

MOLECULAR DISTILLATION

USA LAB

USER MANUAL



WARNING: Read carefully and understand all **INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

1. General

Molecular Distillation is a special liquid-liquid separation technology ,which is different from traditional distillation on the difference boiling point.This is a kind of distillation in high vacuum environment ,for the difference of material molecular movement free path ,was carried out in the heat sensitive material or high boiling point material distillation and purification process.Molecular distillation is mainly used in chemical ,pharmaceutical ,plastics ,oil and other fields.

2. Characteristics

- 1) with High Quality Diffusion Pump
- 2) with one unit of gear pump from the side of feeding tank,with high seal
- 3) with one piece of retaining valve for keeping better seal
- 4) LCD Temperature Display
- 5) High Quality Vacuum Gauge

3. Technical Parameters

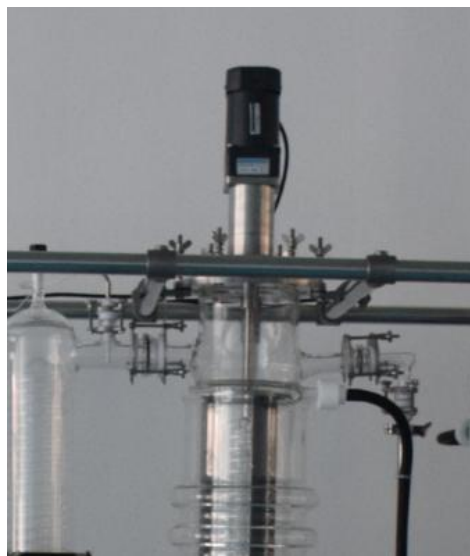
Model No.	USA-150
Effective evaporation area (m2)	0.25
Barrel diameter (mm)	150
Feeding funnel volume (L)	5L
Feed rate(Kg/hr)	1.25 ~12.5
CBD Throughput at end of 8-10 hr.day (kg)	~20
Stirring Motor power (W)	140
Maximum speed (rpm)	600rpm
Gear Pump(60W)	60
Maximum Speed(rpm)	140rpm
Distillate receiving flask (L)	5L
Recycle receiving flask (L)	2L
Operation Pressure	Less than 10pa
Voltage	220V 60Hz single phase

4. Installation steps:

1) After opening the package, take all parts out from package carefully.

2) Please put stainless steel frame on the ground, and must be stable

A . First, install the main evaporator carefully according to position firmed out, then install rotary motor

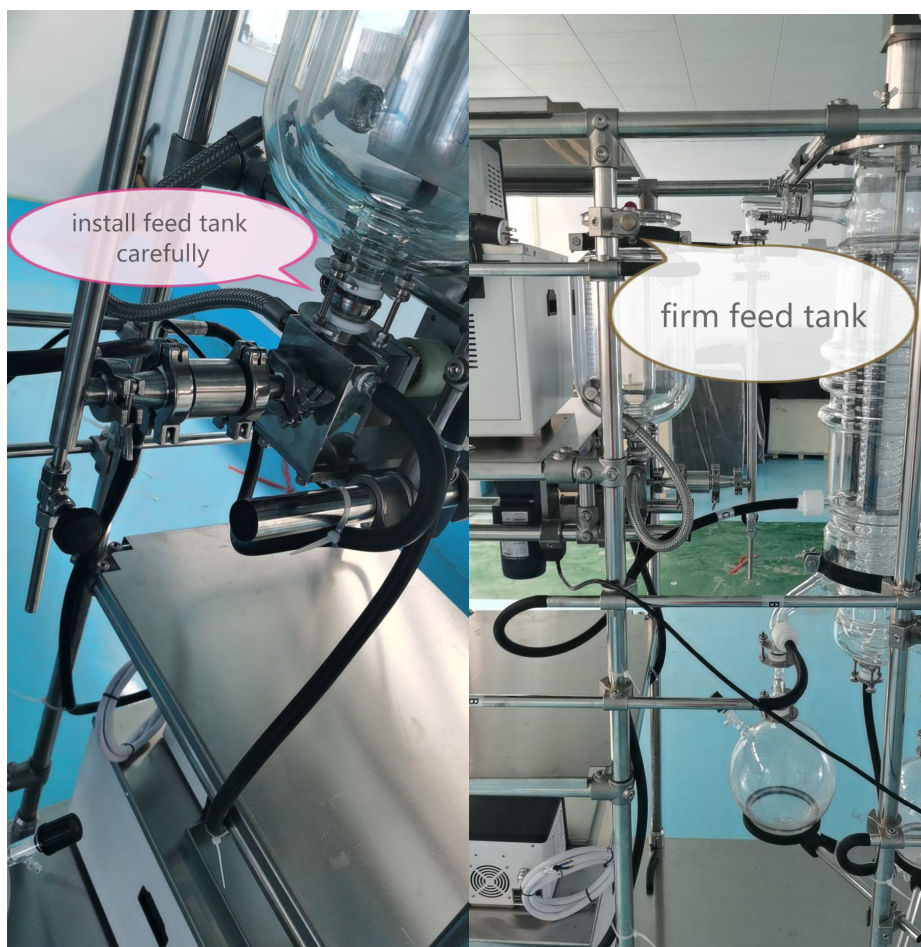


Note: when users install the rotary motor, please carefully screw the screws, and see screw's direction!

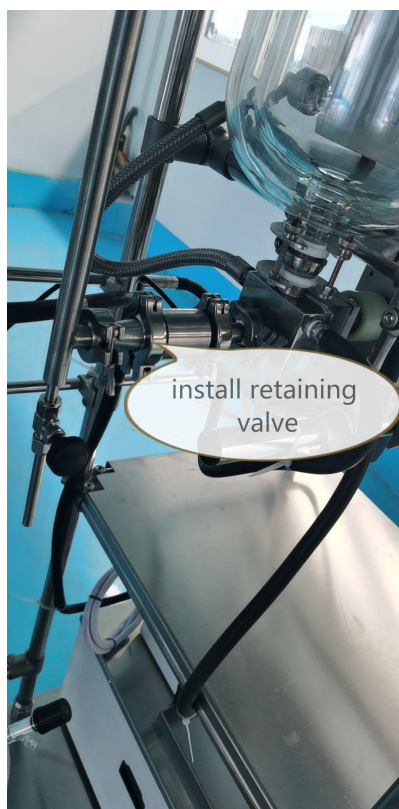
B . Second, firm black clamp like picture:



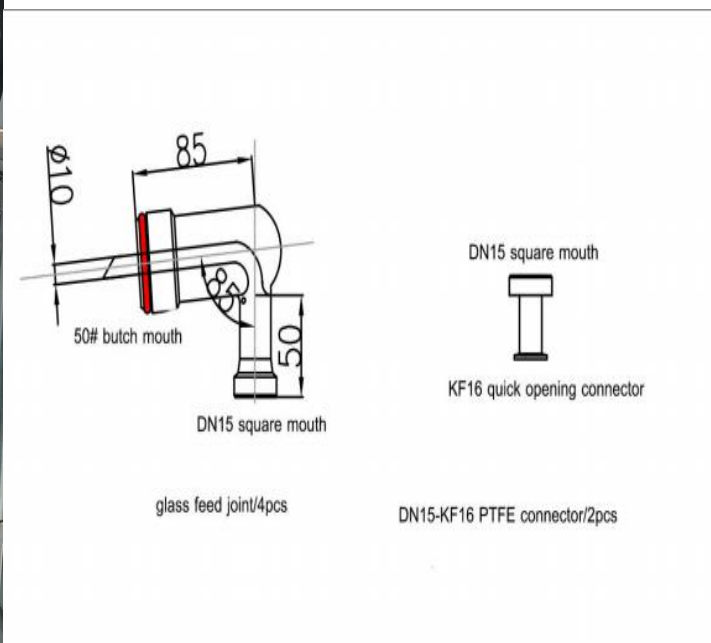
C . Third, install 5L feeding tank, and firm it, like picture:



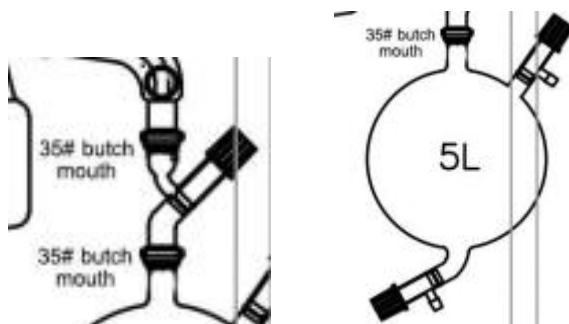
D . Firm the retaining valve like picture:



E. Connect Glass Adapter with Main Evaporator like picture: Note: adjust angle when the glass adapter is not too proper

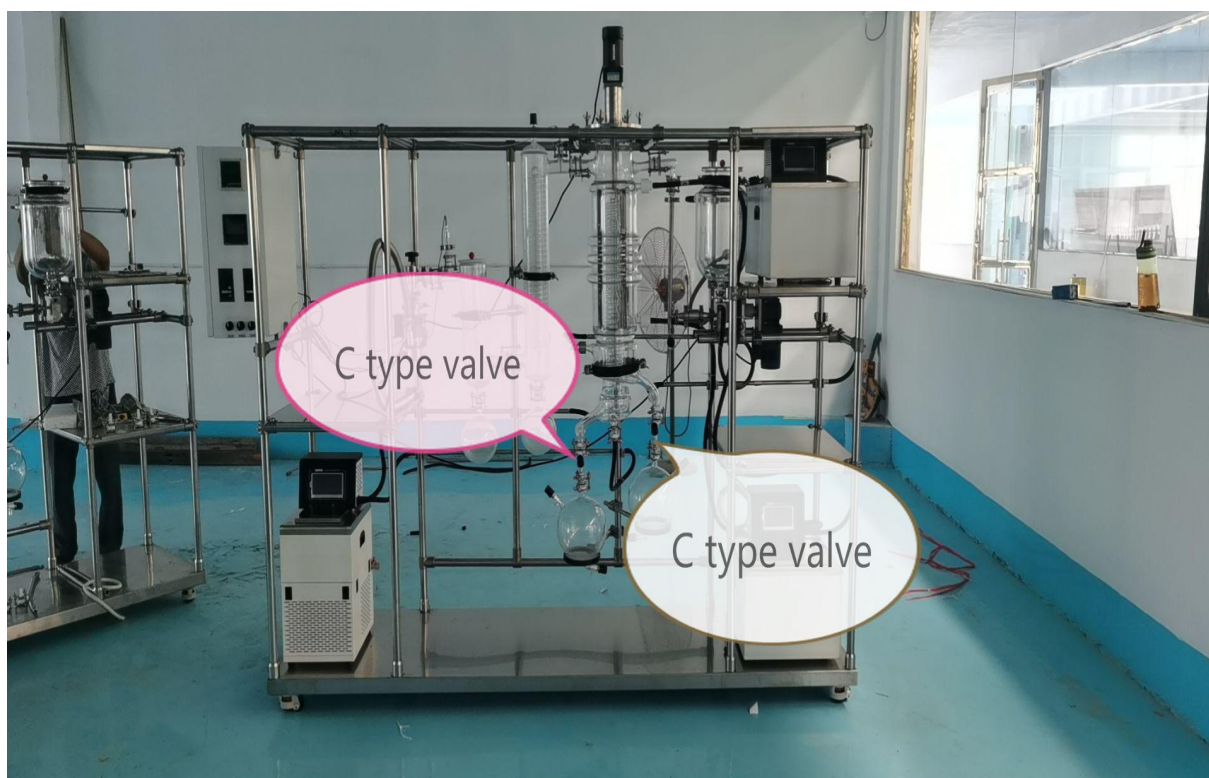


F. Connect C Type Valve and 5L receiving flask according to the positions of support ring like this picture (often we use Marker Pen to mark the positions of support ring)

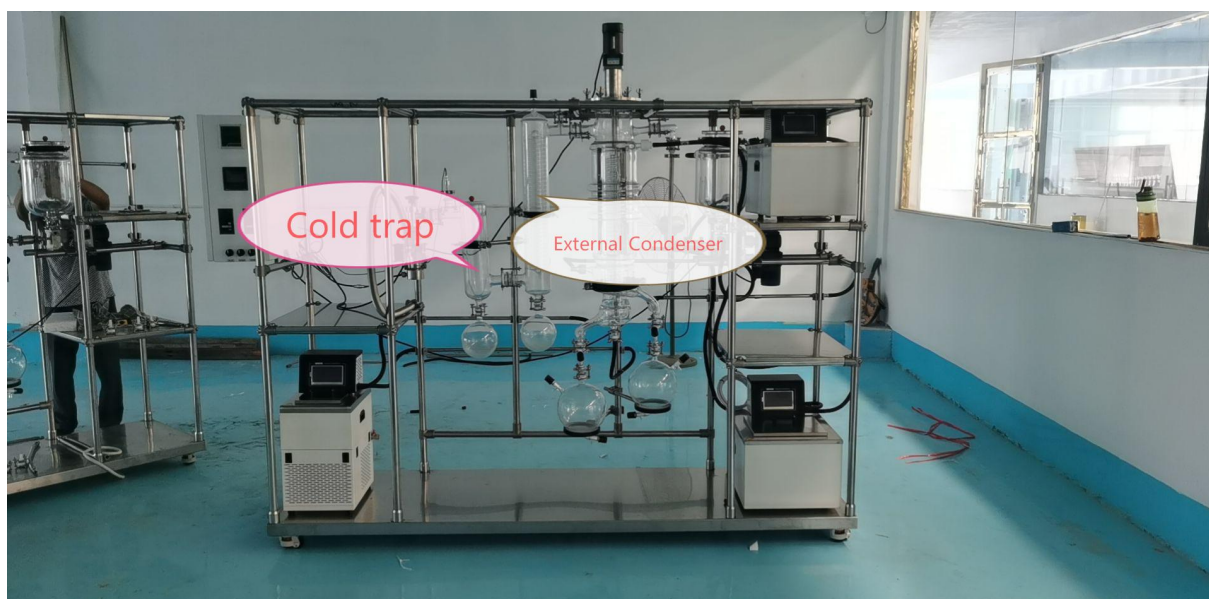


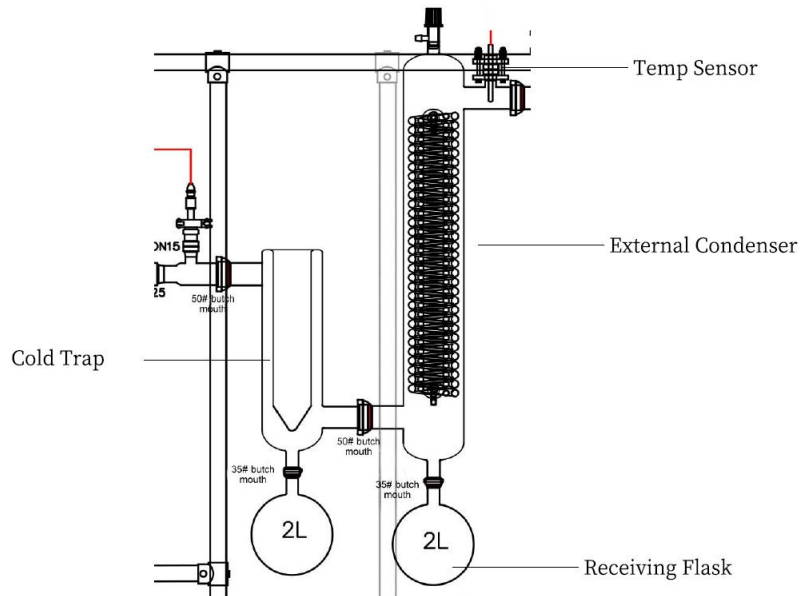
C Type Valve

5L Receiving Flask



G: Connect External Condenser with Main Evaporator, and firm External Condenser and Cold Trap, and firm 2L bottom receiving flask like picture:





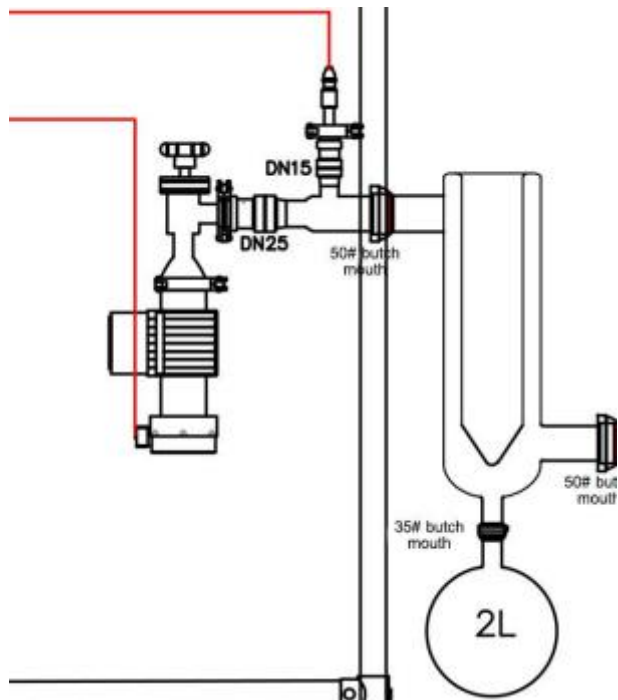
The right is External Condenser, the left side is Cold Trap

H: Connect with Diffusion Pump, Note: User must fill Diffusion Pump Oil before operate it, Not is Vacuum Pump Oil like picture:



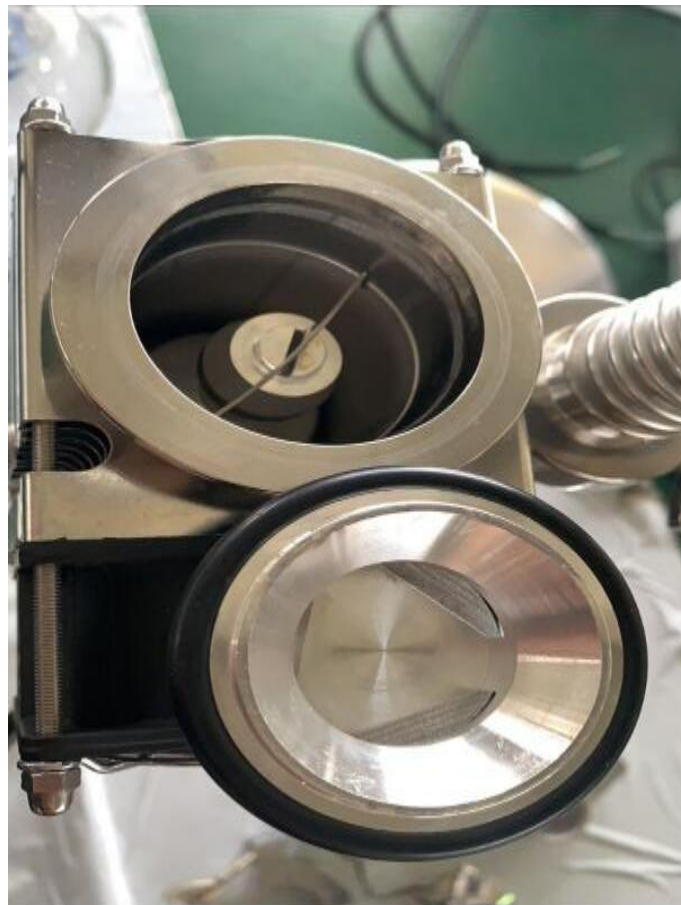
The photo is the back of molecular distillation





The left side is Diffusion Pump, the right side is Cold Trap

Check if it has diffusion pump oil, you need to open the flange from top of the diffusion pump, then you can find like this picture:



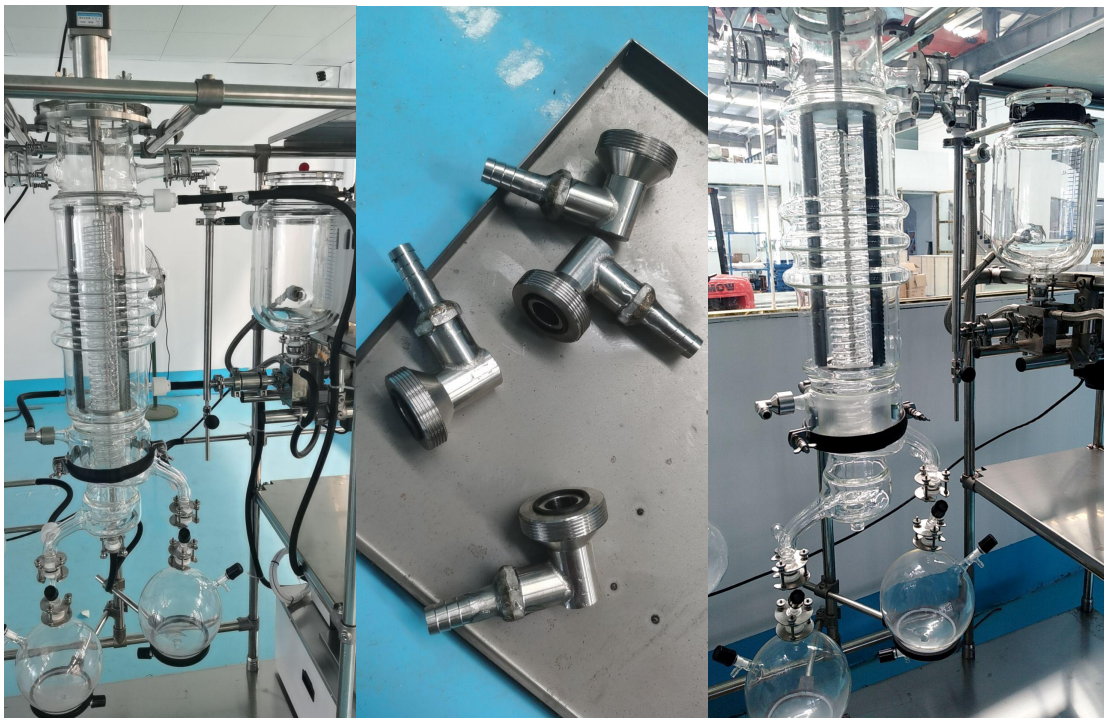
Note: if it hasn't diffusion pump oil, we must to add it about 70ml, then tighten the flange

L: firm control box like picture:



M: connect tubing

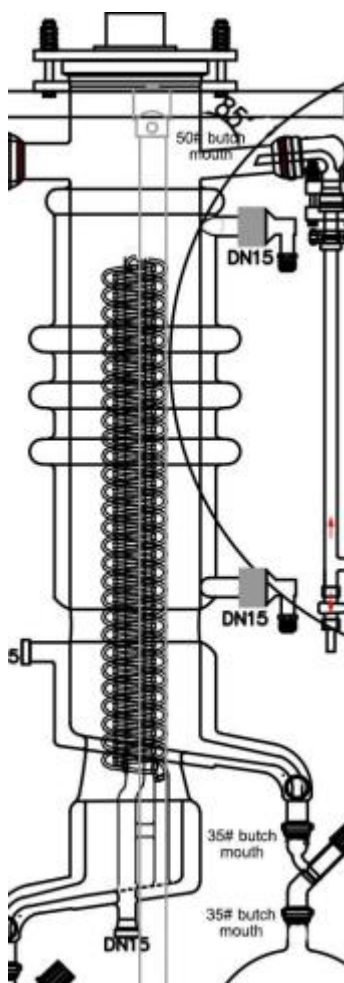
1) : Inlet port and Outlet port of Main Evaporator, we equipped Stainless Steel Adapter and PTFE adapter, customer can use it according to your hobby like picture(standard configuration is PTFE adapter): the adapter of the left picture is PTFE, the adapter is stainless steel



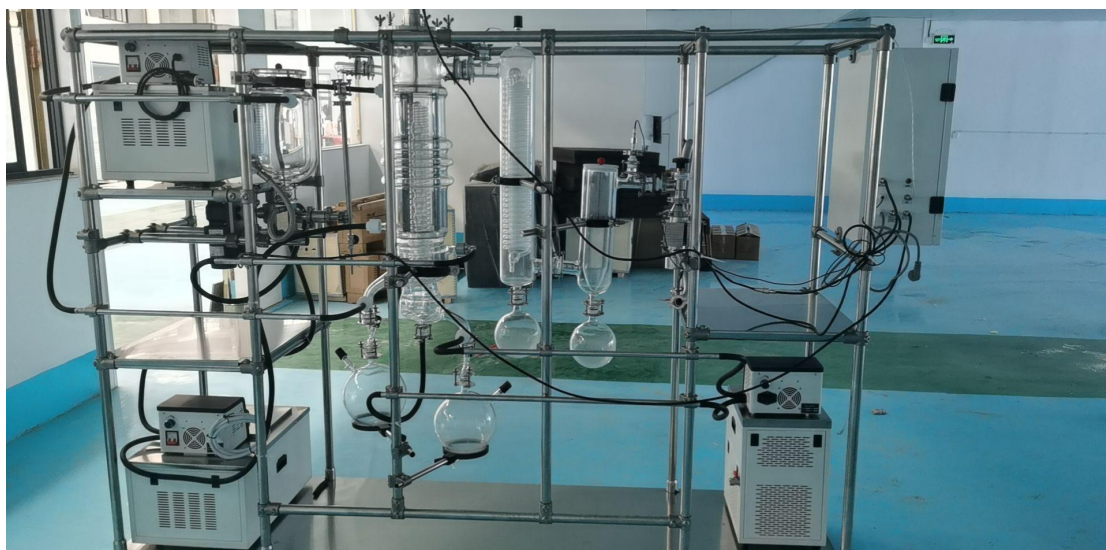


Note1: Stainless Steel adapter with 3/8 Barb, we equipped two pieces or three pieces
And we used black high temperature tubing for connecting with inlet port and outlet port of main evaporator, we often use same letter as a mark on two tubing.

Note2: GY-30A will be connected with these two ports, see Purple Arrow! GY-30A only connect with these two ports of main evaporator.(Port I and Port II)

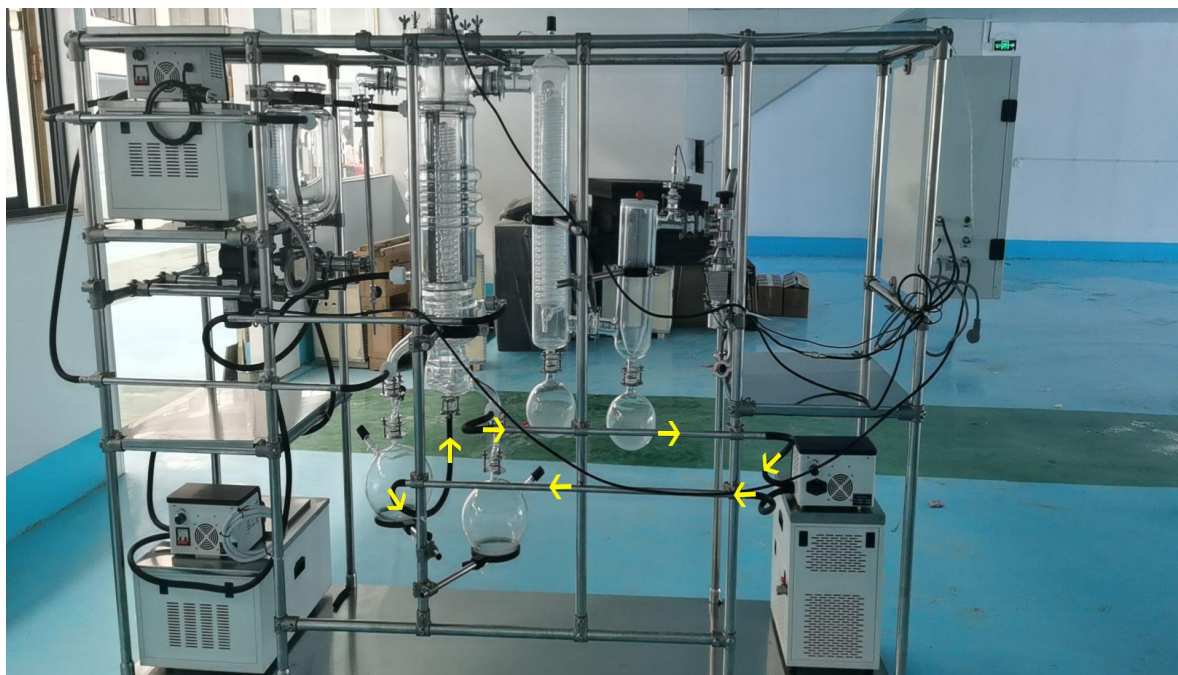


2): the Bottom port of main evaporator and left-lower port of main evaporator, we used short high temperature tubing connects with stainless steel tube, see picture: **this picture is the back of equipment.**



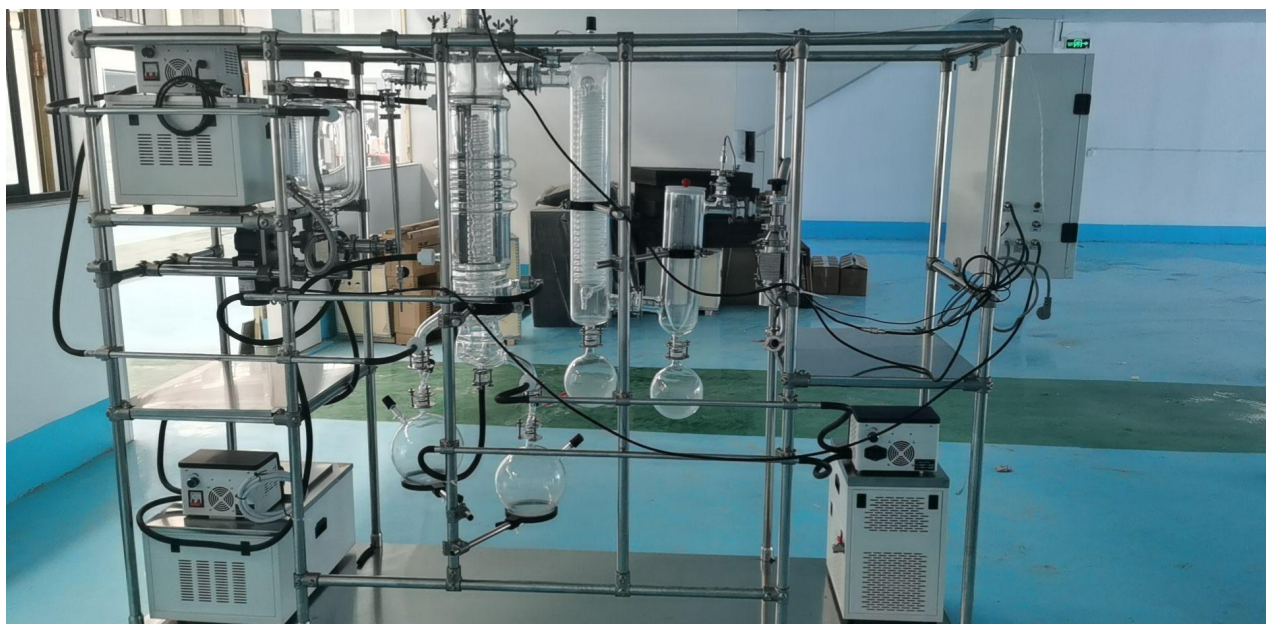
Note: at sometime, **we often use same letter as a mark on two tubing**

Note2: YH-2006 will be connected with these tubing like picture see Yellow Arrow (Operate YH-2006, user needs to refer english manual of YH-2006)



3): the left-top port and the right-lower port of main evaporator, we still use short high temperature tubing connects with stainless steel tube, we often use same letter as a mark on two tubing like picture: it is the back of equipment





**GY-15A will provide heating source to these tubes like picture: see Red Arrow!
(Operate GY-15A, user needs to refer english manual of GY-15A)**

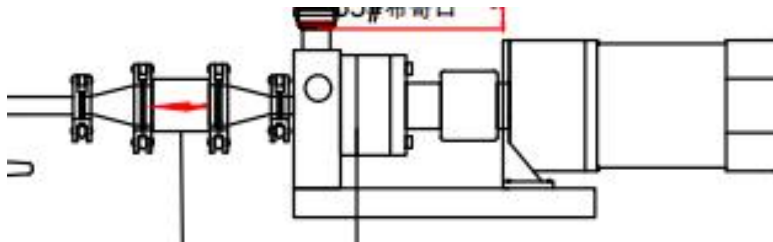


The back of Molecular Distillation:



The front of Molecular Distillation

Note: the heating source needs to be connected with the jacket of gear pump for keeping warm!



N. Wiring Connecting with Control Box



Note1: Vacuum Pump don't need to be connected to control box, because of some customers are using different size vacuum pump

Note2: some wiring are weak, please must be careful when users are connecting temperature sensor and vacuum sensor.



The left side: Vacuum sensor, The right side:Temp sensor

5.Controller Operation:

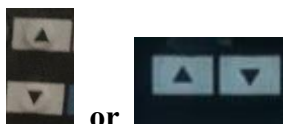
1): First, Users get vacuum by UVP-21 Vacuum Pump,for example: when Vacuum display 2.0E01, it presents vacuum degree about 20Pa ;if the vacuum display 9.8E00,it presents vacuum degree about 9.8Pa

2): when vacuum degree couldn't be pulled continuously by UVP-21 vacuum pump, at this moment you can open diffusion pump for working; normally, the vacuum degree can be arrived to 10Pa lower by vacuum pump only; at this moment, if you haven't added raw materials, we don't suggest to open diffusion pump. after add raw materials, if it couldn't be arrived 10pa lower by vacuum pump only, and vacuum degree couldn't be downed continuously by vacuum pump only, so you need to open diffusion pump at this moment.

3.Stirring Motor, normally you only need set at Hertz(Hz), for example set at 19Hz, the speed about 190rpm; about controller of Stirring motor, it is a frequency-converter, we only use 4 keys, other keys don't need to use them, Users must remember!!!



“Run” Key, “Stop” Key, And “UP”Key, “Down” Key like picture:



Only use these 4 keys ! ! (or users only use rotary knob for working!)

4. Gear Pump, normally User only need to set at 5Hz for operating, it will be ok!
Still User only need to use 4keys, other keys don't need to use them!

Only need to use: “Run” Key, “Stop” Key, And “UP”Key, “Down” Key

Or (or users only use rotary knob for working!)



6. Packing list :

1. Main Evaporator	1set
2. Feed Tank	1pc
3. Retaining valve	1pc
4. Glass Adapter	1pc
5. Tube between Glass Adapter and Retaining valve	1pc
6. C Type Valves	2sets
7. Receiving flask with valve	2sets
8. External Condenser	1pc
9. Cold Trap	1pc
10. Diffusion Pump	1pc
11. Temp Sensor	1set
12. Vacuum Sensor	1set
13. Control Box	1pc
14. Receiving Flask	2pcs
15. GY-15A Heater	1unit
16. GY-30A Heater	1unit
17. YH-2006 Heater/Chiller	1unit
18. UVP-21 Vacuum Pump	1unit
19. UC-50/30 Chiller	1unit
20. High Temperature Tube	several
21. Stainless Steel Tube	several
22. Stainless Steel Frame	1set
23. Support Ring and Clamp	several
24. Stainless Steel Adapter and PTFE Adapter	several
25. Spare glass parts	several(often include an external condenser, two 5L receiving flasks, and some valve,etc.)



—GY-30A Operation Manual

Characteristics:

1. Low Temperature Coolant circulator is used wind-cool-type and complete-close-compressor set to refrigerate. By microprocessor control, cooling systems automatically start, time-lapse turn off, with over-heat and over-current protection
2. The Circulator may export the coolant from reservoir, cool or maintain the temperature of out side lab vessel or establish second constant temperature field.
3. Microprocessor controls the time switch from 0-100 hours.
4. Dual windows, Red and Green LED display the set temperature and the actual temperature, respectively. The readout accuracy is $\pm 0.1^{\circ}\text{C}$, and the stability is $\pm 0.1^{\circ}\text{C}$.
5. Microprocessor-controlled-lock function may lock all parameters.
6. Having Easy-to-use microprocessor control touch keys.

Technical Parameters :

Model	Tem Range ($^{\circ}\text{C}$)	V/AC	Capacit y (L)	Accuracy ($^{\circ}\text{C}$)	Inner bath size	Bath open size
GY-30A	Room+5 -200	220V/60 HZ	30	± 0.1	400mm*330mm *230mm	310mm*280mm

Operation Process :

.Add liquid media in bath, with liquid level no less than 30mm lower than work bench.

1. Selection of liquid media

- A) When work temperature is below 5°C , liquid media shall be alcohol.
- B) When work temperature is between 5°C - 80°C , normally liquid media shall be pure water.
- C) When work temperature is between 80°C - 90°C , normally liquid media shall be 1 5 % glycerin water solvent.
- D) When work temperature over 90°C , normally liquid media shall be Silicone oil

2. Connection of cycling pump:

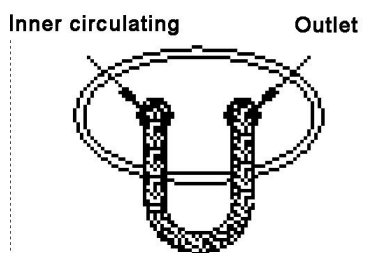
- A) For connection of internal and external cycling pumps, the user only need to connect liquid outlet tube to liquid inlet tube with hose which will be provided with the machine).
- B) Connect external cycle of external cycling pump, connect liquid outlet tube to inlet of

vessel outside the bath, and connect liquid inlet tube to outlet vessel outside the bath.
 (Note: tube on the left side of front panel of instrument is liquid inlet tube, and the one on the rack panel of the instrument is liquid outlet tube)

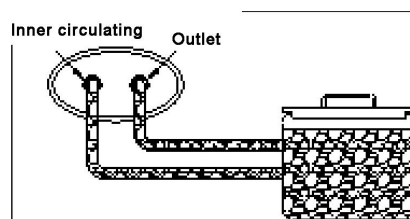
3 .Put on the power (on rack control panel)

4. Instrument shall be operated as follows:

Circulating details



Picture Inner Loop 1.1

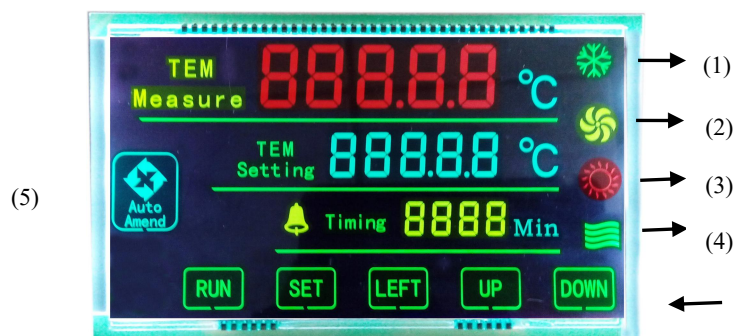


Picture Outer Loop 1.2

- Inner loop :connect with outlet and inner circulating via hose
- Outer loop :The outlet and inner circulating connected to the outer container respectively ,set up the second temperature container (Picture 1.2)
- Drain: When finish all process or need change water ,open the drain valve ,water can achieved ,under the water must a water container ,or use the water pipe connected to the gutter

Display (As picture 2) :

Interface:



Picture 2

一) 、 Function key :

1.  Refrigeration light: When the light flashing refrigeration is on ,the cooling function start working after 2-3 minutes , Refrigeration lights long time bright
2.  Circulating pump light: when long press the RUN key button machine ,circulating pump auto working ,when shut off ,the light dark
3.  Heating light ,start heat function ,the light on ,or it's off
4.  Water level light: the light tip groove liquid level cannot under working table 30mm
5.  RUN key : Long press 5 second ,the the device start or stop working
6.  SET key : TEM Setting and TEM Measure set confirm , and amend etc
7.  LEFT MOVE KEY: SETTING data move key
8.  UP and DOWN KEY: SETTING DATA “ + “or” -”Long press UP key ,can be check environment temperature

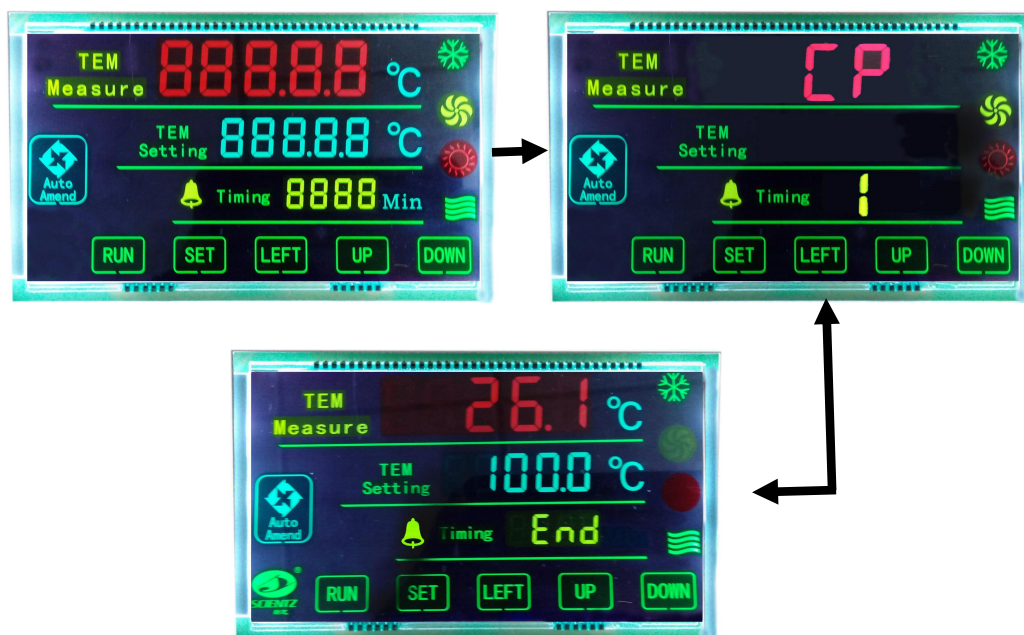
Notice : if TEM Measure area display “ ” indicate sensor input or the signal over measurement limit ,if display “ ”, indicate sensor short circuit or the input signal is lower than the lower limited range when the input signal is beyond the scope of range ,buzzer ,press any key be muted.

二)、 Data setting

A) Please join the bath in liquid medium (such as alcohol).

B) Turn on the power

1、 When turn on the device , (as picture 3) display CP, the first row it's sing point control ,the second empty ,the third it's number 1 ,means reach setting value ,if it's 0 ,that means electric start timing)buzzer alarm ,automatically after 3 ring back to standby model as picture 3



Picture 3

2、 Setting temperature and time:

1) Press SET key ,, TEM Setting area temperature value bottom flash,via pressing(LEFT) shift, increased (UP), and reduce key (DOWN), to SET the required temperature.

2) Press SET key enter into Timing area value bottom flash,via pressing(LEFT) shift, increased (UP), and reduce key (DOWN), to SET the required time ,press SET key ,then save and return to standby model (see picture 4).



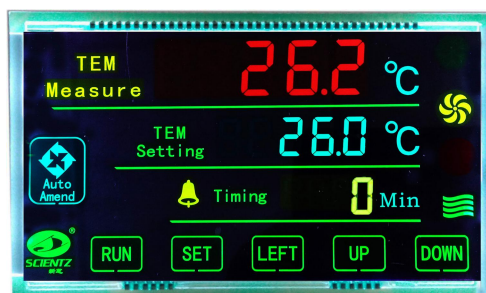
Picture 4 Temperature and time setting

3、 Timing function

When the Timing is set to 0, instrument cancel the Timing function and instrument always running; When Timing set not 0, the meter is timing function, when the meter running time, Timing show END, buzzer, instrument to stop working, and press any key can be muted.

The device work start/stop:

Long press the RUN more than 3 seconds, compressor buzzing, cooling and circulating pump began to work. If you want to stop working and long press the RUN button will stop working, the buzzer alarm, press any key mute. (see picture 5) :



Picture 5 Timing function

Tech Tip

1. Before using, should add full liquid medium.
2. The power supply should be match with the technical parameter. The power should be greater then or equal to the total power of the machine. Ground wire should be used (Connect the snail located at the left bottom on the rear side) .
3. The machine should be put in dry and drafty place, rear and two sides 400mm apart from other articles.
4. After done, all switches should be in turn off Pull out plug, dry and clean bath

Packing list :

- | | |
|-----------------------|-------|
| 1. Main machine | 1set |
| 2. Power supply wire | 1pc |
| 3. Rubber tube | 1pc |
| 4. Cover | 1pc |
| 5. Operational Manual | 1copy |

二. GY-15A English Manual

Characteristics:

1. Low Temperature Coolant circulator is used wind-cool-type and complete-close-compressor set to refrigerate. By microprocessor control, cooling systems automatically start, time-lapse turn off, with over-heat and over-current protection
2. The Circulator may export the coolant from reservoir, cool or maintain the temperature of out side lab vessel or establish second constant temperature field.
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4. Dual windows, Red and Green LED display the set temperature and the actual temperature, respectively. The readout accuracy is $\pm 0.1^{\circ}\text{C}$, and the stability is $\pm 0.1^{\circ}\text{C}$.
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Technical Parameters :

Model	Tem Range ($^{\circ}\text{C}$)	V/AC	Capacit y (L)	Accuracy ($^{\circ}\text{C}$)	Pump flow (L/min)	Drain	Inner bath size	Bath open size
GY-15A	Room+5 -200	220V/60 Hz	14.4	± 0.1	13	no	300mm*240mm *200mm	235mm*160mm

Operation Process :

.Add liquid media in bath, with liquid level no less than 30mm lower than work bench.

1. Selection of liquid media

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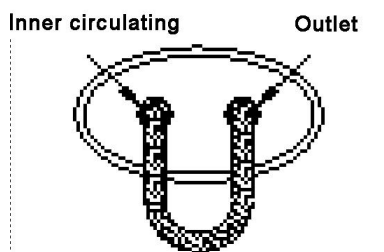
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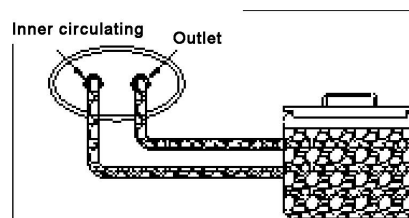
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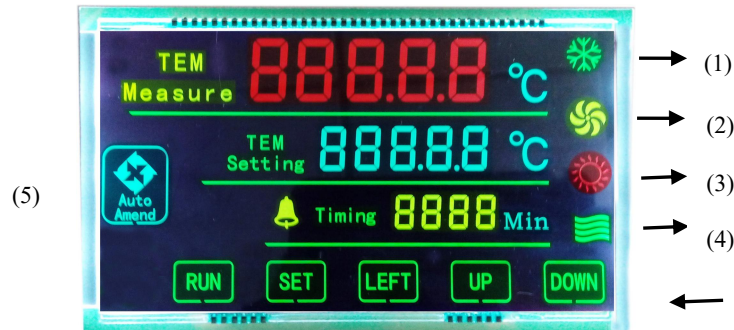


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4.  Water lever light: the light tip groove liquid lever cannot under working table 30mm
5.  RUN key : Long press 5 second ,the the device start or stop working
6.  SET key : TEM Setting and TEM Measure set confirm , and amend etc
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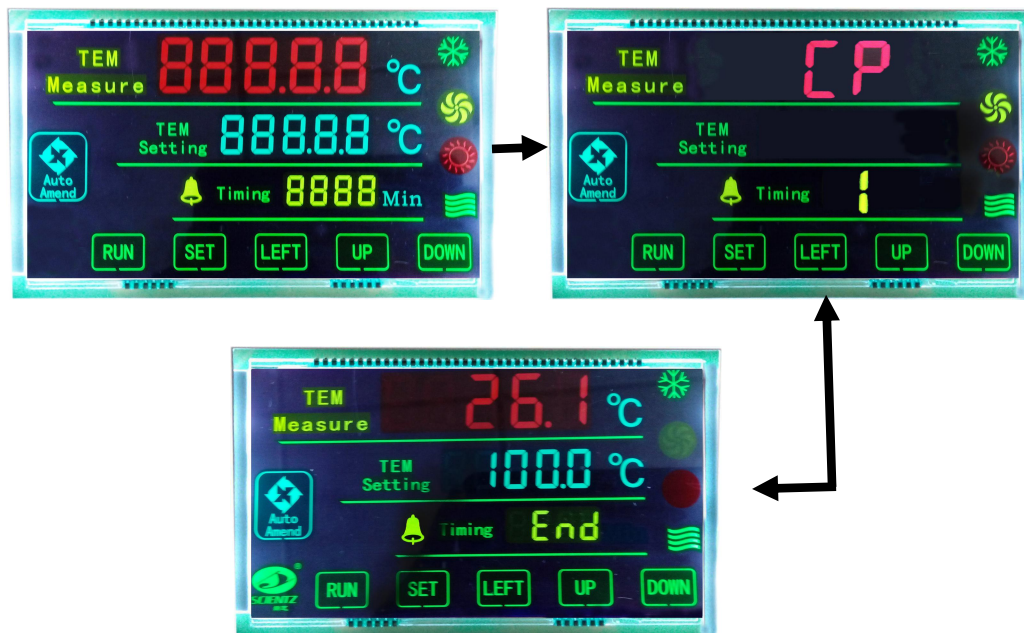
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二)、 Data setting

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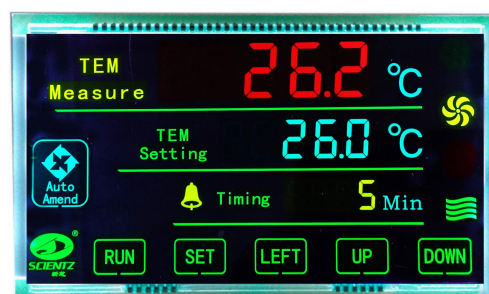


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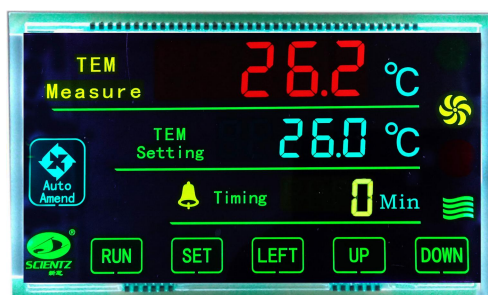
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Tech Tip

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2. The power supply should be match with the technical parameter. The power should be greater then or equal to the total power of the machine. Ground wire should be used (Connect the snail located at the left bottom on the rear side) .
3. The machine should be put in dry and drafty place, rear and two sides 400mm apart from other articles.
4. After done, all switches should be in turn off Pull out plug, dry and clean bath

Packing list :

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|-----------------------|-------|
| 1. Main machine | 1set |
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| 3. Rubber tube | 1pc |
| 4. Cover | 1pc |
| 5. Operational Manual | 1copy |

三. YH-2006 English Manual

1. General

This product is automatic setting of PID algorithm without overshoot, complete function, easy to use, is the best product, analog temperature control is indispensable for medical apparatus and instruments, laboratory instruments commonly used temperature control equipment. Extensively used in Petrochemical industry, National Defense, Metallurgy, Chemical Industry, Physics, Biology Engineering, Chemistry, Pharmaceutical, life science, electronic instrument, quality inspection and measurement, plant laboratory, colleges, Research and Development Institutes and so on.

2. Characteristics

- 1) With complete enclosed air- cooling compressor for refrigeration, low temperature thermostatic bath has outstanding advantages such as quick refrigeration and low noise.
- 2) Refrigeration system is equipped with multi-purpose protection devices such as over heating, over current and so on.
- 3) Temperature can be controlled by microcomputer, which can be operated simply, has alarming device for temperature under low temperature limit and over high temperature limit, and is equipped with PID automatic control.
- 4) Use double windows in red and green, upper window displays measurement value in red, and lower window displays measurement value in green, both in LCD
- 5) Intelligent microcomputer can adjust temperature setting allowance so that digital display distinguish-ability reaches 0.1°C.
- 6) Special user PID can be adjusted.
- 7) It has internal and external cycles, external cycle will discharge thermostatic liquid inside the bath, and establish No. 2 thermostatic bath, also it can discharge liquid outside as cooling or heating source, to lower (raise)temperature of external experimental vessels, and enlarge use scope.

5. Technical Parameters

Model No.	YH-2006
Temperature scope (°C)	-20~100
Temperature change range (°C)	±0.05
Work bath volume (L×W×H) mm	260×200×140
Open slot of work bath (L×W) mm	180×140
Bath Depth(mm)	140
Flow rate of Exterior cycling pump L /min	0-20
Voltage	220V/ 50Hz

4. Operational steps:

1) Add liquid media in bath, with liquid level no less than 30mm lower than work bench.

2) Selection of liquid media

A . When work temperature is below 5°C , liquid media shall be alcohol.

B . When work temperature is between 5°C - 80°C , normally liquid media shall be pure water.

C . When work temperature is between 80°C - 90°C , normally liquid media shall be 1 5 % glycerin water solvent.

D . When work temperature is more than 90°C , normally liquid media shall be oil.

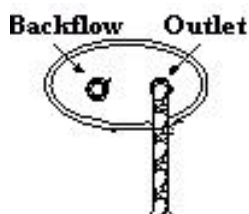
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A . For connection of internal and external cycling pumps, the user only need to connect liquid outlet tube to liquid inlet tube with hose which will be provided with the machine).

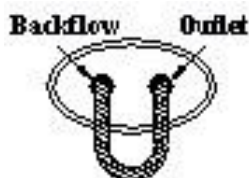
B . Connect external cycle of external cycling pump, connect liquid outlet tube to inlet of vessel outside the bath, and connect liquid inlet tube to outlet vessel outside the bath.

(Note : tube on the left side of front panel of instrument is liquid inlet tube, and the one on the rack panel of the instrument is liquid outlet tube) .

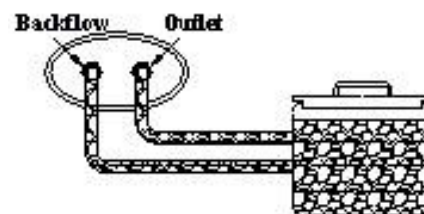
A. Line shows:



(Figure4.1) Internal Recycle



(Figure 4.3) Outlet



(Figure 4.2)Outside Recycle

①Internal Recycle : Use the tube to connect the outlet and back flow (Figure4.1)

- ② Outside Recycle: Make the outlet and back flow respectively connected to the outer container, set up the second temperature field (Figure 4.2)
- ③ Outlet :Direct drainage outlet (Figure 4.3)

B. Interface specification:



Figure 1: Panel Figure

4) Function of each button:

- (1) Refrigeration lights: when refrigeration output light on , when refrigeration delay the light is flickering, refrigeration closing the lights off.
- (2) Circulating pump indicator light: when pump output the light on , pump closed the light off.
- (3) Heating light: when heating output the light on, heating closed the light off
- (4) Water level indicator light: when the water level alarm the light on
- (5) Self-tuning indicator light: Self-tuning time the light flickering.

RUN : Start and stop the operation by long press

SET : For the set value modifying, setting the parameters and modified confirmation

LEFT : Used to set data, control parameter shift

UP : Used to set data, control parameter to modify or inquire the running state ;
Long-press, inquire the environment temperature

DOWN : Used to set data, control parameter modification; Long press to view the rest of the standard state currently running cycle number.

5) Specific operation Settings

- ① Please put liquid medium to tank (such as silicone oil), if the instrument using higher than 80°C, charging with 2 cm space should be under the rabbet, in case of high temperature oil expansion of the overflow.
- ② Plug the power line, turn on the switch on the back of machine.

6) Process Control

1. When turn on the machine, the display as below:

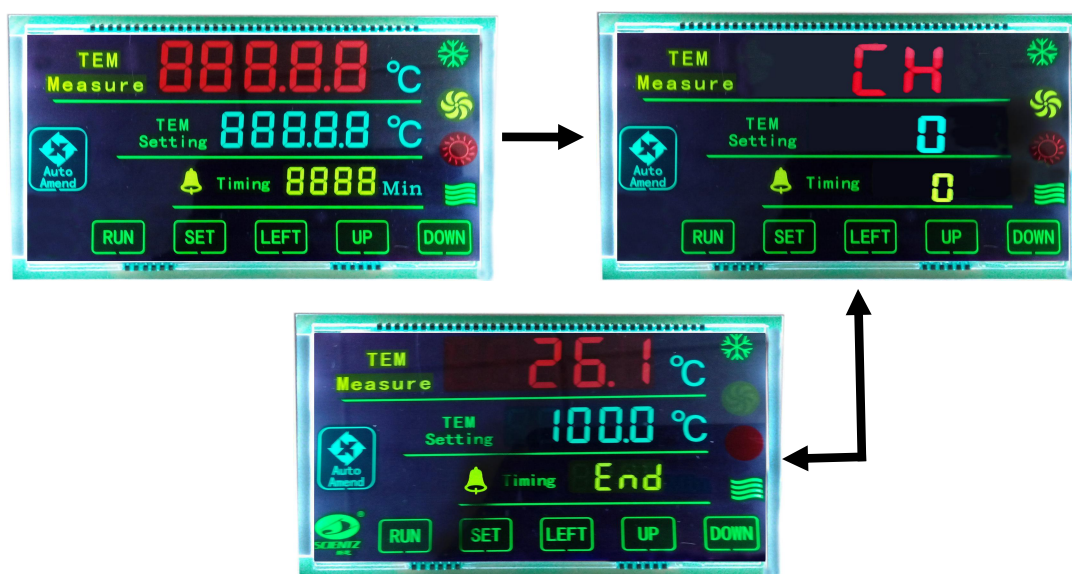


Figure 2: Program in standby

Set temperature and timing:

- (1) Press "SET" button: TEM Measure area display segment number 0001, which the last number flicker. Through move, add and decrease button to setting segment number. (Range: 1-30)
- (2) Press "SET" button, Into "TEM Setting", Temperature value last number flicker, Through move, add and decrease button to setting temperature.
- (3) Press "SET" button, Into "Timing" area, time setting value last number flicker, Through move, add and decrease button to setting time. Press SET key to save and return to standby mode. As shown in figure 2-1.

Note: ① If the first paragraph of time is directly set to 0, the program control into no timing of a single point control, the temperature setting of the first paragraph is for goal setting temperature.

② In addition to the first paragraph time to 0, the program is run at the end of the segment, then from the first paragraph to start another cycle.

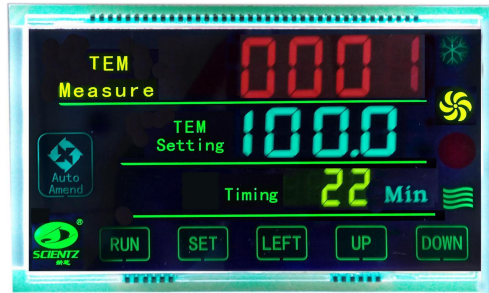


Figure 2—1: Temperature,Time setting

Set parameter modification program: Press “SET” button. TEM Measure area flicker, display need to modificate segment number, press add or decrease button to modification. Then press “SET” button to modification the temperature, time parameter.

- Conversion between single point control and program control

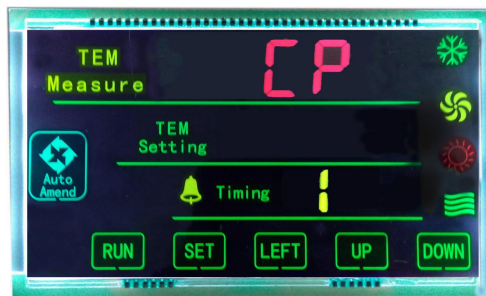


Figure 01:Conversion between single point and program

In standby mode, press SET button and the RUN button for long time, TEM Measure district display CP or CH switch back and forth, when shown as CP is the single point control, when displaying CK is the program control.

● Single Point Control

1. Turn on the machine, display CP (the first row CP is single point control, the second row is empty, the third row display 1 is time-in), 3 times after the buzzer alarm, rang back to standby mode automatically.

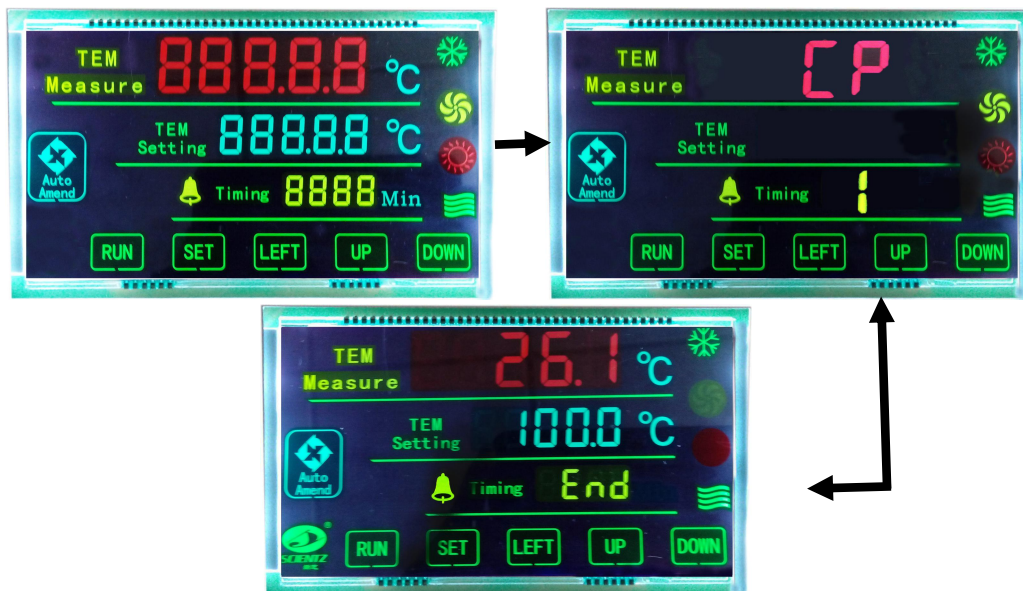


Figure 3: single point standby mode

● Setting temperature and Time.

- (1) Press "SET" button, Into "TEM Setting", Temperature value last number flicker, Through move, add and decrease button to setting temperature.
- (2) Press "SET" button, Into "Timing" area, time setting value last number flicker, Through move, add and decrease button to setting time. Press SET key to save and return to standby mode.

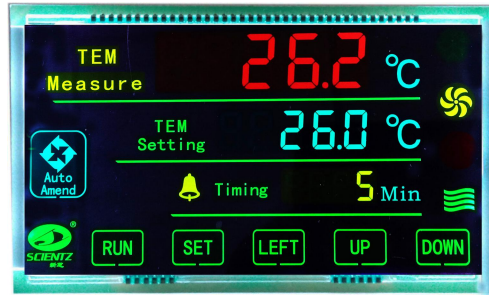


Figure 3—1:Single point temperature and time setting

● Timing Function

When Timing set to 0, instrument cancel the timing function, instrument has been running;

When Timing set not to 0, the meter is timing function, when the meter running time, Timming s how END, buzzer, instrument to stop working, and press any key can be muted.

● Start/ Stop:

1. Open the circulation pump switch, which on the left side of the machine. During working the circulating pump need keep open. (open or closed circulating pump control button to start/stop the circulation pump)

2. Press the RUN button for long time, compressor, you can hear Buzzing that mean refrigeration and circulation pump start to work. If you want to stop working , to press the RUN button for 1 ong time will stop working, the buzzer alarm, press any key mute. (as shown in the figure below) :

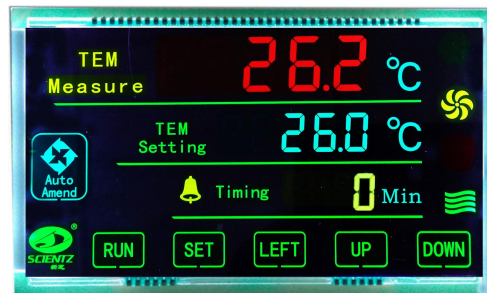


Figure 4: Working Status (standard)

● The customer parameters and PID parameter setting.

Press “SET” and “LEFT” for long time at the same time, Timing area will show LK parameter code, ①make LK=18, press setting button, The controller can enter the customer Parameters

setting; ②make LK=28, press setting button, The controller can enter the PID Parameters setting

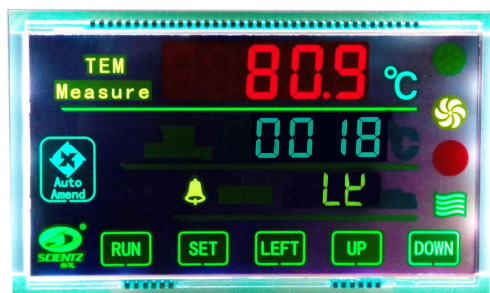


Figure 5: Customer Parameters Setting;

Customer parameter menu as shown below:

Prompt	Name	Setting range	Introductions	Initial Value
HT	Unit of time choose	0/1	0 mean minutes ; 1mean houe	0
SC	Environmenta l temperature measurements	-9.00--+9.00	When measuring the environment temperature and the current environment temperature deviation adjustment	0.00
AL	Alarm setting	0~∞	When measuring the temperature more than AL value, alarm relay output	3.0
CL	Refrigeration control Setting	0~∞	Compressor start-stop control available at the time, when the temperature more than set value + CL and conform to the compressor refrigeration control delay, the light cooling, refrigeration contact through, to start the compressor.	0.5
Ct	Refrigeration control delay	0~3600s	Two adjacent delay time required to start the compressor, Ct=0 V Cancel the function of compressor.	180
Pb	Zero Adjustment	-100.0~100.0	When the zero error of the controller is bigger, full error is small, adjust the value, generally Pt100 rarely adjust the value.	0.0
Pk	Full Adjustment	-1000~1000	When the zero error of the controller is lesser, full error is bigger, can adjust the value. Pk = 4000 x (mercury thermometer reading values - current temperature measuring points)/current temperature measuring points	0

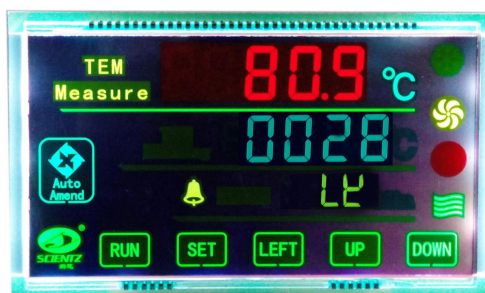


Figure 6: PID Setting

● **PID menu as shown below:**

P	Proportion	2~100	Proportion function adjustment, P ratio effect is smaller, the greater the system gain lower heating only ACTS on the side.	5.0
I	Integral time	20~3600S	Integral action time constant, the I bigger, the weaker the integral action.	400
d	Derivative time	0~3600S	Differential time constant, d is larger, the differential function is stronger , and can overcome the overshoot.	400
Ar	Overshoot inhibition	0~100%	Used to suppress overshoot (Ar identified as: 1.5 to 2 times the steady-state output duty cycle)	100
t	Control cycle	1~100S	Silicon controlled rectifier output is commonly 2 ~ 3 seconds, the remaining power of the larger equipment dispatch T can reduce the static error of PID control.	3

Each parameter changes can have control effect. One minute not press the button automatically return to the standard model, may have the change of each parameter are likely to change the control effect. (one minute not press X key automatically return to the standard model. May be some function parameters are not changed.

5. Precautions :

- 1) Add liquid media into bath before using, Liquid is lower than the workbench face 30 mm can't boot, in case of burn out the heater
- 2) Use 220V/50Hz power supply , power shall be no less than total power of instrument, and power supply receptacle shall be earthed properly.
- 3) Pump switch: machine on the left side of the circulation pump forced switch please don't press,

unless you have special needs.If switch according to the forced circulation pump, circulating pump will be shut down.This fluid position in the tank temperature will be uneven, constant temperature effect.At this point to switch according to the forced circulation pump circulating pump

4)Instrument shall be put on a place that is dry and has good ventilation, rack panel and two sides shall be 300mm away from obstruction.

5) In the process of temperature rising, there will be a frying, please get ventilation treatment. And in the process should pay attention to, because of the high temperature will evaporate some oil, but also pay attention to safety at this time not to touch the tank of the oil and outside circular tube, to prevent burns.

6)After using, all switches shall be turned off, and power plug shall be pulled out.

6. Packing list :

1. main machine	1set
2. power supply wire	1pc
3. Rubber tube	1pc
4. Cover	1pc
5. Operation Manual	1copy