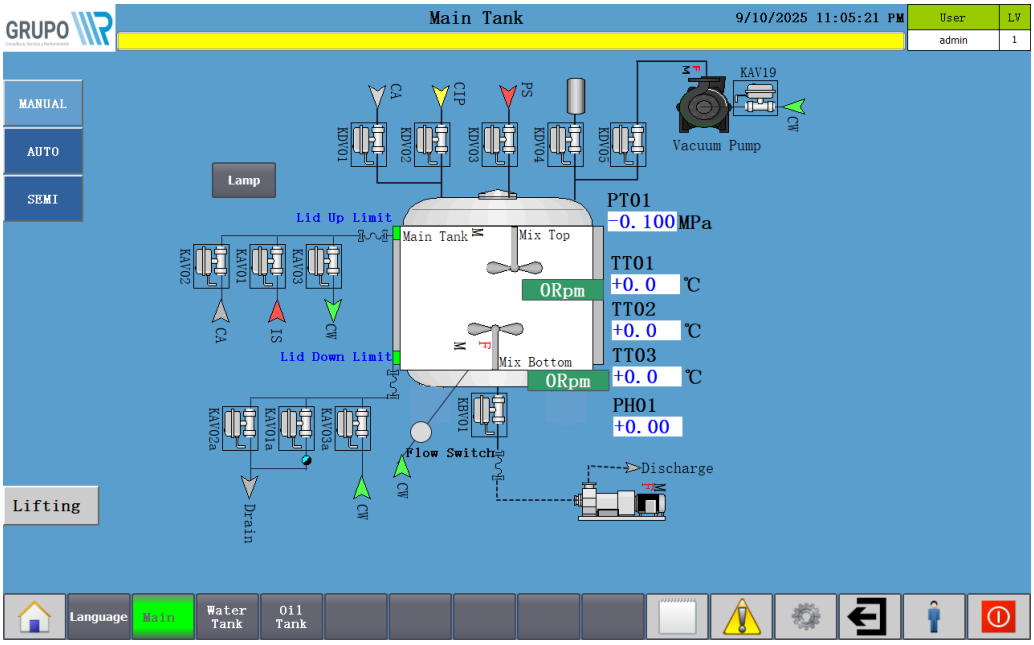
A) Single confirmation button

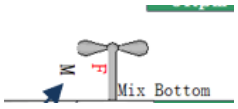
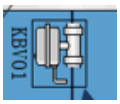




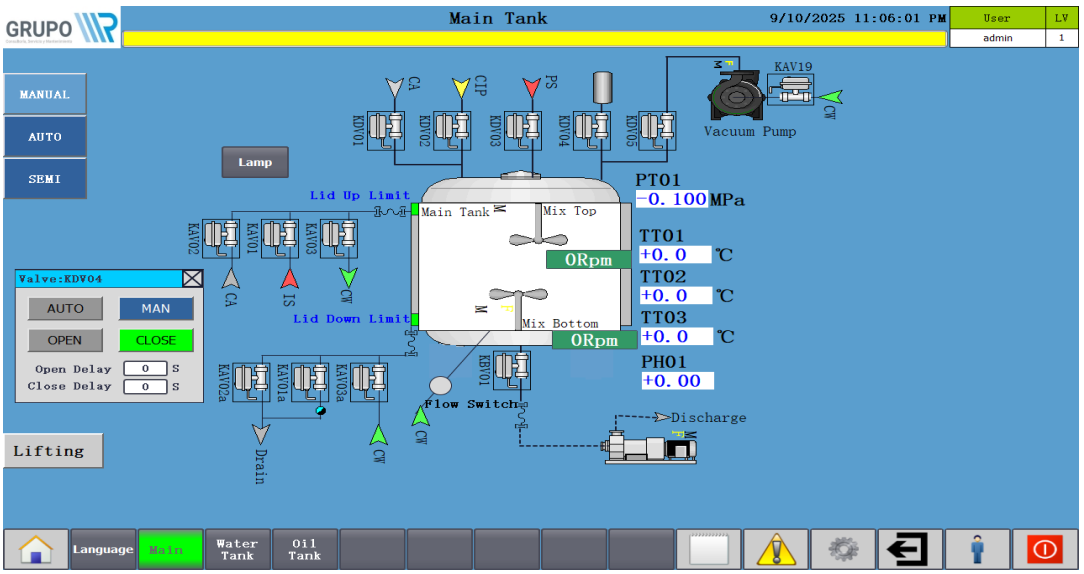
NO.	Refer to picture	Explanation
1.		Triggerable button
2.		Second confirmation button
3.		After clicking the trigger button, a secondary confirmation button will appear near the button area. Click the【CONFIRM】button to enable user operation. This can activate or deactivate the target value.

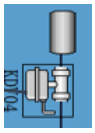
4.		For example, in the case where【MANUAL】is in an invalid state. Click the【CONFIRM】button among the 【CONFIRM】and【MANUAL CANCEL】buttons to switch the【MANUAL】from the inactive state to the active state.
5.		When in the【MANUAL】activation state. In the【MANUAL】activation state, click the【CONFIRM】button on the "CONFIRM [MANUAL]" section to press the【CONFIRM】key so that【MANUAL】can be switched from the activated state to the deactivated state.Clicking on【CONFIRM】will cancel the operation. This method is suitable for all operation interfaces.



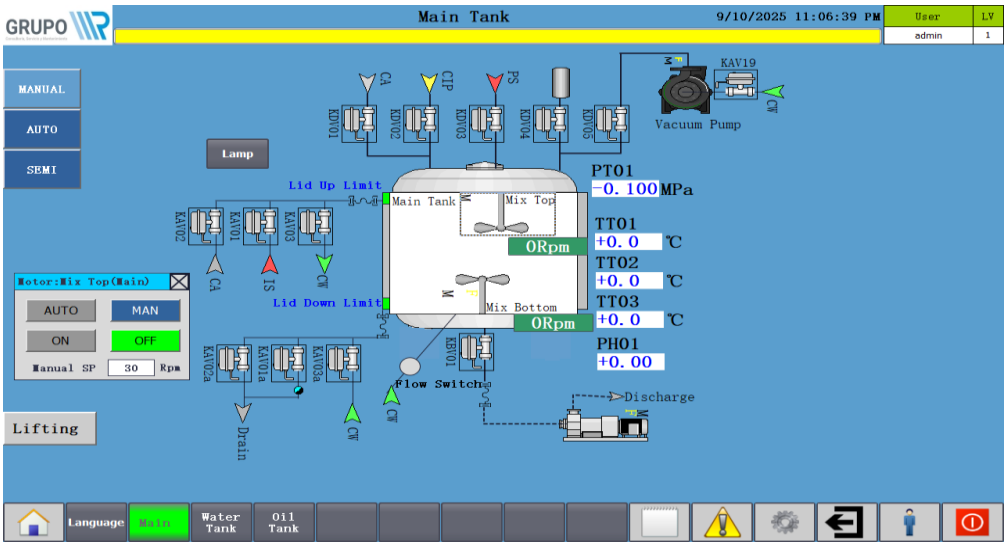
NO.	Refer to picture	Explanation
1.		Manual mode activation
2.		**M**: Manual status marking of equipment
3.		**Frame**: Manual status indicator of the equipment

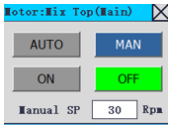
B) Valves and fittings



NO.	Refer to picture	Explanation
1.		Click on the target operation object, and an operation box corresponding to the object will appear nearby.
2.		The operation button area displays the information of the target object, and the user completes the manual/auto and on/off operations of the target object valve by themselves.

C) Equipment category

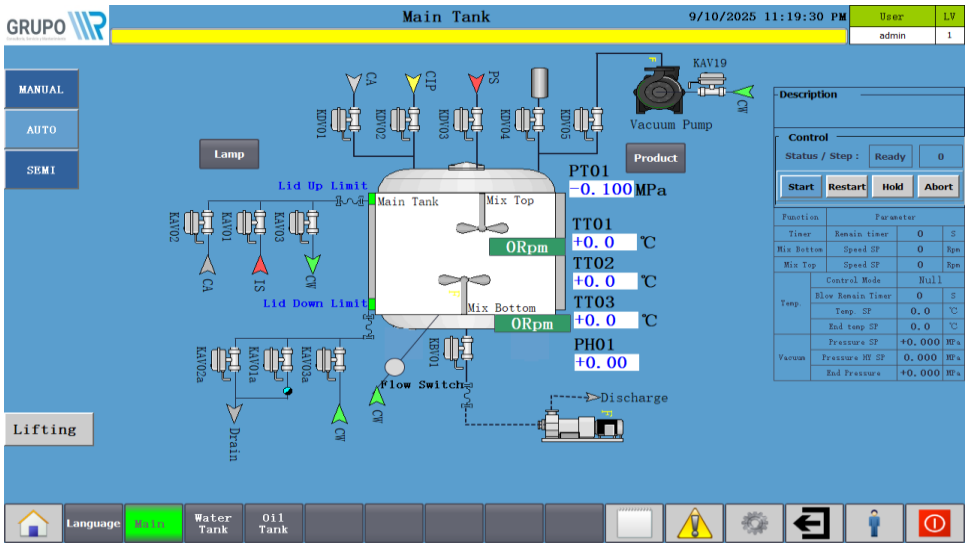


NO.	Refer to picture	Explanation
1.		Click on the target operation object, and an operation box corresponding to the object will appear nearby.
2.		The equipment status is divided into two types. The main body being blue indicates that the system has output commands, while the gray color indicates that the system has no command output.
3.		The operation button area displays the information of the target object. Users can independently complete the manual or automatic operation of the target object and its on/off control, including the manual input of values.

The operations of valve types and equipment types are only applicable in the SYSTEM's MANUAL mode and AUTO mode. In any other modes, the operations will be invalid due to program protection.

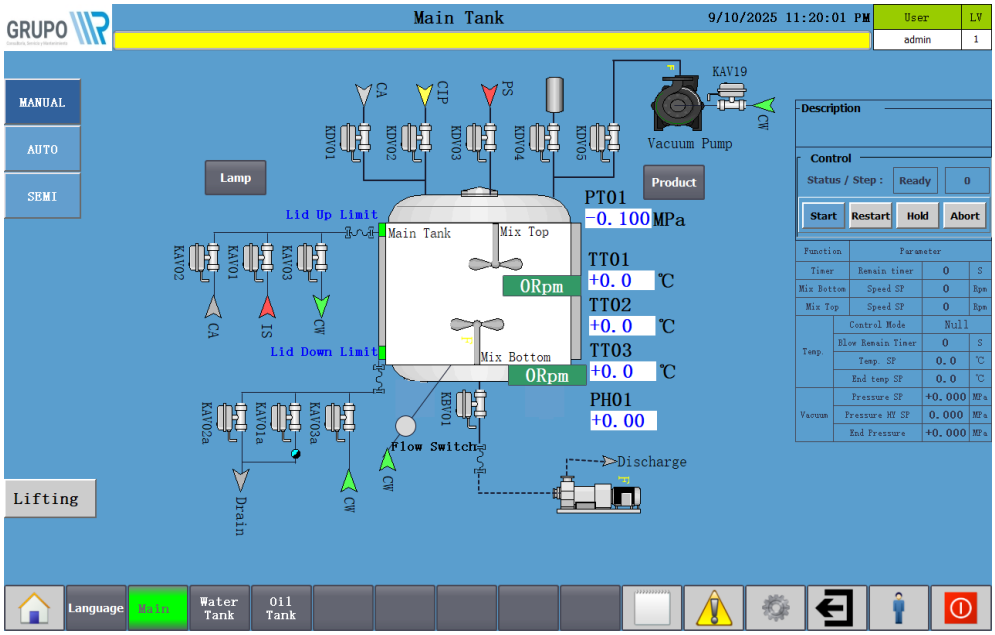
6.5 Automatic Operation Mode

1.Automatic operation mode



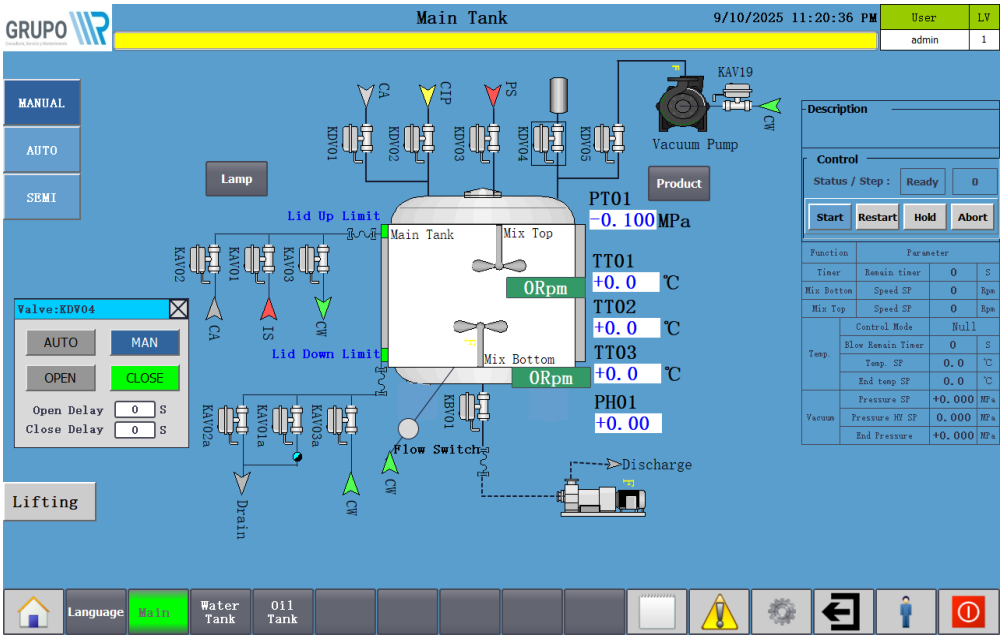
NO.	Refer to picture	Explanation
1.		Automatic mode activated

2.Automatic + Semi-automatic operation mode



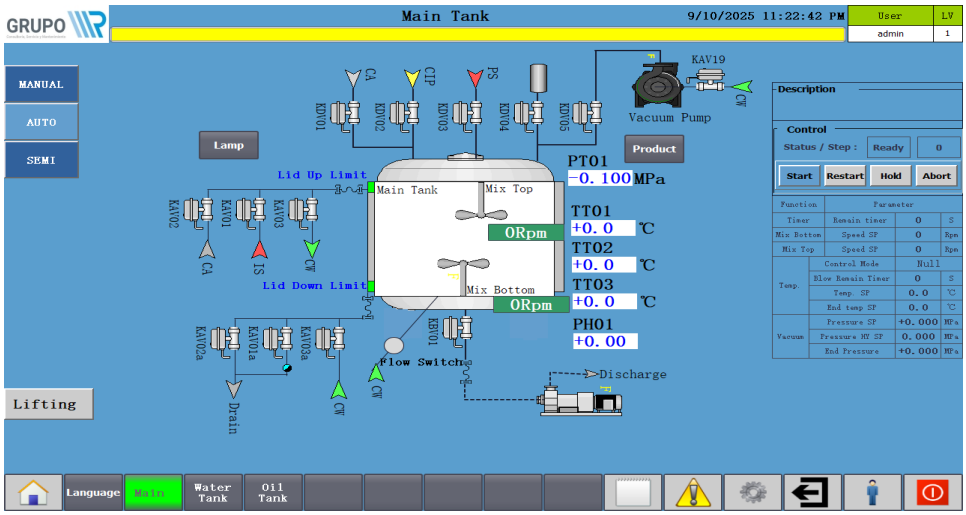
NO.	Refer to picture	Explanation
1.		Semi-automatic button activation

3.Automatic operating system (Take the Main tank as an example; the same applies to others)



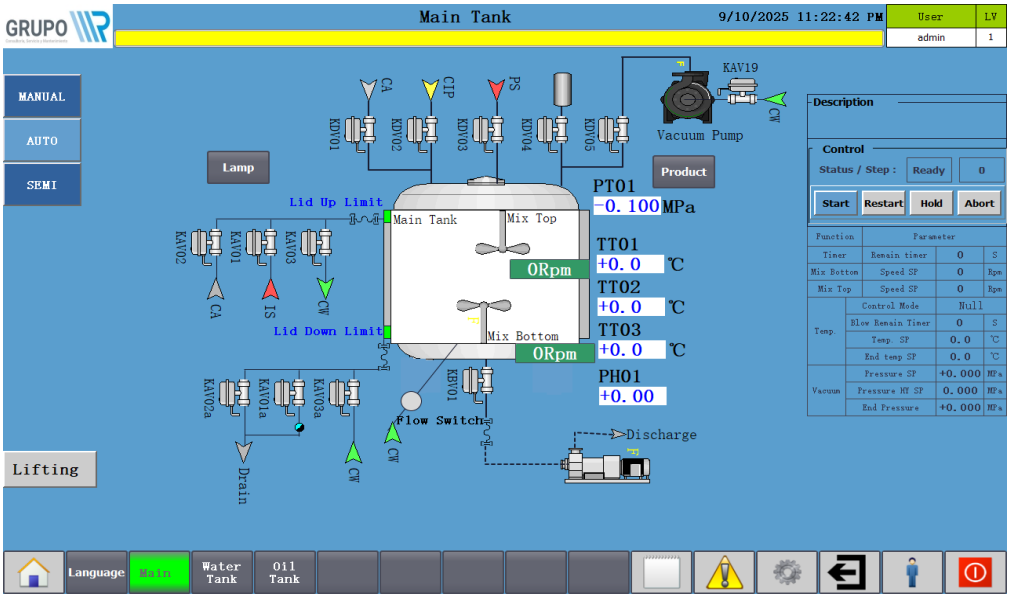
NO.	Refer to picture	Explanation
1.		The system enters the automatic operation mode, activates the "SEMI" mode, allowing users to freely switch the manual-automatic operation of each device in the automatic mode for operation. When exiting the semi-automatic mode, the system will reset all abnormal operations that occurred in the previous semi-automatic mode.

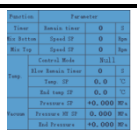
6.6 Recipe Management Operation



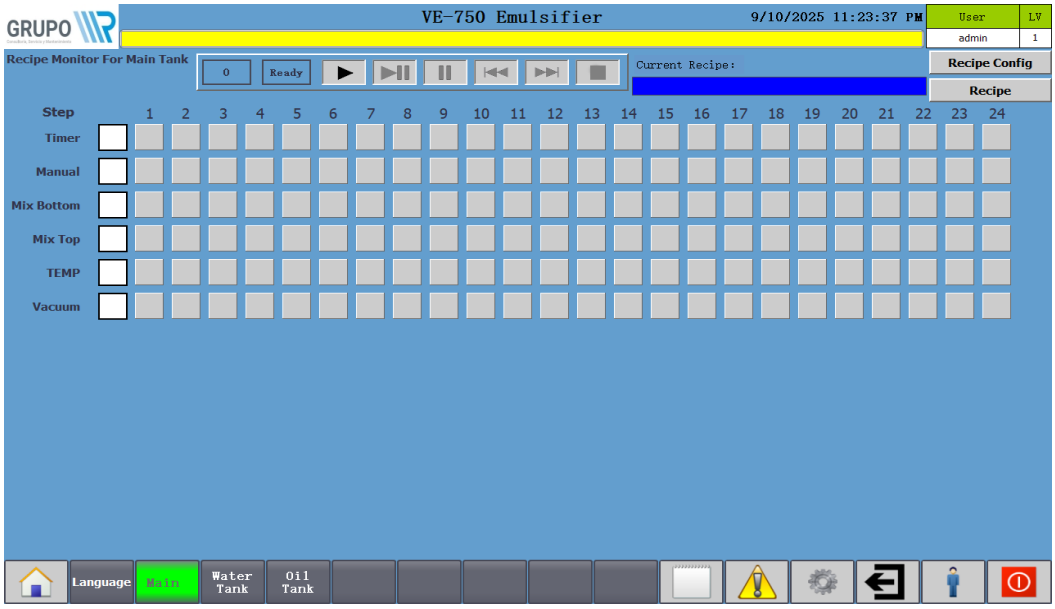
NO.	Refer to picture	Explanation
1.		On the operation interface, select the "AUTO" button to pop up the mode selection box (the functional modules are displayed in blue when stopped and in no color when running), and enter the mode selection interface; as shown in the figure above.

CIP Mode Interface



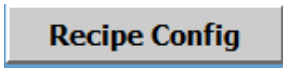
NO.	Refer to picture	Explanation
1.		Program Control Window.
2.		Run parameter monitoring window.

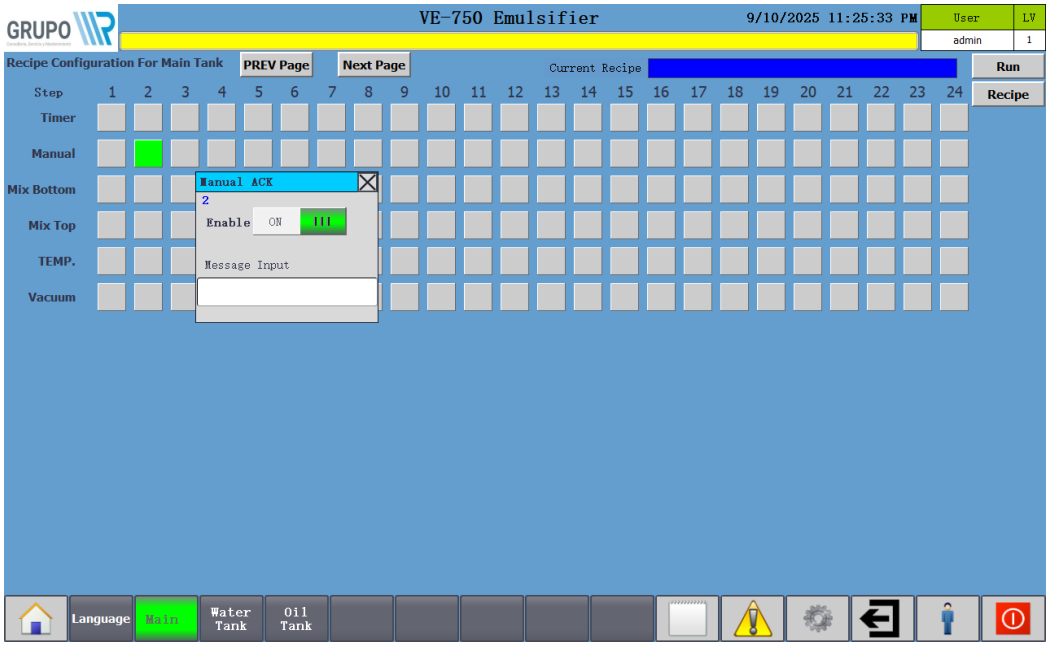
Recipe Monitoring Interface



NO.	Refer to picture	Explanation
1.		Operation steps and status
2.		Start
3.		Continue
4.		Suspend
5.		Last step
6.		Next step
7.		Finish

New Recipe Creation:

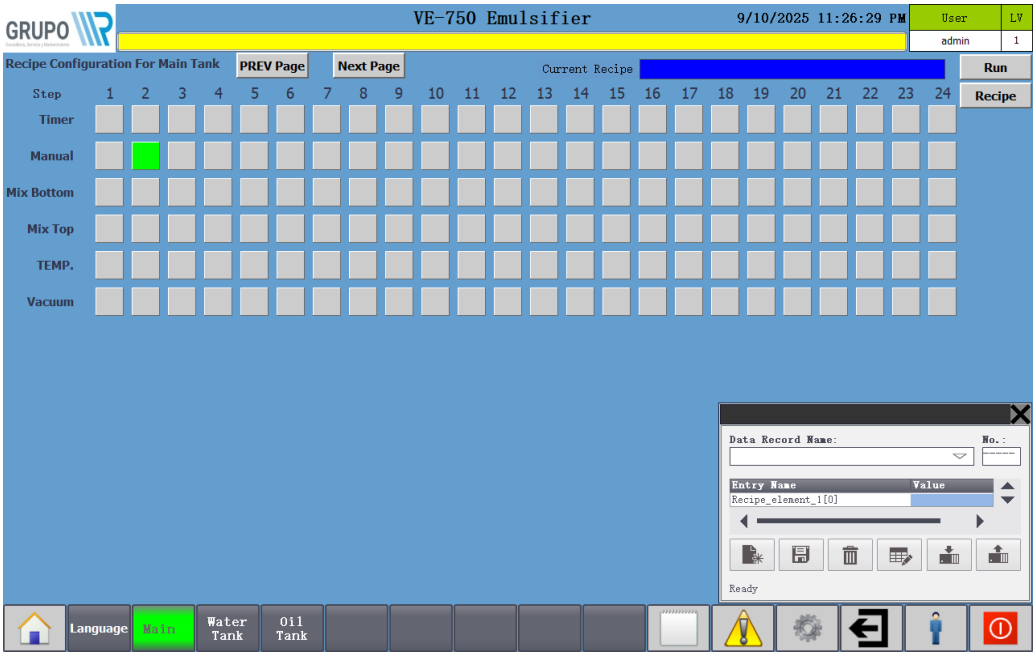
NO.	Refer to picture	Explanation
1.		Click on "Recipe Config" to enter the recipe editing screen. Follow the process in the corresponding steps (1..24) of the process operation method, then cross-reference horizontally and vertically to find the corresponding functional module, and then double-click on the corresponding functional module. As shown in the following figure (the green part indicates the 2nd option of MANUAL for the functional module).

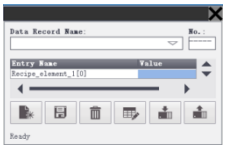


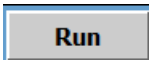
NO.	Refer to picture	Explanation
1.	 	Double-clicking the module will pop up the parameter setting bar. Double-clicking the "OFF " in the window will switch it to the enabled mode "ON". The function module will turn green (indicating that the steps have been enabled), while the recipe configuration module will be

		displayed in green (for enabled steps) or gray (for disabled steps). As shown in the following picture

According to the CIP process, after setting the parameters, follow the process flow and repeat this step until all the parameters are set.



NO.	Refer to picture	Explanation
1.		After the parameters are set, click the " Recipe" er right of the screen until all the parameters are set. After the parameters are set, click the " Recipe" upper right of the screen, and a formula saving interface will pop up, as shown in the following picture:
2.		Operation prompt
3.		New

4.		Save click to save the recipe parameters.
5.		Delete
6.		Rename
7.		Download
8.		Uploading Click on to upload the parameters.
9.		Click on the column for data recording, enter the name of the parameters you want to save
10.		If you need to use this recipe, click the " Run" button to enter recipe monitoring interface.

Each step of the procedure should be operated carefully in accordance with the actual CIP requirements before the recipe is run. After the configuration is completed, carefully check the parameter settings of the corresponding process to ensure that they are correct and error-free!

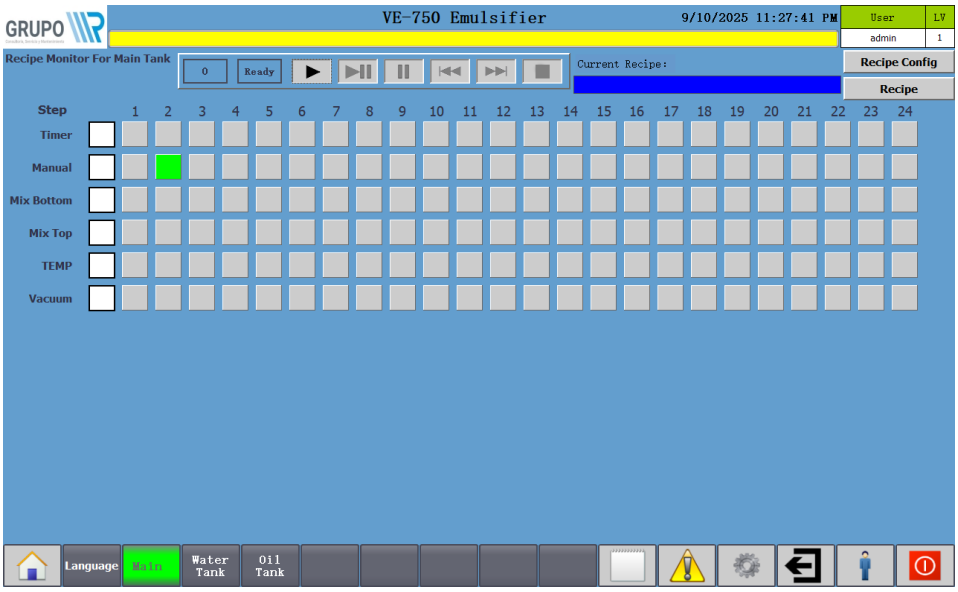
Recipe invocation:

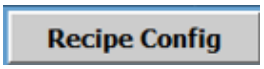
NO.	Refer to picture	Explanation
1.		Based on the production process requirements, the original recipe is invoked. By clicking on the drop-down arrow in the "Data Record Name" column, the saved recipe names will be displayed.
2.		Select the desired recipe name and click on , then confirm the recipe steps.

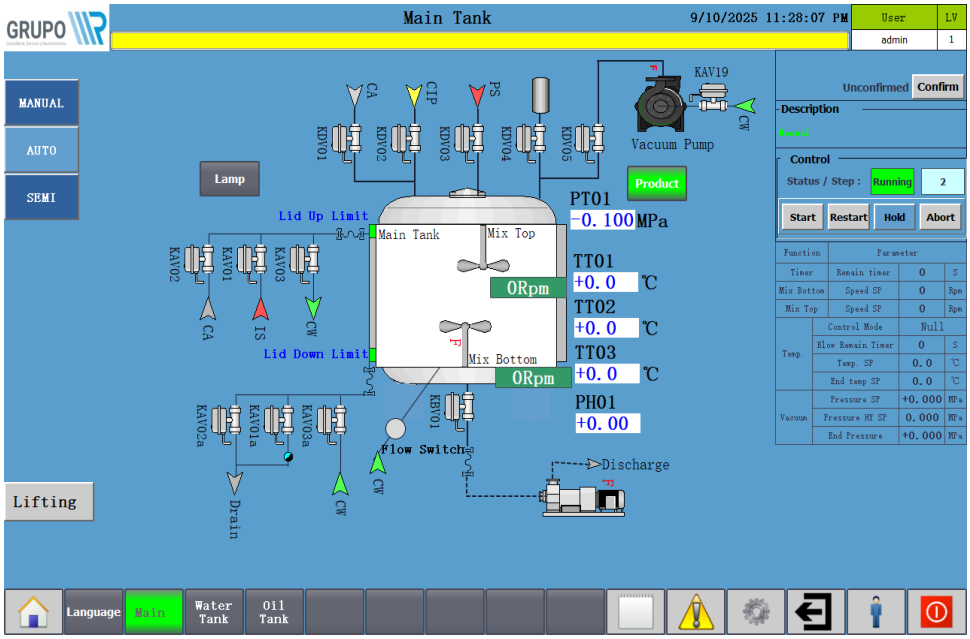
Formula modification:

After entering the formula monitoring screen, first select the formula to be modified from the known formulas. Then, choose the process step that needs to be modified. According to the corresponding functional module, double-click the functional module to pop up the parameter setting box, and make the parameter modifications and save the formula.

Automatic Operation:



NO.	Refer to picture	Explanation
1.		Enter the formula monitoring interface, click the formula button to select the known formula and download it. Confirm whether the formula steps meet the process requirements.

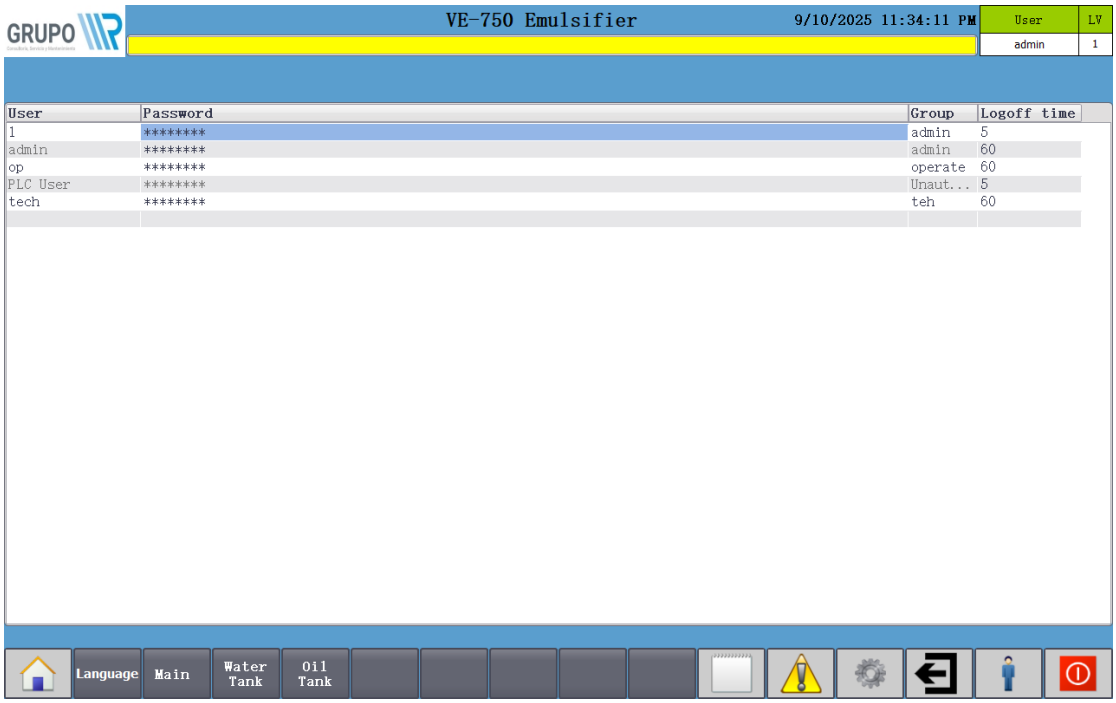


NO.	Refer to picture	Explanation
1.		After confirming the information, return to the main screen and click "Run" in the running window to execute the automatic program.
2.		Click to "Product" enter to monitoring interface to view the complete running status of the formula.

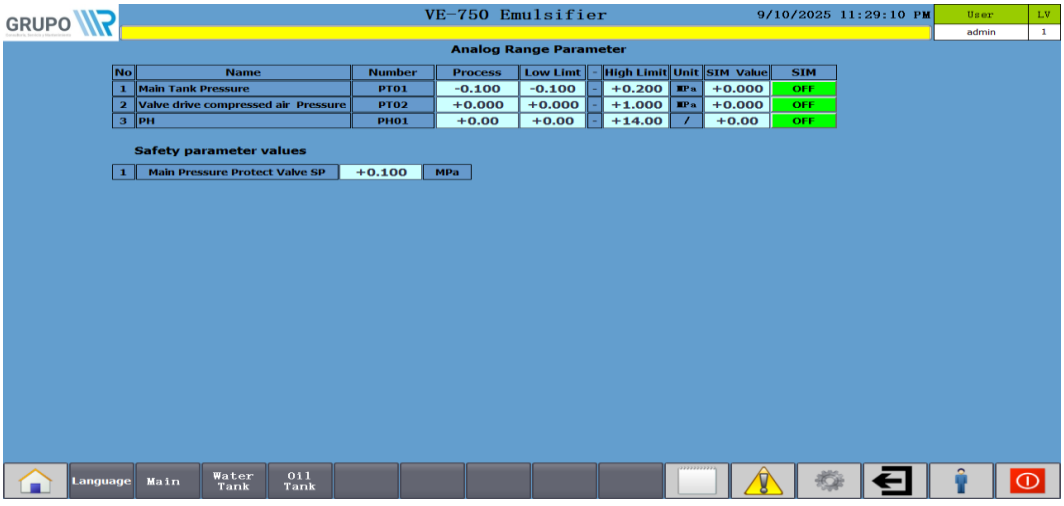
6.7 System Settings Operation

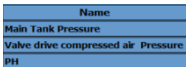
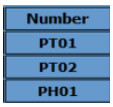
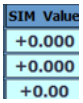
User Management: Allows the highest-level users to customize the creation of authorized users, passwords, and permission levels.

NOTE: Only the administrator password is provided. The other user accounts and passwords are created by the administrator account.



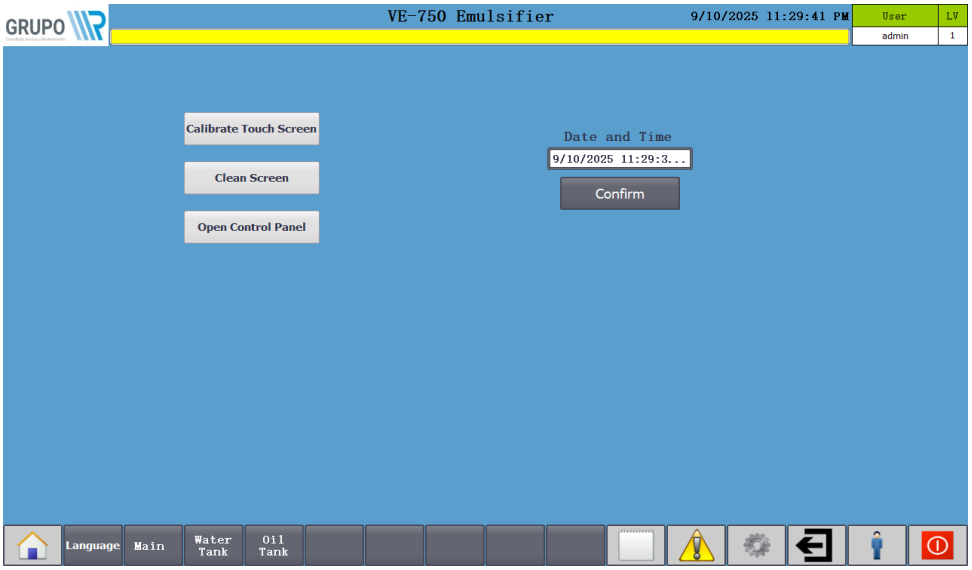
Instrument measurement range parameters:

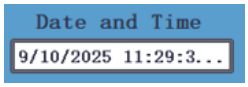


NO.	Refer to picture	Explanation
1.		Parameter name
2.		Parameter number
3.		Real-time value of parameters
4.		Settable measurement range
5.		Parameter unit
6.		Parameter simulation function switch: In the event of instrument failure, maintenance or malfunction, this function allows users to perform simulation operations to enable the equipment to continue operating. After enabling this function, input the simulation values within the range of the instrument's measurement range parameters. Pay attention to observing the process values to meet the requirements of the actual working conditions, so that the equipment can continue to operate for a short period of time.

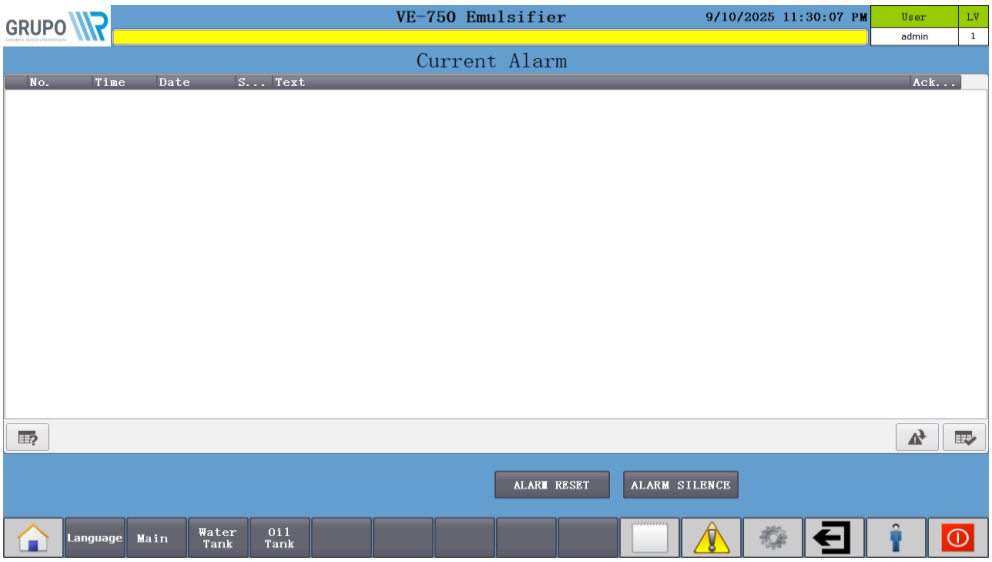
Please note that once the settings are completed, this simulation value becomes a fixed one. There is a risk of operation failure. Please operate with caution. The system will lose its validity after a restart.

Clock setting



NO.	Refer to picture	Explanation
1.		The input area for year, month, day, hour, minute and second, After inputting, press the Enter key to confirm. Once the clock displayed is consistent with the set value, click the "Set Confirmation" button to achieve synchronization of the PLC and the touch screen clock.

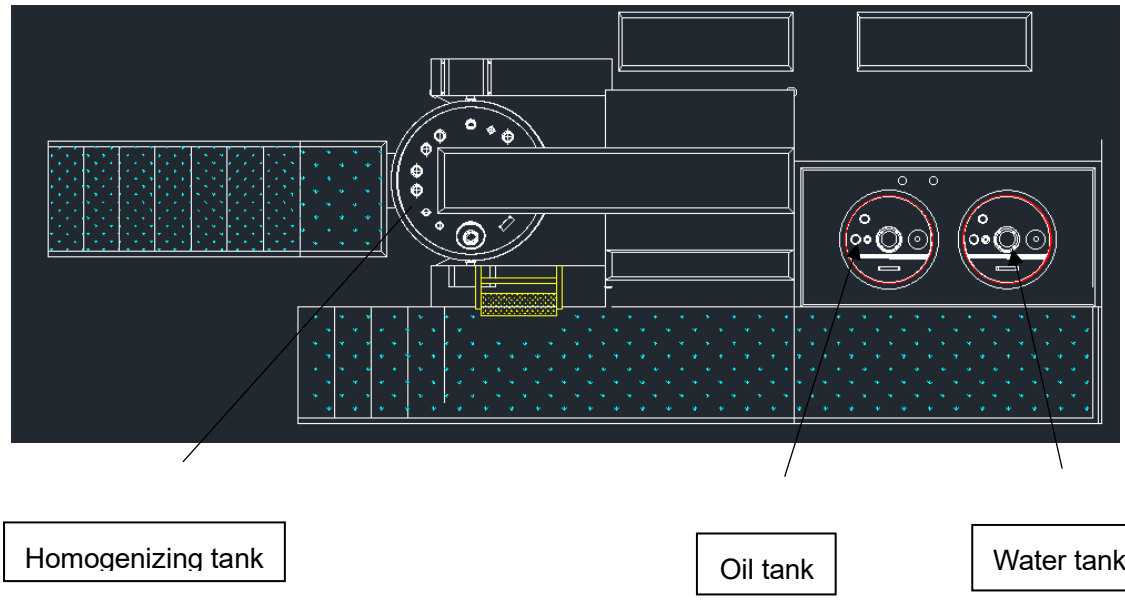
System alarm



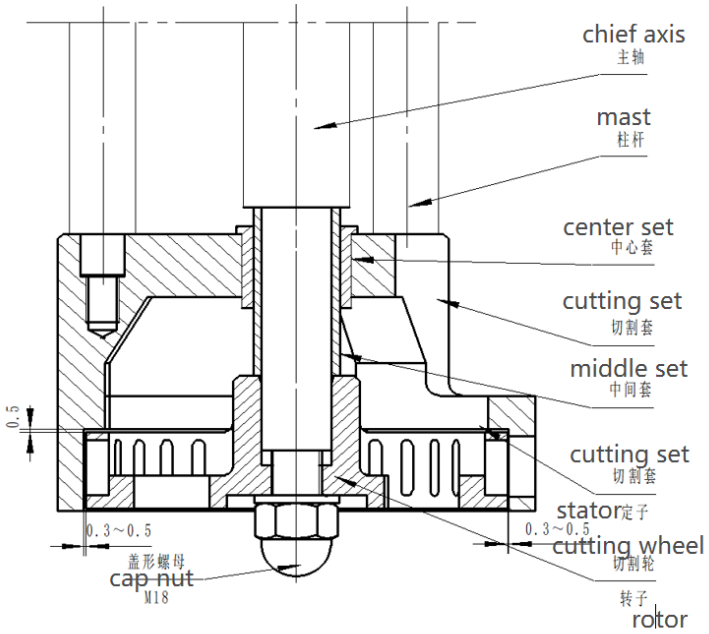
NO.	Refer to picture	Explanation
1.		Real-time alarm information bar
2.		After resolving the fault as indicated by the real-time alarm information bar, click the 【Alarm Reset】 button to clear the corresponding alarm.

7.Figures

Figures 1: Overall layout plan schematic diagram



Figures 2: Homogeneous Head Description



① The rotating part of the cutting shaft shows no jamming phenomenon. The axial play is

less than 0.10mm.

② Stator and rotor clearance control: Axial 0.5mm, Radial unilateral 0.3-0.5mm. If necessary, it can be adjusted to 0.8mm.

③ All fasteners must be tightened. The rotor should not loosen from the main shaft, and the stator should not loosen from the column rod.

④ If the clearance shifts after tightening or gets stuck, loosen the M16 conical nut (at the upper end of the column rod), adjust the stator state, so that the peripheral clearance between the stator and the rotor is similar, and ensure the axial clearance. After adjustment, tighten the M16 conical nut.

8. Alarm and Trouble Shooting

8.1 Alarm List Explanation

NO.	Alarm test	Failure cause	Solutions
1.	Low pressure alarm for compressed air!	1. Air compressor failure; 2. Pipeline leakage; 3. Filter blockage.	1. Inspect and repair the air compressor; 2. Detect and repair leaks; 3. Replace the filter element of the filter.
2.	System emergency stop!	1. Confirm whether the button is in the pressed state; 2. An accidental press triggers an emergency stop.	Reset the emergency stop and investigate tangential hazards.
3.	The frequency converter for the	1. Fault of the frequency	1. Maintenance / replacement of

	main tank's stirring has malfunctioned!	converter itself 2. Motor overload 3. Improper parameter setting 4. Unstable power supply 5. Check the fault code of the frequency converter.	frequency converter; 2. Elimination of motor overload (such as when the stirring paddle gets stuck); 3. Re-matching of parameters; 4. Check if the power supply is stable; 5. Refer to the frequency converter manual or consult the frequency converter service for information based on the code.
4.	The frequency converter for the main tank's stirring has malfunctioned!		
5.	The frequency converter of the water boiler has malfunctioned!		
6.	The frequency converter of the water boiler is malfunctioning!		
7.	The frequency converter in the oil tank has malfunctioned!		
8.	The frequency converter for the oil tank has malfunctioned!		
9.	Vacuum pump overheating!	1. Working continuously for a long time; 2. Heavy workload; 3. Failure of the cooling system.	1. Reduce the duration of continuous work; 2. Adjust the vacuum level to alleviate the load; 3. Inspect and repair the cooling

			system.
10.	Hydraulic oil pump is overheating and overloaded!	1. System pressure is high; 2. Viscosity of the hydraulic oil is inappropriate; 3. Internal wear of the oil pump.	1. Adjust the system pressure; 2. Replace the hydraulic oil with the appropriate viscosity; 3. Overhaul / replace the oil pump.
11.	The main tank rotor pump has overheated!	1. The viscosity of the material is too high; 2. The rotational speed of the pump is too high; 3. The sealing parts are worn out.	1. Dilute the materials or change the pump; 2. Adjust the speed; 3. Replace the seals.
12.	The rotor pump in the oil-water boiler has overheated!		
13.	The cooling water flow rate in the main tank has reached a low alarm level!	1. Flow switch failure; 2. Pipeline blockage; 3. Water supply valve not fully opened.	1. Inspect and replace the flow switch; 2. Clean the pipeline; 3. Fully open the valve and observe the water output.
14.	Low alarm for the cooling water flow rate in the water tank due to insufficient stirring!		
15.	Low alarm for the cooling water flow rate		

	in the oil tank!		

8.2 Common Faults and their Solutions

NO.	Common Faults	Failure cause	Elimination methods
1.	Vacuum level cannot be established.	(1) The valve is not closed, and the vacuum valve for the tank cover is not opened. (2) The sealing ring is damaged, causing leakage. (3) The vacuum pump is not operating properly.	① Close each valve; ② Replace the sealing ring; ③ for the maintenance of the vacuum pump, please refer to the manual of the liquid vacuum pump.
2.	The pump cannot create a vacuum.	(1) No working fluid; (2) The system without working fluid has a serious leakage problem. (3) The rotation direction is incorrect.	①Check the working fluid; ②Fix the leak area; ③Replace two wires to change the rotation direction.
3.	Homogenizer and mixer motor does not start or the motor is overloaded.	(1) At least two power lines are broken.; (2) Motor bearing failure; (3) Homogeneous rotor	①check the wiring; ②Replace the motor bearings; ③Check whether the homogeneous rotor

		sintering; (4) There is a foreign object stuck in the homogenizer head or the stirrer. (5) Short circuit in winding (6) Damage to the homogeneous rotor sliding bearing;	rotates smoothly. ④Remove foreign objects ⑤Inspect the motor windings (coils) ⑥Replace the sliding bearing;
4.	The scraper does not scrape the walls during operation or there are metallic sounds when it is running.	(1) The eccentricity of the stirring paddle is quite severe.; (2) The scraper base is not rotating smoothly and is stuck in an inappropriate position. (3) Scraper wear	①Adjust the position of the mixing paddle. ②Remove the dirt from the scraper base and replace the pinion shaft. ③Replace the scraper plate.
5.	The working fluid in the vacuum pump enters the purifier and the tank.	（1）When shutting off the vacuum pump, the vacuum valve on the vacuum system was not closed.	①When shutting off the vacuum pump, first close the vacuum valve on the vacuum system.

9. Equipment Maintenance

9.1 Regular Maintenance Cleaning

NO.	Item	Content	Standard
1.	Material replacement and maintenance	1. Thoroughly clean all components in contact with the materials (tank body, homogenizer head, conveying pipeline, rotor pump); 2. Rinse with clean water or food-grade cleaning agent in a cycle, and disinfect if necessary; 3. Check if the remaining materials have been completely removed to avoid cross-contamination.	The inner walls of the components are free of any residual materials, and the cleanliness meets the industry hygiene standards (for example, food-grade equipment must comply with GMP cleaning requirements)
2.	Maintenance after failure	1. Conduct a secondary inspection of the faulty components (such as checking the bearing lubrication after the motor overload, and checking the sealing components after the vacuum leakage); 2. Replace or supplement the vulnerable parts around the faulty components (such as the homogenizer head sealing parts, the motor terminal); 3. Test the stability of the system after the fault repair (run at no-load for 30 minutes, simulate production conditions).	The faulty component is operating normally and there are no secondary fault risks. The relevant parameters (such as rotational speed and vacuum degree) have returned to the normal range.
3.	Long-term maintenance shutdown	1. Drain all the water and steam from the pipelines to prevent freezing and corrosion; 2. Clean the tank body and the homogenizer head, apply anti-rust oil (on non-material contact surfaces); 3. Cut off the main power supply, shut off the gas source and water source, and cover with a	The equipment is free from rust and dust accumulation. It can operate normally upon reactivation without the need for extensive maintenance.

		dust cover; 4. Run the machine without load for 10 minutes every month to prevent the bearings from rusting.	

10.Packageing and Transportation

1. Packaging acceptance standards

Appearance: The wooden box is undamaged and unwarped, the sealing tape is not cracked, and the labels are clear and complete; the inner packaging is not loose, and the bubble film and foam cotton are not detached.

Fixity: When pushing the pallet, the equipment does not shake obviously, the bolts and steel straps are firmly fixed without loosening or abnormal noise; the precision components (such as the homogenizer head) do not shift within the packaging.

Moisture-proof: The moisture absorber in the electrical control cabinet is not damp or discolored, the ventilation holes of the wooden box are unobstructed, and there are no traces of rain or moisture entering.

2. Transportation and Adaptation Requirements

Loading Method: The equipment must be placed upright in the transportation vehicle (strictly prohibited from being inverted or tilted at an angle greater than 15°). The bottom of the pallet should be fixed to the vehicle floor with wooden blocks. A gap of ≥ 300mm should be reserved between adjacent equipment to prevent mutual collision during transportation.

Environmental Control: Extreme environments should be avoided during transportation. The temperature should be controlled between -5°C and 40°C, and the humidity should be ≤ 85%. Open-air transportation in rainy or snowy weather is strictly prohibited to prevent the equipment from getting damp or components from cracking due to freezing.

Loading and Unloading Requirements: When using forklifts or cranes for loading and unloading, the dedicated lifting points of the equipment (refer to the "Overall Layout

Diagram" of the equipment for identification) should be used. The lifting rope's load-bearing capacity should be ≥ 1.5 times the total weight of the equipment (G.W.) to avoid uneven force on the lifting points and equipment deformation.