GLACIER

POLAR EDITION -86°C ULTRALOW FREEZER

MODEL NU-9728 -86°C ULTRALOW TEMPERATURE FREEZERS

NuAire, Inc. | 2100 Fernbrook Lane | Plymouth, MN 55447 | U.S.A. | 763.553.1270 | WWW.NUAIRE.COM

NuAire Glacier "Polar Edition" -86°C Ultra-low Temperature Freezer

NuAire Glacier "Polar Edition" -86°C Ultra-low Temperature Freezers are developed for reliable storage conditions of research samples for laboratories, hospitals, repositories and more. A manufacturing focus on the refrigeration system, controls, alarms/monitoring, ergonomics, construction, and energy efficiency makes the Polar Edition ideal for the long term storage of cancer cells, stem cells, cord blood, T-cells, organ/tissue, and other samples.

Performance

- **Temperature Uniformity** – Reliable and safe conditions with a ±5°C variance at 80°C. Your research is in good hands with NuAire.
- **Temperature Recovery** – Polar Edition Glacier Freezer has a 30% faster temperature pull down rate than other freezers on the market. This means temperature set point returns to normal quicker with the Polar Edition after door openings.
- **Low Noise Operation** – The combination of energy efficiency compressors and a properly designed refrigeration system, Glacier operates at 47 dba noise level.

Features

Standard Features

- CFC-free foam insulation 127 mm [5 Inches]
- Access port
- Heavy-gauge steel cabinet
- Heavy-duty swivel casters
- Claw-like inner door latches
- Key lock
- Two [2] air insulated inner doors
- Four [4] compartments
- Four [4] shelves – Three [3] adjustable
- Multi-point gasket seals
- Eye-level controls
- Four [4] year parts only warranty (International)
- Two [2] year parts and labor warranty (U.S. and Canada)

Optional Features

- Cobex® temperature recorder
- CO_2 back-up system [NU-UB2]
- Painted steel interior
- Surge suppressor
- Cryo gloves
- Floor anchor system
- Inventory system

Electrical Requirements

- 115V 60 Hz

Temperature Control System

- Microprocessor control system
- Digital temperature display
- Set point security system

Refrigeration System

- Air-cooled cascade refrigeration system
- Two [2] air-cooled compressors
- Temperature range -50°C to -86°C
- 100% HFC and CFC-free refrigerants
- Efficient down feed evaporator
- High capacity air-cooled condenser

Alarm Systems

- Microprocessor alarm
- Battery back-up
- Remote alarm contacts

Specifications

Model	Interior Volume	Area Footprint (Nominal)	Dimensions (Exterior W x D x H)	Dimensions (Interior W x D x H)	Net Weight	Electrical
NU-9728GA	**25.7 ft³ (728 L)**	**9.51 ft2 (0.88 m²)**	**39.8* x 34.4** x 78.3 in. (1010 x 870 x 1990 mm)**	**34.2 x 23.6 x 55.1 in. (870 x 600 x 1400 mm)**	**820 lbs (373 kg)**	**115 Vac, AC, 20 amp.**

* add additional 2.6" (66 mm) for Door Hinges and Latch
** add additional 2.5" (64 mm) for electrical box

Maximum Capacity

Fiberboard Boxes, 2" high (2ml) in Racks	Sample Vials, 2ml (2" box), 100-Cell Dividers	Fiberboard Boxes, 3" high (4ml) in Racks	Sample Vials, 4ml (3" box), 100-Cell Dividers	Standard Microplate with Foil Tape, in Racks	Standard Microplate with Cover Lid, in Racks
576	**57,600**	**384**	**38,400**	**3,456**	**2,596**

Alarms

Alarm Type	Event	Visual Alarm	Audible Alarm	Signal to Alarm Contact
Status Alert	Abnormal ambient (too high or too low), or abnormal freezer loading (too much warm product at once)	Flashing STATUS Indication Light	None	None
High Temperature	Interior chamber warms beyond high temp setpoint	Flashing ALARM Indication Light; LED Display Flashes Actual Chamber Temp.	Periodic Beep. 15 minute delay after set point avoids event.	Yes
Low Temperature	Interior chamber warms beyond low temp setpoint			Yes
Power Failure	Loss of Power		Periodic Beep	Yes
System Monitoring Failure	Sensor Abnormality	Error Code	Solid Beep	No
Status Alert	Freezer Running Under Stress Low Voltage High Ambient Temperature	Lamp Illuminated	None	No
Auto Return	Touch key is not pressed for 90 seconds	None		No
Door Alarm	Door Ajar	OPEN lamp on	Solid Beep	Yes

All models are designed to meet CE and SGS USTC criteria for safety and performance.

Product Features

[1] Easy-In/Easy-Out door latch for one-handed operation, positive seal against gasket. Padlock provision standard.

[2] Universal keyed door lock offers added security.

[3] Integrated, microprocessor-based control system and LED display includes comprehensive setpoint, alarm, monitoring, diagnostic and communications functions (details on next page).

[4] Circular-chart temperature recorder (optional) mounts easily in pre-engineered mounting space. *

[5] Insulated and gasketed inner doors seal inside to offer additional protection and improve uniformity. Inner door latches are standard. Doors can be easily removed for defrosting.

[6] Front access to washable, electrostatic condenser filter for routine condenser air filter cleaning.

[7] High impact, recessed casters and leveling feet.*

[8] New generation Cool Safe compressors are specifically designed for low temperature applications.*

[9] Multiple access ports permit insertion of independent probes, instrumentation, liquid N_2 or liquid CO_2 back-up injectors.*

[10] Commercially available HFC refrigerants are highly efficient, environmentally safe and non-ozone depleting.*

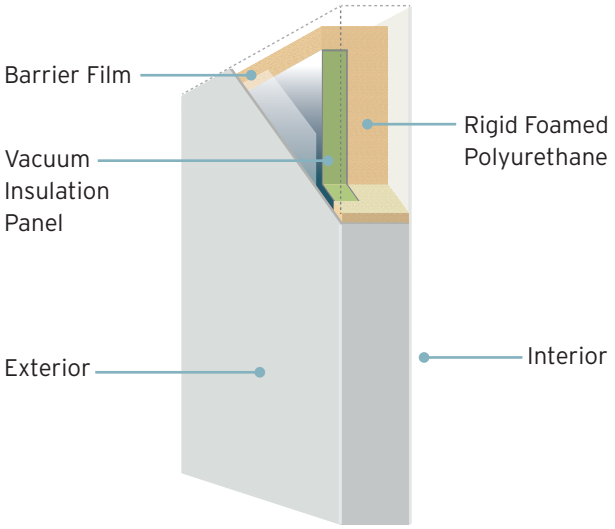
[11] Internal voltage and power management systems assure component protection over wide voltage ranges.*

[12] Remote alarm contacts, optional communication port available.

[13] Vacuum relief valve.

* not visible

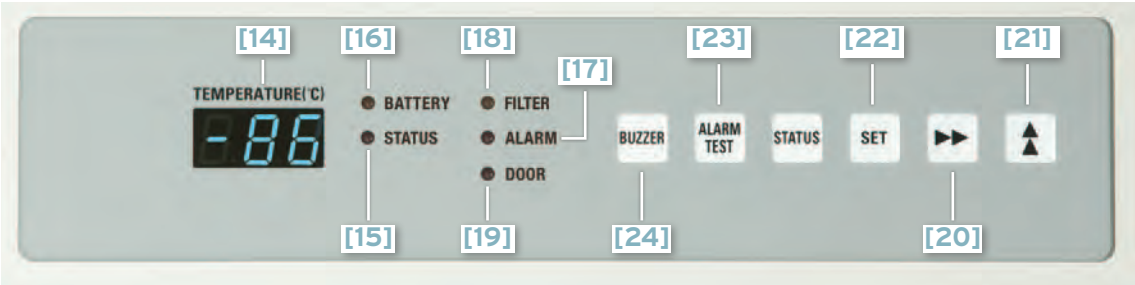
Vacuum Insulated Panels



High-efficiency Vacuum Insulation Panel thin-wall composite is a design that yields more interior storage volume within a conventional freezer footprint. Vacuum Insulation Panels minimize energy transfer to and from the ultra-low temperature interior. The composite construction, complete with reflective barrier film and structural closed-cell foam, is used on all walls and the outer door. This advanced insulation technology offers structural stability to eliminate distortion, and inhibits moisture accumulation that can lead to icing. Aggregate insulation efficiency minimizes compressor cycle run-time to lower energy costs.

Controls

The control panel is located at eye-level on the front of the main door. Freezer settings and functions can be monitored or changed from this centrally-located panel.



[14] Temperature - Digital display defaults to actual chamber temperature. Display mode changes when setpoint, alarm parameters, programming and diagnostic functions are performed.

[15] Status Light - Status alert function uses predictive intelligence to determine if freezer is operating within specifications under existing environmental conditions.

[16] Battery Light - Ni-MH battery powers control memory and alarm functions during power failure.

[17] Alarm Light - Alarm indicator lamp glows when freezer is in alarm condition; alarm ringback is factory set for 30 minutes, adjustable in 10 minute increments from 10 to 60 minutes.

[18] Filter Light - Filter indicator lamp glows when electrostatic filter requires removal for cleaning.

[19] Door Light - Door alarm indicator has 2 minute delay until audible alarm activates; delay time is adjustable.

[20] Right Arrow - Setpoint entry advances digital display to next position.

[21] Up Arrow - Setpoint entry advances digital to next value from 0 to 9.

[22 Set Button - Press to set temperature; set button is also used for other diagnostic functions.

[23] Alarm Test Button - Alarm test verifies readiness of alarm function and Ni-MH battery charge.

[24] Buzzer Button - Buzzer silence temporarily mutes alarm.

[25] Compressor start-up delay sequence delays re-start after building power failure; allows facility power to reach equilibrium to permit smooth compressor start-up.

Energy Saver Cascade Cooling System

One of the most important concepts in designing a superior energy saving ultra-low freezer is how efficiently heat is exchanged between the high and low stage circuits. By providing optimum heat exchange pathways in the design, it not only increases efficiency of the system, leading to greater energy savings, but it will also have an effect of reducing stress on the compressors, leading to greater overall system reliability.

The new cap tube heat exchanger is but the latest step in increasing the available heat exchange areas in the system. This patent pending innovation drastically increases the efficiency of the entire system. The end result is less energy consumption, while improving the overall efficiency of the freezer.

[A] Low Stage Capillary Tube
Liquid refrigerant under pressure is passed through the capillary tube where it evaporates in the low stage evaporator to absorb heat energy from the product stored in the freezer.

[B] Evaporator Coil
The evaporator coil is wrapped around the exterior shell to provide proper temperature uniformity within vacuum insulation panels and foamed-in-place urethane insulation.

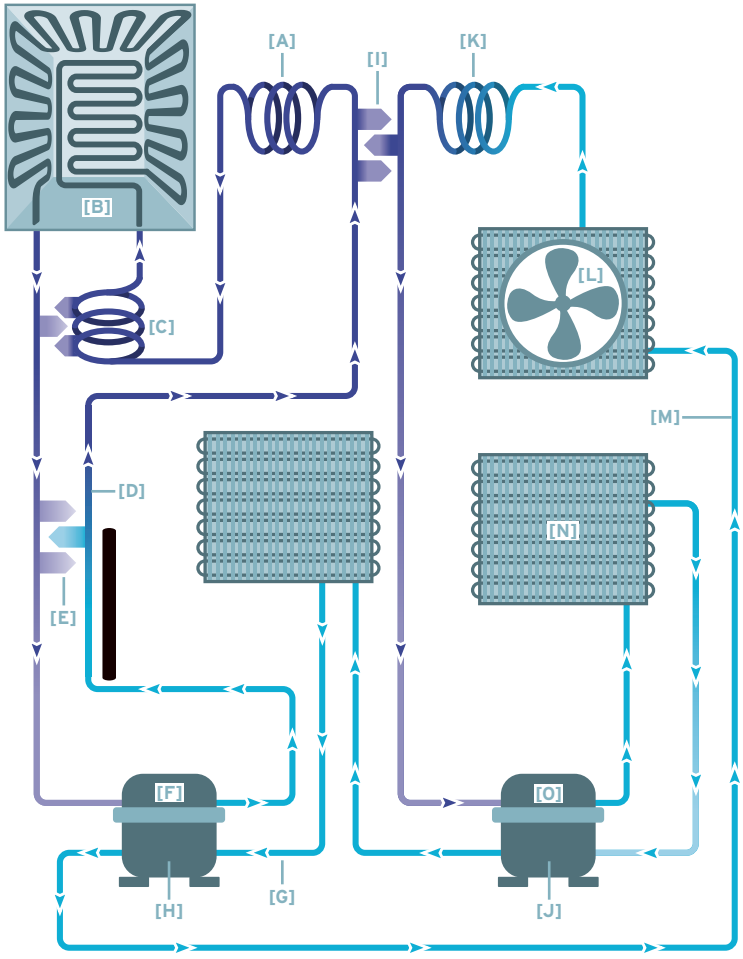
[C] Capillary Tube
Low stage capillary tube heat exchanger provides heat transfer between high and low temperature points offering better energy efficiency.

[D] Low Stage Refrigerant
Commonly available worldwide, R508.

[E] Low Stage Heat Exchanger
Heat is efficiently transferred from the low stage to the high stage.

[F] Low Stage Compressor
The compressor pumps refrigerant through the low stage circuit.

[G] Air Cooled Pre-Condenser
Removes heat energy from the high stage refrigerant en route to the low stage compressor.



[H] Low Stage Oil Heat Exchanger
High stage refrigerant passes through the low-stage oil pump to cool oil resulting in high-stage refrigerant being used to increase the durability of the low stage compressor.

[I] Interstage Heat Exchanger
To increase overall system efficiency heat energy is transferred to the high stage circuit.

High Stage Circuit

Low Stage Circuit

[J] High Stage Oil Heat Exchanger
High stage refrigerant passes through the high stage oil to cool lubricating oil en route to the low stage compressor through the air-cooled pre-condenser. Thereby increasing the reliability of the high stage compressor.

[K] High Stage Capillary Tube
Liquid refrigerant under pressure is passed through the capillary tube where it evaporates in the inter stage heat exchanger to absorb heat energy from the low stage refrigerant circuit.

[L] Main Condenser and Motor/Fan
An exclusive triple pass forced air condenser increases overall system efficiency by providing maximum surface area for heat rejection

[M] High Stage Refrigerant
Commonly available worldwide. Selected for optimum cooling performance in compliance with international environmental protection laws.

[N] Air Cooled Pre-Condenser
Removes heat energy from the high stage refrigerant en route to the high stage oil reservoir.

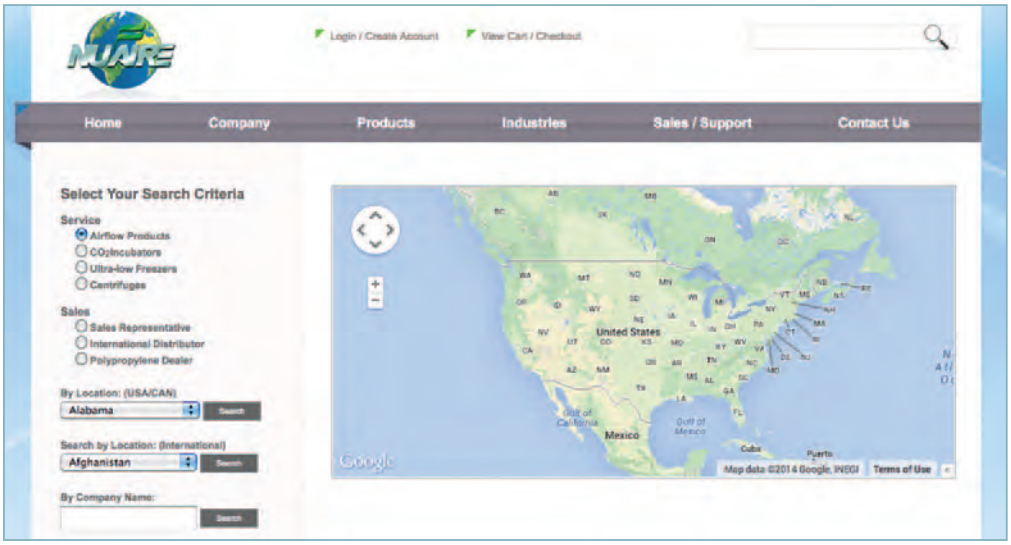
[O] High Stage Compressor
The compressor pumps refrigerant through the high stage circuit.

[P] Instrumentation (Not Shown)
Temperature and pressure sensors throughout the high and low stage circuits transmit information to the 'Status Alert' central controller for operation, monitoring, interpretation and component protection.

energy saver

Sales and Service Information

Please visit NuAire's Web site at: www.nuaire.com and select the "Sales/Service Locator" option from the "Sales / Support" menu. Information can be found there for both United States and international distributors.



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