

# -150°C CRYOGENIC FREEZER

CRYOPRESERVATION FOR LONG-TERM SAMPLE STORAGE AT -150°C

MORE CONVENIENT AND SAFER THAN USING LIQUID NITROGEN



**kaltis**<sup>®</sup>  
The future has a name

Samples stored at  $-150^{\circ}\text{C}$  in an ultra-low temperature freezer can be semi-permanently preserved. This is because freezing damage due to ice crystal formation in the cells is prevented. Vitrification is maintained without additional crystallization, ensuring cell viability over long storage periods.

## Advantages

- Proven, dual cascade, CFC/HCFC-free refrigeration system ensures rapid pull down and internal temperature stability at  $-150^{\circ}\text{C}$ .
- Excellent top to bottom temperature uniformity.
- Efficient usage of storage space. Storage for up to 9000 samples.
- Easy access to samples.
- Lower operating costs than LN<sub>2</sub>.
- Low profile chest cabinet with Stainless Steel interior and independent sub-lids.

## Applications

- |  |  |
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| <ul style="list-style-type: none"><li>· Blood Banks: HLA, Red Cells</li><li>· Bone Marrow Preservation: Skin, Bone, Heart Valves, Corneas, Musculoskeletal Tissues</li><li>· Cancer Research: Tumor Cells</li><li>· Genetic Engineering – Cultures</li><li>· HLA: (Lymphocytes) Organ Transplant</li><li>· IVF: Embryo / Sperm storage</li></ul> | <ul style="list-style-type: none"><li>· Microbiology: Viruses, Bacteria, Cell Culture</li><li>· Monoclonal Antibody Preservation</li><li>· Repositories: Cell Cultures</li><li>· Preservation of Sperm &amp; Fertilized Ova</li><li>· Plant Cell Preservation</li><li>· Pharmaceutical: Cultures</li></ul> |
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## Operating Temperature

- Range:  $-100^{\circ}\text{C}$  to  $-150^{\circ}\text{C}$

## Refrigeration System

- Air cooled refrigeration system designed to maintain the set temperature in elevated ambient temperature environments.
- Asclepius™ dual cascade refrigeration system, with two, air-cooled compressors.
- CFC/HCFC-free refrigerants.
- Extra large condenser with two aerodynamic axial fans for increased air flow and heat expulsion.
- Down flow evaporator for efficient refrigerant flow, oil return, and longer compressor life.
- Washable condenser filter keeps fins dust-free, ensuring optimal cooling efficiency.
- Built-in, self activating LN<sub>2</sub> Backup System guaranteeing the internal temperature in the event of a power failure.

## Control System

- Minerva™ Microprocessor controller with key pad & multi-functional display.
- Password protected.
- Independent operating temperature and high/low alarm settings.
- Temperature adjustable between  $-100^{\circ}\text{C}$  and  $-150^{\circ}\text{C}$  in  $1^{\circ}\text{C}$  increments.

## Alarm System

- Intelligent self-diagnostic system monitors system parameters and displays alarm status in real time.
- Audible & visual alarms for: Temperature changes, Power failure & Low backup battery voltage
- The backup battery provides automatic, continuous full system functionality during a power failure.
- Remote alarm contacts for complete protection.
- Automatic temperature fluctuation recognition and logging.
- Touch pad alarm test functions for testing the alarm system without opening the freezer lid.

## Electrical System

- Automatic voltage compensation.
- Built-in surge suppressor.
- Solid state relays. No moving parts in compressor drive circuit.
- Circuit breaker to protect the compressor and power supply circuits.
- Built-in automatic restart delay. Ensures on line quality, decreasing power load and protecting the compressor.

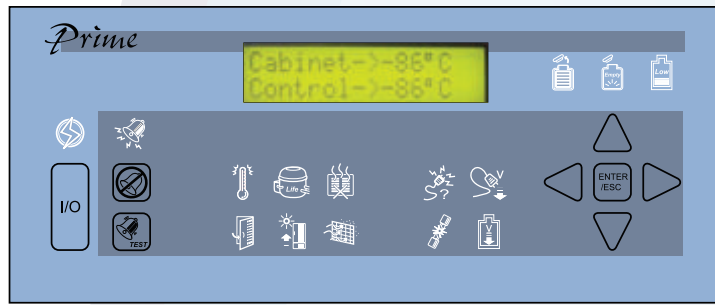
## Monitoring System

- Voltage compensation indicator. Automatically monitors and adjusts incoming voltage & compensates for voltage spikes.
- Low battery indicator. Flashing indicator when battery needs replacement.
- Surge suppressor indicator monitors circuit breaker.
- Compressor monitoring protects and automatically adjusts freezer temperature, guaranteeing internal temperature stability & extending compressor life.
- Built-in an RS485 data port. Allows monitoring of all freezer functions (requires optional DAQ Gateway).
- Real time clock.
- Alarm history: Records alarm time and highest temperature.
- Built-in Digital Temperature Recorder

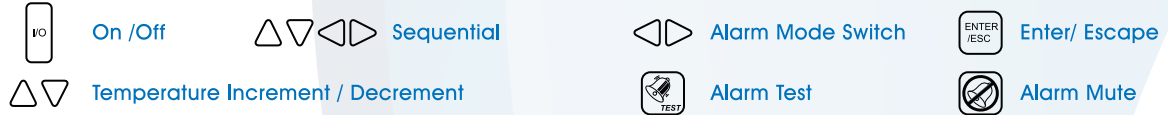
## Cabinet

- Closed cell, specially formulated CFC/HCFC-free urethane insulation.
- Heavy-gauge steel cabinet with high-impact powder coated exterior finish.
- Stainless steel interior with rounded corners for easy cleaning.
- Access port, with cap.
- Dual wheel, heavy-duty swivel castors.
- Low profile design for easier sample access.
- Heavy-duty counter-balanced lid with integrated key lock for security.
- Double seal gaskets with hot gas halo to minimize frost build-up.
- Integrated key lock for added security.
- Independent sub-lids for added internal temperature protection.

## Prime Series Microprocessor controller.



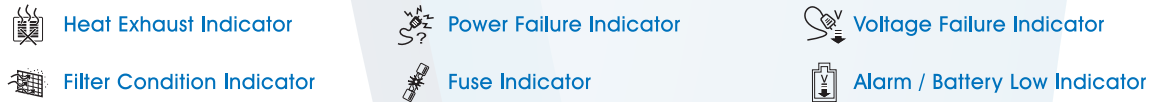
### Control Keys



### Indicators



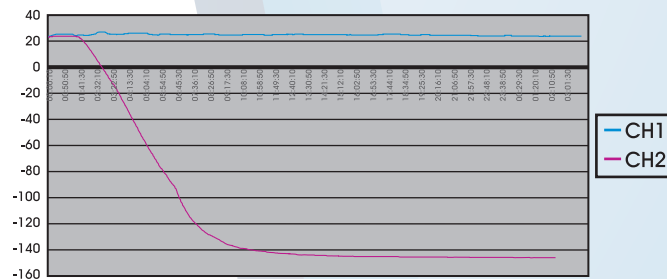
### Heat Exhaust Indicator



### Backup system



## Performance Data



## Specifications

	AC013P	DC013P
Power requirements	220~240V 50 Hz	208~230V 60Hz
External dimensions (cm)	W93 x D85 x H99.5	
Internal dimensions (cm)	W50 x D45 x H58	
Net weight (Kg)	250 Kgs	
Capacity (Liters/Cu.ft)	130/4.6	
Exterior cabinet	Powder coated galvanized steel	
Interior cabinet	Stainless Steel	
Temperature	Settable in 1°C increments between -100°C~-150°C	
Controller	Minerva™ Microprocessor controller	
Temperature display	Digital	
Sensor	RTD PT100	
Status function	Audio & Visual indication	
Compressor	Hermetic Type, First & Second cascade	
Refrigerant	CFC/HCFC Free	

## POWER CONSUMPTION / HEAT GENERATION

220V~240V/ 50H

Ambient	Model	Heat Generated W 30°C to -150°C	Heat Generated W/Hr -150°C	Power Consumption W 30°C to -150°C	Power Consumption W/Hr -150°C	Power Consumption KW/Month -150°C
30°C	AC013P	55680	2800	32750	2002	1441440
25°C	AC013P	46400	2600	2600	1860	1339200

## Inventory System and Accessories

### Inventory System

Model No.	Freezer Capacity		Description (Sample Access)	
	Liters	ft <sup>3</sup>	Side	
R2-101-S	130	4.6	2"	9 racks (90 boxes)
R3-71-S			3"	9 racks (63 boxes)

#### DAQ Gateway

For remote monitoring, control, and data logging of freezer operation data, including

- Display of freezer temperature, time, and event history.
- Numeric and graphic temperature display.
- Setting of operating parameters.
- Data export (.txt file).
- Adjustment of data log time

#### Validation

Kaltis® offers IQ, OQ and PQ validations.

#### Temperature Probes

Additional temperature sensors can be fitted to the alarm system. These are factory installed and must be specified with the order. An additional temperature display is required for each temperature probe to monitor the internal cabinet temperature.

#### Chart Temperature Recorder

Inkless, 6" (15.2cm) circular chart, 7-day temperature recorder utilizing pressure sensitive chart paper. 1 box of 50 charts included.

#### Remote Phone Alarm (RPA)

- Multiple freezers can be connected. Telephone notification of high/low alarm and power failure events.
- Built-in backup battery: Will dial a phone number on power failure.
- Set by normal key pad phone: Will dial up to 5 numbers.



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