EV400 SERIES

ROTARY EVAPORATORS

USER MANUAL – Version 202303RE

INDEX

DISCLAIMER

Thank you for selecting our products.
We are sure that you will be completely satisfied with the performance of this new unit entering your laboratory. We invite you to carefully read this user manual and to keep it close to the instrument for convenient and fast consulting. For any possible clarification or any request for assistance please contact either your local Representative or LabTech at the following address:

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The contents of this document are subjected to change without notice. All technical information in this document is for reference purposes only.

INTRODUCTION

About your system

LabTech develops and produces innovative Rotary Evaporation systems used whenever high precise evaporation process.
LabTech follows the "Green Lab Conditions" regulations by using eco-friendly materials.
By adapting new technologies and innovations to maintain top reliability level worldwide, all production. steps are focused to offer high quality and customized solutions to meet any requirement.

Compliance

Products tested and found compliant with the requirements defined in the EC Council Directive for Electromagnetic Compatibility defined by 2014/30/EU as well as Low Voltage Directive (LVD) 2014/35/EU can be identified by the CE mark on the rear of the unit. The testing has demonstrated compliance with the following directives:

- EN 61326-1:2013
- 2014/35/EC
- 2014/30/EC

WEEE/RoHS

This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2011/65/EC. It is marked with the following symbol:

Warranties and Liabilities

Seller warrants the products manufactured and sold by it, to be, for the period of warranty coverage, free from defects of materials or workmanship under normal prior use and service. The period of warranty coverage is specified for the respective products in the respective Seller instruction manuals for those products but shall in no event exceed 1 year from the date of shipment thereof by Seller. Seller's liability under this warranty is limited to such of the above products or parts thereof as are returned, prepaid transportation to Seller's plant, not later than 10 days after the expiration of the period of warranty coverage in respect thereof and are found by Seller's examination to have failed to function properly because of detective workmanship or materials and not because of improper installation or misuse and is limited to, at Sellers election, either (a) repairing and returning the product or part thereof, or (b) improper installation or misuse and is limited to, at Seller's election, either (a) repairing and returning the product or part thereof, or (b) furnishing a replacement product or part thereof, prepaid transportation by Seller in either case. In an event Buyer discovers or learns that a product does not conform to warranty, Buyer shall immediately notify Seller in writing of such non-conformity, specifying in reasonable detail the nature of such non-conformity. If Seller is not provided with such written notification, Seller shall not be liable for any further damages which could have been avoided if Seller had been provided with immediate written notification, this warranty is made and accepted in lieu of all other warranties, express or implied. All other obligations and liabilities of Seller, whether in contrast or tort (including negligence) or otherwise, are expressly excluded. In no event shall Seller be liable for any costs, expenses, or damages, whether direct or indirect, special, incidental, consequential, or other, on any claim of any defective product, more than the price paid by Buyer for the product including prepaid return transportation charges.
No warranty is made by Seller of any Seller product which has been installed, used or operated contrary to Seller's written instruction manual or which has been subjected to misuse, negligence or accident or has been repaired or altered by anyone other than Seller or which has been used in a manner or for a purpose for which the Seller product was not designed nor against any defects due to plans or instructions supplied to Seller by or for Buyer.

Conventions

All safety symbols are followed by **WARNING** or **CAUTION**, which indicates the degree of risk for personal injury and/or instrument damage. Cautions and warnings are followed by a description. A **WARNING** is intended to prevent improper actions that could cause personal injury. A **CAUTION** is intended to prevent improper actions that may cause personal injury and/or instrument damage. The following safety symbols may be found on your instrument and/or in this guide.

	**Burn Hazard:** This symbol alerts you to the presence of a hot surface that could or may cause burn injuries.
	**Electrical Shock Hazard:** This symbol indicates that an electrical shock. could or may occur.
	**Fire Hazard:** This symbol indicates a risk of fire or flammability could or may occur.
	**Chemical safety:** This symbol indicates a risk of chemical substance could or may occur.

Contact us

There are several ways to contact LabTech SRL.

To contact Technical Support:
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E-mail marketing@labtechsrl.com

To suggest changes to documentation:
Send an e-mail with subject: Technical Publications Editor at customer.care@labtechsrl.com

Safety Rules

General Information

Please carefully read this user manual before starting to use the instrument and follow its prescriptions with the utmost care. This user manual is part of the delivery, hence must be always kept together with the instrument on its working place.
It is imperative that every person operating with this system has read and fully understood this manual. The non-observance of the instructions contained herein, or improper use may involve damages/injuries that are not covered by product liability.

Electrical safety

The instrument must be used within the rated voltage. Prior to use, please check if the wire is aged. In case of aged wires, please contact the after-sales service for inspection. It is forbidden to disassemble the instrument and to connect internal circuit parts, to avoid a short circuit or open circuit.

Fire safety

Numerous reagents are flammable and explosive. When the solvent vapor concentration reaches a certain level, it becomes flammable and could cause fire. The instrument should be kept away from the sources of ignition and high temperature places. If there is solvent pungent smell, carefully check whether there is gas or liquid leakage, and turn off the power.

Chemical safety

During the working of the unit, some solvents inside or outside of the unit may form peroxide or flammable and explosive gasses. Do pay enough attention to avoid explosion when processing hazardous or unknown substances.

Recommendation

Never place the unit in a location where excessive heat, moisture, or corrosive materials are present.
The unit construction provides extra protection against the risk of electrical shock by grounding appropriate metal parts. The extra protection may not function unless the power cord is connected to a properly grounded socket. It is the user's responsibility to assure that a proper ground connection is provided.
Fix all glass components before lifting or down the system. Let the system lift up and down calmly and slowly to avoid the vibration of glass vessel.
The unit surface may get hot especially when using water bath or oil bath, therefore care must be taken to avoid possible scalding.
Make sure that there is no water inside the bath before using oil, otherwise hot oil will splash and may cause scalding.
Make sure to evaporate organic solvents in a place with enough ventilation. The accumulation of organic solvent vapor inside the unit may bring to an explosion.
Lift up the rotation vessel first, turn off the instrument and disconnect the power cord from the power socket when no operation is needed.
Never place the equipment in a humid place. The moisture may reduce the insulation capacity.
Keep a free room of more than 100 mm around the equipment. If the distance is too short, it may damage items around it.
Please put the equipment on a firm, strong bench. Avoid the resonance from the bench. This will decrease the risk of vibrations and noise.
Fluids in the rotating flask should not be over half of the flask's full volume.
Clean the heating bath periodically. Distilled water or purified water are recommended.
The unit has been preset to operate as water bath. If oil bath is needed, please recalibrate the instrument or contact the Labtech Service Team.
It's better to consult the Labtech Service Team before performing any maintenance. Wrong actions may damage the equipment and make the warranty void.

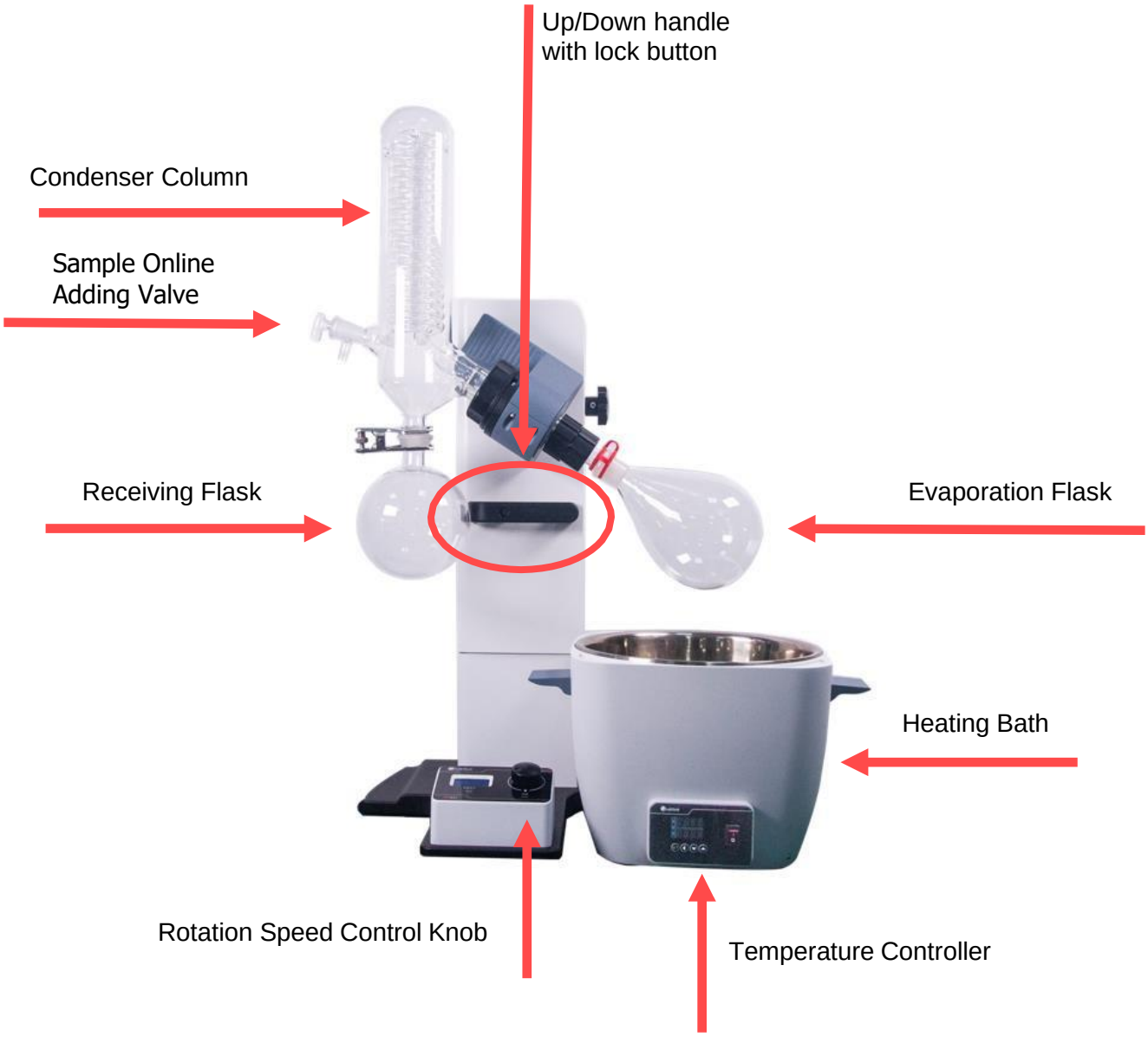
Others Information

Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your unit. If you have any questions concerning the operation of your unit or the information in this manual, please contact us.
Transport the unit with care. Sudden jolts or drops can damage the unit's components.

General Information

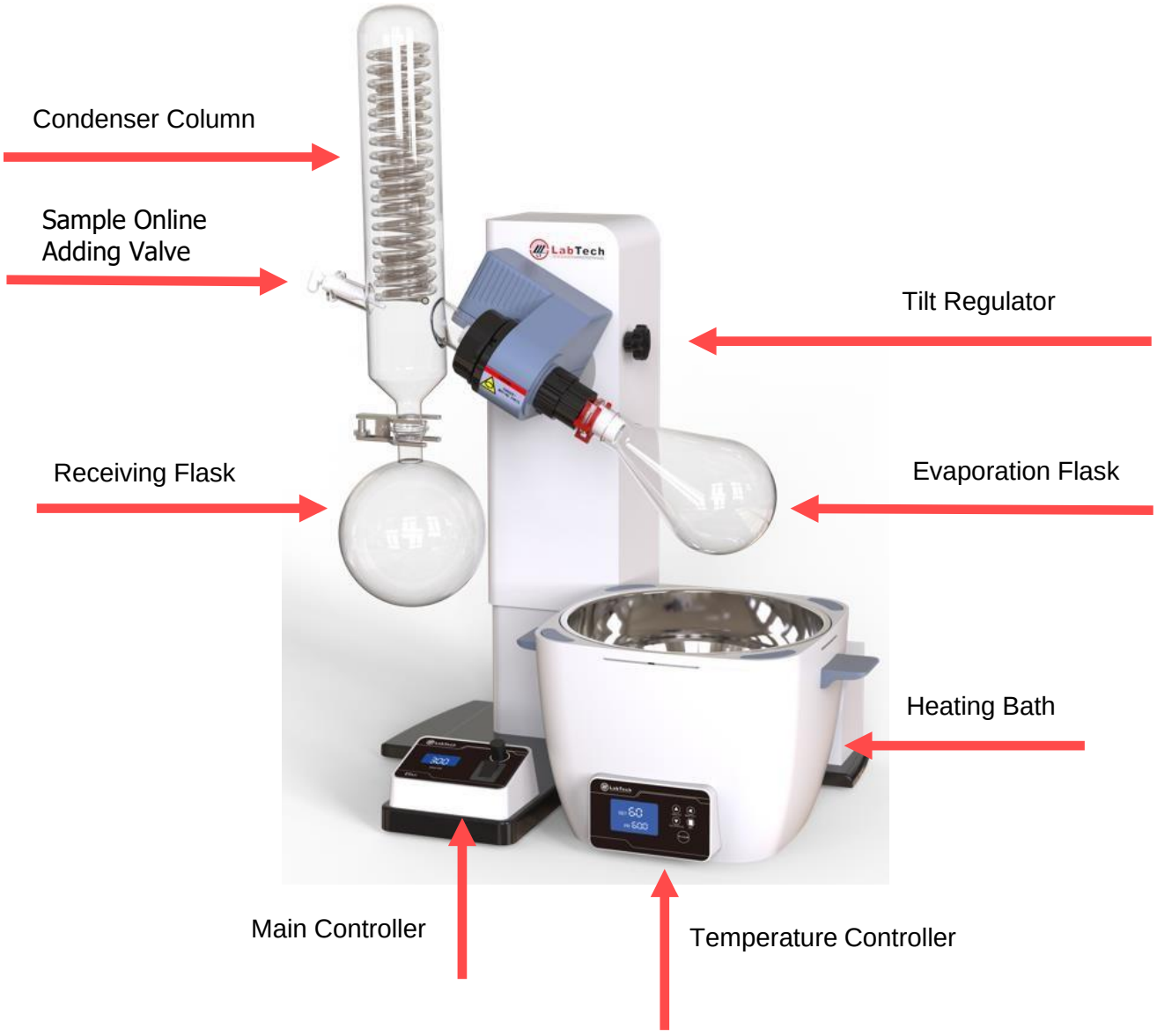
EV400H

FRONT VIEW



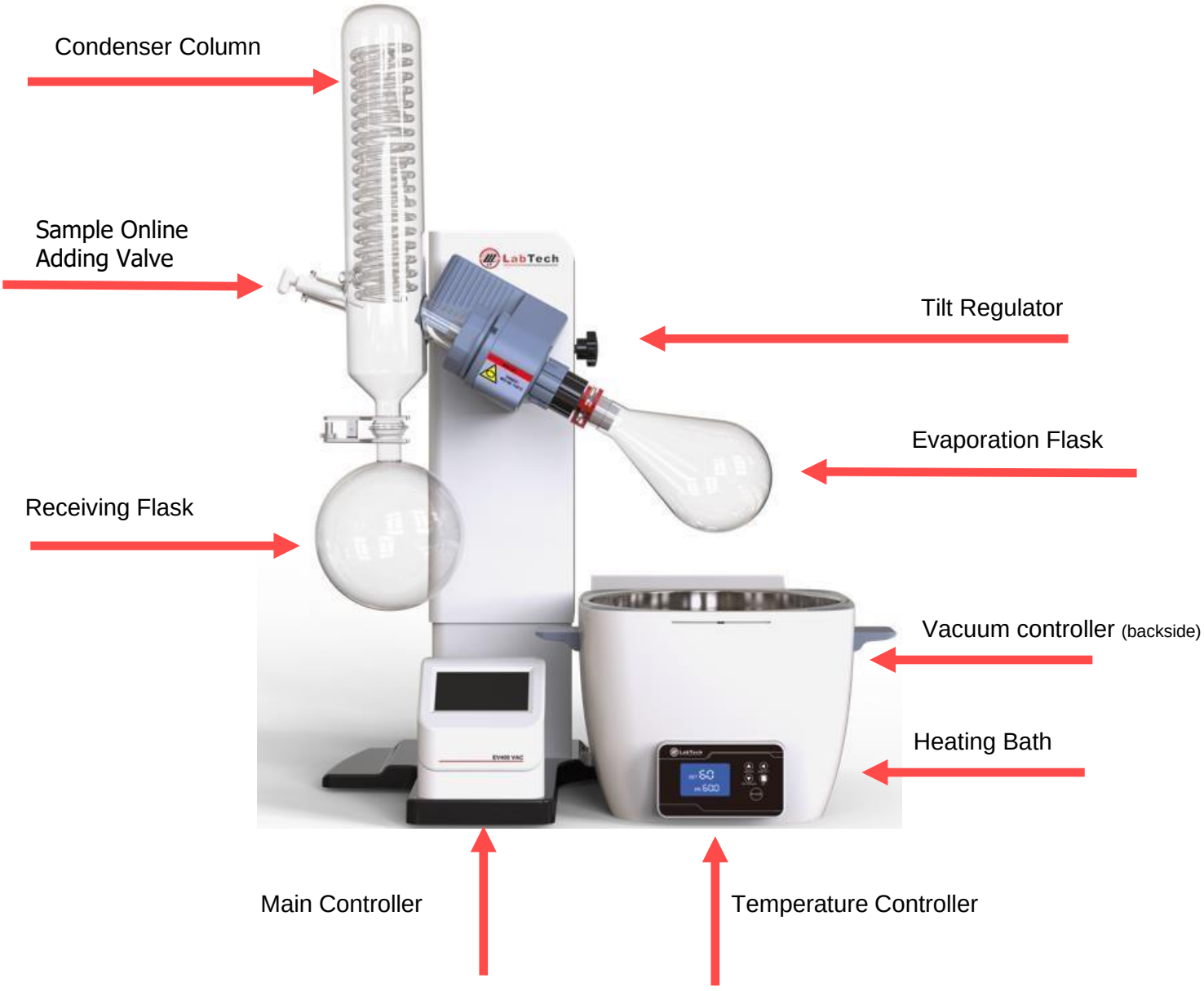
EV400

FRONT VIEW



EV400Touch and EV400VAC

FRONT VIEW



SPECIFICATION

LabTech rotary evaporator system, in combination with LabTech chiller and vacuum pump, provides a total solution package to customer who wants to have an efficient, fast, and gentle way to separate liquids.

The rotary evaporator principle is that the evaporating flask generates an effective heat transfer for fast evaporation and prevents a local overheating whilst leading to a smooth mixing of the content.

Model	EV400H	EV400	EV400Touch	EV400VAC
Display	LCD	LCD	Colour Touch Control	
Max. Rotation Speed	300 rpm			
Rotation motor power	40W			
Lift Up/Down	Manual	Motor		
Lift Stroke	150 mm	160 mm		
Head Tilt Angle	0° - 60° degree			
Rotation Flask	50-2000 mL	50-3000 mL		
Condenser	1200 cm^2 (Standard) / 1500 cm^2 V: Vertical Condenser L: Diagonal Condenser			
Clockwise/counter-clockwise Rotation	Yes	-	Yes	Yes
Gradient Distillation	-	-	-	Yes
Built-in Vacuum Controller	-	-	-	Yes
Solvents Library	-	-	-	Yes
Vapor Temperature	-	-	Optional	Optional
Auto-Distillation	-	-	-	Optional

Bath Temperature	Ambient - 230℃
Temperature Accuracy	±1℃
Heating Power	1300 W
Bath Volume	5 L

Installation

Please check all parts and accessories before installation and setup according to the following.

Site Requirements

Ambient Temperature Range: 10°C to 40°C (50°F to 104°F)
Relative Humidity Range: 10% to 80% (non-condensing)
Operating Altitude: Sea Level to 8000 feet (2438 meters)
Never place the unit in a location where excessive heat, moisture, or corrosive materials are present.
Please put the equipment on a firm, strong bench. Avoid the resonance from the bench. This will decrease the risk of vibrations and noise.

Dimensions and Weights

Unit	High (cm)	Width (cm)	Length (cm)	Diameter (cm)	Weight (Kg)
EV400H	64	44	55	-	17
EV400	64	44	55	-	25
EV400Touch	66	47	58	-	25
EV400VAC	66	47	58	-	25
HB-03 Thermal Bath	-	-	-	33	4

Electrical Requirements

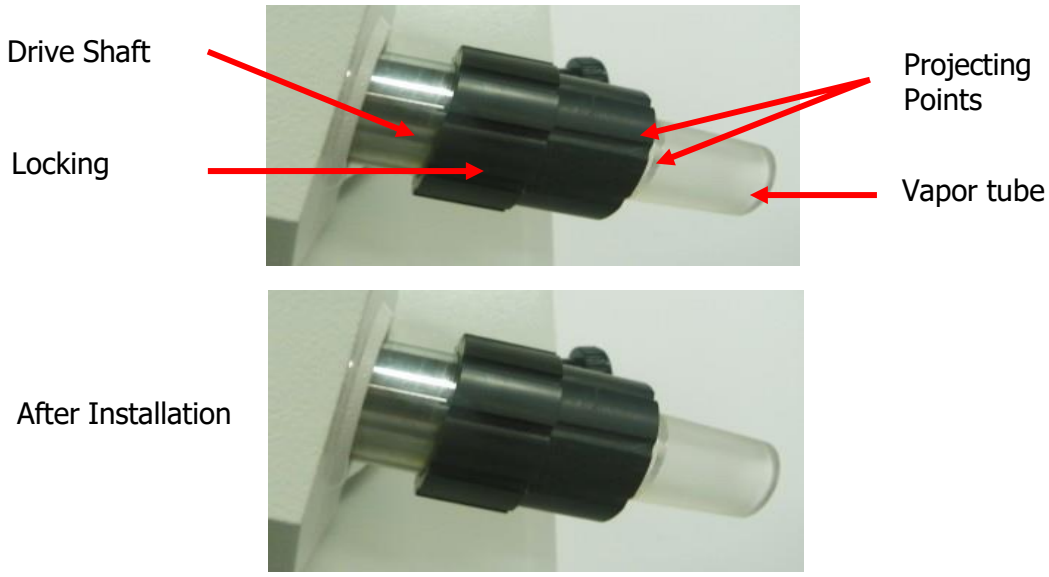
The unit provides extra protection against the risk of electrical shock by grounding appropriate metal parts. The extra protection may not function unless the power cord is connected to a properly grounded socket. It is the user's responsibility to assure a proper ground connection is provided. The unit is supplied with a European power cable. It is used to relate to power supply. Plug the cord into socket and plug the rear into electric socket of the unit. Then the unit is ready to be used.

The following power options are available:

UNIT	Voltage (V)	Frequency (Hz)	Fuse	IP Degree	Power Consumption (W)
EV400H	230	50/60	10	21	100
	115	60	10	21	100
EV400	230	50/60	10	21	100
	115	60	10	21	100
EV400Touch	230	50/60	10	21	150
	115	60	10	21	150
EV400VAC	230	50/60	10	21	150
	115	60	10	21	150
HB-03 Thermal Bath	230	50/60	10	21	1300
	115	60	10	21	1300

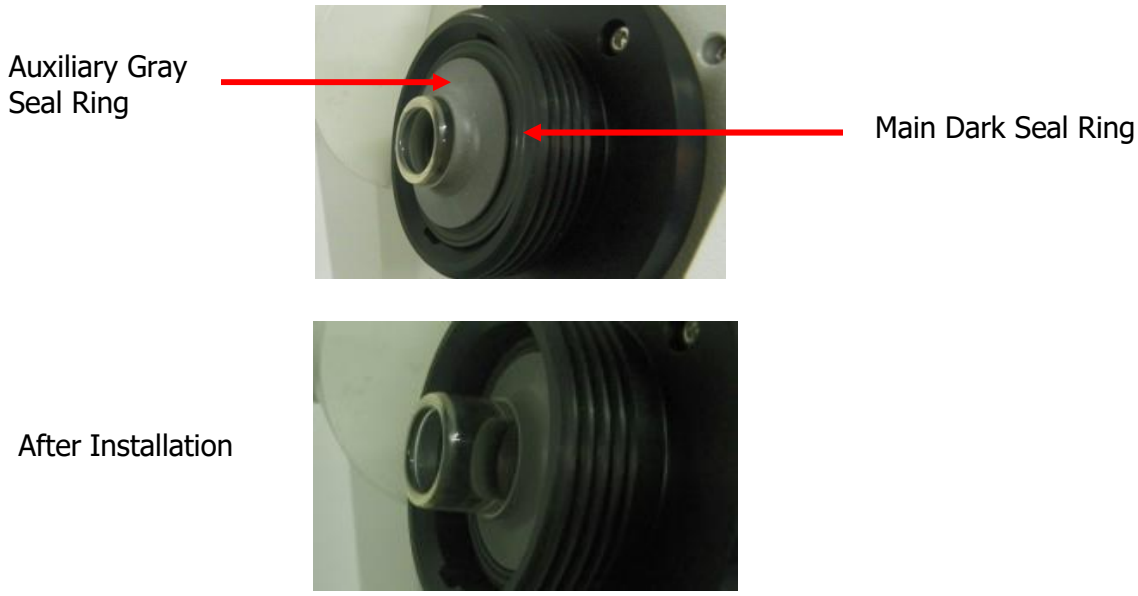
Installation of vapor tube

Insert the vapor tube into the drive shaft until it stops, rotate the vapor tube to fix its projecting points to the groove of locking nut. Then rotate clockwise the locking nut tightly. Try to pull the vapor tube out to check if it was firmly installed.



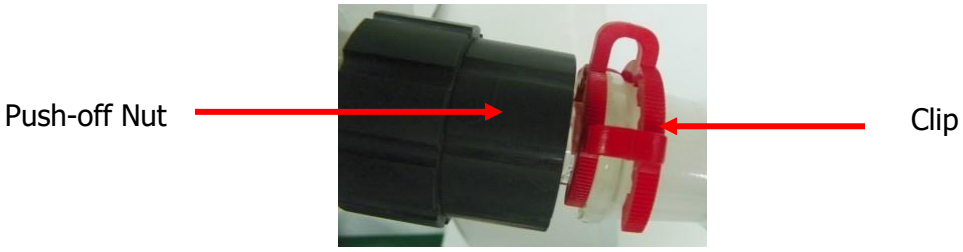
Installation of the seal rings

Place the dark seal ring in the vapor tube with the spring side face inside, then fit the grey seal ring to vapor tube with central bulge part out. Press the two seal rings to the bottom. Note the seal ring direction, improper installation will cause system vacuum failure.



Installation of the evaporating flask

Connect the evaporating flask to the end of the glass axis and fix it by a clamp. Manually rotate the evaporating flask to check if it was fixed firmly. The evaporating flask can be easily detached from the glass axis by rotating counter-clockwise the push-off nut below.



Note: When replacing the evaporating flask, first switch off the power and turn on the PTFE valve to balance the pressure inside and outside the system.

Installation of the condenser

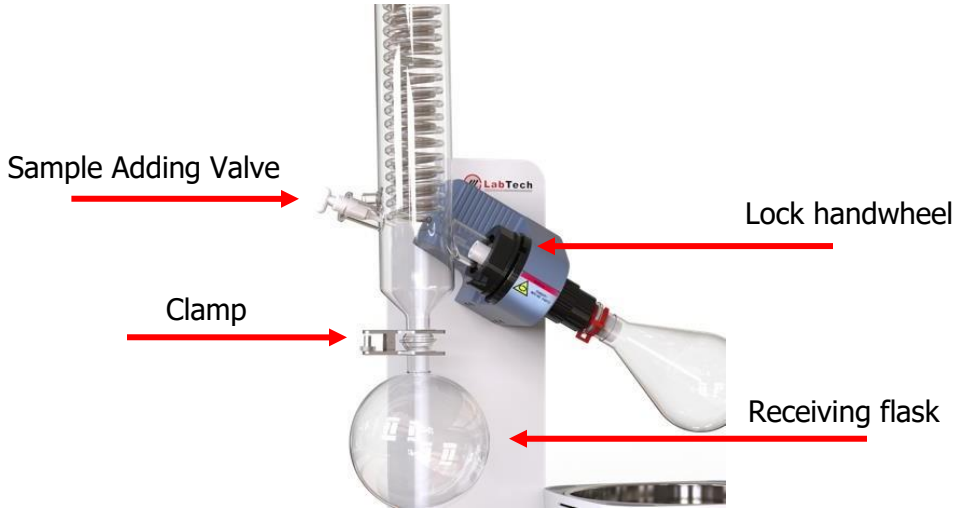
Cover the condensation tube by the lock handwheel. Place the whole system above the top-left corner of the rotation head. When the condenser mouth connects fully to the seal ring inside the rotation head, spin the lock handwheel tightly; do not over-tighten.

Installation of the sample adding valve

Insert the sample adding valve into the condensation tube and adjust the block set to an optimal position.

Installation of the receiving flask

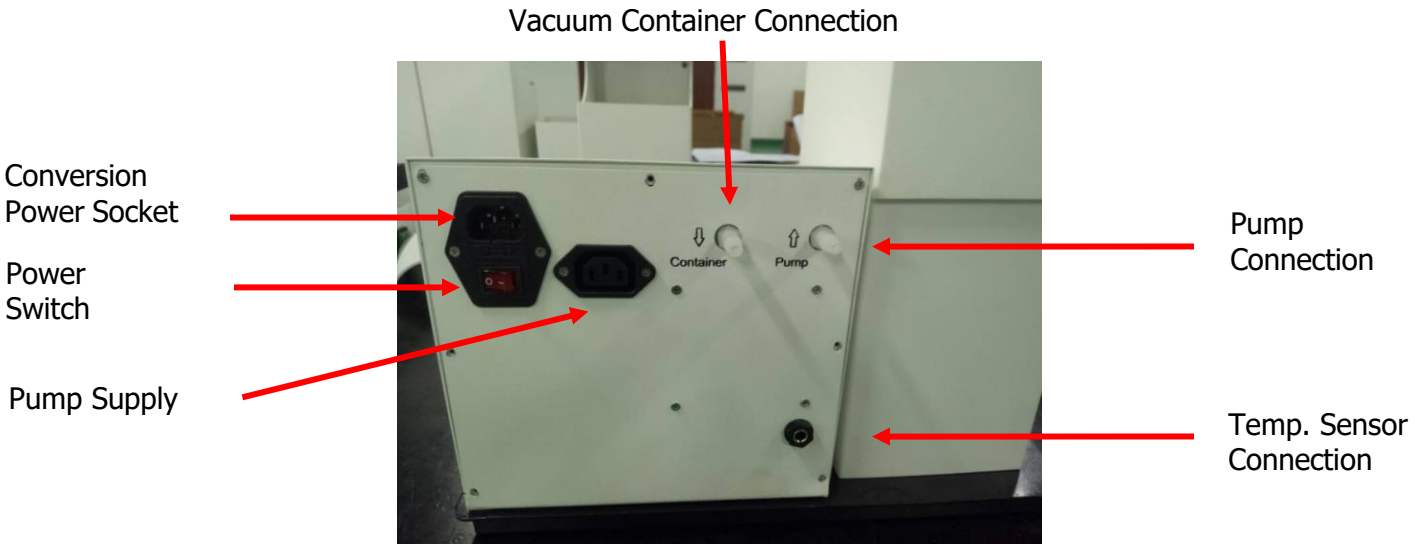
Let the receiving flask cover the condensation tube and adjust the end-screw of the clamp to fix them.



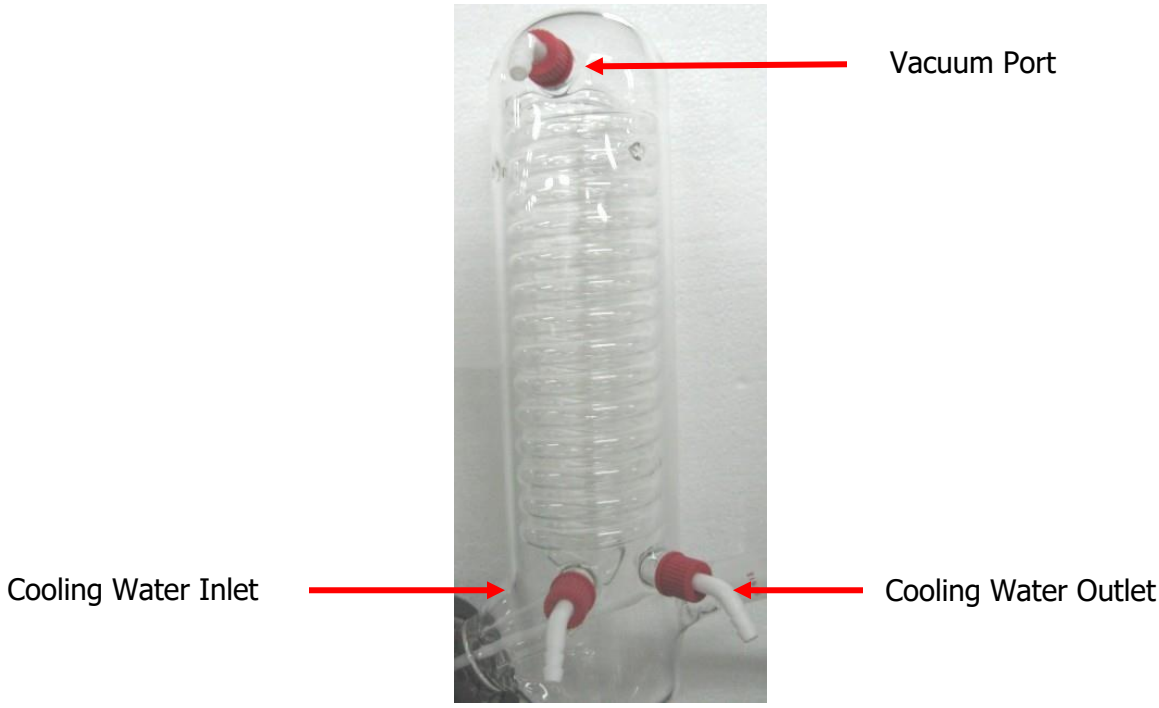
NOTE: When replacing the evaporating flask, be sure to switch off the power and turn on the sample adding valve (see above pic.) to let the pressure inside and outside of the system to get balanced.

Connection of the vacuum controller of the EV400VAC

1. Connect the instrument which needs the vacuum to the "Container" port of the vacuum control port and connect the vacuum pump to the "pump" port of the vacuum control unit. Be sure there is no leakage.
2. The control on/off of the vacuum pump by the vacuum controller can be done by connecting the vacuum pump to the conversion power socket on the back of the vacuum controller.
3. Switch on the vacuum controller of the EV400VAC



Installation of the vacuum/water tubes



Operation

HOW TO ADJUST THE TILT ANGLE OF THE ROTATION HEAD

Loosen the tilt regulation knob and adjust the tilt angle of the motor to the appropriate degree then lock the knob. Common angle is 30°.

NOTE: This function is only available for the vertical type of condenser; do not adjust the rotation head when the diagonal condenser is in use.

HOW TO OPERATE THE MAIN UNIT OF THE OF EV400H

Rotation speed setting of EV400H

Set the rotation speed via the knob as shown in the picture below.
Rotate it clockwise to increase speed, counter clockwise to decrease.
The LCD screen shows real time the rotation speed.
Set the rotation speed to minimum, switch on the instrument, then increase the speed; 100rpm is commonly set.

Lift up/down of EV400H

Firstly, set the rotation speed to minimum, switch on power, press the up/down control button inside the handle as shown in below picture, lift up/down the rotary evaporator to suitable height. Loose the up/down button to fix it.
Careful handling will avoid flask breakage.

Rotation sense of EV400H

In stop status (invalid in running state), press and hold the speed control knob for 3s until "LC" displayed, the lower line displays code, input "9" by rotating the knob, then press the knob to enter the parameter set interface, press the knob to display "dIF" which means rotation direction, rotation the knob to set dIF value. dIF=0 for clockwise rotation, dIF=1 for counter clockwise rotation, press and hold control knob for 3s to save and quit the setting interface.

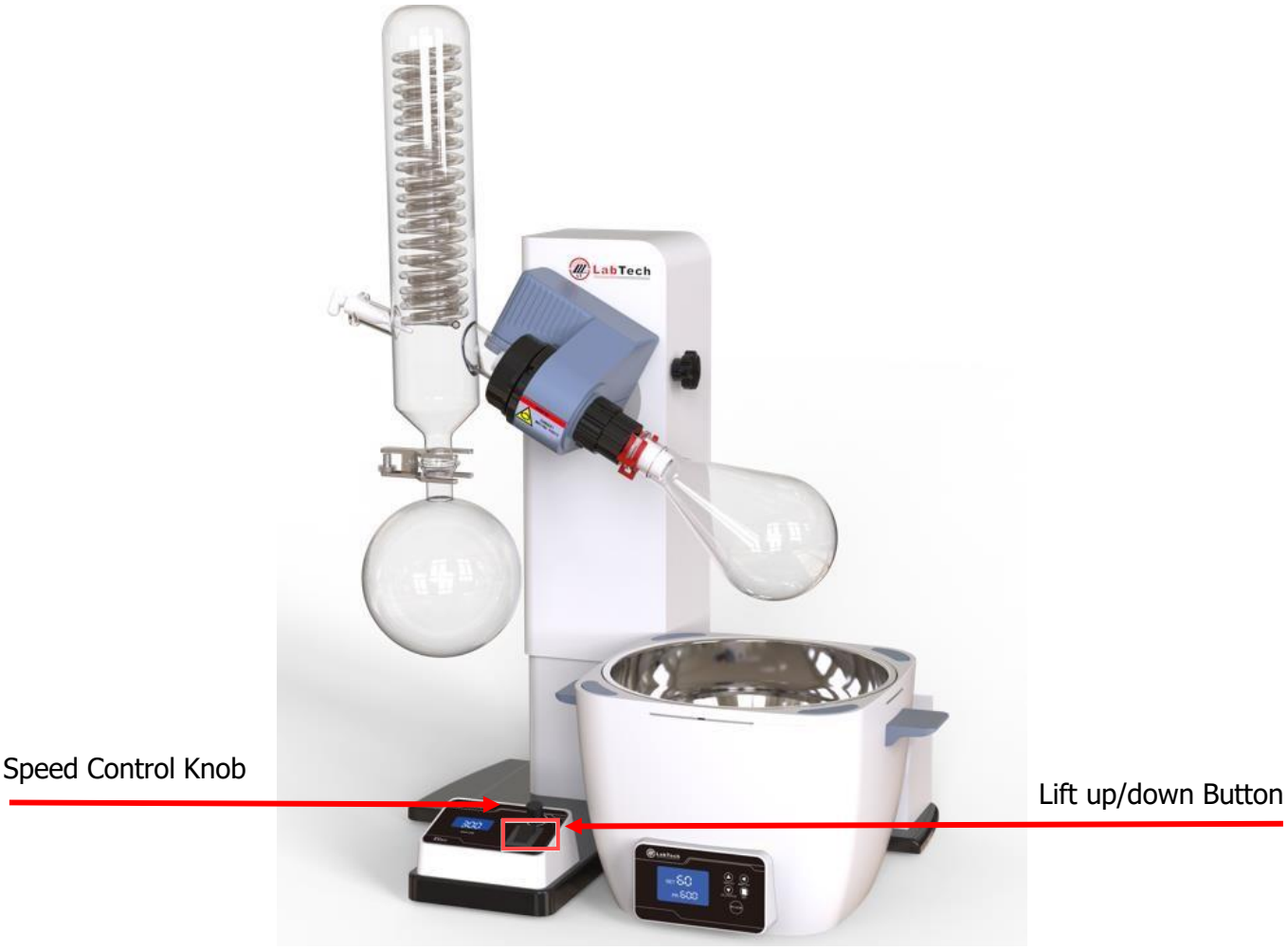
HOW TO OPERATE THE MAIN UNIT OF THE EV400

Rotation speed setting of EV400

Set the rotation speed via the knob as shown in the picture below.
Rotate it clockwise to increase speed, counter clockwise to decrease.
The LCD screen shows real time the rotation speed.
Set the rotation speed to minimum, switch on the instrument, then increase the speed; 100rpm is commonly set.

Lift up/down of EV400

Adjust the height of rotation flask by using the appropriate button.
Careful handling will avoid the risk of flask breakage.



HOW TO OPERATE THE MAIN UNIT OF THE EV400Touch/EV400VAC

The EV400Touch and EV400VAC are equipped with an advanced touch control panel which ensures smart and programmable evaporation.

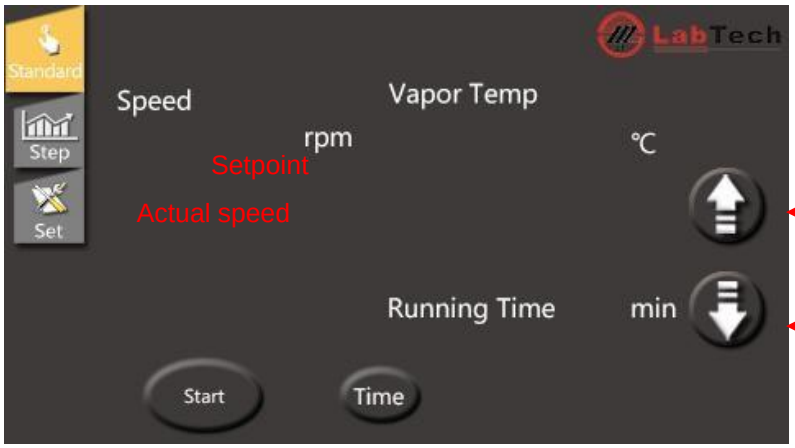
The EV400Touch supports Standard and Gradient Step evaporation mode.

The EV400VAC supports Standard, Gradient Step, solvent library, and auto-distillation functions.

EV400TOUCH

Lift Up/Down

Click the up/down key to move the rotation flask up/down, **click it again to stop**.

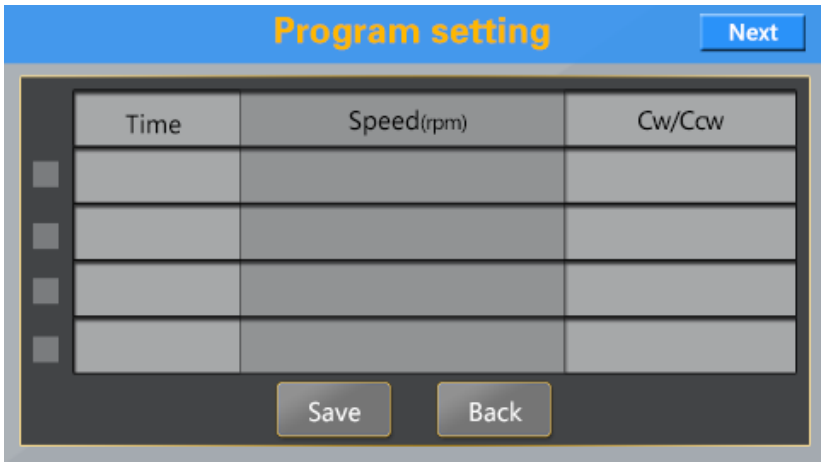


Standard Control Mode

Rotation speed: Upper white numbers are set speed. Lower yellow numbers are real value. Click the white number to change the setting speed.
Vapor Temp: Displays the vapor temperature which requires a vapor sensor (optional).
Running time: Displays the real running time. The time can be set via the "Time" icon.
Start/Stop: Starts/Stops the system.

Step Control Mode

Running Step: In Step mode the current running step no. and running time of this step will be displayed.
Set: Set step program in below picture

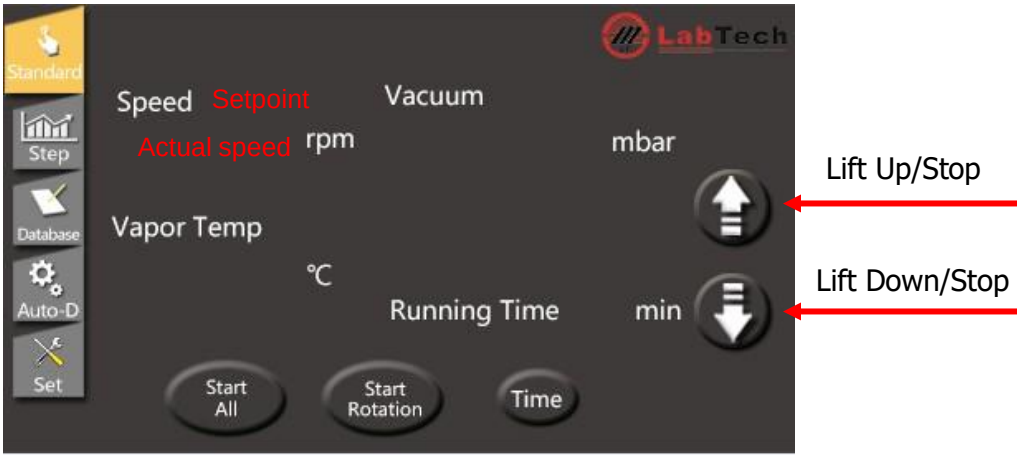


The EV400 Touch supports up to 8 steps with parameters including **time, rotation speed, direction** (**0**: clockwise, **1**: counter clockwise)
Choose **checkbox** to set different steps.

Set interface

Parameters can be checked in the SET page including internal parameters, alarm info and can be exported to a USB flash disk etc.

How to operate the main unit of EV400VAC



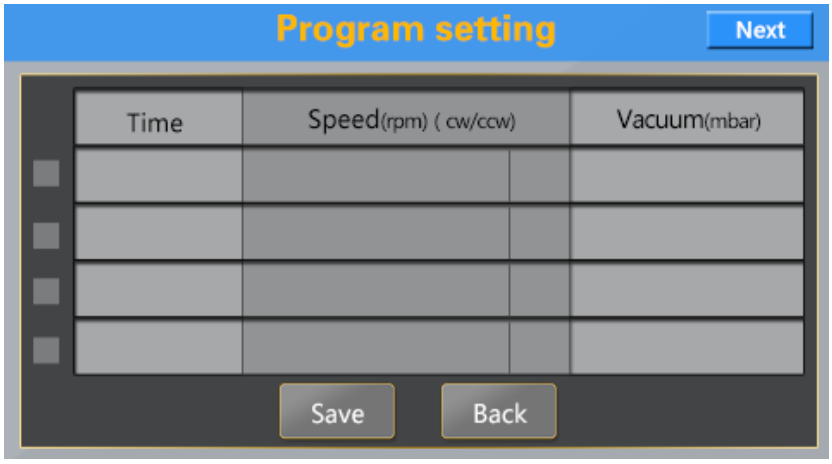
The EV400VAC has 4 different control modes including standard, step (program) control, database (solvent library) and Auto-Distillation (option). Click the icons to choose a suitable control mode.

Standard Control Mode

Rotation speed: Upper white numbers are set speed. Lower yellow numbers are real value. Click the white number to change the setting speed.
Vapor temp.: Displays the vapor temperature which requires a vapor sensor (optional).
Running time: Displays the real running time. The time can be set via the "Time" icon.
Start/Stop All: Starts/Stops both the rotation system and the vacuum control system.
Start/Stop Rotation: Starts/Stops the rotation system.

Step mode

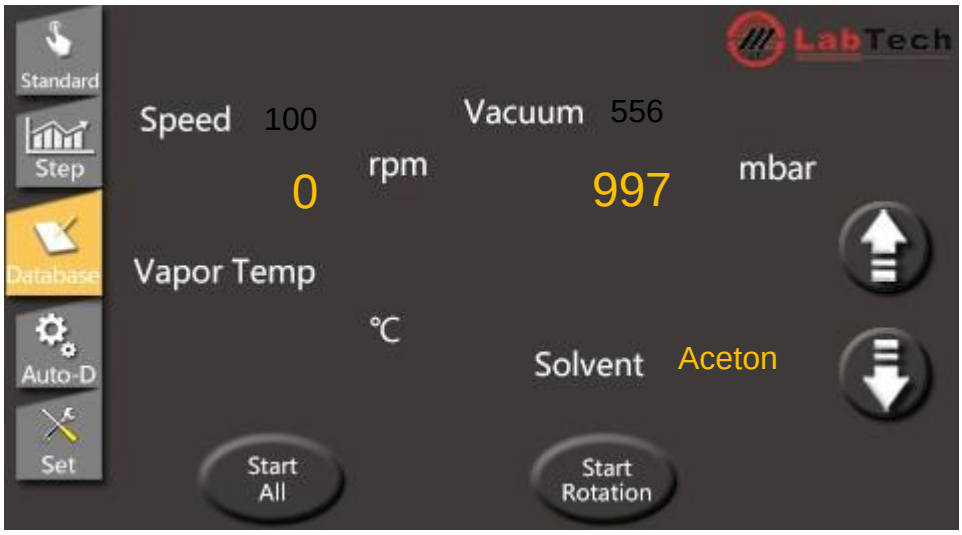
Step no.: In Step mode, current running step no. and running time of this step will be displayed.
Set: Set step program in below picture.



The EV400VAC supports up to 8 steps with parameters including **time, rotation speed, direction** (**0**: clockwise, **1**: counterclockwise) and **vacuum pressure (from 0 up to 999 mBars)**
Choose **checkbox** to set different steps.

Database

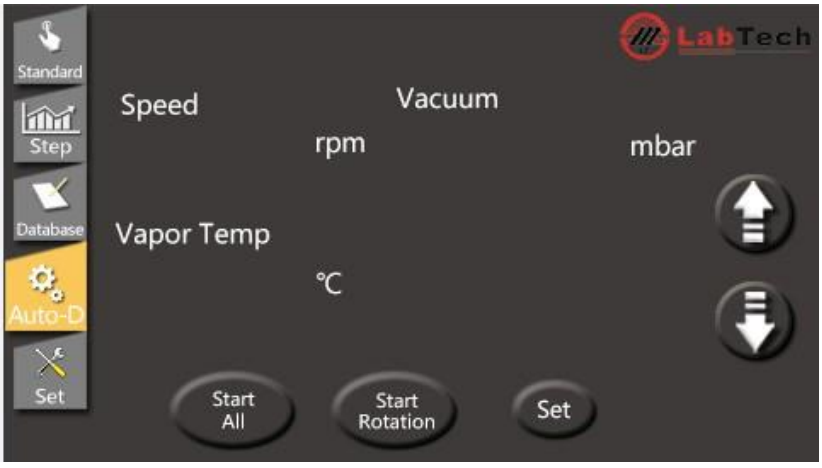
The solvents in the library are tested with the heating bath set at 60°C, hence, please set bath temperature at 60°C when using the library function.



Solvent: Displays the selected solvent and related parameters. Click the yellow solvent name to enter the library database and set.

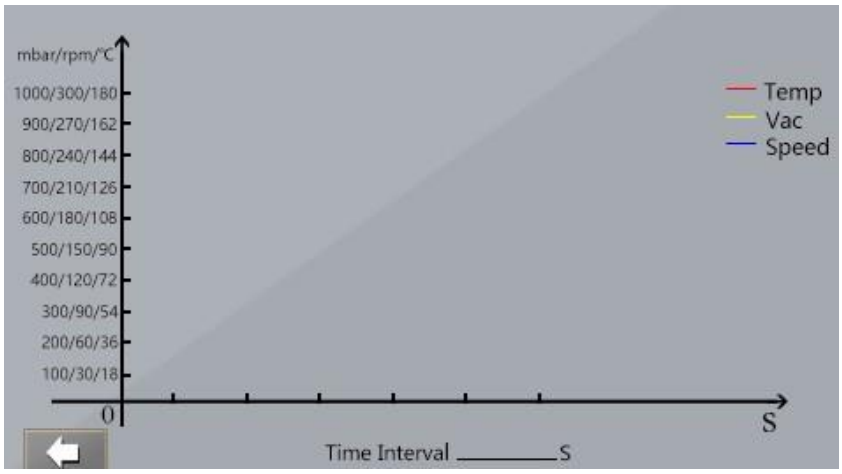
Auto-Distillation (Optional function)

For uncertain distillations, the Auto-D function can be used to identify the boiling point automatically.

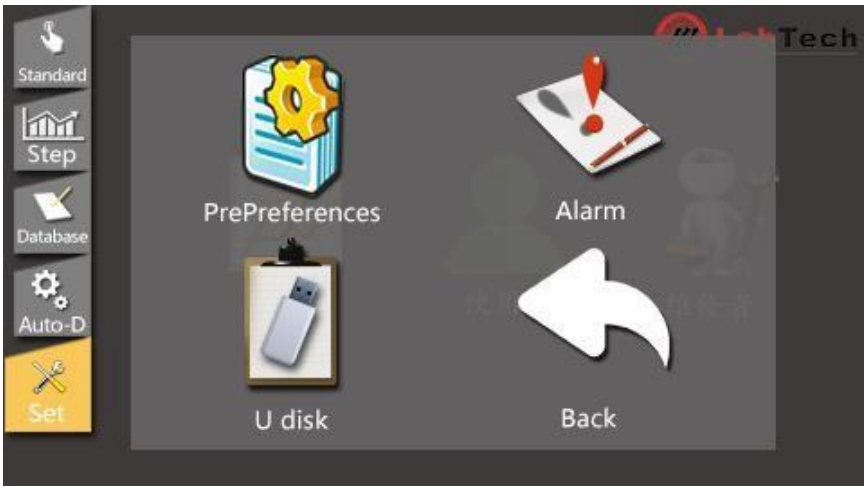


Set interface.

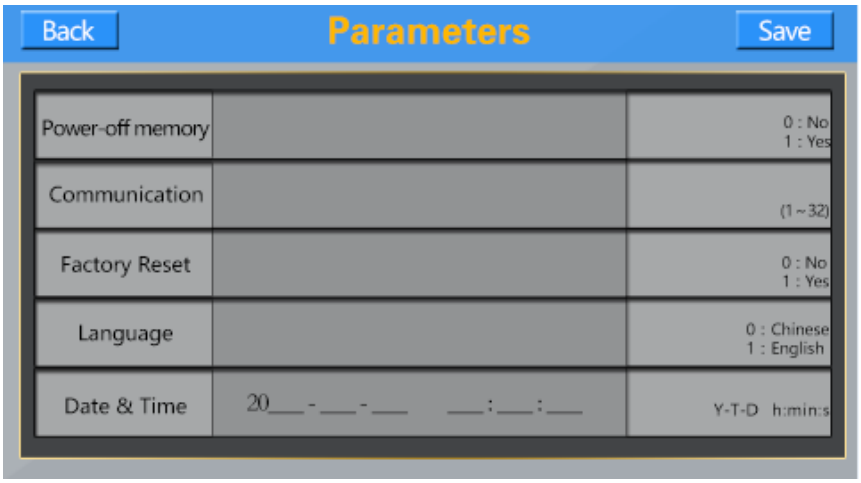
1) Distillation curves: Click the Curves icon to check the evaporation info. including rotation speed, vacuum pressure, vapor temp. etc.



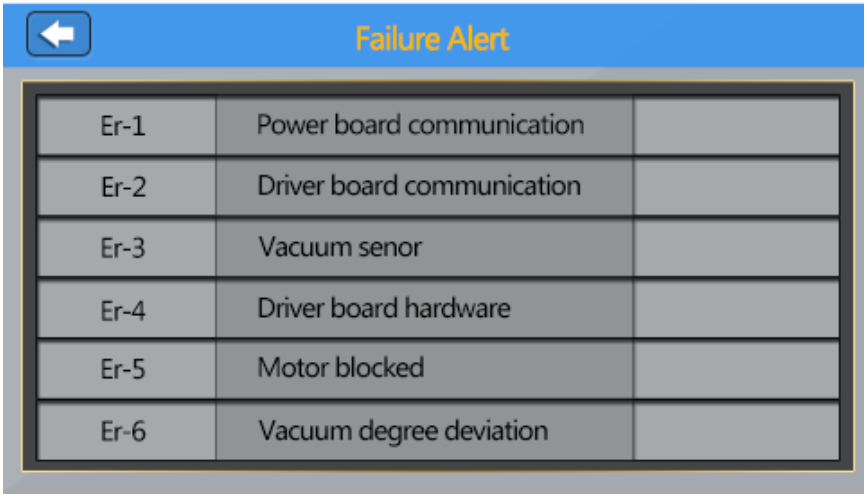
2) User interface



Parameters: please don't change the factory set parameters if unnecessary.



Alarm: Check the alarm info. in below page



U Disk: Export distillation curves to an USB flash disk

How to operate the heating bath

Choose the appropriate heat transfer medium

Bath Type	Temp. Range	Heat Transfer Medium	Remark
Water bath	Ambient~100℃	Water	Hardness of the water must be as low as possible; When using deionized water, please add 0.2% Na2B4O7*10H2O solvent for anti-corrosion.
Oil Bath	100℃~210℃	Silicone Oil	Viscosity of the silicone oil must be below 50 centipoises.

Pour into the heating bath an appropriate volume of liquid. Connect the unit to the power, press the green button to switch on the unit. Red to switch off.

HB-03PLUS Heating Bath

SET: Set or check temperature, holding time and other parameters.
SHIFT/AT: In set interface, the key is a digital transposition key. In other interface, press and hold the key for 6 seconds to enter or the quit auto-calibration system.
DEC/RERUN: In set interface, press the key to decrease value, press and hold it to speed up the value decrease. In other interface, press and hold the key for 3 seconds can rerun the system after finishing the heating phase.
INC/LED: In set interface, press the key to increase value, press and hold it to speed up the value increase. In another interface, press the key to backlight on/off.

How to setup parameters

Press the SET key to enter the **temperature set** interface, SP will be displayed in the upper line, then the temperature can be set via. △ ▽ ◁

Press the SET key a 2nd time to enter the **holding time set** interface, ST will be displayed in the upper line, then the desired holding time can be set on the setpoint.

Press the SET key a 3rd time to enter the **heating mode set** interface, ND will be displayed in the upper line, then the heating mode 0 (water bath) or 1 (oil bath) can be set.

Press SET key a 4th time to save and go back to the normal interface.

The lower line of the LCD screen displays the total running time. When the actual temperature is up to the setpoint, the timer starts and the second signal of time flashes. The screen will display **End,** when the holding time is over, and the beeper will keep buzzing for 30 s. Press and hold ▽ for 3 s to rerun the main function.

Note: The holding time can be set from 00:01 to 99:59.
By setting the holding time to 0, the lower line of the LCD screen will display the setpoint temperature and the system keeps the heating state.

When the unit is overheating, the buzzer will sound and ALM will be displayed on the LCD screen. If the overheating state is caused by the temperature set operation, there will be no buzz and only ALM be displayed on the screen.

Press any key to stop the buzzer.

In parameter set interface, the screen will turn to normal interface automatically in case of no operation in 1 minute.

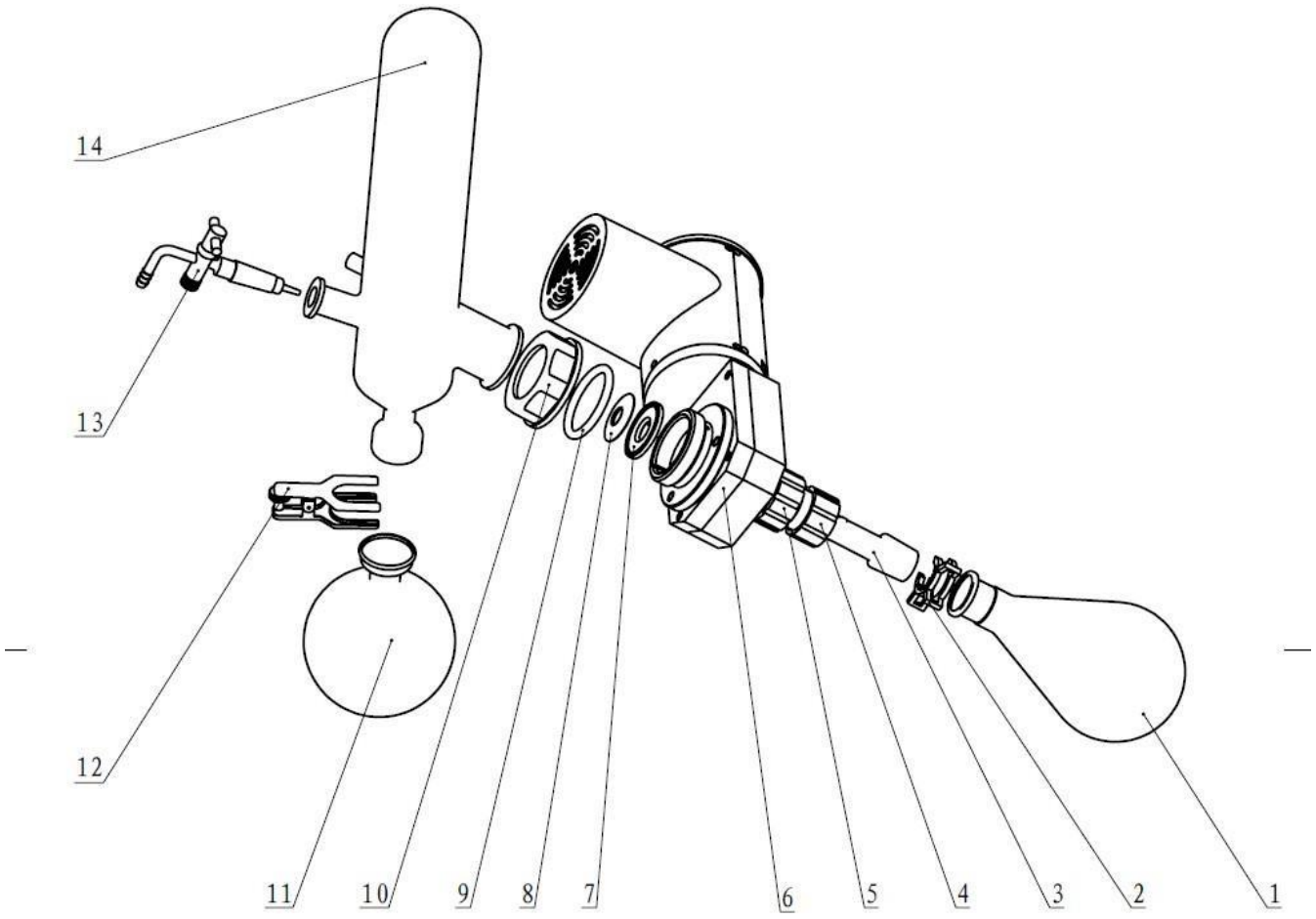
How to shut down the rotary evaporator system

(1) Shut down the heating bath; (2) Set the rotation speed to 0 and lift the evaporating flask; (3) Shut down the main unit; (4) When the flask is cooled to ambient, turn off the vacuum pump and/or the chiller, if any.
NOTE: After switching off the instrument it's better to disconnect the power plug from power socket to guarantee the safety.

Periodically replace heating liquid and clean the bath to keep longevity.

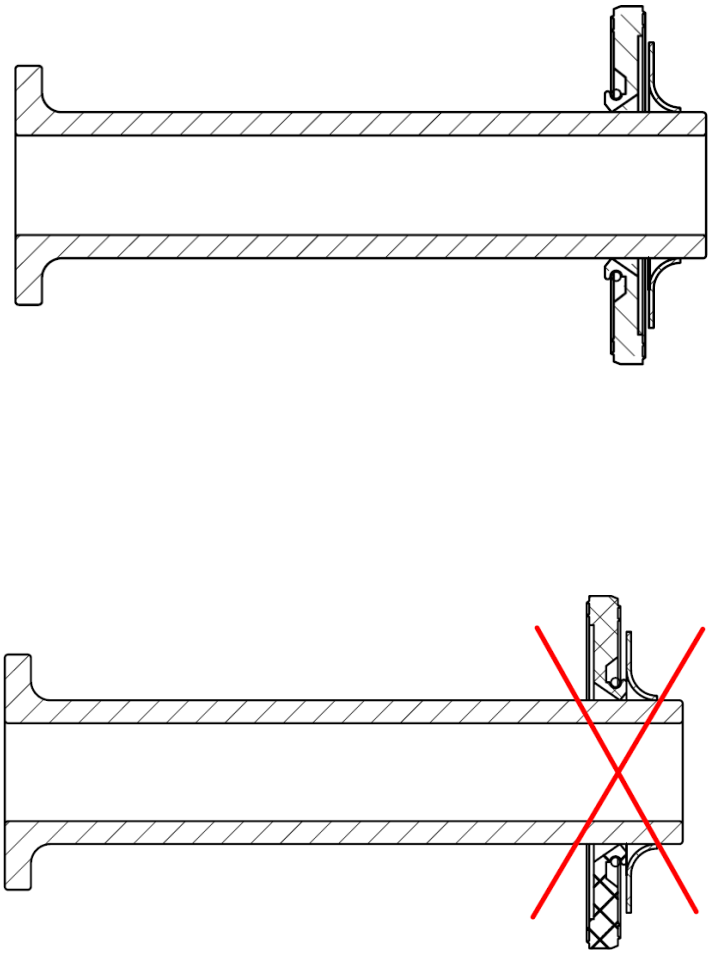
How to clean and install the seal system

The picture below depicts the basic configuration of the seal system.
1. Shut off the power, remove the PTFE valve, the receiving flasks (#11) and the condenser (#14).
2. Rotate counter-clockwise the push-off nut (#4) to detach the evaporating flask (#1). Pull the glass axis (#3) out. At the same time, get off the two seal rings (#7, #8) from the other end of the glass axis.
3. Clean involved components.
4. Reassemble the system according to the installation procedure.



1. Evaporation Flask 2. Clamp 3. Glass Axis 4. Push-off Nut 5. Locking Nut 6. Rotation part 7. Main Seal Ring 8. Auxiliary Seal Ring 9. Spring 10. Condenser Lock Handwheel 11. Receiving Flask 12. Clamp 13. Sample Adding Valve 14. Condenser

NOTE: Be sure to install the seal ring in right direction (see below pictures). Incorrect installation will cause improper system vacuum.



How to connect the LabTech Vacuum Pump

1. Connect the vacuum pump to the power with the provided power cord.
2. Connect the evaporator condenser and the vacuum pump tightly by the rubber tube and make sure the system is without leaking. The gas is drained from the exhaust connector by the connected tube.
3. Put the switch in the— position to start the vacuum pump, put the switch in the O position to turn off the vacuum pump.

⚠ **NOTE: In order to guarantee the longevity of this product, please reduce the possibility of unnecessary continuous working and avoid the solvent being sucked into pump.**

Please see the user manual of the vacuum pump for more detailed instructions.

How to connect The LabTech water chiller

The plumbing connections are located on the rear of the chiller and labelled "SUPPLY" and "RETURN". Remove the plastic protective plugs from both plumbing connections. Install the barbed adapters to these connections.

1. Connect the fitting "SUPPLY" to the hose feeding inlet of the evaporator condenser. Connect the fitting "RETURN" to the hose from the outlet of the evaporator condenser. Clamp all connections.
It is important to keep the distance between the chiller and the evaporator as short as possible. Tubing should be straight and without bends.
2. Before starting the unit, fill the water tank and double-check all electrical and plumbing connections.
3. Place the switch located on the rear of the unit to the up position, the controller will flash, and the unit starts.
4. Place the switch located on the rear of the unit to the down position, the unit will be shut down.

NOTE: If you want to turn on the unit again after a shut down, please wait for at least 10 seconds.

Please see the user manual of the water chiller for more detailed instructions.

SOLVENTS TABLE

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point at 1013 mbar	Density in g/cm³	Vacuum in mbar for boiling point at 40 °C
Acetone	CH_3H_6O	58.1	553	56	0.790	556
n-amylalcohol, n-pentanol	C_5H1_2O	88.1	595	37	0.814	11
Benzene	C_6H_6	78.1	548	80	0.877	236
n-butanol	$C_4H_{10}O$	74.1	620	118	0.810	25
tert. butanol (2-methyl-2-propanol)	$C_4H_{10}O$	74.1	590	82	0.789	130
Chlorobenzene	C_6H_5Cl	112.6	377	132	1.106	36
Chloroform	$CHCl_3$	119.4	264	62	1.483	474
Cyclohexane	C_6H_{12}	84.0	389	81	0.779	235
Diethylether	$C_4H_{10}O$	74.0	389	35	0.714	850
1,2-dichloroethane	$C_2H_4Cl_2$	99.0	335	84	1.235	210
1,2-dichloroethylene (cis)	$C_2H_2Cl_2$	97.0	322	60	1.284	479
1,2-dichloroethylene (trans)	$C_2H_2Cl_2$	97.0	314	48	1.257	751
Diisopropyl ether	$C_6H_{14}O$	102.0	318	68	0.724	375
Dioxane	$C_4H_8O_2$	88.1	406	101	1.034	107
DMF (dimethyl-formamide)	C_3H_7NO	73.1		153	0.949	11
Acetic acid	$C_2H_4O_2$	60.0	695	118	1.049	44
Ethanol	C_2H_6O	46.0	879	79	0.789	175
Ethylacetate	$C_4H_8O_2$	88.1	394	77	0.900	240
Heptane	C_7H_{16}	100.2	373	98	0.684	120
Hexane	C_6H_{14}	86.2	368	69	0.660	360
Isopropylalcohol	C_3H_8O	60.1	699	82	0.786	137
Isoamylalcohol (3-methyl-1-butanol)	$C_5H_{12}O$	88.1	595	129	0.809	14
Methylethylketone	C_4H_8O	72.1	473	80	0.805	243
Methanol	CH_4O	32.0	1227	65	0.791	337
Methylene chloride, dichloromethane	CH_2Cl_2	84.9	373	40	1.327	850
Pentane	C_5H_{12}	72.1	381	36	06.26	850
n-propylalcohol	C_3H_8O	60.1	787	97	0.804	67
Pentachloroethane	C_2HCl_5	202.3	201	162	1.680	13
1,1,2,2-tetra-chloroethane	$C_2H_2Cl_4$	167.9	247	146	1.595	20
Tetrachlorocarbon	CCl_4	153.8	226	77	1.594	271
1,1,1-trichloroethane	$C_2H_3Cl_3$	133.4	251	74	1.339	300
Tetra-chloro-ethylene	C_2Cl_4	165.8	234	121	1.623	53
THF (tetrahydrofurane)	C_4H_8O	72.1		67	0.889	374
Toluene	C_7H_8	92.2	427	111	0.867	77
Trichloroethylene	C_2HCl_3	131.3	264	87	1.464	183
Water	H_2O	18.0	2261	100	1.000	72
Xylene (mixture)	C_8H_{10}	106.2	389			25
o-xylene	C_8H_{10}	106.2		144	0.880	
m-xylene	C_8H_{10}	106.2		139	0.864	
p-xylene	C_8H_{10}	106.2		138	0.861	

Preventive Maintenance

ROTATING PART

Use tepid diluted HCI to clean the glass vessel if necessary.
To guarantee the longevity of this unit, please disconnect the unit from the power socket after switching off the unit.
In normal working conditions, the sealing ring should be replaced every two years.
If it is difficult to lift up/down but an internal mechanical driving sound could be heard, please adjust the tension steel wire according to following instructions (see the below picture):
First, lay down the unit. There is a yellow tension block under the base. Rotate clockwise the two M6 tension screws on it with a hexagonal wrench to tighten the steel wire. Too tight steel wire may cause tension failure or noise.

LABTECH WATER CHILLER

Reservoir Cleaning

Periodically inspect the fluid inside the reservoir. If cleaning is necessary, flush the reservoir with a cleaning fluid compatible with the circulating system and the cooling fluid.
The cooling fluid should be replaced periodically. Replacement frequency depends on the operating environment and run time.
Before replacing the cooling fluid ensure that it is at a safe handling temperature.

Condenser Cleaning

For proper operation, the unit needs to pull a substantial amount of air through the condenser. Dust and/or debris accumulated on the fins of the condenser will lead to a loss of cooling capacity. Optional air filters are available, if needed please contact the Labtech Service Team
Periodic vacuuming of the condenser fins is necessary. The cleaning frequency depends on the operating environment. After the initial installation we recommend a monthly visual inspection of the condenser. After several months, the cleaning frequency will be established.
Use care when cleaning the condenser fins, they can easily bend.

Troubleshooting

NO INDICATION LIGHT
Check the power cord; ensure it is plugged in.
Check the fuse; ensure it is not burned.

INADEQUATE TEMPERATURE CONTROL OF THE HEATING BATH
Check the power cord; ensure it is plugged in.
Check if there is too much scale in the heating bath. Clean it if necessary.
The heating bath has relay that if temperature goes over 5ºC of set point, the system gives display and sound alarm plus stop electrical resistance.

THE MOTOR DOES NOT ROTATE
Check the power cord; ensure it is plugged in.
Check if the synchronous belt driving is damaged.

NOISE IN THE ROTATING PART
There could be accumulation of powder (abrasion of the seal ring). Disassemble the glass tube and remove it.
The synchronous the belt could be heavily worn or works out of its seat. It must be replaced.
The bearing is over-loaded. Replace it.

NO OR NOT ENOUGH VACUUM
Check the seal ring to see if the ring is abraded, if so, replace it.
The sucking state of the vacuum pump is abnormal. Check the vacuum pump and tighten the head.
Check if the glass parts are broken and replace them if so.
The glass parts cannot seal tightly. Put a vacuum grease layer on the glass parts.

ABNORMAL LIFT UP/DOWN
Tighten the steel wire by adjusting two M6 screws under the base.
Check the malfunction of motor.

ATTENTION PLEASE: Please contact the Labtech Service Team if the above suggestions have no effect.

Declaration of Conformity

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EU/UE
DICHIARAZIONE DI CONFORMITÀ
DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ
KOFOMITÄTSERKLÄRUNG
DECLARACIÓN DE CONFORMIDAD

CE

Noi
We
Nous
Wir
Nosotros

LabTech s.r.l.

(nome del produttore) (manufacturer's name) (nom du fournisseur) (Name des Anbieters)(Nombre del productor)

Via Fatebenefratelli, 1/5 24010 SORISOLE (BG) – ITALY

(indirizzo) (address) (adresse) (Anschrift)(Dirección)

dichiariamo sotto la nostra unica responsabilità che il prodotto
declare under our sole responsibility that the product/system
déclarons sous notre seule responsabilité que le produit/système
erklären in alleiniger Verantwortung, dass das Produkt/System
declaramos bajo nuestra exclusiva responsabilidad que el producto/sistema

ROTARY EVAPORATORS EV SERIES

(modello) (model) (modèle) (Modell)(modelo)

al quale questa dichiarazione fa riferimento, è conforme con le seguenti norme
to which this declaration relates is in conformity with the following standards
auquel se réfère cette déclaration est conforme aux normes
auf das sich diese Erklärung bezieht, mit der/den folgenden Normen
el modelo al que se refiere esta declaratión, es conforme a las siguientes reglas

EN 61326-1:2013

(titolo e/o numero e data) (title and/or number and date) (titre et/ou no et date) (Titel und/oder Nummer und Datum)(titulo y/o el numero y la fecha)

Secondo le prescrizioni della(e) Direttiva(e):
Following the provisions of Directive(s):
conformément aux dispositions de(s) Directive(s):
Gemäß den Bestimmungen der Richtlinie(n) :
En conformidad con las especificaciones de las directivas:

2014/35/EC, 2014/30/EC

(titolo e/o numero della direttiva) (title and/or number of directive) (titre et/ou no du directive) (Titel und/oder Nummer von Anweisung)(titulo y/o numerode la Directiva)

LabTech s.r.l.
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24010 SORISOLE (BG)
P. IVA 03242600165

Mr. Diego Cortesi
General Manager
10/09/2019

Spare Part List

HB-03Plus	Teflon coated Heating bath with LCD display
HB-05	SSL Heating bath with LCD display
HB-ES	external shield of the heating bath
EDL-QTH002	Support rod EV311/EV311PLUS/EV311ADV 220N
ESJ-QTH002	Support rod of EV400/TOUCH/VAC 180N
ESD-QTH001	Support rod of EV400H/311H 85N
ESD-QTN004	Support rod of EV400H/311H 95N from Y2020
EDL-CGQ002	Heating bath temp. sensor
EDL-HJP001/BXGP001/PTF002	Internal Heating bath with heater (Teflon coating) 115V
EDL-HJP002/BXGP001/PTF002	Internal Heating bath with heater (Teflon coating) 230V
EDL-RBH002	Thermal protector of heating bath
DDL-PVCM083	Label of VC1000
EDL-KGDY003	Power switch
EDL-DJ002	Rotation motor EV311/321/331 (stopped)
ESD-DJ001	DC brushless motor of EV400H
EV-WG017	DC brushless motor of EV400H （New)
EDL-DJ002CAP	Cap of rotation motor EV311/321/331
ESJ-DYB006	Touch screen of EV400TOUCH
ESJ-DYB009	Power board of EV400TOUCH
ESJ-DYB004	Driver board of EV400TOUCH
EDL -DYB070	Power board of EV400
EDL-XSP070	Display screen of EV400
EDL-XN002	Control knob of EV400H
EDL-DYB065	Power supply board 1 of EV311VAC for rotation display
EDL-DYB066	Power supply board 2 of EV311VAC for vacuum display
SBZ-DYX004	Power Conversion Cord
EDL-YG002	PTFE pipe ,sample adding pipe
HPSE-FL110	touch pen
EDL-PVCM010	Label of HB-05
ESJ-PVCM002	Label of HB-03 plus
EDL-TBD001	internal belt for rotary evaporator

EDL-LHQ001	Clutch
EDL-KG001	Micro Switch
ESJ-DYB009	Power supply board of EV400TOUCH
ESD-XP001	Electromagnetic coil
ESD-DYB001	Power supply board of EV400H
EBZ-BZX004/006	Package material of RE glassware box
EDL -DYB071	Power board of HB03PLUS/110V
EDL-GSS001/LK001/74	Stainless Steel Wire/pc Manual model
EDL-GSS001/LK001/76	Stainless Steel Wire/pc Automatc model
EDL-WYJT001	External screw thread joint
LV400T-CC	Cable of EV400VAC controller
ESJ-DYB007	power board for EV400VAC
ESJ-DYB008	Driver board of EV400VAC
ESJ-BLPO03	29/42 Top joint of 50104-T