

Accelerating the path to discovery®

# ecodyst

## HYDROGEN MODERN ROTARY EVAPORATOR



## OPERATING MANUAL

## **ECODYST HYDROGEN SUMMARY DESCRIPTION**

Rotary evaporators (rotovaps) are ubiquitous devices in chemistry labs and industries performing chemistry, including labs in the chemical, pharmaceutical, environmental, materials, life science, and cannabis industries. A rotovap consists of a heating fluid bath, rotating motor, evaporating flask, condenser, collection flask, and vacuum source. Traditional rotovap condensers require external sources of cooling materials such as dry ice, liquid nitrogen, water or glycol. Glycol requires additional recirculating chiller equipment, which are often bulky, heavy, and inefficient. The traditional rotovap for decades have also been characterized with inefficient vapor condensing, operational cost, unreliability, high energy consumption and material waste.

Using a proprietary and innovative self-cooling technology, Ecodyst has revolutionized the rotovap to be more efficient, to have a smaller footprint, to have greater output, and to be less costly to operate as compared with traditional methods. This disruptive technology has set new standards worldwide for rotary evaporators.

Ecodyst's green condenser technology does not require an external source of cooling materials, eliminating the major sources of material waste associated with rotovaps. Ecodyst's devices are equipped with intelligent self-cooling condenser technology that is extremely efficient at condensing vapors. This technology is environmentally friendly, energy efficient, reliable and sustainable. Additionally, the condenser achieves rapid cool down (reaches -40C in 60 seconds) and is always-available, which eliminates downtime, increases productivity, and saves time and money.

Hydrogen is a powerful, small footprint and intelligent self-cooling rotovap invented for scientists by scientists. Additionally, this modern all-in-one rotovap has superior advantages, has a large cooling survey area condenser and extremely fast rates of evaporation. The hydrogen is a plug-and-play rotovap that allows scientists to focus on more complex tasks.

The only action required is flip the switch.

### **Superior advantages of the Modern Rotovap**

1. Intelligent self-cooling condenser
2. Fast rates of evaporation
3. Small footprint
4. Always-available condenser
5. No dry ice or external chiller
6. No associated operational cost
7. High levels of productivity
8. Preserves water, no water bills
9. Environmentally friendly
10. Pays for itself within 3 to 5 year

## ABOUT THIS MANUAL

This operating manual provides the technical and operational details for the Hydrogen.

- Please read this manual carefully and obey all safety and warning notices.
- Ensure that every operator reads this manual.
- Ensure that this manual is accessible for every operator.
- Pass on the operating manual to the subsequent owner.
- In addition, please observe the regional regulations

TABLE OF CONTENTS

**SAFETY INSTRUCTIONS ..... 5**  
    General Safety Instructions ..... 5  
    Intended use ..... 5  
    Improper use ..... 5  
    Installation / Electrical Safety ..... 6  
    Personnel Qualification ..... 6  
    Operating Company’s Obligations ..... 6  
    Safety During Use ..... 8  
    Disposal ..... 8

**ACCESSORIES AND SPARE PARTS ..... 9**  
    Scope of Delivery ..... 9

**DEVICE DESCRIPTION ..... 10**  
    Device Overview ..... 10  
    Controller Overview ..... 10  
    Technical Data ..... 11

**ASSEMBLY ..... 13**  
    Installation ..... 13  
    Condenser controller ..... 13

**POST OPERATIONS ..... 15**  
    Cleaning ..... 15  
    Maintenance ..... 15  
    Troubleshooting ..... 15  
    Transportation and Storage ..... 15

**SUPPORT ..... 15**  
    Warranty ..... 15

**SERVICE ..... 16**  
    Confirmation of Condition of Unit ..... 16

**CONTACT DETAILS ..... 17**

## SAFETY INSTRUCTIONS

### General Safety Instructions

The device has been constructed according to state-of-the-art technology and recognized safety regulations. However, risks may still arise during installation, operation and maintenance.

Please ensure the operating manual is available at all times.

The device may only be used under the following circumstances

- Only operate the device, if it is in full working order.
- Ensure all operators of the device possess the necessary safety and risk awareness.
- Operate the device according to the instructions stipulated in this manual only.
- If there is something you do not understand, or certain information is missing, ask your manager or contact the manufacturer.
- Do not do anything on the device without authorization.
- Only use the device according to its intended use.

### Intended use

- The device is intended for use by trained and authorized personnel only. The device is suitable for the following
- Economical cooling as alternative to tap water systems use.
- Research application.

### Improper use

Any use which deviates from the device's intended use is considered to be improper. The manufacturer does not accept liability for any damages resulting from non-permitted uses. The risk is carried by the operator alone.

### **Installation / Electrical Safety**

- The device may only be connected when the mains voltage corresponds to the information on the type plate of the unit.
- The mains connection must be accessible at all times.
- Repairs may only be performed by a qualified electrician.
- Never operate the unit with a damaged power cord.
- Always turn the unit OFF and disconnect mains power before performing any maintenance or service.

### **Personnel Qualification**

- The device may only be operated by qualified persons.
- The device may only be operated by individuals who have been instructed in its proper use by qualified persons.
- The device may only be operated and maintained by persons who are of legal age.
- Other personnel may only work with the unit under continuous supervision of an experienced qualified operator.
- This manual must be read and understood by all persons working with the device.
- The personnel must have received special safety instructions in order to guarantee responsible and safe work procedures.

### **Operating Company's Obligations**

#### **A. Installation Site**

- The device must be positioned in a suitable location.
- The device must be installed sufficiently stable on a strong and level surface.
- All screw connections must be securely tightened.
- The device should be located as close as possible to the process requiring cooling.

- The device should not be installed closer than 1.4 meters (4 feet) to a heat-generating source, such as heating pipes, boilers, etc.
- If possible, the device should be located near a suitable drain to prevent flooding in the event of leaks.
- Do not place the device where corrosive fumes, excessive moisture, excessive dust, or high room temperatures are present.
- The site must have an 80% relative humidity and temperature between 5 - 35 °C
- Adequate clearance should be allowed on the front, sides, top, and rear of the device for access to connections and components.
- The front and side vents of the device must be a minimum of 21 cm (8 inches) away from walls or vertical surfaces, so air flow is not restricted.

#### **B. Changes to the Unit**

- No unauthorized changes may be made to the unit.
- No parts may be used which have not been approved by the manufacturer.
- Unauthorized changes result in the EC Declaration of Conformity losing its validity, and the appliance may no longer be operated.
- The manufacturer is not liable for any damage, danger or injuries that result from unauthorized changes or from operating the unit other than described in this manual.

#### **C. Safety for the Personnel**

Ensure that only qualified personnel operate the device. Observe the following regulations:

- Laboratory guidelines
- Accident prevention regulation
- Ordinance on Hazardous Substances
- Other generally accepted rules of safety engineering and occupational health
- Local regulations

### **Safety During Use**

- Wear the appropriate protective clothing when working on the device (clothing, protective glasses and if necessary, safety gloves).
- Do not use the device in potentially explosive areas. The device is not protected against explosion. There is no explosion or ATEX protection available.
- Do not operate or assemble devices in the vicinity which are emission or radiation sources (electromagnetic waves) for the frequency range ( $3 \times 10^{11}$  Hz to  $3 \times 10^{15}$  Hz).
- Avoid putting pressure on the display when you do not operate the device. • Eliminate errors immediately.
- Do not use abrasive material to clean the glass surfaces. Only wipe with damp cloths.
- Always switch the device off after use.

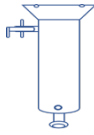


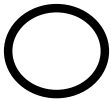



### **Disposal**

- Check the device components for hazardous substances and solvents.
- Clean all components before disposal.
- Dispose of the device according to the valid national legal regulations.
- Dispose of the packaging material in accordance with the valid national legal regulations. • Have refrigerant emptied before disposal



## ACCESSORIES AND SPARE PARTS

## Scope of Delivery

Qty	Part No	Picture	Description
1	ECO-333-1H		Ecodyst 1H Complete with Glassware, No Vacuum Pump to Include:
1	ECO-777-091		100mm Flange condenser Glassware with Inlet Hose Connection
1	ECO-777-091		Rotovap Adapter
1	ECO-777-166		100mm quick release flange clamp
1	ECO-777-164		100mm Viton O-Ring
1	ECO-777-007		Vapor Tubing 5 ft
1	ECO-333-001		1000ml Round Bottom Flask, 24/40 Outer Joint
1	ECO-333-002		1000ml Receiving Flask, 35/25 Ball Joint

DEVICE DESCRIPTION

Device Overview



Controller Overview



**Technical Data**

**Power Supply**

100-120/200-240 V 50/60 Hz

**Hydrogen Cooling Capacity Specs**

Evap Temp (°F)	Evap Temp (°C)	Cooling Capacity		
		Btu/hr +/- 5%	Watts +/- 5%	Power Consumption (W) +/- 5%
-40	-40	620	182	220
-30	-35	835	245	259
-20	-30	1116	327	300
-15	-25	1458	427	343
-10	-20	1857	544	388
5	-15	2322	680	434
10	-12	2844	833	482

**Hydrogen Dimensions**

Dimensions		Hydrogen
W x D x H	Inches	12 x 15 x 29
W x D x H	mm	304.8 x 381 x 736.6
Including condenser	Inches	18.25 x 15 x 29
Including water bath	Inches	17.75 x 16.25 x 29
Overall W x D x H	Inches	17.75 x 16.25 x 29
Overall Footprint	Sq. in.	288.44
	Sq. ft.	1.8
Weight	lbs	120

**Condenser Cooling Unit Specs**

Standard Supply Voltage	115V, 15 amps, 60 Hz
Power Supply	656 W
Default Set Temperature	-40°C
Temp stability of condenser coils	+/- 0.1
Operating Temp. Range (°C)	Ambient .... -40°C
Cooling time	(-35, 90 secs)
Right Side Vent & Back Fan	Vent & fan must be unblocked for efficient cooling

**Rotovap Component Specifications**

<b>Specifications</b>	<b>Ecodyst 1H Rotovap</b>
Motor Type	Brushless DC motor
Speed Range	20-280rpm
Display	LCD (speed/temp/time)
Clockwise and Anti-clockwise	Yes
Heating Temperature Range	Room temp. to 180°C
Control Accuracy	water: ±1°C oil: ±3°C
Heating Power	1300W
Stroke Displacement	automatic 150mm
Timer	Yes
Time Setting Range	1-999min
Permissible Ambient Temperature	5-40 °C
Permissible Relative Humidity	80% RH
Protection Class	IP20
Protection class	IP21
USB Interface	Yes
Voltage/Frequency	100-120/200-240V 50/60 Hz
Power	1400 W

**Key Features**

- Digital display of rotation speed, heating and cooling temperatures allows for optimal control of all distillation processes
- Automatic motor lift releases the evaporating flask to a safe position in case of power failure
- 5L heating bath with wide temperature range from room temp. to 180°C. Water/oil heating mode can be changed only through a switch
- Overheating protection temperature at 220°C
- Speed range from 20 to 280 rpm, and interval operation in clockwise and anticlockwise directions for drying process
- Ejection mechanism ensures easy removal of evaporating flask
- Highly chemical resistant double stainless steel spring sealing ring sealed with PTFE provides an excellent sealing performance
- Remote function provides PC control and data transmission



## ASSEMBLY

### Installation

1. Remove hydrogen from packaging and save or dispose of packaging material
2. Place O-ring in the condenser groove
3. Open clamp and put over condenser flange
4. Slide condenser over hydrogen condenser
5. Secure clamp and tighten with flat head screwdriver
6. Put coupling and coupling spring on eco adapter and secure to the drive head.
7. Attach supplied tubing to rotovap adapter and condenser body hose connector.
8. Attach receiving flask to condenser body with pinch clamp.
9. Plug in hydrogen and turn the switch to one located on the lower left side.
10. Hydrogen display will light with 8.8.8.8 for startup period
11. Hydrogen is preset to  $-37.5^{\circ}\text{C}$  but the actual temperature can reach  $-40^{\circ}\text{C}$
12. Bottom display bar will show the set temperature and the top display will show the actual temperature of the condenser.
13. Check all ports for vacuum leaks, tighten clamps and adapters as needed.

### Controllers



Press  or  to set the value as required.

**Lift Key**

Press to lift the flask up

**Lower Key**

Press to lower the flask down

**Rotation Speed Key**

Press, then turn the "Control Know" to navigate the speed

**Interval Key**

Press, then turn the "Control Know" to set an interval

**Water Bath Temperature Key**

Press, then turn the "Control Know" to navigate the temperature

**Control Know**

**Timer Key**

Press, then turn the "Control Know" to set a timer



## POST OPERATIONS

### Cleaning

Recommended to clean condenser glass after use and replace tubing as needed.

### Maintenance

The unit is maintenance-free. Any necessary repair must be performed by an authorized Ecodyst distributor. Please contact Ecodyst or your local Ecodyst distributor

### Troubleshooting

Loss of Vacuum	Assess and tighten clamps on various components Check vacuum seal on rotary evaporator
Ice Build Up on Condenser	Ensure EcoChyll is not left on for long periods without Condensing

### Transportation and Storage

- Store and transport the unit and its components only if they were emptied and cleaned in the original packing material.
- Alternatively store and transport the unit in a container which prevents damages during transportation.

## SUPPORT

### Warranty

Ecodyst provides a 1-year warranty for the products described here (excluding glass and wearing parts) if you register using the warranty card enclosed. The warranty is valid from the point of registration. The serial number is also valid without registering. The warranty covers part and manufacturing defects.

(Serial number on back top corner of EcoChyll)

### Questions / Repair work

If any aspect of installation, operation or maintenance remains unanswered in the present manual, please contact us.

SERVICE

**Confirmation of Condition of Unit**

In the case of repair, copy and complete the Confirmation of condition of unit and send it to Ecodyst.

Product number

Serial number

Reason for repair

Has the device been cleaned, decontaminated/sterilized?

\_\_\_ Yes \_\_\_ No

Is the unit in a condition which does not represent any health threats for the staff of our service department?

\_\_\_ Yes \_\_\_ No

If not, which substances has the unit come into contact with?

**Legally binding declaration**

The customer is aware of being legally liable to Ecodyst for any damages arising from incomplete and incorrect information.

Signature:

Date:

Please note: The shipper is responsible for the return of the goods in well packed condition, suitable for the mode of transport.

Last name, first name

Company

Street

Zip code, city, country

E-mail



CONTACT DETAILS

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