

Controlled Freeze-Thaw System

Preserve Biologics with Precision: Automated, Traceable Freeze-Thaw for Bioprocessing Excellence

Deliver high-quality, consistent results with traceable, programmable freeze-thaw control for liquid biologics.



Preserve Product Integrity
Rapid, uniform freezing and controlled thawing protect biological activity



Ensure Batch Consistency
Customizable freeze-thaw profiles with programmable formula control



Support Compliance & Traceability
GMP-compliant logging with real-time data capture



Simple to Operate, Easy to Maintain
Intuitive interface and professional technical support



GWP GWP<750



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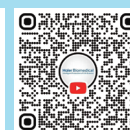
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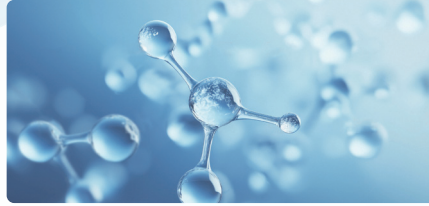
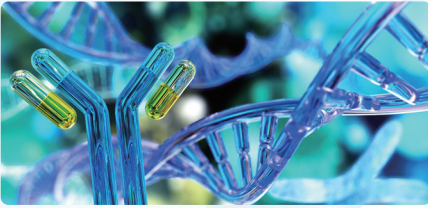


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| Enhancing Product Integrity Through Controlled Thermal Processing



The Controlled Freeze & Thaw System is designed for use in the downstream processing of liquid biological products within the biopharmaceutical industry. It enables precise, programmable freezing and thawing of high-value biologics—such as antibody APIs, vaccine APIs, recombinant proteins, blood-derived products, and growth hormones—prior to low-temperature storage or formulation. By ensuring consistent thermal profiles, the system helps preserve product integrity, reduce variability, and streamline batch processing. Ideal for biopharma manufacturers and CDMO providers, this system supports GMP-compliant operations across R&D, clinical, and commercial production scales.

| Performance. Precision. Scalability. Compliance



Optimised Thermal Processing to Reduce Loss and Boost Yield

1. Fast-Freezing Technology for Enhanced Product Durability

A professional refrigeration system using both heat conduction and radiation modes enables rapid and uniform cooling. This ensures consistent batch freezing, protects sample integrity, and reduces total freeze time by up to 25% [6 hours vs. competitors 8+ hours]

2. Adjustable Thawing Speed for Time-Saving Efficiency

Customize the rewarming rate based on product needs. An optional mixing function reduces static thawing time by over 30%, while also ensuring protein uniformity and stability of product quality

3. Increase the Output Value of Every Batch

Compared to conventional methods, this system delivers:

9x faster freeze/thaw cycles

>10% increase in batch value (This data is the data tested with trypsin)

Significantly lower active ingredient loss

This helps improve overall production yield and reduce waste—ideal for high-value biologics like antibody APIs or recombinant proteins

4. Optional Features Available

(1). Mixing Function

(a) Freezing and thawing will affect the changes in protein concentration, and proper mixing during thawing will help to stabilize the protein concentration and product quality

(b) The melting speed has increased by 30%+

(2). System Health Status Monitor

(a) Real-time monitoring of the operating status of the core components of the equipment, identify the risks in advance, and provide early warning reminders

(b) Automatic correction and continuous self-learning according to different working conditions to improve equipment stability and service life

*The data is from the laboratory of the user experience center of Haier Biomedical



Consistency from R&D to Commercial Scale

1. Flexible Formula Management

Tailor freeze-thaw profiles to product needs

Precisely control temperature curves to match the unique thermal sensitivity of various biologics—supporting both research and production environments

2. Consistent Results Across Batches

Locked-in processes ensure repeatability

Apply validated freeze-thaw programs to every batch to maintain stable product quality and meet GMP standards

3. Seamless Scale-Up from Lab to Manufacturing

Transfer R&D conditions directly to production

Freeze-thaw parameters developed at small scale (5L) can be replicated at 100L or 300L volumes without curve deviation

Standardised thickness and cooling design support linear scale-up for commercial output



The freezing and thawing process is traceable to ensure GMP compliance

Compliance with FDA 21CFR part 11 requirements
Possesses a complete GAMP5 validation system to ensure engineering compliance
Full traceability of the entire freezing and thawing process, with real-time temperature curve recording to ensure compliant use

Expert Process Support for Worry-Free Scale-Up

We provide professional freeze-thaw process development services to help users rapidly identify and optimise their ideal process parameters. From research and development to full-scale production, our technical team supports process exploration across all stages—ensuring smooth scale-up, reducing material consumption, and accelerating time to production. The result: shorter development cycles, lower costs, and more consistent, high-quality outcomes

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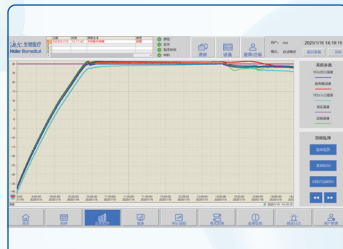


Designed for Everyday Use



Modular design

Break free from the constraints of site space



Data security

Even in the event of a temporary power outage



Flexibility

Compatible with various brands of freezing storage bags



Adjustable cantilevered platform

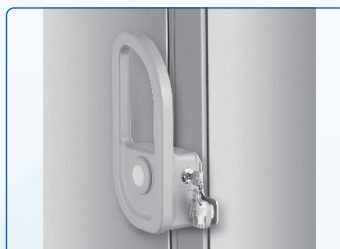
For comfortable, multi-angle operation



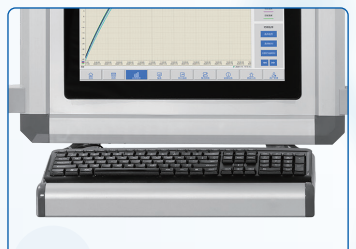
15-inch intelligent control large screen
sensitive touch control



Integrated Printer
For instant process documentation

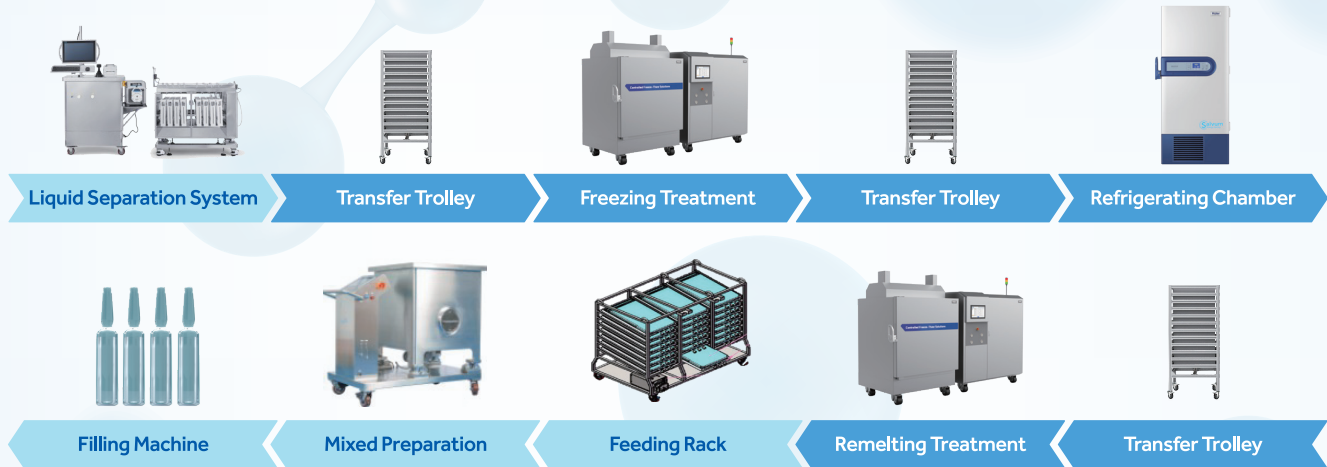


Ergonomic handle design
Smooth door operation



Waterproof keyboard
Convenient for cleaning

Integrated Workflow for Biologic Freeze-Thaw Processing



Why Choose Haier

Haier Biomedical, founded in 2005, was listed on the Sci-tech Innovation Board of the Shanghai Stock Exchange in 2019 (stock code: 688139). It is a digital scenario solution provider for life science and medical innovation based on the transformation of the Internet of Things. Aiming to create the best user experience, the company provides comprehensive digital scenario solutions represented by smart laboratories, in-hospital medication, smart public health, and smart blood use for life science users such as pharmaceutical companies, universities, and research institutions, as well as medical and health users such as hospitals, disease control centers, blood stations, and grass-roots public health.

Specifications

Model	HDR-80W300T	HDR-80W100T	HDR-80W200T	HDR-80W5T
Voltage (V/Hz)	380/50 3-PHASE	380/50 3-PHASE	380/50 3-PHASE	220/50
Case Size (L*W*H)(mm)	3100*1400*2300	2400*1900*2400	3100*1400*2300	800*1150*1700
Maximum Capacity (L)	300	100	200	≤5
Box Weight (approx.)(kg)	1700	/	/	300
Freeze-Thaw System	Contact Freeze-Thaw (Flat)			
Temperature Interval (°C)	-80~50			
Temperature Uniformity (°C)	±1			
Control Precision (°C)	±0.5			
Supported Bag Types	2D/3D single-use bags with hanger or tray support; ideal for cryogenic, cold chain, and bioprocess applications.			
Choose Accessories	Preventive Protection Mechanisms			
	Mixing Function			

*Haier Biomedical reserves the right to change products and specifications without prior notice.