

Automatic Distillation Range Tester BLS-86



Thanks for using our products!

For easy use and master of functions and features of the instrument, read this manual carefully before operation, to avoid failure due to improper use and ensure normal use. Please keep this manual in file after reading and place it at position convenient for future reference.

Function:

This instrument is used for determination of distillation range of petroleum products according to the test method in GB/T 6536, complying with ASTM D86 and IP123. This instrument will automatically control the heating process and distillation speed, as well as record and print all record data.

Feature:

- (1) Automatically controlling of test process. 10" touch LCD for display of temperature, volume and curves during the whole process.
- (2) Level tracking system consists of American Haydon high-stepping linear motor, imported integral linear ball screw circumferential positioning laser tracker (Japan KEYENCE). The cooling tube and cylinder room are refrigerated mechanically; imported Danfoss (Secop) compressor. Circulate in the cooling medium. Check and add cooling water every 2 years.
- (3) Automatically heating control of distillation over, the sample can be heated to 95% of the flow rate from initial boiling point controlled within 4~5ml per minute.
- (4) Provide initial boiling point and final boiling point temperature, and various percentage temperature and flow rate.
- (5) Automatically measuring of local atmospheric pressure, and corrected to standard atmospheric pressure.
- (6) Stopping of test by the steam temperature available.
- (7) The test result can be stored, queried and printed.

Working Conditions:

Indoor working environment: temperature: 10-38°C (recommend: 10-28°C); humidity≤70%.

Technical Parameters:

- 1, Power: AC220V±10% 50Hz
- 2, Heating power: 2KW
- 3, Cooling power: 0.5KW
- 4, Steam temperature: 0-400°C
- 5, Oven temperature: 0-500°C
- 6, Refrigeration temperature: 0-60°C
- 7, Refrigeration accuracy: ±1°C
- 8, Temperature measurement accuracy: ±0.1°C

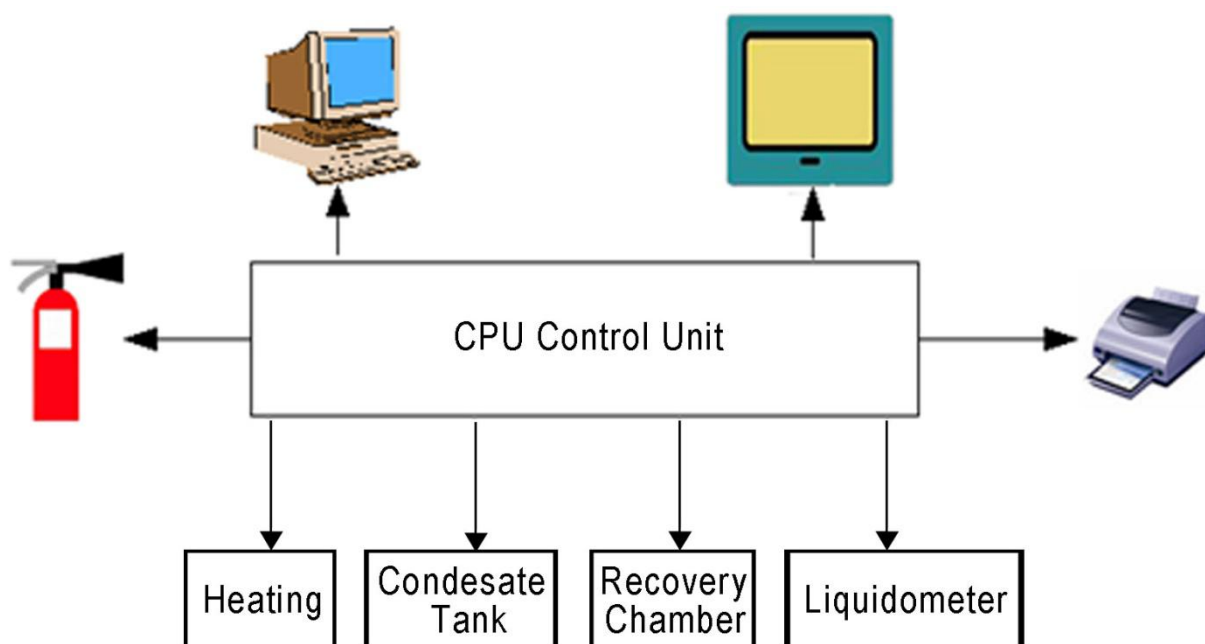
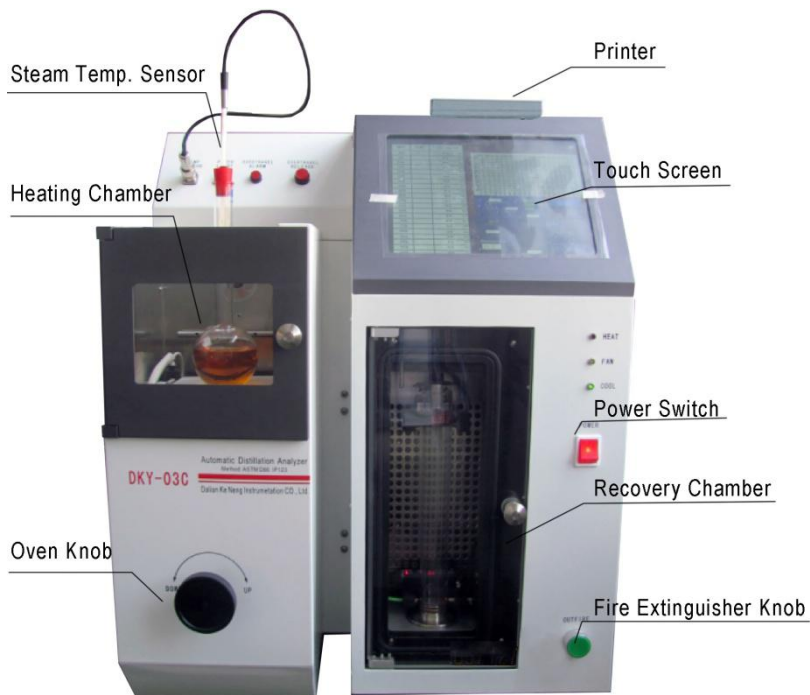
9, Volume accuracy: $\pm 0.1\text{ml}$

10, Fire alarm: extinguish by nitrogen (prepared by customer)

11, Sample state: suitable for natural gasoline (stable light hydrocarbon), motor gasoline, aviation gasoline, jet fuel, special boiling point solvent, naphtha, mineral spirits, kerosene, diesel fuel, gas oil, distillate fuels.

Structure:

This simulated distillation device consists of automatic bath/distillation temperature control system, refrigeration system, automatic level tracking system, security system and other components. The instrument adopts multi-thread operation and control, to achieve automated operation control, computing and display, improving intelligent and automatic measuring. This instrument adopts fuzzy temperature control principle. A freon compressor is used in the refrigeration equipment for temperature control for precise control of condenser and receive chamber temperature. The temperature measurement system adopts high-precision heat resistance for precise measuring of steam temperature. This instrument adopts imported high-precision level tracking system for precise measuring of distillation volume with accuracy of 0.1ml.



Structure

In order to facilitate human-machine interaction, the system adopts true color touch screen, the user can set parameters via the touch screen, realizing real-time monitoring of operating parameters, recording critical temperature, tracing temperature-volume curve, storing 256 groups of test data, and querying of history data of various oil.

This instrument complies with GB/T6536-2010. The user can enable/disable automatic pressure calibration. The system has built-in atmospheric pressure measuring device with high accuracy. In addition, the instrument is equipped with temperature, pressure, auxiliary equipment, fire extinguisher and level tracking equipment etc for automatic monitoring. In case of malfunction, the system will automatically prompt for immediate measures to prevent accidents.

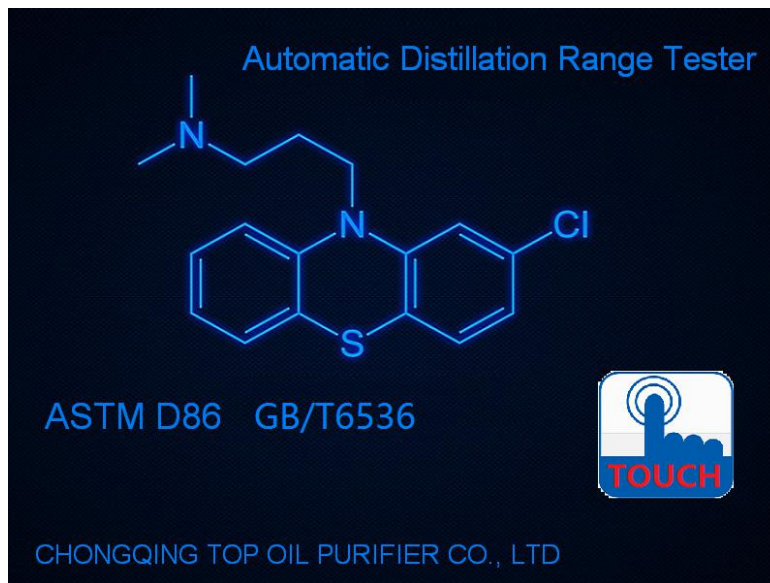
Features:

- 1, Compact, beautiful, easy to operate.
- 2, Fuzzy temperature control, high precision, fast response.
- 3, 10.4" large color touch screen, easy to use.
- 4, High level tracking accuracy.
- 5, Automatic distillation process and monitoring.

Operation:

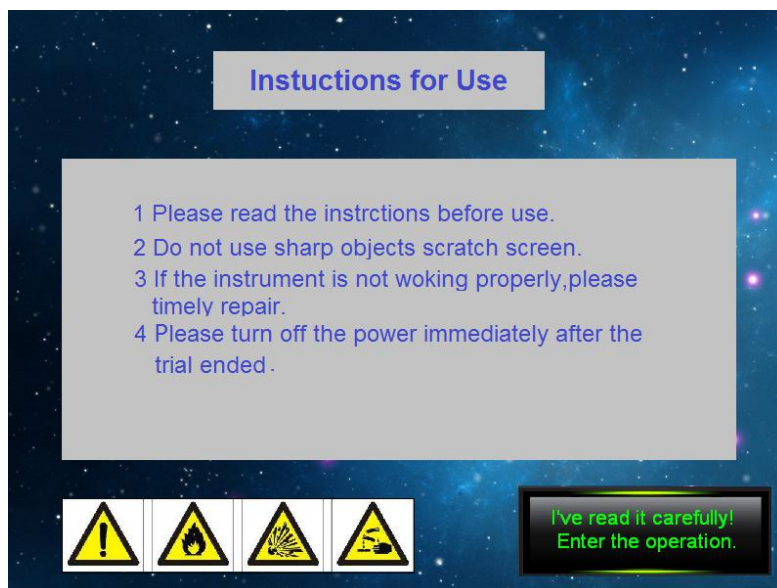
- 1, Count the spare parts after unpacking. In case of any damage, contact us in time.
- 2, Handle the instrument vertical. The swing angle to the height shall not exceed 30 degrees. Install the instrument in ventilated dark place with distance of 0.2 m or above from the wall. Place the instrument evenly to reduce vibration and noise.
- 3, Check the antifreeze which was added before ex-factory.
- 4, Connect the power of the instrument to power outlet with capacity 220V/15A or above. Ground reliably.
- 5, Get 100ml sample using a measuring cylinder. Pour all samples in the measuring cylinder into the distillation flask. No liquid shall flow into the branch tube of distillation flask.
- 6, Insert the steam temperature sensor into the distillation flask vertically. The lowest part of sensor shall be 10mm lower than the lowest part of bottom of inner wall of branch tube of distillation flask.
- 7, Insert the branch tube of distillation flask into the condenser for 25 mm~50mm, so that the rubber plug of branch tube is connected to the condenser tightly. Turn the knob of lift to adjust the height of oven. Adjust the quartz glass partition, so that the oven is aligned with the bottom center of distillation flask.
- 8, Hang the drainage sheet on the cylinder wall, and then put the cylinder into the recovery chamber. Rotate the cylinder, so that the drainage sheet is not in the initial boiling point light path. Turn off the door of recovery chamber.
- 9, Check if every part is ready. Turn on the main power. Set distillation parameters as prompted on the touch screen (see the following section for detail).
- 10, Turn off the power switch after the test ends.

Instruction of touch screen



1. Booting

Click “CLICK HERE” to enter the next screen.



2 Precautions

Click “OK” to enter the next screen.



3 Selection of Oil

Select proper type of oil, otherwise, abnormal test results will occur.

Supported oil: diesel, gasoline, kerosene, methanol, benzene, solvent oil and custom oil products. For unknown type of oil and custom oil products, estimate the initial boiling point before work and set it in the system.

MBA	TEMP	TIME
IBP		Min Sec
5%		Min Sec
10%		Min Sec
15%		Min Sec
20%		Min Sec
25%		Min Sec
30%		Min Sec
35%		Min Sec
40%		Min Sec
45%		Min Sec
50%		Min Sec
55%		Min Sec
60%		Min Sec
65%		Min Sec
70%		Min Sec
75%		Min Sec
80%		Min Sec
85%		Min Sec
90%		Min Sec
95%		Min Sec
FBP		Min Sec

The Curve Graph

Start

Set up

Record

Save

Back

4 Monitoring of Test

- 1, Click Start, the system will start to work at pre-set parameters.
- 2, Click Set to enter the Set screen for setting of test parameters.
- 3, Click History to enter History Query screen for querying of history sample data.

- 4, Click Back to exit the screen automatically and return to Step 2.
- 5, The Store button is gray, which means that it is invalid in current state.
- 6, The temperature of various critical volume points during distillation is displayed in the lower left area of the screen.
- 7, The temperature-volume curve during heating is displayed at the top, whereas the x-axis represents the volume, and y-axis represents the temperature.
- 8, Real time values of the parameters during the heating are displayed in the middle and lower area, including the atmospheric pressure, heating temperature, temperature of steam in the distillation flask, refrigeration tube temperature, recovery chamber temperature and recovery volume.

Note: Before clicking Start, make sure that all test parameters are set correctly, otherwise, once the test begins, you cannot modify the parameters. If you click Stop button during testing, the test will end in advance, this test is unsuccessful and all data is invalid. Click Back to perform test again.

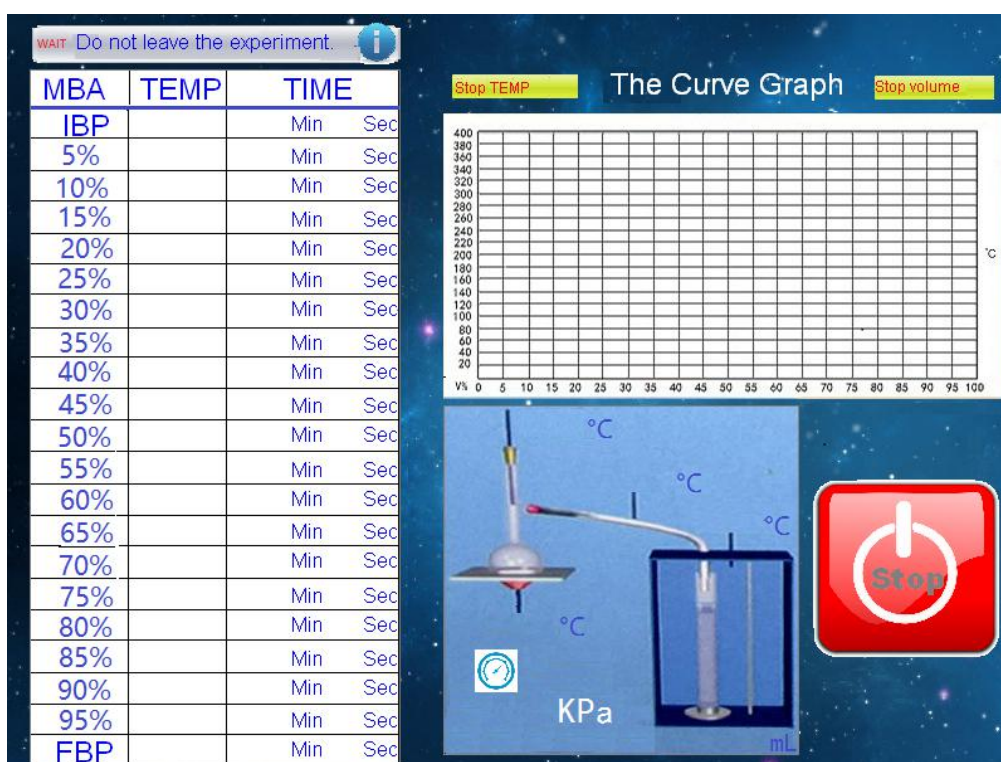


5 Setting of Parameters

- 1, Click the hand-shape region to set parameters. At most one decimal place can be input. After choosing a parameter, click Set to determine the parameter. The parameters are automatically saved after modification. CE is the backspace key.
- 2, Click Reset, all parameters will restore to the initial value before last setting.
- 3, The special measuring column is designed for debugging. Click it to enter special password area. The operator shall not click this column. In case of wrong operation, click the Back button.
- 4, Click Self-test to enter self-test screen to test all parts of the system, and ensure that all parts can work properly. On the 1st of each month, the system will automatically prompt the user for self-test. The user can also set manually at each operation for self-test.

- 5, Before delivery of the equipment, the default diameter of cylinder is calibrated to 26.3mm. As cylinders of other diameter are used, set the diameter of the cylinder accurate to three decimal places. For the setting range, see the appendix.
- 6, Click Back to return to the test monitoring screen.
- 7, Click the Temperature Control button, the system will work based on the set temperature. Click Room Temperature, the system will default to work under the current temperature, and the setting is invalid. To avoid frequent start of the temperature control system, only as the difference between the setting and the current temperature exceeds 3°C, can the temperature control system start.
- 8, Click the clock icon in the upper right corner to enter the time setting screen.
- 9, All settings have a range. Any entry outside the range will be ignored automatically by the system. For specific range, see the appendix.

For example: The current condenser temperature is 15°C. As the user enters 30°C, select the Temperature Control option, the temperature control system will start to heat and hold after the temperature reaches the setting. As the user enters 2°C, select the Temperature Control option, now refrigeration is required. But the compressor of refrigeration system cannot start frequently, so the temperature control system will still not work after setting. Now click the Back button and confirm the setting is complete, click the Start button to start the refrigeration system.



6 Test Starts

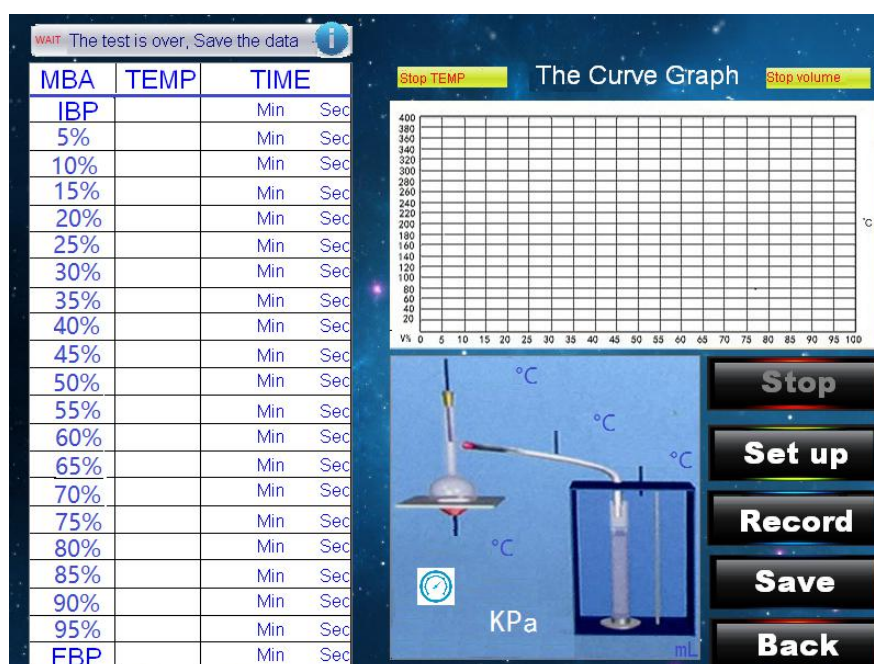
Click Stop to quit the test in case of emergency. This button is invalid as it is gray.

Note: After the test starts and in normal state, the system will conduct distillation at the set parameters in order; only when the temperature of the refrigeration tube, the temperature of the recovery chamber meet the requirements, and the oven temperature is below 40°C, can the test starts, otherwise, the system will automatically adjust the temperature, and the oven will not heat during this process.



7 Distillation Completed

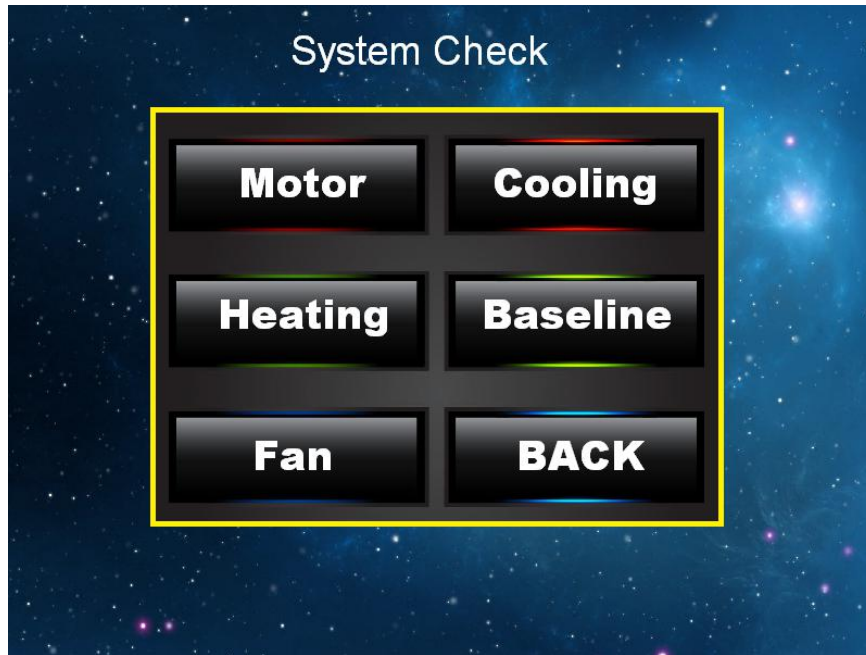
After distillation final boiling point occurs, the distillation process ends. The system automatically stops heating. The temperature of condenser and receiver chamber keeps the original settings. Current critical data is saved and displayed on the screen, giving voice signal. Click OK to enter the next screen.



8 Distillation Selection Completed

- 1, Click Store, the system will automatically save current parameters and print all test data.
- 2, Click Back, the system will continue to the next test.

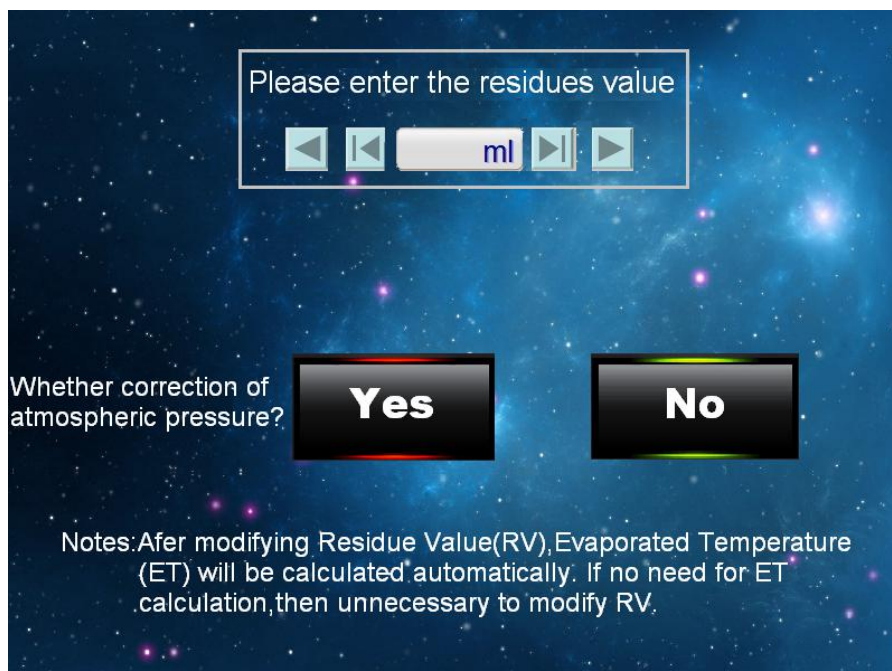
Note: After the test ends, click the Save button to save the data. The system can save 256 groups of final test data. After the number of tests is greater than 256, the system will automatically overwrite the oldest data.



9 Self-test

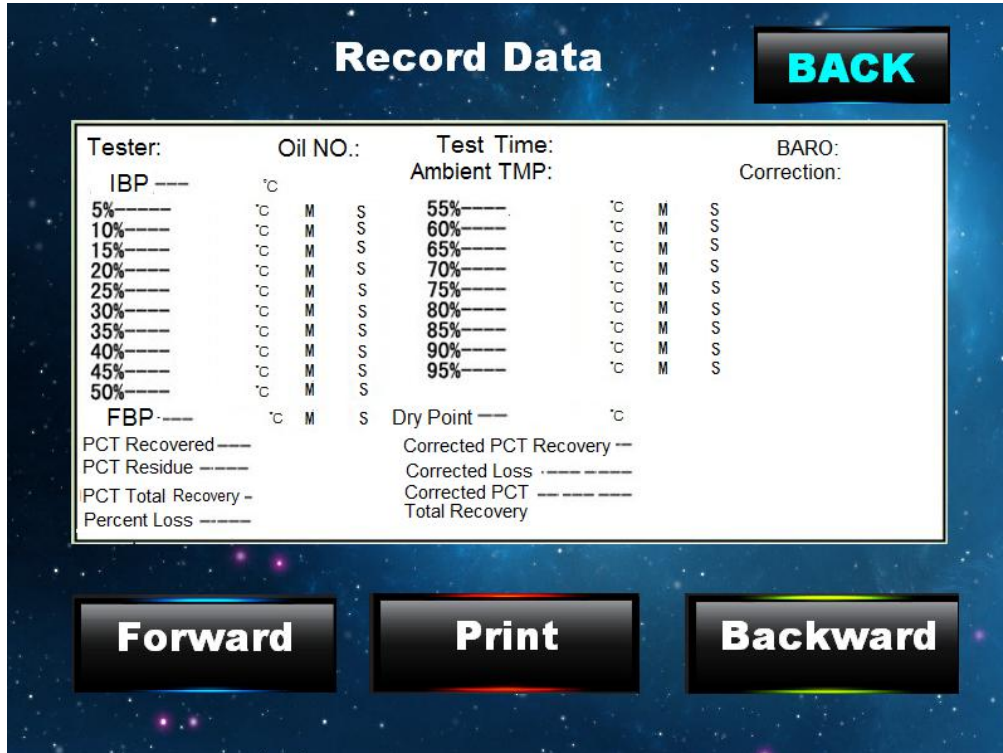
- 1, During self-testing, the level tracking device can move up and down under control. Do not run the tracking motor to the top or bottom of recovery chamber.
- 2, The self-test of refrigeration equipment takes 5 minutes.
- 3, During self-test of the heater, the oven will heat for 20s.
- 4, During calibration self-test, the thermometer and pressure of steam can be calibrated. Be careful.
- 5, During self-test of the auxiliary system, the fan will work and give alarm.
- 6, At 1st of each month, the equipment will automatically prompt for self-test.

Note: it is not recommended for frequent self-test of refrigeration equipment. New entry is possible during self-test.



10 Correct based on Atmospheric Pressure or not

To select correction of atmospheric pressure or not. To correct the temperature measurement based on the atmospheric pressure, click the check mark, then the system will automatically correct and store the data, which can be printed through a printer. After returning to the main monitoring screen, all data is the corrected one.



11 History Data Query

- 1, Click the Left arrow to move up. Query the history data based on the test time.
- 2, Click the Right arrow to move down.
- 3, Click Print to print the displayed query results.
- 4, Click Back to return to the main monitoring screen.

Note: the history test time, laboratory staff, oil numbers, temperature and the final distillate volume will be displayed in this page.



12 Selection of History Data for oil

Select the distillation oil model for query. To facilitate inquiries, classification is required. The system can store up to 256 sets of data. Click Clear History button to clear all history data.



13 Online Selection

This device can support touch screens and computer terminals. After booting, the touch screen is valid by default. Click the Computer button on the touch screen, the system will automatically shut down the touch screen to enter a computer terminal. Choose a touch screen to enter the touch screen control terminal.

This function is invalid for this version. Only the touch screen is valid!

The Cylinder isn't Clean!



14 Alarm for cylinder not clean

Click the Start button, the system will begin distilling. The level tracking device will automatically detect whether the cylinder is clean. As the wall of cylinder is not clean, the touch screen will automatically prompt as shown in the figure. Click the exclamation point area, and then clean the cylinder again before conducting the test.

Liquid Level Tracking Failure!



Resolvent

2 Press this button to increase the green value.

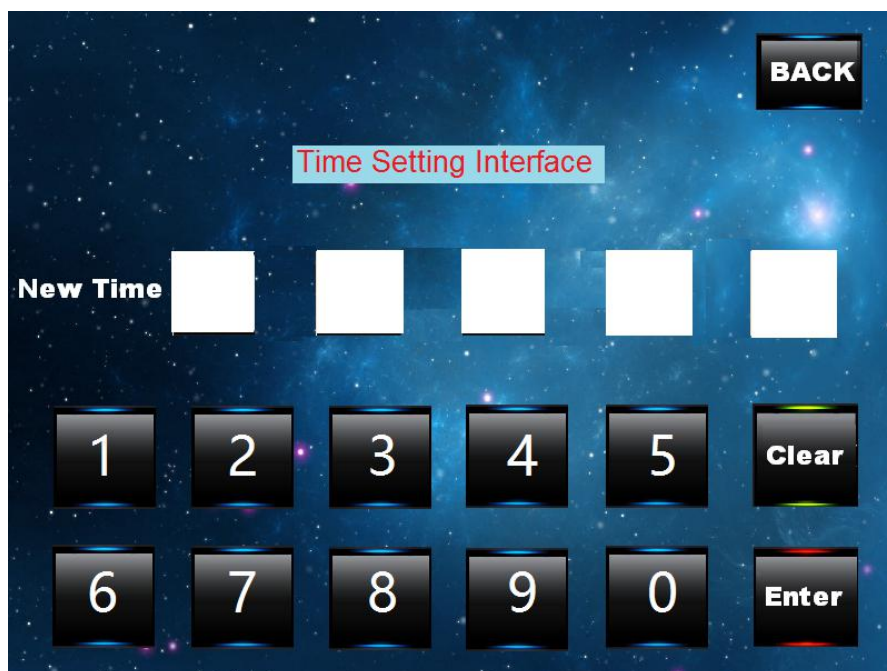
1 Open the transparent cover



15 Level Tracking Out of Control

When the level tracking system is abnormal, to avoid damage to the equipment, the level tracking out of control screen will automatically appear. This test is deemed to be a failure. The oven will automatically stop. Click OK to conduct the test again.

Note: When the user's parameter settings are wrong, or the heating speed is too high, or the distillation oil is opaque, the level tracking device will not work normally, making it impossible to track or out of control.



16 Time Calibration

- 1, To set a new time after entering the screen.
- 2, Click the Clear button first to enter the time setting mode.
- 3, Enter a new time in order. Click OK after setting, the system time is modified successfully.
- 4, Click Back to return to the Setting of Parameters screen.

Example: The current time is 01-01-2012 12:00:00, and the new time is 01-02-2012 16:30:00. Click Clear and enter 1, 2, 0, 2, 0, 1, 1, 6, 3 and 0 in sequence, and then click OK.

Note:

- 1, To ensure safety, ground the instrument well before usage; check the earth terminal regularly.
- 2, Do not store or operate the instrument in wet and corrosive environment; wrap it for long time storage to prevent entering of dust!
- 3, Any test sample at the surface of the instrument shall be wiped off as soon as possible with a warm cloth. Pay special attention to electric control parts to avoid entering of water.
- 4, Put the box at level position in the room.
- 5, When the system automatically prompts an error, please troubleshoot step by step following the manual.
- 6, Avoid sticking of oil at the bottom of flask. Wipe with a cloth if any, otherwise, it may cause a fire.
- 7, This device is calibrated before ex-factory. Do not touch optical and other precision equipments during operating.
- 8, Set accurate parameters, otherwise the test results may be false.
- 9, Do not start the refrigeration equipment continuously. Wait for 10 minutes or more before re-start.
- 10, The bath must be filled with medium before powering on to avoid damage the heater.

- 11, For long time storage of the instrument, extract all liquid in the bath using a pump. Wipe the equipment with a cloth to avoid affect of the lifetime of the instrument caused by medium. Fill the bath with medium before the next usage.
- 12, For safety, the rear port can be connected with nitrogen or carbon dioxide source. For equipments without automatic extinguisher, in case of a fire, turn off the main power switch, and then press the red Fire button on the front panel, gas flow will be jet to fight the fire.

Maintenance:

- 1, In case of any faults during usage of the instrument, do not dismantle freely. Repair it by professionals. Or contact us in time for repair.
- 2, The instrument is tested before shipment and qualified.
- 3, Any faults of the instrument due to quality problems within one year commencing from the date of shipment will be repaired free. We will provide our customers with high quality service sincerely, quality first, reputation first, service first. Welcome for advice for improvement.

Packing List

No.	Description	Size	Q'ty	Unit	Remarks
1	Simulated Distillation Device		1	Set	
2	Power line		1		
3	Fuse	6×30 15A	1		
4	Distillation flask		2		
5	Cylinder	No scale	2		
6	Flask support plate	Φ38mm	1		
7	Flask support plate	Φ50mm	1		
8	Distillation stopper		6		
9	Drainage sheet		2		
10	Measuring cylinder cover		1		
11	Cleaning lead		1		
12	Temperature sensor	Glass	1		
13	Printing paper		2	Roll	
14	Manual		1	Copy	Attached printer manual (Chinese/English)
15	Certificate		1	Copy	Chinese/English
16	Printer		1	Set	
			Packing Staff		
			Inspector		
			Packing Date		

Thanks for choosing our products!