Queue

Basic SI Series Upright Freezers

Installation and Operation Manual

Table of Contents

310655H03 Rev. A

Table of Contents

1 Introduction

SI Basic Series -86°C upright freezers feature the use of vacuum insulation technology to minimize wall thickness and provide extra storage space. Because of the thin wall construction, SI models can hold more inventory than conventional models that take up the same lab space.

Standard SI Series features include:

- High storage capacity — up to 15 inventory racks
- Separately mounted inner doors with adjustable hinges for each door
- A pressure equalization port to combat the vacuum created after door openings

2 Safety Precautions

In this manual and on labels attached to this product, the words WARNING and CAUTION mean the following:

- WARNING: a potentially hazardous situation which, if not avoided, could result in serious injury or death.
- CAUTION: a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or damage to the equipment.

Before installing, using or maintaining this product, please be sure to read this manual and product warning labels carefully. Failure to follow these instructions may cause this product to malfunction, which could result in injury or damage.

Below are important safety precautions that apply to this product:

- Use this product only in the way described in the product literature and in this manual. Before using it, verify that this product is suitable for its intended use.
- Do not modify system components, especially the controller. Use OEM exact replacement equipment or parts. Before use, confirm that the product has not been altered in any way.
- Your unit must be properly grounded in conformity with national and local electrical codes. Never connect the unit to overloaded power sources.
- Disconnect the unit from all power sources before cleaning, troubleshooting, or performing other maintenance on the product or its controls.

3 Pre-Installation

3.1 Unpacking

At delivery, examine the exterior for physical damage while the carrier's representative is present. If exterior damage is present, carefully unpack and inspect the unit and all accessories for damage.

If there is no exterior damage, unpack and inspect the equipment within five days of delivery. If you find any damage, keep the packing materials and immediately report the damage to the carrier. **Do not return goods to Queue without written authorization.** ***When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment.***

4 General Recommendations

The SI Series refrigeration system is designed to maintain ultra-low temperatures with safety in a +32°C (90°F) ambient environment, **only** when the freezer is used for storage.

WARNING! This unit is not a "rapid-freeze" device. Freezing large quantities of liquid, or high-water content items, will temporarily increase the chamber temperature and will cause the compressors to operate for a prolonged time period. Attempting to utilize this freezer improperly may jeopardize safety or cause undue stress or damage to the refrigeration compressors.

Avoid opening the door for extended time periods since chamber temperature air will escape rapidly. Room air, which is higher in humidity, replacing chamber air may cause frost to develop in the chamber more rapidly.

4.1 Initial Loading

When loading the unit with "pre-frozen" materials, the operating temperature setpoint of the freezer should be set no lower than the temperature of the "pre-frozen" material. Allow the unit to operate at the setpoint for eight hours. The setpoint may then be lowered in increments no greater than 10°C. Allow a stabilizing period of eight hours for each ten degree adjustment, until the desired setpoint is achieved.

CAUTION! Failure to follow these procedures or overloading the unit may cause undue stress on the compressors or jeopardize user product safety.

5 Installation

Do not exceed the electrical and temperature ratings printed on the dataplate located on the lower left side of the unit.

CAUTION! Improper operation of the equipment could result in dangerous conditions. To preclude hazard and minimize risk, follow all instructions and operate within the design limits noted on the dataplate.

5.1 Location

Install the unit in a level area free from vibration with a minimum of six inches of space on the sides, rear, and top. Refer to Section 5.4 for further instructions on leveling cabinets. Allow enough clearance so that door or lid can swing open at least 90 degrees.

Do not position the equipment in direct sunlight or near heating diffusers, radiators, or other sources of heat. The ambient temperature range at the location must be 59 to 90°F (15 to 32°C).

CAUTION! To allow for proper air flow, a minimum of six inches of clearance space is required behind the freezer.

5.2 Wiring

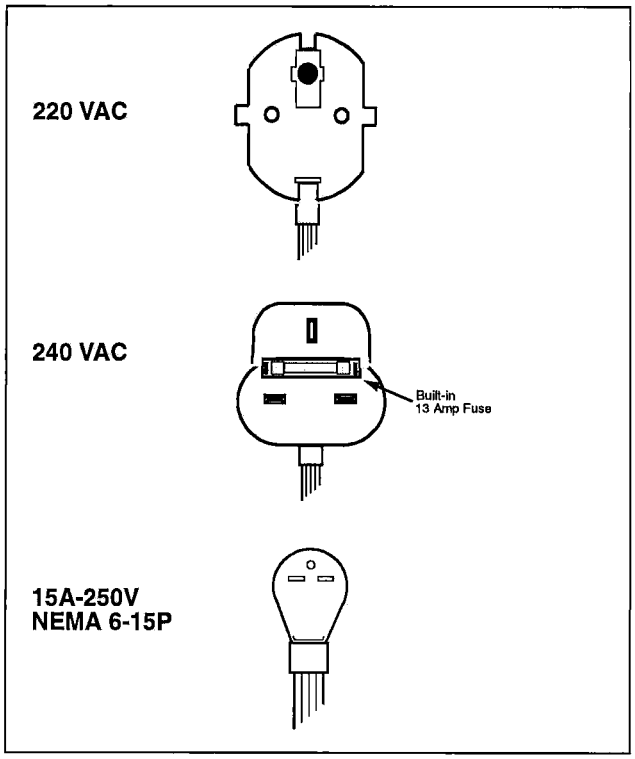
CAUTION! Connect the equipment to the correct power source. Incorrect voltage can result in severe damage to the equipment.

CAUTION! For personal safety and trouble-free operation, this unit must be properly grounded before it is used. Failure to ground the equipment may cause personal injury or damage to the equipment. Always conform to the National Electrical Code and local codes. Do not connect the unit to overloaded power lines.

Your freezer is equipped with a service cord and plug designed to connect it to a power outlet which delivers the correct voltage. The plug is one of the three types shown in Figure 1. Supply voltage must be within +10%, -5% of the freezer rated voltage.

Queue SI Series freezers are equipped with a standard built-in Voltage Safeguard circuit to detect and adjust low line voltage.

CAUTION! Never cut the grounding prong from the service cord plug. If the prong is removed, the warranty is invalidated.



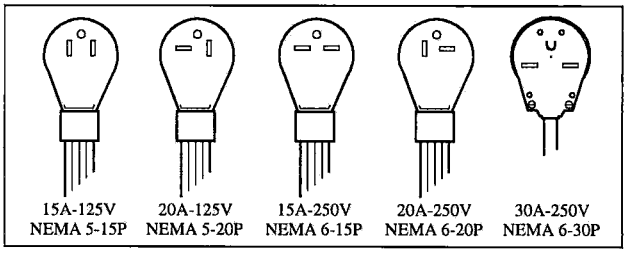


Figure 1. Plug Styles for SI Models

5.3 Superinsulated Cabinet Construction

In SI models, the cabinet walls have a vacuum insulation core encapsulated by a sealed film laminate and wrapped in Mylar.

CAUTION! Never drill holes in or near the cabinet walls. Drilling could damage the insulation and make the unit inoperable.

5.4 Leveling

Before operating the freezer, be sure that it is level both front to back and side to side.

SI models have adjustable leveling feet which are located adjacent to the front casters.

6 Pressure Equalization Port

When an upright ultra-low temperature freezer door is opened, room temperature air rushes into the storage compartment. When the door is closed, the fixed volume of air is cooled rapidly. Pressure drops below atmospheric pressure, resulting in a substantial vacuum. Re-entry into the cabinet is impossible until internal pressures are returned to atmospheric pressure. Without a pressure equalization mechanism, it can take several minutes before the door can easily be reopened.

SI Series models feature a port that provides vacuum relief within 30 seconds after door openings. To minimize warm air entry, the port automatically closes as soon as pressures are equalized.

The pressure equalization port is located in the bottom front center of the storage chamber. Although the port is designed to self-defrost, excessive frost accumulation in the bottom of the chamber could eventually restrict air flow. Therefore you should periodically inspect the port and brush away any loose frost using a stiff nylon brush.

WARNING! Because the defrost heater for the pressure equalization port operates continuously, the surfaces near the port can get hot if the unit is plugged in but the freezer is not in use. You can avoid this by unplugging the freezer when it is not being used for cold storage.

WARNING! Always wear proper gloves to protect the skin when working inside ultra-low temperature freezers.

7 Operation

7.1 Control Panel Features

Before the initial start up, take some time to become familiar with the controls on your freezer. Figure 2 illustrates the Queue SI Upright Freezer control panel.

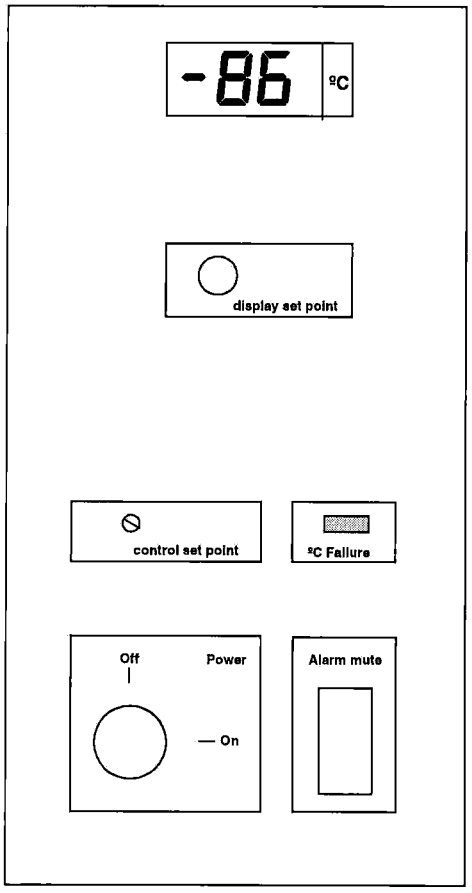


Figure 2. SI Control Panel

1. Keyed Power On/Alarm On switch.
2. LED digital temperature display.
3. Recessed temperature control setpoint adjustment.
4. Temperature setpoint adjust button.

7.2 Start Up

Refer to Figure 2 as you complete the following procedures.

7.2.1 Turning the Power On

To start up the freezers, complete the following steps:

1. Plug the freezer into the power outlet (refer to Section 5.2 on page 2).
2. Turn the key switch to the POWER ON position. The digital temperature display shows the cabinet temperature.

Note: *The alarm function is not active at this time.*

7.2.2 Setting the Cabinet Temperature

To set the cabinet temperature, complete the following steps:

1. Insert a small screwdriver into the slotted screw labeled Control Setpoint and simultaneously press and hold the Setpoint Display button. The temperature display changes to read the existing setpoint value.
2. Turn the setpoint screw (clockwise for a colder setting and counterclockwise for a warmer setting) until the desired setpoint shows in the digital temperature display.
3. Release the Setpoint Display button. The digital temperature display returns to the cabinet temperature.

7.2.3 Alarm

The alarm is operated by the freezer electronic control system. The alarm is preset at the factory with a cold setpoint:

- For units designed to operate at -75°C and -85°C, the alarm setpoint is approximately 90% of the freezer temperature setpoint. For example, if the freezer setpoint is -80°C, the alarm setpoint is -72°C.
- For units designed to operate at -50°C and warmer, the alarm setpoint is 80% of the freezer temperature setpoint. For example, if the freezer setpoint is -45°C, the alarm setpoint is -36°C.

To activate the alarm, wait until the freezer reaches operating temperature and turn the key switch to the ALARM ON position.

WARNING! You must turn the three-position key switch to the ALARM ON position to activate the alarm and place it in operation.

8 Maintenance and Troubleshooting

WARNING! Unauthorized repair of your Queue freezer will invalidate your warranty. Contact Queue Technical Service at 1-800-438-4851 for additional information.

CAUTION! Maintenance should only be performed by trained personnel.

8.1 Condenser Maintenance

8.1.1 Cleaning the Condenser

Clean the condenser at least every six months; more often if the laboratory area is extremely dust prone.

To clean the condenser, complete the following steps:

1. Pull the grill open.
2. Remove the filter. Check the fans. If a fan is not operating, contact a Queue Authorized Service Company immediately.
3. Vacuum the condenser.
4. Replace the filter and close the grill.

8.1.2 Cleaning the Condenser Filter

Clean the condenser filter every two or three months.

1. Pull the grill open.
2. Remove the filter.
3. Shake the filter to remove loose dust, rinse the filter in clean water, shake the excess water from the filter, and replace the filter.
4. Close the grill.

Note: *Countertop models do not have filters.*

8.2 Gasket Maintenance

Periodically check the gaskets around the door or lid for punctures or tears. Leaks are indicated by a streak of frost which forms at the point of gasket failure. Make sure that the cabinet is level (refer to Section 5.4 on page 2 for leveling information).

Keep the lid and door gaskets clean and frost free by wiping gently with a soft cloth.

8.3 Defrost Procedures

To defrost the equipment, complete the following steps:

1. Remove all products and place in another cabinet.
2. Turn off the unit and allow the interior to warm to room temperature.
3. Dispose of the ice and wipe out any water standing in the bottom of the cabinet.

If there is freezer odor, wash the interior with a solution of baking soda and warm water. Clean the exterior with any common household cleaning wax.

8.4 Alarm Battery Maintenance

Have a technician check the condition of the alarm battery at least once a year.

To replace the alarm battery, complete the following steps:

1. Remove the front grill. The alarm battery is located directly behind the grill. The terminals are the "push on" type.
2. Grasp the terminal with pliers and work it gently back and forth while pulling it off. The fittings are tight.
3. Remove the battery and put the new battery in place.

Note: *You may have to cut a strip of silicone rubber in order to remove the battery.*

4. Connect the battery terminals and replace the front grill.

9 Chart Recorders

Panel-mounted six-inch seven-day recorders are available as options for all freezer models.

9.1 Set Up and Operation

To prepare the recorder to function properly, complete the following steps:

1. Open the recorder door to access the recorder.
2. Connect the nine volt DC battery located at the recorder's upper right corner. This battery provides backup power.
3. Install clean chart paper (refer to Section 9.3 below).
4. Remove the plastic cap from the pen stylus and close the recorder door.

Recorder operation begins when the system is powered on.The recorder may not respond until the system reaches temperatures within the recorder's range.

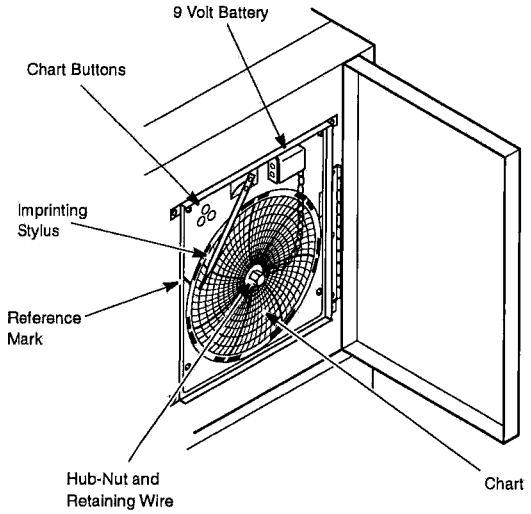


Figure 3. Chart Recorder

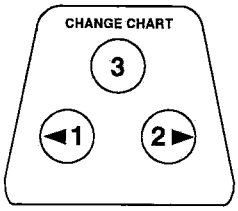


Figure 4. Chart Buttons

9.2 Power Supply

The recorder normally uses AC power when the system is operating. If AC power fails, the LED indicator flashes to alert you to a power failure. The recorder continues sensing cabinet temperature and the chart continues turning for approximately 24 hours with back-up power provided by the nine-volt battery.

The LED indicator glows continuously when main power is functioning and the battery is charged.

When the battery is low, the LED flashes to indicate that the battery needs to be changed.

9.3 Changing Chart Paper

To change the chart paper, complete the following steps:

1. Locate the pressure sensitive buttons at the front, upper left of the recorder panel.
2. Press and hold the Change Chart button (#3) for one second. The pen will move off the scale.
3. Unscrew the center nut, remove the old chart paper, and install new chart paper. Carefully align the day and time with the reference mark (a small groove on the left side of the recorder panel).
4. Replace the center nut and hand tighten. Press the Change Chart button again to resume temperature recording.

9.4 Calibration Adjustment

This recorder has been accurately calibrated at the factory and retains calibration even during power interruptions. If required, however, adjustments can be made as follows:

1. Run the unit continuously at the control setpoint temperature. Continue steady operation for at least two hours to provide adequate time for recorder response.
2. Measure cabinet center temperature with a calibrated temperature monitor.
3. Compare the recorder temperature to the measured cabinet temperature. If necessary, adjust recorder by pressing the left (#1) and right (#2) chart buttons.

Note: *The stylus does not begin to move until the button is held for five seconds.*

10 Optional Equipment

In addition to the optional chart recorder, the following equipment is available for some freezer models. Refer to the Accessories for more information on these and other options, including inventory racks and storage boxes.

For additional information, contact your Queue dealer or Queue Customer sales at 1-800-252-7100.

10.1 Voltage Safeguard

This fully automatic device monitors the supply voltage and increases voltage if necessary so the freezer always operates within the factory recommended limits.

> **CAUTION!** The Voltage Safeguard unit does not allow you to operate a 115 volt product on 230 volts or vice versa. It is designed to provide 5 to 15% voltage correction, depending on the freezer model.

10.2 Remote Alarm

The remote alarm terminals on the back of the freezer are connected to freezer internal dry contacts. You can connect a remote alarm package with a separate 24 volt power supply.

11 Accessories

Note: *For accessories and options not described herein, or for special modifications, contact Queue.*

Inventory Component Description, Ultra-Low Temperature Freezers

Description	Catalog No.
For All Models	
Fiberboard boxes and grid dividers are packaged in lots of one dozen	
Fiberboard box, 5-1/4 in. square x 2 in. high, one dozen.	5954
Fiberboard box, 5-1/4 in. square x 3 in. high, one dozen.	5956
Grid divider, fiberboard, 100 cell, 7/16 in., holds 100 12 mm vials, one dozen.	5958
Grid divider, fiberboard, 49 cell, 5/8 in., holds 49 16 mm vials, one dozen.	5959
Grid divider, fiberboard, 64 cell, 9/16 in., holds 64 14 mm vials, one dozen.	5960
Grid divider, fiberboard, 81 cell, 1/2 in., holds 81 13 mm vials, one dozen.	6212
Adjustable single stack, holds (16) 2 in. or (12) 3 in. boxes.	6112-1
Solid stainless steel shelf:	6670

Temperature Recorders

All six inch recorders utilize pressure-sensitive chart paper (1 box @ 50 charts included); no inking is required.

Description	Catalog No.
Temperature recorder, 6 in. circular chart, seven-day drive, panel mounted. Factory installed.	6183
Temperature recorder, 6 in. circular chart, seven-day drive, free-standing, Customer installed.	6383

Chart Paper

Description	Catalog No.
Chart paper, package of 50, for 6 in., seven-day recorder, -115°C to +50°C.	6185

Surge Suppressor

Description	Catalog No.
Surge Suppressor, free standing.	6185

Alarm Systems

Remote Alarm/Monitoring

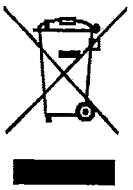
Description	Catalog No.
Deluxe Electronic Remote Alarm System. User programmable to sound alarm in the event of temperature rise or power failure. Can dial up to four telephone numbers to advise of alarm condition across any telephone system which accepts pulse dialing. One system can monitor up to four individual freezers or up to three groups of freezers. Contact Queue for detailed specifications.	6224

WEEE Compliance

Great Britain

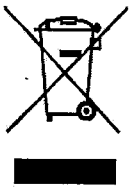
WEEE Compliance. This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96EC. It is marked with the following symbol. Thermo Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Scientific's compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at **www.thermo.com/WEEERoHS**

Deutschland



WEEE Konformittät. Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96EC erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet. Thermo Scientific hat Vereinbarungen getroffen mit Verwertungs-/Entsorgungsanlagen in allen EU-Mitgliederstaaten und dieses Produkt muss durch diese Firmen widerverwetet oder entsorgt werden. Mehr Informationen über die Einhaltung dieser Anweisungen durch Thermo Scientific, die Verwerter und Hinweise die Ihnen nützlich sein können, die Thermo Scientific Produkte zu identizfizieren, die unter diese RoHS Anweisung fallen, finden Sie unter **www.thermo.com/WEEERoHS**

Italia



Conformità WEEE. Questo prodotto deve rispondere alla direttiva dell'Unione Europea 2002/96EC in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). È marcato col seguente simbolo. Thermo Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Scientific con queste Direttive, l'elenco delle ditte di riciclaggio nel Vostro paese e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili sul sito **www.thermo.com/WEEERoHS**

France

Conformité WEEE. Ce produit doit être conforme à la directive européenne (2002/96EC) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est merqué par le symbole suivant. Thermo Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles-ci. Davantage d'informations sur la conformité de Thermo Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Scientific qui peuvent aider le détection des substances sujettes à la directive RoHS sont disponibles sur **www.thermo.com/WEEERoHS**

Important

For your future reference and when contacting the factory, please have the following information readily available:

Model Number: _____

Serial Number: _____

Date Purchased: _____

The above information can be found on the dataplate attached to the equipment. If available, please provide the date purchased, the source of purchase (Queue or specific agent/rep organization), and purchase order number.

IF YOU NEED ASSISTANCE:

SALES DIVISION

Phone:	828/658-2711 800/252-7100
FAX:	828/645-3368

LABORATORY PARTS and SERVICE

Phone:	800/438-4851
FAX:	828/658-2576

TECHNICAL SUPPORT

Phone:	800/438-4851

275 Aiken Road
Asheville, NC 28804
U.S.A.