Refrigeration Freezers

Link to SERVICE/REPAIR INFO
## Refrigeration: Service and Emergency Outage Plan

### For all Refrigerators or Freezers except the Cold Room:

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ace Lab Systems</td>
<td>1550 S. Kingshighway, St. Louis, MO 63110</td>
<td>(314) 771-7272</td>
<td>(314) 771-6956</td>
<td><a href="mailto:tammyc@AceLabSystems.com">tammyc@AceLabSystems.com</a></td>
</tr>
<tr>
<td>Dry ICE</td>
<td>Continental Carbonic, 8535 Scudder Rd (near Airport/Kinlock)</td>
<td>314-524-5888</td>
<td>314-568-2538</td>
<td><a href="mailto:henry@diruscioassociates.com">henry@diruscioassociates.com</a></td>
</tr>
<tr>
<td>Arctic Ice Inc</td>
<td>1498 Kinark Drive, (&lt; 1 mile from BRDG)</td>
<td>(314) 989-9090</td>
<td>8-5pm, Emerg till 9pm</td>
<td>arctic-icestl.com</td>
</tr>
</tbody>
</table>

### Cold Room:

- Items labeled with “HIGH PRIORITY” must be maintained at or near this temperature. They should be transported to the FV -80 with dry ice ASAP.
- Do not move any items to Liquid Nitrogen.

### -80 Freezer:

Certain items labeled with “HIGH PRIORITY” must be maintained at or near this temperature. They should be transported to the FV -80 with dry ice ASAP.

### -20 Freezer:

If another -20 is operating (CRO-20, R124 Lab -20, R127 Lab -20, Depot -20), move items labeled “HIGH PRIORITY” to that location. When that space is used, take items to FV -20 freezer using dry ice.

### Cold Room:

Move “HIGH PRIORITY” items to other local refrigerators (CRO Refrigerator, Office, Low Temp Incubator) or incubators. If outage is extensive, move remaining items to FV Cold room with dry ice.

### Gases:

- Airgas Mid America (Rowena)
  - Phone: (314) 533-3100
  - Fax: (314) 533-0901
  - Emerg: (314) 966-7313
  - Address: 3500 Bernard Street, St. Louis, MO 63103
  - Website: [www.airgas.com](http://www.airgas.com)
Refrigeration: Dry Ice Supplier, Continental Carbonic

Continental Carbonic
Hank Hedges
314-524-5888
Used by BS Jul 2013
hhedges@continentalcarbonic.com

I-70 @North of Airport
Refrigeration: Dry Ice Supplier, Artic Ice, Overland
Lab Systems: Freezer Alarm Control Panel Wall Layout

Twisted pair Sensor Lines to:
- Cold Room sensor across hallway
- Minus 20 freezer in Instrumentation rm

New: Analog Phone Line Ceiling drop connected to IT/Phone closet

TIP #MITREC004
VM500-5 Alarm Dialer
Made by Omegaphone
Omega.com
Model: OMA-VM505

12” x 12” Alarm Control Box mounted behind -80

-80 Freezer

Incubator

-20 Freezer
Connections for 1-8 RTD sensors
2 per

Connections for 1-2 Door open sensors

Ext alarm relay

Power Adapter line to 110V

Lab Systems: Freezer Alarm; Control Panel

TIP Temp Pro d: #MITREC004 VM500-5 Alarm Dialer
Made by Omegaphone
Omega.com
Model: OMA-VM505

Notes:
1) Requires ANALOG phone line, not digital.
2) Programmable by voice message text prompts after dialing into the control panel (see user manual).
3) To access dial 314-513-4988, enter PIN 0000.

Analog Phone Line
Phone # 314-513-4988
Outside line: dial 8-then #
Added by ATT/ M. Petz 10/14/10
Analog line By Guarantee Elec 11/4/10
Moved to Shoretel: 3/31/11 by ATT (Ed)

Hotlink to TIP Temp catalog: Tip Phone: 800-847-8367

Link to Omega VM505-Alarm Dialer User Manual... pdf 25 pgs
Power Adapter line to 110V

Lab Systems: Freezer Alarm; Control Panel
Sensor Connections and Settings

1) -80; R126D, L=-90C, H=-60C

2) -20; R126D, L=-30C, H=-10C

3) Coldroom; R126A, L=0C, H=10C

4) -20 CRO; R126B, L=-30C, H=-10C

9) Door Sensor 1, Cryotank; R126C, Remote alarm triggered

10) Door Sensor 2, inactive Closed loop at present

Analog Phone Line
Phone number: 314-513-4988
Added by ATT/ M. Petz 10/14/10
Analog line By Guarantee Elec 11/4/10
Fix Dialtones: ATT 11/9/10
Implemented: 11/10/10 RGM.
Moved to ShoreTel and tested 3/31/11 RGM

Corrected sensor from -67 (output) to -77 (actual) on 6/7/11 RGM

Input “on/green”, Door Sensor enabled

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Temp</th>
<th>Temp</th>
<th>Temp</th>
<th>SNR # displayed</th>
<th>Temp</th>
<th>Temp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.</td>
<td>5.</td>
<td>6.</td>
<td># displayed</td>
<td>7.</td>
<td>8.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>6.</td>
<td>High on Sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3.</td>
<td>7.</td>
<td>Low on Sensor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.</td>
<td>8.</td>
<td>Time Sensor on Alarm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Implemented: 11/10/10 RGM.
Moved to ShoreTel and tested 3/31/11 RGM

Corrected sensor from -67 (output) to -77 (actual) on 6/7/11 RGM
Lab Systems: Freezer Alarm; Monitor/Set, Access from Any Phone

CHECK STATUS:
1) Dial 314-513-4988, wait for 4-5 rings for Monitor to Answer
2) Enter PIN “0000”, note from digital phones at STLCC enter each digit slowly, you may even have to enter five zeros vs. four.
3) Listen to options for Status or setting limits
4) Press “1” for Status, wait for message to Enter Sensor Number.
5) Enter the number before the parenthesis below to access the sensors. For instance, enter “3” on your phone to get a status report of the Cold Room.
6) Enter “0” to exit and end the phone call.

SET LIMITS:
1) Dial as above, enter PIN, listen for prompts
2) Enter “2” to set Limits, system will respond with “Enter Sensor “
3) Enter 1,2,3,4 for appropriate sensor as shown in boxes below
4) System will respond with “Current message is…..”
5) Enter “1” to change, wait for tone, record short message, wait for system
6) System will continue thru all options, Enter 1 to change, Enter 2 to skip without changes, Enter 0 to stop setting for this sensor
7) Note: Due to digital/analog issues, you may have to enter extra digits or enter some values twice including PIN as 00000 vs. 0000.
8) Note on Negative Values: Enter asterisk “*” before number for negative values

TURN OFF CRYO or Door Open Circuits
1) Dial as above, enter PIN, listen for prompts
2) Press “2” to set Limits, system will respond “Enter Sensor “.
3) Press “9” for Cryo sensor (door 1)
4) System will respond “Door 1 time delay is xx minutes”
5) Press “1” to change limits or any other key to exit
6) System will respond “Enter number (delay minutes) then press #
7) Enter any value (0 to 999). Note an entry of “0” will disable this door sensor
8) System will respond with entered value and return to set limits menu

*) Door Sensor 2, inactive
Closed loop at present
9) Door Sensor 1, Cryotank; R126C, Remote alarm triggered
4) -20 CRO; R126B, L=-30C, H=-10C
3) Coldroom; R126A, L=0C, H=10
2) -20; R126D, L=-30C, H=-10C
1) -80; R126D, L=-90C, H=-60C

STLCC_CPLS; Morrison 3/24/2015
Refrigeration: Temp Conversion Chart

37°C = 98.6°F human body
22°C ~ office temp
4°C = 39°F home refrigerator
-20°C = -4°F home freezer
-80°C = -112°F DNA temp
-132°C = -207°F Cryo storage
Refrigeration: -85°C, ArcticTemp, BRDG R126, 13cuft

-85°C Ultra Low Freezer

Catalog # V85-13
Interior Dimensions (W x F-B x H)  20" x 22" x 51-1/4
Exterior Dimensions (W x F-B x H)  35" x 33" x 79"

**Features:**

- Compressor life is extended by an energy-saving low stage (operates only on demand).
- Compressors are protected with a constant flow of refrigerant.
- Heat is efficiently and effectively dissipated by an air-cooled condenser with three fans.
- Monitoring light to warn of clogged condenser.
- Refrigeration has an automatic timer system that will restart the unit in case of power failure.
- Large air-cooled condenser with front to back air flow resulting in cooler compressors.
- Special hinged grill for easy opening provides for a quick visual check of the condenser.
- CFC-Free DuPont Suva 95 Refrigerant.
Refrigeration: -80 Storage Map, Log Book

Drawer 5

Drawer: 19.5” W x 9” H x 22” Deep

Drawer 1

Rack ID: 3R  Top

Rack ID: 3R  Bottom

Front

Back

STLCC-CPLS; Morrison 3/24/2015
Refrigeration: -20/-80 Freezer Log Book Guidelines

• Status Information:
  – 4/3/12; Divider tabs are on order (BobM)

• Guidelines
  – Using the map of freezer, determine the RACK ID associated with the storage location you are using
  – Behind the tab for each RACK ID, fill in a summary level description for each box added or changed in the rack.
  – To document detailed contents of a box, use the blank BOX ID forms to enter description and notes for each box well/location
  – An Excel version of the Blank forms for the RACK ID and Box contents is located on the Imager/Nano PC in a folder named: Refrigeration
Refrigeration: -80, Inventory, Box Detail Form

<table>
<thead>
<tr>
<th>Tube ID</th>
<th>Description/Notes/Ownership/Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
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<td>24</td>
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<td>25</td>
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</table>
Refrigeration: -80, Combo Lock Reset

RESETTABLE COMBINATION LOCK

Transportation Security Administration (TSA) baggage screeners are trained to recognize the Travel Sentry™ logo on TSA – accepted locks. They have access to a secured set of codes and tools which allow them to open, inspect and relock baggage which is locked with a TSA – accepted lock.

Your new lock is preset at the factory to unlock at 0-0-0. Make sure you are able to open and close the lock prior to setting your own combination. Carefully follow each step to ensure proper setting procedures.

1. Adjust dials so the preset factory combination of 0-0-0 appears clearly in the “windows”.

2. Pull shackle straight up and rotate it 90° counter clockwise so the notch on the shackle aligns with the notch in the lock body.

3. Firmly press shackle down into the body of the lock and rotate it counter clockwise an additional 90°. The shackle should be pushed securely inside the body of the lock so it will not come out.

4. Set the 3 dials to any combination you choose. Make sure each number appears clearly in the window. Record your combination – once the lock is set, there is no way to open it without the combination.

5. Rotate the shackle 180° clockwise. The lock is now ready to be used with your new combination. To change the combination again, repeat steps 1-5.
Refrigeration: -20, BRDG R126, VWR, 20cuft

VWR Manual Defrost Upright -20C Freezer. 20 Cubic Feet
115V, 4 Fixed Shelves.
Exterior Dim: 32In W X 29In D X 70In H
Usable Interior Dim: 27In W X 18In D X 57In H.
Shipping Weight 335Lbs. Leveling Legs. 770 Btu/HR
Refrigeration: -20 Storage Map, Log Book

Drawer 1

Drawer/Shelf 5

Drawer: 19 Deep x 9” H x 27” Wide

Rack 3R Top

Rack 3R Bottom
Refrigeration: -20/-80 Freezer Log Book Guidelines

• Status Information:
  – 4/3/12; Divider tabs are on order (BobM)

• Guidelines
  – Using the map of freezer, determine the RACK ID associated with the storage location you are using
  – Behind the tab for each RACK ID, fill in a summary level description for each box added or changed in the rack.
  – To document detailed contents of a box, use the blank BOX ID forms to enter description and notes for each box well/location
  – An Excel version of the Blank forms for the RACK ID and Box contents is located on the Imager/Nano PC in a folder named: Refrigeration
Refrigeration: -20, Inventory Box Detail Form

<table>
<thead>
<tr>
<th>Tube ID</th>
<th>Description/Notes/Ownership/Dates</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
Refrigeration: Freezer Racks, Stainless,

- **80 Drawers:** 22” Depth x 10” H x 19.5 Wide
- **20 Shelves:** 19” Depth x 10” H x 27” Wide

<table>
<thead>
<tr>
<th>Description</th>
<th>Dimensions</th>
<th>Quantity</th>
<th>Cost per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fisher Sci: Upright Freezer Racks for 2 in. Boxes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth x Height x Width</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 16.5 x 6.7 x 5.4 in. (41.9 x 17 x 13.7cm) 9 (3 x 3 array) 03-395-479 Each | 16.5 x 6.7 x 5.4 in. (41.9 x 17 x 13.7cm) 9 (3 x 3 array) 03-395-479 Each for $82.28  
| 16.5 x 9.4 x 5.4 in. (41.9 x 23.9 x 13.7cm) 12 (3 x 4 array) 03-395-493 Each | 16.5 x 9.4 x 5.4 in. (41.9 x 23.9 x 13.7cm) 12 (3 x 4 array) 03-395-493 Each for $78.60 for -20 shelves, 4 each  
| 16.5 x 10.9 x 5.5 in. (41.9 x 27.7 x 13.9cm) 15 (3 x 5 array) 03-395-480 Each | 16.5 x 10.9 x 5.5 in. (41.9 x 27.7 x 13.9cm) 15 (3 x 5 array) 03-395-480 Each for $98.34  
| 22.1 x 6.7 x 5.5 in. (56.1 x 17 x 13.7cm) 12 (4 x 3 array) 03-395-481 Each | 22.1 x 6.7 x 5.5 in. (56.1 x 17 x 13.7cm) 12 (4 x 3 array) 03-395-481 Each for $85.78  
| 22.1 x 9.4 x 5.4 in. (56.1 x 23.9 x 13.7cm) 16 (4 x 4 array) 03-395-494 Each | 22.1 x 9.4 x 5.4 in. (56.1 x 23.9 x 13.7cm) 16 (4 x 4 array) 03-395-494 Each for $110.32 for -80 drawers, 3 each  
| 21.1 x 10.9 x 5.5 in. (56.1 x 27.7 x 13.9cm) 20 (4 x 5 array) 03-395-482 Each | 21.1 x 10.9 x 5.5 in. (56.1 x 27.7 x 13.9cm) 20 (4 x 5 array) 03-395-482 Each for $135.09  
| 21.1 x 12.7 x 5.5 in. (56.1 x 32.3 x 13.5cm) 24 (4 x 6 array) 03-395-483 Each | 21.1 x 12.7 x 5.5 in. (56.1 x 32.3 x 13.5cm) 24 (4 x 6 array) 03-395-483 Each for $249.75  
| 26.8 x 9.4 x 5.3 in. (68.1 x 23.9 x 13.5cm) 20 (5 x 4 array) 03-395-466 Each | 26.8 x 9.4 x 5.3 in. (68.1 x 23.9 x 13.5cm) 20 (5 x 4 array) 03-395-466 Each for $188.58  

<table>
<thead>
<tr>
<th>Description</th>
<th>Dimensions</th>
<th>Quantity</th>
<th>Cost per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIDSCI: Upright Freezer Drawer Rack, Rack only, Fits 2in.Boxes,</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 4 Boxes High x 4 Boxes Deep                                                | UFD-442, UFD-442-W-XX with white dividers  
| Upright Freezer Drawer Rack, Rack only, Fits 2in.Boxes, 4 Boxes High x 4 Boxes Deep | UFD-442, UFD-442-W-XX with white dividers  
| UFD-332 3x3                                                                 | UFD-332 3x3                                                                 |
| UFD-332-W-XX with white dividers                                           | UFD-332-W-XX with white dividers |  

STLCC-CPLS; Morrison 3/24/2015
Refrigeration: -20C; FV, ArcticTemp, 20cuft.

![ArcticTemp -20°C Upright Manual Defrost Freezer](image)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>ATF16</th>
<th>ATF20</th>
<th>ATF-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity (Cu. Ft.)</td>
<td>16.0</td>
<td>20.1</td>
<td>4.7</td>
</tr>
<tr>
<td>Shelves</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Lower Storage Gate</td>
<td>Yes</td>
<td>Yes</td>
<td>No - Has Basket</td>
</tr>
<tr>
<td>Lock</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Magnetic Door Gasket</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Adjustable Temp. Control</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Door Racks</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Automatic Interior Light</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Finish</td>
<td>White</td>
<td>White</td>
<td>White</td>
</tr>
<tr>
<td>Length - Left To Right</td>
<td>30&quot;</td>
<td>33&quot;</td>
<td>25.3&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>61&quot;</td>
<td>67&quot;</td>
<td>33.5&quot;</td>
</tr>
<tr>
<td>Depth - Excluding Handles</td>
<td>30.3&quot;</td>
<td>30.3&quot;</td>
<td>21.8&quot;</td>
</tr>
<tr>
<td>Net. Weight (lbs.)</td>
<td>162</td>
<td>191</td>
<td>72</td>
</tr>
</tbody>
</table>
Refrigerator: BRDG R124, Marvel, ~8 cuft, Bench/Floor

<table>
<thead>
<tr>
<th>Brand Name</th>
<th>Marvel Scientific</th>
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<tbody>
<tr>
<td>Part Number</td>
<td>8CRF7103</td>
</tr>
<tr>
<td>Number of Items</td>
<td>1</td>
</tr>
<tr>
<td>Capacity</td>
<td>227 liters</td>
</tr>
<tr>
<td>Color Name</td>
<td>White</td>
</tr>
<tr>
<td>Current Rating</td>
<td>3.3 Amps</td>
</tr>
<tr>
<td>EAN</td>
<td>0768388047139</td>
</tr>
<tr>
<td>Inside Depth</td>
<td>20.25 inches</td>
</tr>
<tr>
<td>Inside Height</td>
<td>28.5 inches</td>
</tr>
<tr>
<td>Inside Width</td>
<td>28 inches</td>
</tr>
<tr>
<td>Item Depth</td>
<td>24 inches</td>
</tr>
<tr>
<td>Operating Frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Size Name</td>
<td>With Door Lock, Door Type Solid, Door Hinge Left, Door Color White, Cabinet Color White</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>33/45 Degrees Celsius</td>
</tr>
<tr>
<td>UNSPSC Code</td>
<td>41103006</td>
</tr>
<tr>
<td>UPC</td>
<td>768388047139</td>
</tr>
<tr>
<td>Voltage</td>
<td>115 Volts</td>
</tr>
</tbody>
</table>

Temp setting dial
Refrigeration: Hasp Lock Signage (FV example)

SECURE HASP LOCK
AFTER EACH USE
Refrigeration: Cold Room, BRDG, Nor-Lake Scientific,

Nor-Lake Model: M18966 SN: 09091321, W28707
Control Panel Model CP7L, SN 09-05196
LOCAL SERVICE: Steve Diruscio, 636-305-9966,
   personal cell #: 314-568-2538

Email: henry@diruscioassociates.com

NOR-LAKE SCIENTIFIC, www.norlake.com
727 Second Street
P.O. Box 248
Hudson, Wisconsin 54016
800-477-5253
715-386-2323
866-961-5253 Parts
800-388-5253 Service: Jeff Koblika
715-386-4290 FAX

Replace paper wheel monthly. Instructions on inside door. Press “3” wait for pen to move, replace paper wheel, press “3” again. Align wheel with mark at 3pm position
Refrigeration: Cold Room, BRDG, Control Panel, Buttons

Note; only those buttons shown below are typically used.

Display Only (no setting)
Prod Temp =
Air Temp =
Set Points =

AUX2: (ref)
Sensor setting

CLOCK:
Set Day/Time

SET: Set Control Temps

On/Off ALL items “Green” = on

ALARM:
Display, reset, Silence “Red” if alarm has occurred

Move cursor to next parameter, accept values

Press Down Arrow to move To next screen

Hotlink to NorLake CP7L Control Panel Manual.. pdf
Refrigeration: Cold Room, BRDG, Control Panel, SET Mode

Use these screens for ALARM conditions to set Product Temperature above the Current reading and thus restart the cooling system. See next slide on ALARMS.

- **Room Set Points 1**
  
  Temperature > 04.0°C

  SCHEDULE > DISABLED

  Goto Schedule >

- **DISABLED**: Normal mode, no ramped temp schedule is being used at BRDG

- **AIR TEMP**: Press ENTER to change values using up/down arrows, Press ENTER again to save new values.

  Room Air Temperature
  
  High Alarm > 070.0°C
  Low Alarm < -700.0°C
  Alarm Delay > 120 sec

- **PRODUCT TEMP**: Press ENTER to change values using up/down arrows, Press ENTER again to save new values.

  Product Temperature
  
  High Alarm > 070.0°C
  Low Alarm < -70.0°C
  Alarm Delay 120 sec

- **ALARM DELAY**: Wait time before alarm sounds; helpful when door is opened

  Press Down Arrow to move To next screen
Refrigeration: Cold Room, BRDG, Alarms

1. During normal operations, if an alarm occurs, the Alarm button will glow RED and an audible alarm will sound.
   - Press ALARM button once to silence the alarm
   - Press again to bring up successive screens, continue until “NO MORE ALARMS”
   - If alarm sounds persist, open the upper cabinet and toggle the two switches or remove the two lower door panel screws, open small door, remove/reattach the phone-like line.

2. The Air Temperature alarm provides early warning that perhaps the door has been left open too long. Press ALARM button to silence after investigating the issue.

3. The Product Temperature alarm will **SHUT DOWN THE SYSTEM** for safety of system components.
   - **To restart the system you MUST set the High Product Alarm temperature ABOVE the current temperature reading.**
   - Press the SET key and **follow the instructions on the previous slide** to move to the Product temperature menu, raise the set point above the current reading, then press ENTER and return to the main menu.
   - You should hear a “click” in the panel above as a switch is reset to start the cooling compressor, fans, and lights.
   - After the normal temperature setting has been reached, use the menus on the previous slide to restore original Upper and Lower temperature set points.
   - If the Alarms continue, call service/repair numbers on the first page of the instructions.
Refrigeration: Cold Room, Fuses in Upper Panel

9/24/13; Shutdown cause was blown fuse 10A 250V sloblo in upper control panel (accessible from lower panel, remove screws). Testing components on this circuit did not yield root cause for blowing fuse.
### Refrigeration: Cold Room Fuse Repair Oct 2013

#### Invoice

**Bill To:**
ST LOUIS COMMUNITY COLLEGE  
c/o ACCOUNTS PAYABLE  
1005 N WARSON  
St. Louis, MO 63132  
(314) 971-3795

**Ship To:**
ST LOUIS COMMUNITY COLLEGE  
c/o BOB MORRISON  
1005 N WARSON  
St. Louis, MO 63132  
(314) 971-3795

<table>
<thead>
<tr>
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<th>Qty</th>
<th>B/O</th>
<th>Ship</th>
<th>Description</th>
<th>Tax</th>
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<th>Disc</th>
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<td>FUSE</td>
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<td>5.00</td>
<td>0%</td>
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<td>1</td>
<td>ON SITE LABOR - NORLAKE M18966, S/N # 09091321, W28707</td>
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**Total Item Count = 3, Total Items Shipped = 3**
Refrigeration: Cold Room, BRDG, Maintenance of Condenser

VERY IMPORTANT:
- Clean this monthly.
- The cold room condenser and compressor is located off the north end of the dock.
- The thin “radiator-like” panel must be clear of debris or the unit may shut down, particularly in Spring and Summer months.
Refrigeration; Woods, Upright, -20C, @ FV

Woods Upright Freezer
34” W x 34” D x 65” H
Refrigeration: Refrigerator; FV, Hotpoint, 27 cu ft.

Hotpoint (currently in SM235 Prep next to Cold Room)
STLCC ID = 3-54595
28” W x 31” D x 62” H
Refrigerator on Top, rh door
Refrigeration section below, pull down door
CROSLEY CT15A2A Refrigerator

Model Number: CT15A2A

28” W x 31” D x 62” H

Style: Top Refrigeration w/o Ice thru door
Brand: CROSLEY
Defrost: Automatic
Manufacturer: MAYTAG
Built-in Ice Maker: No
Access Type: Door

Capacity and Size Measures

Fresh Food Volume: 10.79 (cu. ft.) Height: 60 (inches)
Refrigeration Volume: 4.17 (cu. ft.) Width: 28 (inches)
Total Volume: 14.96 (cu. ft.) Depth: 29 (inches)
These units are ideal for maintaining the 14°C used in ligation reactions or 17°C for storing oocytes, cooling blood samples prior to coagulation testing or storing samples from ambient to 4°C. Features of both units include press-to-set microprocessor controller and large, easy-to-read LCD. Peltier cooling uses no compressors or CFCs. Watertight well functions as a small refrigerated bath.

MiniFridge II (pictured) is supplied with standard block (2 x 3 x 3 3/4 in.) that accommodates small beakers, flasks and microplate block modules. Includes domed plastic lid.

Chamber Dim. [W x D x H] in. (cm): 6 1/4 x 3 3/4 x 2 1/4 (15.4 x 9.7 x 5.7)

Temperature Range (°C): 4°C to ambient.

Overall Dimensions [W x D x H] in. (cm): 9.75 x 11.75 x 7.25 (24.8 x 28.6 x 18.4).

Ship. Wt lbs (kg): 10 (4.5).

Electrical: 115V, 50/60 Hz, 100W.

Link to How it works
Thermoelectric cooling
Peltier Effect at Wikipedia
Refrigeration: BRDG Refrigerator, Office area

GE® ENERGY STAR® 25.4 Cu. Ft. Side-By-Side Refrigerator with Dispenser
Model #: GSHL5KGXLS (GSHLKGXECLS)
APPROXIMATE DIMENSIONS (WxHxD)
35 3/4 in x 69 1/2 in x 35 in

MWF Water Filtration Cartridge (See next Slide for Ordering Info)

GE - SmartWater Replacement Water Filter for GE Refrigerators
Best Buy 9/13/11 Reorder per AT.
Model: MWF | SKU: 7219137
Refrigeration: Office, BRDG, GE 25 cuft, Ice Maker Parts

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<tbody>
<tr>
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</table>

Shipping Costs $5.95
Tax $5.57
Final Total $74.27
Refrigeration: Office, Order Water Filters at Best Buy

MWF Water Filtration Cartridge
Improved version of GWF
Reduces more waterborne contaminants such as Mercury, Toxaphene, p-dichlorobenzene, Carbofuran, Alachlor and Benzene
Also reduces lead, cryptosporidium and giardia
Also replaces FXRT and FXRC filters when used with a reusable adaptor (Part number: Adapter)
Replace filters every six (6) months

Requisition:  R1458471
Order Date:  10-JUN-2014
Delivery Date:  12-JUN-2014
Commodity Total:  103.15

Item Description
1 BS19312311, GE Replacement Water Filter

Quantity:  2.00
Unit Price:  46.0000
Extended:  92.00
Discount:  0.00
Additional:  0.00
Tax:  0.00
Commodity Line Total:  92.00

COA Year Index Fund Orgn Acct Prog Acty Locn Proj
S 14 125902 591352 7111 10

Document Accounting Total:  103.15
Refrigeration: Cryogenic, CryPro N2 Autofill Tank System

- Auto-Fill Convenience
- Large Vial Capacities
- Remote Alarm Contacts
- Digital Temperature Display
- Easy-to-Select Setting Options
- VWR Two-Year Limited Parts and Labor and Five-Year Limited Vacuum Warranty

Model: AF-10 (PS- includes packing system) from VWR
Static Holding Time: 33 days

**Evaporation Rate: 5 L/day**

- Liquid Nitrogen Capacity: 165 L
- Weight Empty: 111 kg (245 lbs.)
- Weight Full: 243 kg (537 lbs.)
- Internal Diameter: 53.3 cm (21")
- External (23 1/8 x 30 1/2 x 44")
- Vial Capacity (2 mL): 10,400 vials

**WARNINGS: READ AND FOLLOW**
1. Always wear gloves and protective eyewear when opening or handling racks
2. Discharge of LN2 can cause rapid depletion of oxygen in the area and dangerous conditions for personnel. Pay attention to warnings and alarms.
3. Never connect device to a supply line with > 22 psi supply pressure
4. Validate/check alarms by holding Stop/Start Fill together >8 secs, all LED should light up and audible alarms should sound.
5. NEVER insert a hollow rod or tube into the tank, LN2 will shoot out the top
6. Perform Normal Evaporation Rate (NER) test by measuring LN2 level over a period of 48hrs with a wood or plastic rule, level should not drop >1” per day
7. Do not let ice or debris collect in the bottom of the freezer, clean periodically.
8. NEVER use chlorine-based disinfectants or cleaners.

Hotlink to Biosafety, Safe Handling/Storage of Liquid Nitrogen

Hotlink to “Similar” Model Manual (Taylor-Wharton)…pdf 45 pgs
Refrigeration: CryoPro, Menu Instructions

1. Press and hold Temp/Mute > 8 sec to enter the controlling Menus. A symbol “----” indicates entry at the root or base level.

2. Press Start Fill (increment) or Stop Fill (decrement) to scroll through setting options list (items in #6 below)

3. Press Temp/Mute again to set values for any specific setting in the list

4. Press Start Fill (increment) or Stop Fill (decrement) to change values for the settings

5. Press Temp/Mute after setting values will SAVE the setting and return to the root “----” level.

6. To exit without saving settings, you must Power OFF the device before hitting the Temp/Mute button and wait for at least 3 minutes before resuming any other menu settings.

7. Symbols Used are:

   – ---- Root or base level
   – tSP Temperature Set Point, adjust the temperature alarm setting. Set to -132C for BRDG.
   – SEN Sensor Choice, select sensor type (2 or 4, use “4”)
   – tAd Temperature Alarm Delay, Adjust time before the audible sounds after temperature exceeds set value (5,15,30,45,60,75,90,105)
   – AAd Audible Alarm Delay, adjust time alarm is silenced after MUTE is pressed (No retrigger for same error when muted ,5,15,30,45,60,75,90,105)
   – rAD Remote alarm (0= immediate, or 15,30,45,60,75,105)
   – Ver Version of Firmware, display version loaded on the device (1= major, 2= minor)
   – Ser Control Serial Number, identifies the control should it be required (1=first 2 digits, 2=rest)
   – SS Sensor State, if thermistor is in “G” or “L”, pressing Start Fill and Stop Fill together will identify which and releasing them will display the value. ( Left-to-right: #1 High Alarm in gas, #2 Low Alarm in LN2, #3 Stop Fill in gas, #4 Start fill in LN2)
   – SU Sensor Value, filtered value each thermistor, Pressing Start Fill and Stop Fill together and then release to display the value.
   – SU2 Sensor Value, unfiltered value of thermistor.
Refrigeration: CryoPro, Alarms and Defaults

- **High Temp Alarm:** Sounds and flashes when thermocouple temperature rises above the defined setting (tSP menu)
- **Open Thermocouple Alarm:** If internal thermsister is damaged or not plugged in, Opn displayed along with audible alarm
- **Low Level Alarm:** Level of LN2 has dropped 1” below low level sensor
- **High Level Alarm:** Level of LN2 has risen 1” above high level sensor
- **Low LN2 Supply Alarm:** Level has not reached high level sensor in last 30 minutes of filling, usually a sign that reservoir tank is empty
- **Sensor Fault Alarm:** Open circuit or crimped locations of sensors, all LEDs go dark.
- **Remote Alarm Output:** 2amp signal through external sensor indicating alarm condition has not been corrected with set limits
- **Test Button:** Tests audible and LEDs;
  - Press STOP/FILL/TEST button >8 secs, audible sounds and all LEDs should light up
  - Continue holding for another 5 secs, remote alarm relay will be tripped
  - USE THIS BUTTON to close the fill valve when the LN2 level is still below the fill level
- **Watch Dog Test:** The tank should restart itself after any power disruption. To test this feature press the STOP FILL/TEST button >8 sec and hold them while pressing/holding TEMP/Mute, Control should reset with “000” displayed for 4 seconds.
- **MUTE:** Press Temp/Mute to silence audible alarms. Use settings to set time delay
- **Default Settings** are: High Temp = -100C, Alarm Delay = 5min, Audible Mute Delay = 15 min
  Remote alarm delay = 30 min, Sensor defaults to 2 vs. 4.
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</table>
Special Note: All sections of equipment that may allow for the liquid to be trapped must be protected by a pressure release device preferably vented to an outside location. This includes any section of piping between two valves.

AIRGAS
- Part Number: LN 160LTRS 22PSI (NI 160LT22 )
- BRDG Account# QNA40 as of 6/3/11.
- Tag all tanks with current account number

Note: For tank on caster platform order:
NI 230LT22 per deliveryman 4/11/11. (RGM)
R06K-8C20 Plug with leads (from CryoPro Manual, pg 20)

Pins 1 (11am) and 2 (6pm) are closed during normal operations which corresponds to Door Shut on Freezer alarm panel.

Pins 2 and 3 are closed during Remote alert conditions (door open on freezer Alarm).

Also See: Taylor-Wharton 10K Cryostorage Systems
Refrigeration: Cryotank, LN2 Losses and Use

(from Published Paper
www.biomedicalmarketing.com/pdffiles/LN2Consumption.pdf )

1. **Storage System Static loss of 9 liters per day**
   - Function of diameter of upper opening surface area

2. **Use loss; 0- 8 liters per day**
   - add/remove samples, check levels

3. **Transfer loss of 3- 6 liters per fill event**
   - hose line and fittings will be cooled from 25C ambient to -192C during a fill

4. **Source cylinder static loss** of 1.5 - 6 liters per day
   - also, don’t assume it came fully filled, may have lost 20% from supplier warehouse to your facility

**Total Losses: 12 liters and up to 29 liters per day**
- depending on usage and condition of equipment
- 6 days of use from the source tank for worst conditions to about 15 days at best
Refrigeration: Cryo, Supply Tank Swapout

Early on the day the new supply tank is to arrive: (Every other Friday about 11am)

1. Push and hold the FILL button on the Cryo storage system to put the remainder of the gas in the existing supply tank into the storage system. You may have to do this several times as the system fills for only 8 seconds if already at the HIGH mark. Note, this may cause a “HIGH” level LN2 alarm because the level in the tank has been raised above the fixed high level sensor. This can be muted using the MUTE button.

2. Shut off the supply tank valve to the Cryo system

3. After frosting of the supply line has diminished, disconnect the line at the supply tank port using an appropriate wrench. Use gloves if needed.

When the new LN2 Supply Tank arrives:

1. The AIRGAS representative will remove the old supply tank and put the new one in it’s place.
2. Connect the supply line from the Cryo storage system to the “Liquid” port on the new supply tank and tighten with a wrench.
3. Open the valve on the new Supply tank fully. Note their may be some frosting of the supply line at this time, but unless a fill is needed, this should stop quickly.
4. Check the Pressure (Green valve) to make sure it is in fully closed position. This is only opened to add pressure to the LN2 supply tank.
This frost pattern indicates continuous or frequent draws from supply tank, not necessarily a leak at this location.

Likely cause is leak in connections, transfer hose, valve fault in cryo unit, or frequent access/use of storage system.

Perform test fill operation while observing all connections (supply tank and rear of cryo system) and hose for liquid or gas leaks.

Other Frost Patterns:
- Frost on transfer hose; probable rupture of inner fluid line.
- Frost at bottom of supply tank; probable loss of vacuum in supply tank.
- Frost at supply tank level gage; potential leak in fill gasket, contact supplier.
- Pressure valve (green) on supply tank in open vs. closed position.
# Refrigeration: VWR CryoPro, Transfer Hose

## Cryogenic Transfer Hoses
Supplier: Western Enterprises

- Cleaned for oxygen service
- Exceptional flexibility, hose resists kinking
- Machined CGA stainless steel end connections
- Constructed of 316 stainless steel for all wetted parts
- Use in cryo-biological and medical systems, and gas filling plants

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<tr>
<th>Diameter</th>
<th>Weight</th>
<th>CGA#</th>
<th>Supplier#</th>
<th>VWR#</th>
<th>Price</th>
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<tr>
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<td>3.17 lb</td>
<td>CGA-295</td>
<td>312-WMH-2-16</td>
<td>300008-025</td>
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</table>
**Refrigeration: Cryo; Valves, Fittings, Filters**

ASCO 8600A013 In-Line Filter, Brass, Stainless filter mesh, Supplied with CryoPro tank on elbow from base unit to feed source

| 3/8 | 1.9 | 100x100 | .35 | 140 | .0065 | -- | 400 | 750 | 8600A013 @ |

AIRGAS WESWMV-4-22 Western® 22 PSI X 1/4" NPT Male Relief Valve
Warning on Low Oxygen due to Nitrogen evaporation:
Sea Level Oxygen level = 20.1%
**Default meter setting for alarm: 19.5%**
Denver = 17.2%
Pikes Peak = 12.2%
Everest = 6.8%

Link to Metrology SOP; Gas Detection, Oxygen Levels, Meters, Alarms
**Refrigeration: Liquid Nitrogen Supplier, 160L Tank, Airgas**

Note: Input pressure cannot exceed 22 psi for Autofill system.

**Part Number:**
NI 160LT22

For tank on wheels order: NI 230LT22 per deliveryman 4/11/11. (RGM)

**Airgas Mid America Phone:** (314) 533-3100
**Fax:** (314) 533-0901
**Address:** 3500 Bernard Street, St. Louis, MO 63103

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### Pricing:

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<tr>
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<th>Extended Price</th>
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</tr>
<tr>
<td>NI 230LT22SS</td>
<td>Call For Price</td>
<td>Call For Price</td>
</tr>
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</table>

**Caution:**
- Always use in accordance with the Material Safety Data Sheet
- Cylinder must be stored and used in an upright, secure manner
- Always follow local fire code requirements when storing gas cylinders

**Application:**
- Refrigeration
- Cryogenic grinding of plastics
- Food freezing

**Specs:**
LINDE
LAB DEWAR LINDE (UNION CARBIDE)
Model LR-31
SN 230-126-M1
30 Liter Max N Capacity.

7 Storage Cylinders, approx 2.5” dia, 8” deep

Always use approved hose for transfer, Stainless Steel

Cryogenic Transfer Hoses
Supplier: Western Enterprises

Cleaned for oxygen service
Exceptional flexibility, hose resists kinking
Machined CGA stainless steel end connections
Constructed of 316 stainless steel for all wetted parts
Use in cyro-biological and medical systems, and gas filling plants
Ice-O-Matic Flakers EMF450

Maximum ICE production in a minimum amount of space:
- No additional side clearance required on a 30 inch wide bin
- Maximum ICE production in a 16 inch wide cabinet
- Works on all industry dispensers and bins

Dependable ICE-O-Matic Flake ICE Makers remove excess water by pushing the flaked ICE through an extrusion process. The result is high quality flaked ICE which is ideal for medical, supermarket, or restaurant applications.

ICE-O-Matic Tough Constructed with a brass evaporator and rugged stainless steel transport system enclosed in polyurethane insulations.

Filter-Free Air No air filter to change

Production Produces up to 472 lbs. of ICE per day

Link to IceOMatic Installation Manual … pdf

Link to IceOMatic Technical Manual … pdf
Refrigeration: Ice-O-Matic @ FV Internal Control Switches

Primary On/Off Toggle Switch: Note remove front panel to access this area

Secondary Bin Control Switch located in extreme right rear upper part of cabinet. See closeup below.

Secondary Bin Control Switch (thin copper over bin diaphragm) See Next Slide for details
Mechanical Bin Control
The mechanical bin control is located in the top panel of the ice bin on the EF Series and on the top of the down chute on the EMF Series. When ice fills the down chute on the EMF Series units, or ice fills the bin on EF Series units a rubber diaphragm pushes up against a switch.

To check the bin switch, push up on the diaphragm or switch arm raising it approximately 1/8 inch. This movement should actuate (open) the switch. The switch should close when returned to the normal position. The switch can be adjusted by loosening the adjusting screws and moving it to the proper position.

Important! The secondary bin switch should only be utilized as a safety. If the machine is shutting off on the secondary control, the primary control should be adjusted.
Ice Maker; Ice-o-Matic at FV Model 450 Series Footprint

TOP VIEW

Ice Dispense Area
*To Bin* in Bottom
of Machine-5.50" 
(140mm) DIA

7/8" (22mm) DIA Hole 
for Electrical 
Connection to 
Control Box

ICE Maker Water Out 
1/2" (13mm) I.D. 
Plastic Tubing
Refrigeration: Ice-Maker, Flaker, BRDG, F0522 Scotsman

http://www.bi-staterefrigeration.com/home/
Service: Bi-State Refrigeration
P.O. Box 1566 · St. Peters, MO 63376
636-379-7217
314-291-7217
800-292-7217
Fax: 636-379-3715
Model: F0522A-1A Ice Flaker
SN: 09101 3200 1 1001
Installed 1/26/10, 3yr warrantee

Model: B530P Bin (30”, 500lb cap)

Scotsman Ice Systems · 775 Corporate Woods Parkway · Vernon Hills, IL 60061
1-800-SCOTSMAN
Fax: 847-913-9844
E-mail: customer.relations@scotsman-ice.com
www.scotsman-ice.com

All Models
Dimensions (W x D x H):
Unit: 229" x 24" x 23"
(58.2 x 61.0 x 58.4 cm)
Shipping Carton: 25.5" x 27.5" x 28.5"
(64.8 x 69.9 x 72.4 cm)
Shipping Weight: 173 lb/78 kg
BTU per hour: 5,000
Refrigerant: R-404A

Shown on B530S bin with optional KLPA5 legs

Link to Scotsman Ice-Maker Installation and User Manual ... pdf

Link to Scotsman Ice-Maker Service Manual ... pdf

Link to Scotsman Ice-Maker Parts List ... pdf
Refrigeration: Ice-Maker, BRDG, Controls and Codes

**Control Operation - See Manual**

*Water Light On* - Restore water supply to machine.

*De-Scale Light On* - Clean and sanitize machine.

*Test Mode* - Depress Off for 3 seconds, then depress Clean for 3 seconds.

*Recall Diagnostic Codes* - Depress Off for 3 seconds. Press Clean repeatedly to go from most recent to oldest of 10.

*Clear Diagnostic Codes* - Switch unit off, depress and hold Clean and Off for 3 seconds.

*Reset from Code 1, 2, 3 or 4* - Depress Off then Depress On.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Freeze Mode</td>
</tr>
<tr>
<td>F</td>
<td>Freeze Mode is Pending</td>
</tr>
<tr>
<td>B</td>
<td>Bin is Full</td>
</tr>
<tr>
<td>C</td>
<td>Clean Cycle</td>
</tr>
<tr>
<td>L</td>
<td>Board Locked</td>
</tr>
<tr>
<td>E</td>
<td>Test Mode</td>
</tr>
<tr>
<td>D</td>
<td>Off</td>
</tr>
<tr>
<td>E</td>
<td>Self Test Failed</td>
</tr>
<tr>
<td>I</td>
<td>No ice sensed - Retrying</td>
</tr>
<tr>
<td>I</td>
<td>No ice sensed - Shut Down</td>
</tr>
<tr>
<td>E</td>
<td>Auger motor high load - Retrying</td>
</tr>
<tr>
<td>E</td>
<td>Auger motor high load - Shut Down</td>
</tr>
<tr>
<td>E</td>
<td>No water in reservoir</td>
</tr>
<tr>
<td>4</td>
<td>Refrigeration pressure too high / low</td>
</tr>
</tbody>
</table>

All 4 Upper Lights Flashing - Unit Remotely Locked Out - Contact Leasing Company
Refrigeration: IceMaker, BRDG, Maintenance, Scale Removal

Maintenance: Scale Removal

Note: Following this procedure will reset the de-scale and sanitize light.

1. Remove front panel (two screws top left/right)
2. Push and release the Off button.
3. Remove ice from bin or dispenser.
4. Turn the water supply to the ice machine OFF.
5. Drain the water and evaporator by disconnecting the leg of the hose connected to the water sensor and draining it into the bin. Return the hose to its original position.
6. Remove the water reservoir cover.
7. Mix solution of 8 ounces of Scotsman Clear One Scale Remover and 3 quarts of 115 degree F. potable water.
8. Pour the scale remover solution into the reservoir.
   Use a small cup for pouring.
9. Push and release the Clean button: the auger drive motor and light are on, C is displayed and the De-scale light blinks. After 20 minutes the compressor will start.
10. Operate the machine and pour the scale remover into the reservoir until it is all gone. Keep the reservoir full. When all the scale remover solution has been used, turn the water supply back on. After 20 minutes of ice making the compressor and auger motor will shut off.
11. Turn the water supply to the ice machine OFF
12. Drain water reservoir and evaporator by disconnecting the leg of hose connected to water sensor and draining it into bucket. Return hose to its original position. Discard all ice made during the previous step.
Maintenance: Sanitation of Water System

Do steps 1-6 of the De-Scale process if not done in conjunction with this procedure, then.....

13. To sanitize the water system, mix a locally approved sanitizing solution. An example of a sanitizing solution is mixing one ounce of liquid household bleach and two gallons of 95 – 115 F.
14. Pour the sanitizing solution into the reservoir.
15. Push and release the On button.
16. Switch the water supply to the ice machine on.
17. Operate the machine for 20 minutes.
18. Push and release the Off button.
19. Wash the reservoir cover in sanitizing solution.
20. Return the reservoir cover to its normal position.
21. Discard ice made during the sanitizing process.
22. Wash inside of storage bin with sanitizing solution.
23. Push and release the On button.
24. Return the front panel to its original position and secure with the original screws.

Remove hose with pliers on clamp
Refrigeration: Ice-Maker, BRDG, Scotsman, B530S-Storage Bin

Modular Storage Bins

Features

- New sleek, contemporary styling. A perfect match to Prodigy cube ice machines and other Scotsman Kermachines.
- Convenient, built-in scoop holder
- Scoop incorporates anti-microbial Agion® for better sanitation.
- Easily removable baffles, no tools required for cleaning.
- Lightweight.
- Unique recessed drain fitting for maximum installation flexibility.
- Corrosion resistant.
- Spring loaded door with hidden hinges for easy opening and closing.
- Available in metallic finish or durable rotocast plastic.
- AHRI NSF certified.

* except for B230 P

Storage Capacity

<table>
<thead>
<tr>
<th>Application Capacity (kg)</th>
<th>B222S</th>
<th>B322S</th>
<th>B230P</th>
<th>B330P</th>
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<tbody>
<tr>
<td>XMP Capacity (lb/kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>242/110</td>
<td>370/168</td>
<td>242/110</td>
<td>346/156</td>
</tr>
<tr>
<td></td>
<td>190/86</td>
<td>290/132</td>
<td>190/86</td>
<td>270</td>
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</table>

<table>
<thead>
<tr>
<th>Application Capacity (kg)</th>
<th>B930P S</th>
<th>B842S</th>
<th>B948S</th>
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</thead>
<tbody>
<tr>
<td>XMP Capacity (lb/kg)</td>
<td>586/244</td>
<td>778/335</td>
<td>610/277</td>
</tr>
<tr>
<td></td>
<td>420/191</td>
<td>893/406</td>
<td>700/319</td>
</tr>
</tbody>
</table>

Application capacity is based on 90% of total volume in the cubic feet x 84 lb/ft³.
AHRI capacity is based on 80% of total volume in cubic feet x 105 lb/ft³.

Polyurethane Insulation

Foam insulation is forced between the wall and liner under heat and pressure to form a perfect wall to wall bond, preserving ice supply for long periods.

Bin Interior

The polyethylene bin interior is sanitary and easy to clean. Resists scratches and scuffs from ice scoops.

Warranty

- 3 years parts and labor on all cor

Warranty valid in North, South & Central America. Contact factory for warranty in other regions.

Shipping

* LAG/HG = psychiatric only.
Refrigeration: Ice Maker, Repair leak, gasket Apr 2013, Bi-State
Refrigeration: Ice Maker, Repair leak, gasket Apr 2013, Bi-State

[Invoice Details]

<table>
<thead>
<tr>
<th>QUAN.</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>02-0929-58 water seal</td>
<td>116.00</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Breaker</td>
<td>325.00</td>
<td></td>
</tr>
</tbody>
</table>

REFRIGERANT RECOVERY

- MATERIAL: 491.00
- TECHNICAL SERVICE TIME: 152.00
- SERVICE CALL: 60.00
- TAX: 0.00

TOTAL: 703.00

Thank You!

Kevin

Receipt for Services

[Customer Signature]

Date: 5/01/2013

Thank you for your business.
Refrigeration ; FV, So-Low Premier, -80C

Maintenance: Clean cooling condenser grill vent every 90 days

Control Panel (below)
Set @ -80C
Actual -77C
Refrigeration: CryoPro LN2, Liquid or Vapor Phase

Water is the major component of all living cells, and must be present in order for chemical reactions to occur within a cell. During cryopreservation, when water changes to ice, all cellular metabolism ceases. During this process, as the ice forms, the cells become dehydrated, leading to changes in the concentrations of salts and other metabolites that are present. This osmotic imbalance can be highly detrimental to cell recovery. However, cell survival is strongly influenced by a number of factors, most notably the cooling rate. Each cell type has a characteristic optimum-cooling rate, which reflects the highest percentage of survival. This rate can be modified by the use of a cryoprotective agent. Cell survival also depends on the rewarming rate and the storage temperature. (from Cryosite weblink, Australian company)

However, the duration of storage is not indefinite and the storage temperature will directly influence the time during which the samples can be recovered without damage. Lower storage temperatures are associated with extended viability of the preserved samples. While many samples are stored at -80°C, it should be noted that at this temperature metabolic activity has not ceased, it has only slowed down (due to small amounts of unfrozen water). By reducing sample temperatures to below the glass transition phase of water (-132°C), all metabolic activity comes to a halt. Storage below -130°C in liquid nitrogen therefore offers the most secure form of preservation.

Since it is clear that storage in liquid nitrogen containers represents the best long-term option for sample preservation, the question that then needs to be addressed is whether storage should be in the liquid or vapour phases. In liquid phase, samples are completely submerged in liquid nitrogen at -196°C. However, there are a number of risks associated with direct storage in the liquid phase that need to be highlighted. Storage of samples in glass ampoules is not advised, as during the transition from liquid nitrogen to room temperature, the rapid conversion to a gas phase may cause it to explode. While the use of plastic screw-cap cryotubes minimises this potential for explosion, during warming, the liquid may still spray from the interface between the cap and the tube. For this reason it is advisable to open cryotubes within a contained area. The alternative to direct storage in the liquid phase is to store samples above the liquid nitrogen in the vapour phase at -150°C. As this is well below the glass transition phase of -132°C (where all metabolic activity ceases), storage in the vapour phase is therefore both an excellent and safe means of storing your samples.

Vapor phase storage eliminates the possible contamination issues associated with liquid phase storage. This is due to the fact that the samples are not submerged in the liquid nitrogen but instead benefit from the cooling effects of the nitrogen vapors. However, using the vapor phase to maintain low temperatures can often result in a temperature gradient, which needs to be closely monitored. The temperature throughout the chamber must be kept below –130°C to ensure that all metabolic activity remains arrested.
1. Outside of the refrigerator, the electrically-run compressor does work on the Freon gas, increasing the pressure of the gas. As the pressure of the gas increases, so does its temperature (as predicted by the ideal-gas law).

2. Next, this high-pressure, high-temperature gas enters the coil on the outside of the refrigerator.

3. Heat (q) flows from the high-temperature gas to the lower-temperature air of the room surrounding the coil. This heat loss causes the high-pressure gas to condense to liquid, as motion of the Freon molecules decreases and intermolecular attractions are formed. Hence, the work done on the gas by the compressor (causing an exothermic phase transition in the gas) is converted to heat given off in the air in the room behind the refrigerator. If you have ever felt the coils on the back of the refrigerator, you have experienced the heat given off during the condensation of Freon.

4. Next, the liquid Freon in the external coil passes through an expansion valve into a coil inside the insulated compartment of the refrigerator. Now, the liquid is at a low pressure (as a result of the expansion) and is lower in temperature (cooler) than the surrounding air (i.e., the air inside the refrigerator).

5. Since heat is transferred from areas of greater temperature to areas of lower temperature, heat is absorbed (from inside the refrigerator) by the liquid Freon, causing the temperature inside the refrigerator to be reduced. The absorbed heat begins to break the intermolecular attractions of the liquid Freon, allowing the endothermic vaporization process to occur.

6. When all of the Freon changes to gas, the cycle can start over. The cycle described above does not run continuously, but rather is controlled by a thermostat.
Refrigeration: OBSOLETE -80 Storage Map, Inventory

Drawer 5

Drawer: 19.5” W x 9” H x 22” Deep

Box A4

Tube # 1-100

Rack 3R Top

Rack 3R Bottom
ThermAssure X2 is the first RFID Data Logger equipped with a USB cable. This temperature Data Logger generates a PDF evaluation report with the optional power of RFID download. Just plug it into the USB port of any PC and it will generate a PDF report.

$25.00 tax excl.

Reference: X2-3002-USB

Quantity: 1

Add to cart

Do an estimate