

# PURPOSE-BUILT FOR BIOPROCESSING

## RAPID BULK AND SAMPLE COLD STORAGE

### PREPARATION IN HOURS INSTEAD OF DAYS OR WEEKS



FARRAR™ pioneered forced air convection cooling to answer the challenge of preserving biologic samples and materials. The Controlled Rate Chamber (model 4000-LC series) features a 12-inch HMI screen with graphical display of chamber and product temperature. The unit provides repeatable, precise, and rapid freezing and thawing of bulk materials and sample prior to cold storage.

Our Model 4000-LC series rate chamber, purpose-built for bioprocessing applications, helps to reduce freeze/thaw conditioning times, measured in hours, instead of days or weeks.

This precision controlled rapid freeze/thaw chamber helps protect product quality by enabling fast, uniform bulk freezing and thawing of protein or products in a variety of containers of various sizes, (bags, bottles, etc.) including single use system (SUS), polycarbonate vessels or polypropylene vessels.

Our high-performing Controlled Rate Chamber model 4002/05-LC, (air-cooled) or 4102/05-LC, (water-cooled) conducts rapid freeze/thaw for +40°C to -80°C temperature needs. FARRAR's refrigeration experts help customers plan their process and provide performance data to ensure requirements are met.

## KEY FEATURES

- Wide-range temperature capability for nearly any application (+40°C to -80°C)
- Air or water-cooled options available
- Uniform, repeatable results to help ensure quality control
- Cycle start/stop with +/-1°C product temperature tolerance
- Large HMI touchscreen for visual temperature display and profile programming
- Optional product probe for temperature monitoring
- Six customizable profiles via touchscreen for operator selection
- Sizable and powerful cooling capacity achieves steady state in 38min (empty chamber) and is capable of freezing 100L to -80°C in <12h

## BUILT FOR FREEZING

- 60 air exchanges per minute (1000 CFM) quickly and efficiently freezes or thaws samples
- Forced air circulation provides both rapid freezing to the desired temperature and even cooling throughout the container without false freeze points
- Temperature specific conditioning eliminates uncertainty and satisfies processing and shipping protocols for various drug products or substances
- Universal container acceptance for any application (carboys, single use bags, bottles or racks of vials)
- Configurable for all batches and sizes
- Solid phase conditioning assures maximum heat of fusion for greater energy storage and longest cooling capacity over time
- Flexible material handling solutions available for your process and containers

## CUSTOMER BENEFITS

- No set-up time required
- HMI touchscreen provides visual temperature profile progress with export capability
- Simple place and go setup of chamber and control/use one of three freeze/thaw profiles
- No in-process containers or shells required
- Adjustable shelves available to streamline processing
- Provides rapid, efficient, controlled rate freeze/thaw process
- Increases yield rates from 40-90% and reduces freeze/thaw conditioning to hours instead of days or weeks
- Ensures repeatable results

## APPLICATION AND ELECTRICAL REQUIREMENTS

Chamber Volume	23.3 Cu. Ft. (659.8 L)
Temperature Range	Programmable +40°C to -80°C
Electrical	(4002/4102) 208/240 VAC, 3 Phase, 60Hz, 26 FLA (4005/4105) 400 VAC, 3 Phase, 50Hz, 24FLA
Certification	CE International Models UL Field Listing Available
Ambient Operating Temperature	+18°C to +30°C
Air-cooled Condenser Requirements	+18°C to +30°C
Water-cooled Condenser Requirements	Tower Water 85°F (29.5°C), Max. Flow Rate 7gpm (26.5 l/min) Chilled Water 45°F (7.2°C), Max. Flow Rate 3.5 gpm (13.25 l/min)



## DIMENSIONS

Interior Dimensions	(W x D x H) 34" x 27.5" x 43" 863.6 x 698.5 x 1092.2 mm
Exterior Dimensions (W x D x H)	(W x D x H) 75" x 38" x 80" 1901.5 x 960.4 x 2028.8 mm
Net Weight	1,010 lbs. (459 Kg)
Shipping Weight	1,597 lbs. (726 Kg)

## REFRIGERATION SYSTEM

Heat Transfer	Convection, Air Flow Evaporator
High Stage	R-449A
Low Stage	R-508B
Defrost	Defrost- Manual Start/ Automatic Complete
Heat of Rejection/ Air-cooled	38,000 BTU/hr (11 Kw/hr)
Heat of Rejection/ Water-cooled	1,700 BTU/hr (0.5 Kw/hr)

## PERFORMANCE DATA

Pull Down Empty Chamber	< 38 minutes from +25°C to -80°C
100L Load +25°C to -80°C	< 12 Hours
Uniformity Air Temperature	+/- 2.0°C
Uniformity Product Temperature	+/- 1.0°C

## CONTROLLER

Controller	IDEC PLC with 12" Display and 4 outputs (General Alarm, Profile Running, Profile Complete, Door Open), 0-10VDC outputs for chamber probe and optional second probe
Sensor	RTD PT100 Din A
Dry Contacts	Standard (C, NO, NC)

## ORDERING INFORMATION

Model Number	Description	Voltage (Hz)	Amps (FLA) / Breaker
4002-LC	Controlled Rate Chamber, Air-Cooled	208/240VAC - 3 Phase - 60 Hz	26 FLA / 40A
4102-LC	Controlled Rate Chamber, Water-Cooled	208/240VAC - 3 Phase - 60 Hz	26 FLA / 40A
4005-LC	Controlled Rate Chamber, Air-Cooled	400VAC - 3 Phase - 50 Hz	24 FLA / 30A
4105-LC	Controlled Rate Chamber, Water-Cooled	400VAC - 3 Phase - 50 Hz	24 FLA / 30A

## ADDITIONAL SERVICES/OPTIONS

- Validation IQ/OQ/PQ
- Material Handling and Placement Solutions
- Temperature Mapping Studies
- Custom Programming and Testing

