

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 < 1 hour (empty chamber) and is capable of freezing 100L to -80°C in < 12h

BUILT FOR FREEZING

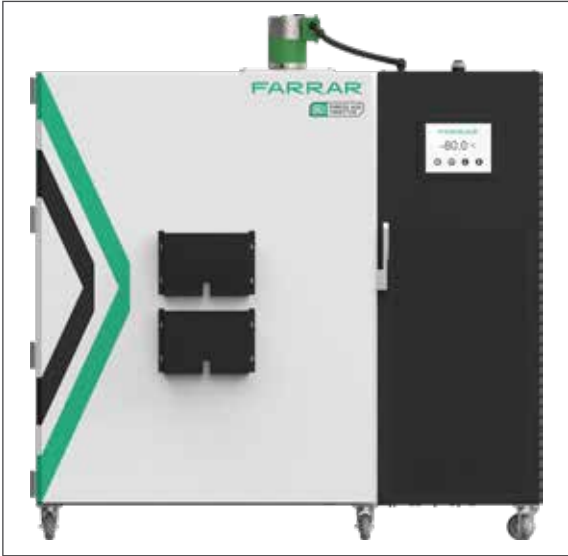
- 60 air exchanges per minute (1000 CFM) quickly and efficiently freezes or thaws samples
- Forced air circulation provides both rapid freezing to the desired temperature and even cooling throughout the container without false freeze points
- Temperature specific conditioning eliminates uncertainty and 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 | < 1 hour 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



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