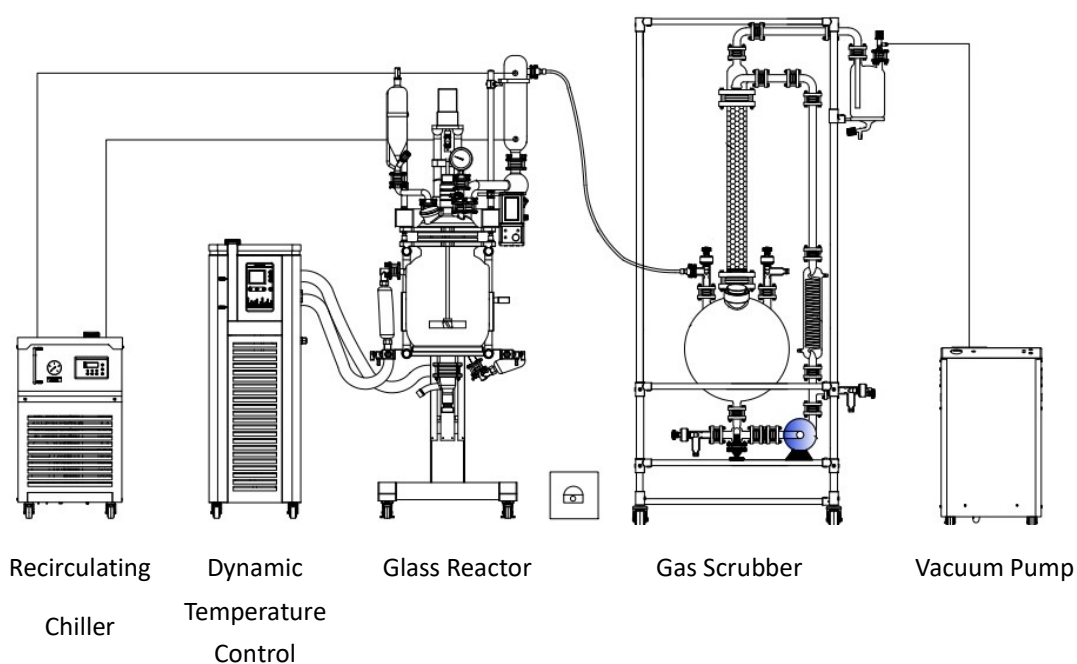




Dynamic Temperature Control Unit

(Cooling & Heating Circulator)



Operation Manual

(Please read the instruction carefully before you use the machine)

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1. Overview

1.1 Preface

Thank you for choosing the StonyLab Dynamic Temperature Control Unit. This user manual provides detailed instructions on installation, usage, and maintenance. Please read the manual thoroughly before use to fully understand its content.

1.2 User Qualification

Operators of this Dynamic Temperature Control Unit should possess practical experience and be well-acquainted with the instructions provided in this manual. In the absence of such knowledge, the device must be operated only under the supervision of qualified technical personnel.

1.3 Legitimate Use

This Dynamic Temperature Control Unit is designed for indoor installation and is intended to work in conjunction with other equipment to create precise temperature conditions required for experimental or industrial processes.

Application Scope:

- (1) Temperature control for double-layer reactors in chemical, pharmaceutical, or biological industries.
- (2) Temperature control for high-pressure reaction vessels.
- (3) Temperature control for thermal testing platforms in automotive technology.
- (4) Temperature control during scale-up processes in micro-reactor systems.
- (5) Temperature control for semiconductor equipment.
- (6) Temperature control for mixing tanks and blending systems.
- (7) Temperature control for distillation and separation systems.

1.4 Improper Use

Improper use of this device, including failure to follow the guidelines in this manual, may result in damage for which the user assumes full responsibility.

Do not operate the device under the following conditions:

- (1) When the power supply does not meet the specified requirements.
- (2) In environments with strong magnetic fields or corrosive substances.
- (3) In areas with explosive gases or dust.

1.5 Warning Signs Used in the User Manual

Sign	Meaning
 Danger	"Danger" indicates an extremely hazardous situation that, if not avoided, will result in death or serious injury.
 Warning	"Warning" indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 Caution	"Caution" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury.
 Be careful of frostbite	Avoid direct contact with surfaces at low temperatures to prevent frostbite.
 Prohibited in the rain	Do not use the device in the rain. Keep it protected from splashing or dripping water.
 Pay attention to high temperature	When the liquid is hot, do not touch or move the container to avoid the risk of burns.
 Caution	Caution: Keep hands and objects away from rotating parts to prevent injury.
	Wear appropriate protective gear to reduce the risk of personal injury.

Prompt	"Prompt" indicates a situation that may result in equipment damage if not addressed.
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1.6 Equipment-Related Hazards

 Danger	Do not use the device in explosion-proof environments. Do not use hazardous materials beyond the instrument's specified limits. Repairs must only be performed by qualified personnel.
 Prohibited in the rain	Avoid using in outdoor environments. Exposure to rain or splashing water may cause electrical leakage, leading to serious injury or fatal accidents.
 Warning	Ensure the power supply matches the specifications indicated on the equipment nameplate. Implement equipotential bonding for the equipment and never remove the internal grounding wire. Before opening the equipment casing for maintenance or repairs, disconnect the power supply and wait at least 5 seconds to allow residual voltage to dissipate, preventing electric shock. Do not operate the equipment if the casing is not properly installed, as this may cause electric shock. In case of refrigerant leakage, follow the procedures specified in GB/T16483-2008 "Safety Data Sheet for Chemical Products." Large refrigerant leaks can cause anesthesia or suffocation risks to personnel. If refrigerant levels are confirmed insufficient, stop using the equipment immediately and have a qualified professional replenish the refrigerant.
 Note	If any abnormalities occur during equipment operation, immediately disconnect the power supply before troubleshooting. Contact professional maintenance personnel if necessary. When cleaning or performing maintenance, always follow proper safety precautions, including wearing protective gloves to avoid injury from condenser fins.

	Refrigerant Discharge: To prevent injury from refrigerant discharge, perform the discharge only within the safe temperature range of 5–40°C.
 Pay attention to high temperature	The outlet and return pipelines, including the valves, can become extremely hot. Avoid direct contact to prevent burns.
 Be careful of frostbite	The liquid outlet, return pipeline, and valve may reach extremely low temperatures. Exercise caution to avoid frostbite.
 Pay attention to	Keep a safe distance from rotating parts to prevent potential injuries.
Prompt	Avoid using the equipment in high-temperature and humid environments, as this may affect normal operation and reduce service life. Regularly clean the condenser. A blocked or dirty condenser will decrease cooling capacity and increase power consumption. Maintain at least 0.7 m of clearance around the air inlet and outlet. Obstructions in these areas can reduce cooling efficiency. Select heat transfer fluids appropriate for the equipment's temperature range and materials. Do not allow the circulating pump to idle under any circumstances. Ensure good ventilation around the equipment at all times. Do not apply excessive force when compressing or handling the equipment casing.

1.7 Other Hazards

 Warning	Exposure to corrosive materials such as acid or alkali vapors around the equipment can degrade component performance and reduce service life.
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	The heat transfer fluid used must not come into contact with food, drugs, tobacco, or similar items to prevent personal injury.
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1.8 Security Measures

	When operating this equipment, always wear appropriate personal protective equipment (PPE), including safety glasses, gloves, and protective clothing.
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2. Product Introduction

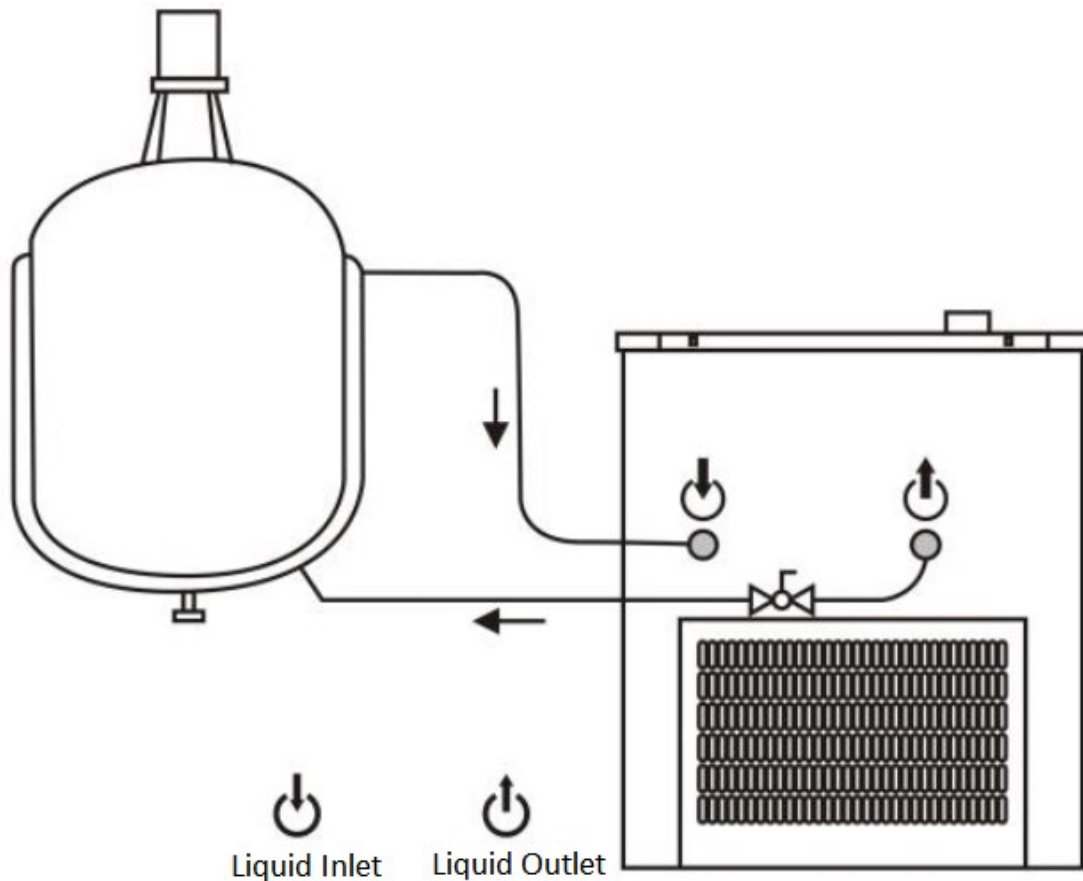
This Dynamic Temperature Control Unit integrates pre-cooling, refrigeration, heating, and circulation functions to externally transfer heat transfer fluids, meeting required process conditions.

2.1 Product appearance



2.2 Product Unpacking and Installation

- (1) Open the outer packaging carefully and remove the user manual. Check the packing list to confirm all components are included and in good condition.
- (2) Install the equipment on a suitable concrete foundation. Level the machine properly. Once leveled, weld the inclined pad iron to the base frame, then pour concrete over the foundation bolts. After the concrete has fully set, securely tighten the foundation bolts.
- (3) During installation, avoid placing the equipment upside down or flat. If lifting is necessary, ensure the load is evenly distributed across the four lifting rings. Avoid applying excessive force to the equipment during placement.
- (4) If the equipment is moved to an environment with a significant temperature difference, allow it to stand for at least 2 hours before use.
- (5) Before the initial startup or after extended inactivity (power off for more than 48 hours), turn on and keep the air circuit breaker closed for at least 4 hours before pressing the start button. This preheats the compressor's crankcase heater, raises oil temperature, and reduces refrigerant content in the oil. Skipping this step may cause severe compressor damage.
- (6) Ensure proper ventilation and maintain ambient temperature below 35°C. Important: Do not block the ventilation openings on the equipment.
- (7) If any liquid spills or splashes onto the equipment casing, clean it immediately and check that all components are in good condition before use.
- (8) External Pipeline Connection: Connect external piping for this Dynamic Temperature Control Unit as shown in the manual. Install a drain valve at the heat transfer fluid discharge port, keeping the valve closed when not in use.



(9) Power Connection

Ensure the power supply meets the specifications listed on the equipment nameplate, and follow the guidelines below:

- The power supply must be reliably grounded.
- The user-provided power supply terminal must be connected to a leakage protector.
- For StonyLab Dynamic Temperature Control Units requiring a three-phase power supply, a three-phase five-wire system (L1, L2, L3, N, PE) must be provided by the user.
- The unit is equipped with a phase sequence protector. If the phase sequence does not match the unit's requirements, the machine will not start. To correct this, swap any two phase wires.

 Caution	If the power supply is not connected in accordance with the specified requirements, resulting in electric shock or equipment damage, the user shall bear full responsibility for any resulting consequences.
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3. Product Operation

3.1 Heat Transfer Fluid Selection

The target temperature range of this Dynamic Temperature Control Unit is determined by the properties of the heat transfer fluid used. It is essential to select a fluid that meets the following criteria:

- Transparent, non-toxic, and non-corrosive
- Low-temperature viscosity of $\mu \leq 22 \text{ mPa}\cdot\text{s}$
- Does not discolor at high temperatures

Important Notes:

- Users are responsible for selecting an appropriate heat transfer fluid.
- Ensure the chosen fluid meets both technical and safety requirements to prevent equipment damage or personal injury.

3.2 Addition of Thermal Conductive Fluid

When adding heat transfer fluid, observe the following safety measures:

- Follow all applicable laboratory safety protocols.
- Wear appropriate personal protective equipment (PPE), including safety glasses, gloves, protective clothing, and non-slip footwear.
- If heat transfer fluid spills or splashes onto any equipment components, immediately disconnect the power supply and contact qualified personnel for cleanup and inspection.

Steps to add thermal conductive fluid:

- Connect the closed refrigeration/heating circulation unit to the external cooling/heating equipment using insulated hoses.
- Turn off the main power switch, then turn on the equipment's power switch.
- Remove the upper cover of the fluid filling port. Slowly pour the heat transfer fluid into the expansion box through the filling port until the fluid reaches halfway up the liquid level indicator tube. Press the Circulation button to begin transferring the fluid into the interlayer of the third-party container. Monitor the fluid level. If it drops to the lower limit of the indicator, stop circulation and add more fluid until it again reaches halfway up the tube. Repeat this process until the third-party container's inter layer is filled and the fluid level stabilizes at approximately one-third of the indicator tube.

- If bubbles persist in the third-party container's inter layer after establishing the circulation path, stop circulation for 10 seconds, then resume it for 10 seconds. Repeat this process several times. Any remaining bubbles will usually dissipate once heating is activated.

4. Equipment Maintenance and Management

To ensure optimal performance and extend the service life of the equipment, users are advised to carry out regular daily maintenance and management.

Before performing any maintenance tasks:

- Disconnect the equipment from the power supply.
- Prepare the necessary tools and materials.
- Follow the procedures outlined in this user manual carefully.

Failure to follow these precautions may result in electric shock or equipment damage.

4.1 Daily Maintenance

- Regularly wipe the surface of the equipment with a soft cloth to maintain cleanliness.
Do not rinse the equipment with water!
- Liquids must not enter any parts of the closed refrigeration and heating circulation device, except for the circulation system.
- Avoid using brushes, abrasive powders, acids, gasoline, or other solvents to clean the surface, as they may damage the protective layer.
- Regularly inspect the connection pipelines of the equipment, and if any signs of aging or damage are found, replace the parts promptly with those matching the original specifications.

4.2 Air-Cooled Heat Dissipation Maintenance

To ensure optimal cooling performance, regularly clean the cooling system (condenser) by following these steps:

- Turn off the power supply to the device.
- Remove the screws on the front panel. Apply gentle outward pressure to tilt the side panel at an angle, and then remove the front panel.
- Use a vacuum cleaner or a soft brush to remove dust from the condenser fins. Clean in the direction of the fins to avoid damage.
- After cleaning, reattach the side panel and secure it in its original position.

 Caution	Do not touch the condenser fins with your hands to avoid injury!
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5. Maintenance Requirements

5.1 Equipment maintenance must be performed by qualified technical personnel or authorized representatives of our company.

5.2 If the equipment requires factory repair, please contact our company for assistance prior to shipping.

5.3 Before returning the equipment for repair, please ensure the following steps are completed:

- Drain the heat transfer fluid from the circulation system.
- Prepare and submit a detailed fault report to our company.
- Properly package the device with safety precautions to prevent damage from vibrations or collisions during transportation.

6. Common Fault Causes Analysis and Solutions

#	Fault Appearance	Possible Causes	Handling Measures
1	No signal display on the touch screen after turning on power	Power not connected	Check the power circuit
		Circuit breaker failure	Stop using the equipment and contact the manufacturer or professional maintenance personnel
2	Temperature control failure	Large voltage fluctuations in the power grid	Restart after the voltage stabilizes
		Poor wiring of the temperature controller	Stop using the equipment and contact the manufacturer or professional maintenance personnel
		Temperature controller malfunction	

#	Fault Appearance	Possible Causes	Handling Measures
3	Compressor running, but cooling capacity decreases	Excessive external environmental temperature	Take measures to reduce the environmental temperature
		Refrigerant leakage	Stop using the equipment and contact the manufacturer or professional maintenance personnel
4	No cooling, abnormal noise	Damaged starting capacitor	Stop using the equipment and contact the manufacturer or professional maintenance personnel
		Compressor damaged	
5	Abnormal shutdown during operation	Temperature controller malfunction	Contact the manufacturer or professional maintenance personnel
		Compressor overheat protection	Improve ventilation; check if condenser fins are blocked
6	Heat transfer fluid not circulating	Circulating pump not started	Contact the manufacturer
7	Abnormal circulation of heat transfer fluid	Blocked inlet	Remove blockages
		Valve in the circulation pipeline is not open	Open the valve
		Improper selection of heat transfer fluid	Replace with appropriate heat transfer fluid
		Conveying pipeline is blocked	Check and clean the pipeline
8	No exhaust or abnormal air volume at the outlet	Fan stuck or motor damaged	Replace the motor
9	DI2 phase sequence alarm	Power line phase wiring error	Adjust the position of any two-phase lines
10	DI3 first-level pressure alarm	Excessive external environmental temperature	Take measures to reduce the environmental temperature

#	Fault Appearance	Possible Causes	Handling Measures
		Foreign object blocking the air inlet of condenser	Clean the condenser and reset the pressure alarm button. If alarms persist, contact the manufacturer
11	DI4 secondary pressure alarm	Auxiliary temperature too high	Contact the manufacturer
		Decreased primary cooling capacity	
12	DI5 first-level thermal overload protection	Power supply voltage too low	After confirming that the power supply voltage and wiring are correct and in good condition, press the reset button on the thermal overload relay to restart the equipment. If alarms occur frequently, discontinue use and contact the manufacturer for assistance.
		Poor contact of the connecting wire	
13	DI7 secondary thermal overload protection	Power supply voltage too low	Once the power supply voltage and wiring have been confirmed to be in proper condition, press the reset button on the thermal overload relay to restart the equipment. If alarms occur frequently, stop using the equipment and contact the manufacturer for further assistance.
		Poor contact of the connecting wire	

7. Warranty Statement

7.1 Free Maintenance Policy

If the product is used under normal operating conditions and experiences failure due to quality

issues within **12 months** from the date of shipment, our company will provide **free maintenance** services.

However, if the equipment is damaged due to **improper use**, maintenance fees may be charged at the company's discretion.

7.2 Exclusions from Free Maintenance

Free maintenance will **not** be provided under the following circumstances within the specified warranty period:

- The user cannot provide a valid warranty card or proof of purchase.
- Failure or damage caused by improper usage, or failure to install or operate the equipment according to the instruction manual or equipment markings.
- Damage caused by improper storage, unauthorized transportation, movement, dropping, or collision.
- Unauthorized maintenance or modifications made without StonyLab's approval,, resulting in malfunction or damage.
- Failures or damage caused by natural disasters or force majeure events, including but not limited to fire, earthquake, flood, wind, lightning, or power abnormalities.
- Normal wear and tear, aging, or the replacement of consumable parts.

7.3 After-Sales Support

In the event of a product malfunction, please contact StonyLab promptly. Our after-sales service team will respond within 24 hours to help minimize any inconvenience or loss to the user.

Note: The final interpretation of this manual belongs to StonyLab Inc. Changes may be made without prior notice.