PURPOSE-BUILT FOR BIOPROCESSING

Rapid bulk and sample cold storage preparation in hours instead of days or weeks

Farrar Scientific pioneered forced air convection cooling to answer the challenge of preserving biologic samples and materials. The Controlled Rate Chamber (model 4000 series) provides repeatable, precise, and rapid freezing and thawing of bulk materials and sample prior to cold storage.

Our Model 4000 series rate chamber, purpose-built for bioprocessing applications, greatly reduces 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, (air-cooled) or 4102/05, (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
- 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
- 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
- Enables fast, uniform freeze/thaw of bulk protein or products
- 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)

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

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)

Controller

Controller	Watlow PID/Standard (NO, NC, C) with 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	Controlled Rate Chamber, Air-Cooled	208/240VAC - 3 Phase - 60 Hz	26 FLA / 40A
4102	Controlled Rate Chamber, Water-Cooled	208/240VAC - 3 Phase - 60 Hz	26 FLA / 40A
4005	Controlled Rate Chamber, Air-Cooled	400VAC - 3 Phase - 50 Hz	24 FLA / 30A
4105	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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