



MP2200 Freezer

(Models 8-2200-12, 8-2200-23, 8-2200-31)

Low Temperature Liquid Bath System
for Freezing Blood Components

Operator and Maintenance Manual



6-07-036.C
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Revision History

Rev A: February 2002

Rev B: July 2002

Rev C: May 2010

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Chapter 1

Introduction

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Intended Use

The THERMOGENESIS CORP. MP2200 Freezer is intended to be used for the fast, efficient freezing of blood components.

How to use this Manual

This Operator and Maintenance Manual is organized to provide easy access to setup and maintenance information for the MP2200 Freezer. Please read this manual in its entirety.



The “**Pen-in-Hand**” icon means pay close attention to the indicated text.



The “**Exclamation**” icon is a caution about a hazard that could cause injury to the operator or others or damage the equipment.



The “**Lightning Bolt**” icon is a warning about an electrical hazard that could cause injury to the operator or others or damage the equipment.



The “**Flame**” icon is a warning about a fire or explosion hazard that could cause injury to the operator or others or damage to the equipment.



The “**Freeze**” icon is a caution about a cold hazard or possible frostbite.



The “**Biohazard**” icon is a warning about a potential biohazard due to contact with blood components or contaminated coolant.



The “**Rotating Hazard**” icon is a warning about a potential injury to the operator from the moving parts of the filtration pump.

1. Introduction

Text Conventions

To convey information readily and consistently, certain text conventions are used throughout this manual. These conventions are:

Text Convention	Used For
Numbered Lists	Lists steps to be carried out in order. <u>For example:</u> 1. Remove the screws from the rear of the motor box. 2. Remove the screws from the Display Panel.
Bulleted Lists	Indicate items to be carried out, but not necessarily in sequence. <u>For example:</u> <ul style="list-style-type: none">• Check the fuses.• Make sure all snap connectors are tight.
Bold Typeface, Uppercase	Calls attention to a CAUTION or DANGER .
Bold Typeface, Lowercase	Emphasizes any term or component that is being described or referred to.
Italics	Refers the user to another section of this Operator and Maintenance Manual that should be consulted. <u>For example:</u> <i>See Troubleshooting – Chapter 6.</i>

Electrical Safety



CAUTION: The chassis of the system is connected to ground by means of a cable, and surfaces on the system that the operator may come in contact with are connected to the chassis by means of screw connections. For protection against electrical hazards, the system must be directly connected to a properly grounded electrical source approved by a qualified electrician. Contact Helmer Technical Service for assistance if you have any questions concerning the electrical connection for the MP2200 Freezer. When servicing the MP2200 Freezer, make sure the power switch is turned off and the unit is unplugged.

Safety Precautions

Safety precautions necessary to operate, maintain or troubleshoot the MP2200 Freezer are outlined below. It is important that these precautions be carefully read and understood. New employees should also be made aware of this information.



CAUTION: For proper and safe operation, keep this manual in a place where it is readily accessible for reference.



CAUTION: Disconnect all power to the freezer before starting any electrical work.



CAUTION: When replacing fuses, be sure the new fuse has the correct amperage rating.



CAUTION: Fire hazard occurs if vapors from the InstaCoolant IV are allowed to reach 42°C (108°F). For operational purposes, THERMOGENESIS CORP. has set the MP2200 safety thermostat to 27°C (80°F). When warming the coolant during a defrost operation, **DO NOT PLACE AN ELECTRIC IMMERSION HEATER IN THE COOLANT.**



CAUTION: The InstaCoolant IV must be above freezing 0°C (32°F) before performing any service inside the freezer. Placing your hands in the coolant when it is below freezing can cause frostbite.



CAUTION: Use of the equipment other than specified by the manufacturer may cause injury to the operator or others, damage the equipment and possibly nullify the freezer warranty.

Copyright Notice

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The material in this manual is intended for use by the purchaser of the equipment covered by the manual. Permission is granted to the purchaser to make one copy of the manual for record retention and internal personal use. This does not create a license to the purchaser under any copyright, trademark, patent, or other intellectual property right of THERMOGENESIS CORP. For additional copies of this manual, contact Helmer Technical Service or the equipment supplier.

1. Introduction

Trademarks

THERMOGENESIS CORP. proprietary trademarks identify products and services of THERMOGENESIS CORP., are the property of THERMOGENESIS CORP. and are protected under State and Federal trademark laws, and under international treaties. Those proprietary trademarks and service marks may not be used, except as provided by law, without the prior written consent of THERMOGENESIS CORP. trademarks and service marks: THERMOGENESIS CORP. Companies own other brand trademarks and tradenames mentioned in this manual.

Disclaimer

THERMOGENESIS CORP. has thoroughly reviewed the contents of this manual to make it an informative and easy-to-use guide for the operation of the equipment and devices described herein. All statements, technical information and recommendations contained in this manual or related documentation are current and believed to be reliable as this document goes to press. For this reason, the contents of this manual are not intended to be and should not be understood as representations or warranties concerning the equipment and devices described herein.

All THERMOGENESIS CORP. products, including the products described in this manual, are covered by specific and limited warranties as described in this manual.

Contact Information

For questions on equipment or device warranties, call Helmer Technical Service at 800.743.5637 (U.S./Canada) or +1.317.773.9092 (non-U.S./Canada) weekdays (except U.S. holidays) from 8:00 a.m. to 5:00 p.m. Eastern Standard Time.

Helmer Scientific
14400 Bergen Boulevard
Noblesville, IN 46060
Tel: 800.743.5637 (U.S./Canada)
Direct: +1.317.773.9092 (non-U.S./Canada)
Fax: +1.317.773.9082
Web: www.helmerinc.com

European Union Authorized Representative:
Medical Device Safety Service GmbH (MDSS)
Schiffgraben, 41
D-30175 Hannover
Germany
Web: www.mdss.com

Limited Warranty

THERMOGENESIS CORP. ("THERMO") products are designed and manufactured to provide reliable, trouble-free performance when properly maintained and used in accordance with the operating instructions provided with each unit. Each unit is carefully inspected, tested and found to be in good working order prior to shipping.

Warranty

THERMO warrants to the original purchaser that the unit will be free from defects in materials or workmanship for one year from the date of shipment. THERMO also warrants that spare parts will be free from defects in material workmanship for a period of ninety (90) days, or the maximum time required by applicable local law, from the date of shipment of the spare part. Equipment failure due to reasons other than manufacturing defects such as accident, misuse or failure to timely perform scheduled maintenance in accordance with the maintenance schedule included with the operating instructions for the unit is excluded from Warranty coverage. This Warranty covers only the cost of parts needed to make Warranty repairs. Labor charges and shipping charges for replacement parts will be billed to the purchaser. THERMO reserves the right to replace any malfunctioning unit or part with a new or refurbished unit in lieu of repairing such unit.

This warranty and THERMO's obligation to repair or replace defective parts is the sole and exclusive remedy of purchaser. Under no circumstances shall THERMO be liable for consequential or economic damages that might arise from a defective part.

NOTE: The use of coolant, other than what is recommended by ThermoGenesis Corp., could void product warranty.

THERMO WARRANTIES, AS SET FORTH HEREIN, ARE EXCLUSIVE AND ARE IN LIEU OF, AND PURCHASER HEREBY WAIVES, ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR WARRANTY OF NON-INFRINGEMENT.

1. Introduction

Procedure

If Warranty repairs are needed, contact Helmer Technical Service, 14400 Bergen Boulevard, Noblesville, IN 46060, Telephone: +1.317.773.5637 or 800.743.5637 in the US; Fax: +1.317.773.9082. For emergency repairs at night or on weekends or holidays, contact your THERMO Authorized Service Provider ("Service Provider") directly and notify Helmer Technical Service on the next business day. Failure to notify Helmer Technical Service on the next business day after a request for emergency repairs may result in denial of coverage for that service call.

When calling for service have available: (1) detailed information about the problem; (2) the serial number of the unit; (3) the service record for the unit; (4) the date and place of purchase of the unit.

Limitations

EQUIPMENT OR SPARE PART MALFUNCTIONS OTHER THAN THOSE CAUSED BY DEFECTS IN MATERIALS OR WORKMANSHIP, INCLUDING MALFUNCTIONS CAUSED BY MISUSE, ACCIDENT OR FAILURE TO PERFORM SCHEDULED MAINTENANCE, ARE EXCLUDED FROM COVERAGE. ANY ALTERATIONS OR MODIFICATIONS MADE TO THE UNIT (OTHER THAN MODIFICATIONS OR ALTERNATIONS MADE BY THERMO) RENDER THE WARRANTY NULL AND VOID. THERMO WILL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES RESULTING FROM EQUIPMENT MALFUNCTION OR LOSS OF USE OF THE EQUIPMENT. THERMO MAY AUTHORIZE INDEPENDENT CONTRACTORS TO PERFORM SERVICE. SERVICE PROVIDERS ARE INDEPENDENT CONTRACTORS, NOT THERMO EMPLOYEES, CONSEQUENTLY, THERMO IS NOT RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE SERVICE PROVIDERS, INCLUDING WITHOUT LIMITATION, FAILURE BY A SERVICE PROVIDER TO RESPOND TO CALLS FOR EMERGENCY SERVICE IN A TIMELY FASHION.

Chapter 2

Overview

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Specifications

Height:	105 cm (42 in)
Height with lid open:	185 cm (73 in)
Width:	260 cm (103 in)
Depth:	94 cm (38 in)
Electric Defrost Heater:	1000 W
Unit Weight:	601 kg (1325 lbs)
Coolant Volume:	492 liters (130 gal)
Product Final Core Temperature:	-30°C (-22°F)
Line Voltage / Amperage:	200-240 VAC
Current (Max)	12A
Frequency	50/60 Hz
Minimum Circuit Breaker:	20 Amps
Installation Category	II

For Indoor Use Only

Mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage

Operating Environment

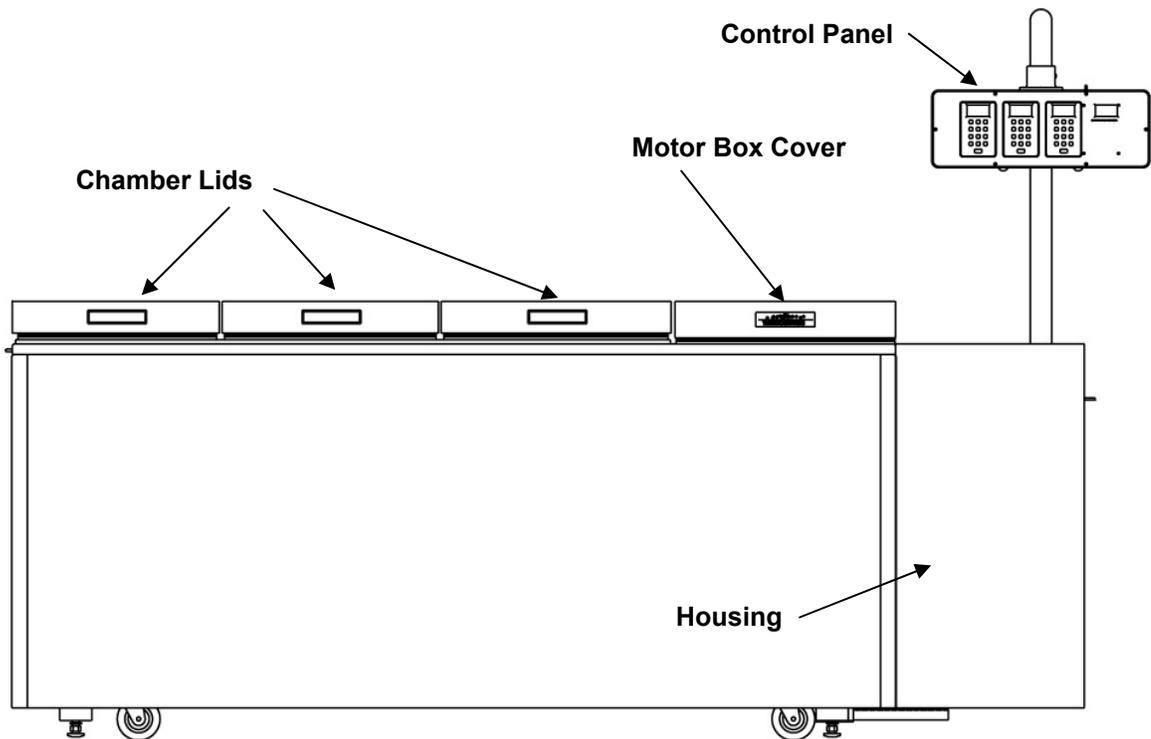
Temperature:	15°C to 30°C (59°F to 86°F)
Relative Humidity:	10% to 80%
Altitude	≤ 2000m
IP	40
Pollution Degree	2

2. Overview

Operational Overview

The THERMOGENESIS CORP. MP2200 Freezer (Figure 1) is a low temperature liquid bath freezer. Blood components are frozen using a low temperature re-circulating liquid coolant passing outside polyurethane pockets containing the blood components. One-touch defrost and water filtration cycles allow for automatic water removal, thus reducing ice build-up.

Figure 1: MP2200 Freezer



Safety Devices

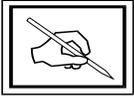
Safety thermostat

The MP2200 Freezer monitors temperature of the coolant with a temperature sensor and a thermostat (See *Major Components, InstaCoolant /V*, for a description of the coolant). This thermostat cuts all power to the freezer if coolant temperature exceeds 27°C (80°F).

During defrost operation

During a defrost cycle, the heater warms the coolant from its chilled temperature to about 3°C (37°F). If the heater does not shut off at 3°C and

continues to operate, the thermostat will override the defrost cycle at 27°C (80°F) and shut off power to the unit.



NOTE: A small red light is located on the right side of the freezer, in the upper left hand corner. When this red light is on, the coolant temperature is above the safety thermostat temperature setting and all power to the machine has been shut off.

Major Components of the Freezer

Refrigeration system (sold separately)

The MP2200 Freezer is available with air or water-cooled two-stage remote condensing unit. Contact Helmer Technical Service for more information.

Motor box

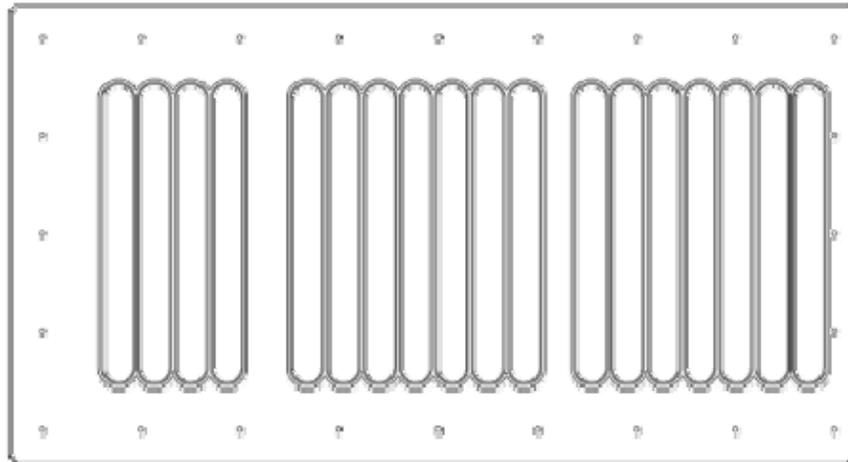
Located at the right side of the freezer, the motor box contains three coolant circulating pumps, electrical components, safety thermostat, connection for the electrical defrost heating element and the exhaust fans for cooling the motorbox compartment.

Deck and pockets

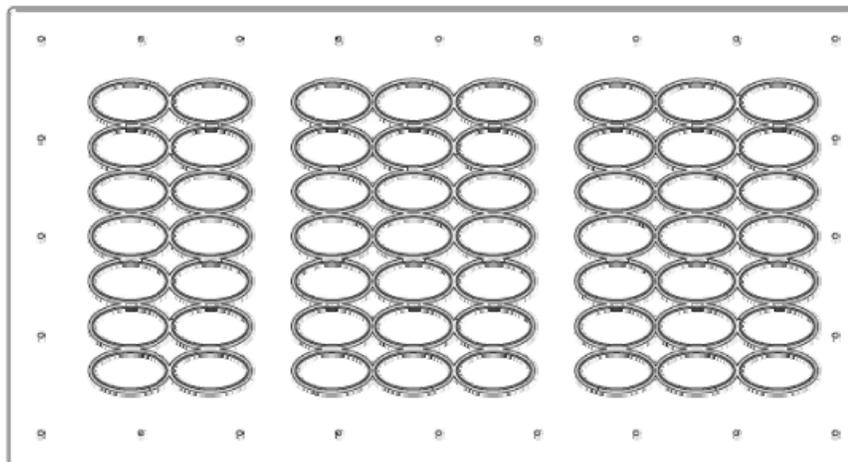
The deck of the MP2200 Freezer is located under the three lids and holds the pockets in which the blood components are placed (Figure 2). The pockets are made of a polyurethane material capable of maintaining flexibility at low temperatures. The pockets hang down into the three freezing chambers. During a freezing cycle, the pockets encapsulate the blood components during coolant circulation. The deck and pockets provide a tight seal to insulate the low temperature reservoir from the ambient room temperature.

2. Overview

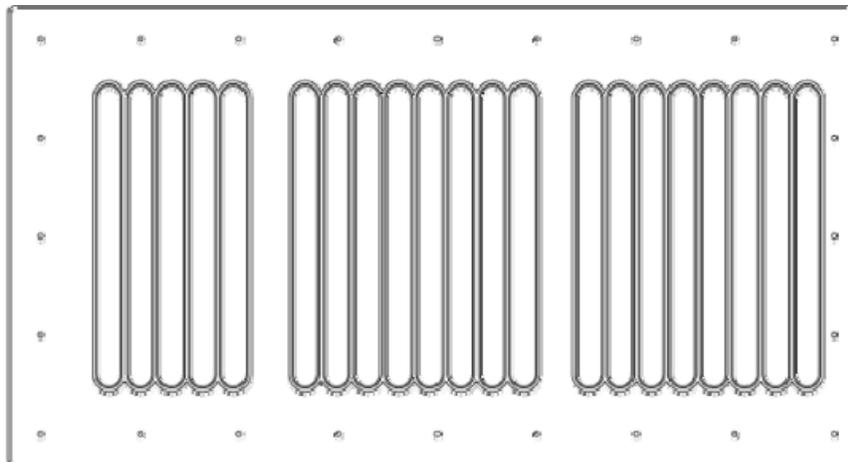
Figure 2: Deck and pocket arrangements



8-2200-12, 18-pocket configuration



8-2200-23, 56-pocket configuration

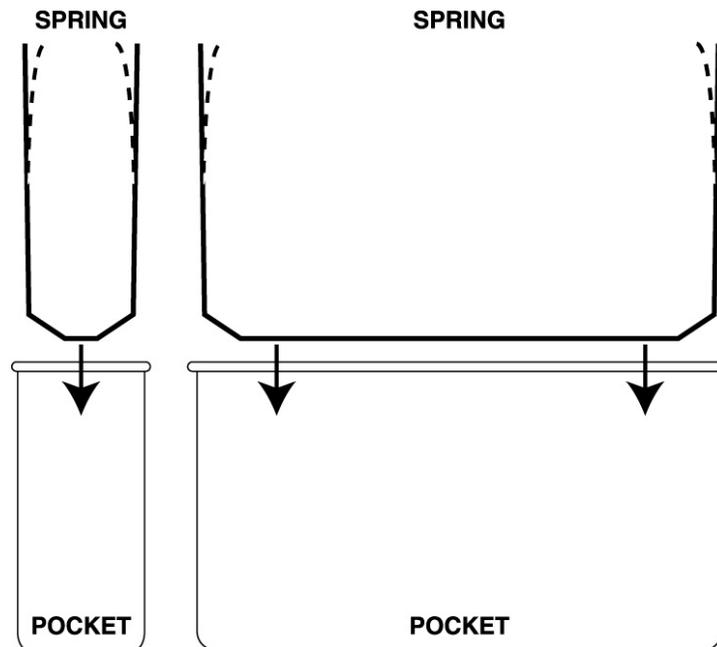


8-2200-31, 21-pocket configuration

Pocket springs

The pocket spring is a metal insert that assists with insertion and removal of blood components.

Figure 3: Pocket spring



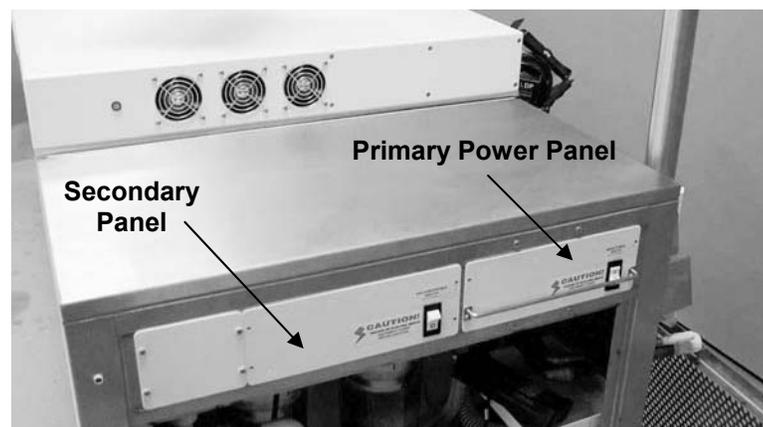
Freezing chambers

Located below the deck are three freezing chambers. During the freezing cycle, these chambers are filled with low temperature InstaCoolant IV. The coolant circulates around the pockets, freezing blood components.

Power panels

Located on the housing console at the right side of the freezer, these panels contain the electronics that operate the freezer (Figure 4). The main power switch is located on the primary power panel. Fuses for the various electrical components are located in these two panels.

Figure 4: Power panels



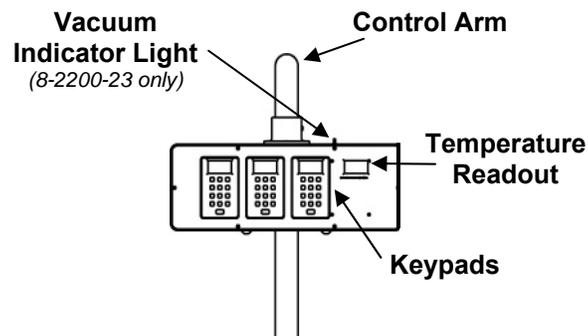
2. Overview

Control panel

The control panel is located on the control arm (Figure 5). The commands for operation, defrost, calibration and temperature setpoint are entered using the keypads.

(For model 8-2200-23 only) On top of the control panel is a small, red vacuum indicator light. When lit, it indicates that the vacuum system has reached the setpoint where the pockets are expanded. Blood components may now be inserted or removed from the pockets.

Figure 5: Control arm and control panel

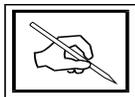


Over temperature indicator light

On the right side of the freezer is a small red light, located in the upper left-hand corner of the housing. When lit, it indicates that the safety thermostat has shut off power to the freezer due to high coolant temperature.

InstaCoolant IV

InstaCoolant IV (Dow Chemical Company Syltherm XLT) is a silicone-based heat transfer fluid specifically designed for use in low temperature systems. While the fluid operating range is -100°C to 260°C (-150°F to 500°F), the vapors of the fluid have a flashpoint¹ at 42°C (108°F).



NOTE: THERMOGENESIS CORP. provides a safety thermostat that automatically shuts off all power to the freezer when the coolant temperature exceeds the safety temperature setting. THERMOGENESIS CORP. sets the safety temperature limit at 27°C (80°F).

¹ The lowest temperature at which the vapor of a liquid can ignite momentarily in air. This assumes an ignition source is present such as a flame or an electric heater element.

Chapter 3

Installation

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Unpacking And Inspection

Check for any shipping damage upon receiving the freezer. If there is any apparent damage, notify the shipping company immediately. Contact Helmer Technical Service if there are any problems.

The following items should be included with the freezer:

- Installation Kit
- Accessory Kit
- Spare Parts Kit
- Silica Gel Replacement Kit

Please record the following information located on the back of the freezer in the spaces marked below:

MP2200 Freezer

Model Number: _____

Serial Number: _____

Date of Purchase: _____

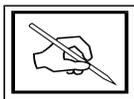
The condensing unit is sold separately. Please record the following information located on the condensing unit in the spaces marked below:

Condensing Unit

Model Number: _____

Serial Number: _____

Date of Purchase: _____



NOTE: Condensing unit installation must be performed by a qualified refrigeration service company.

3. Installation

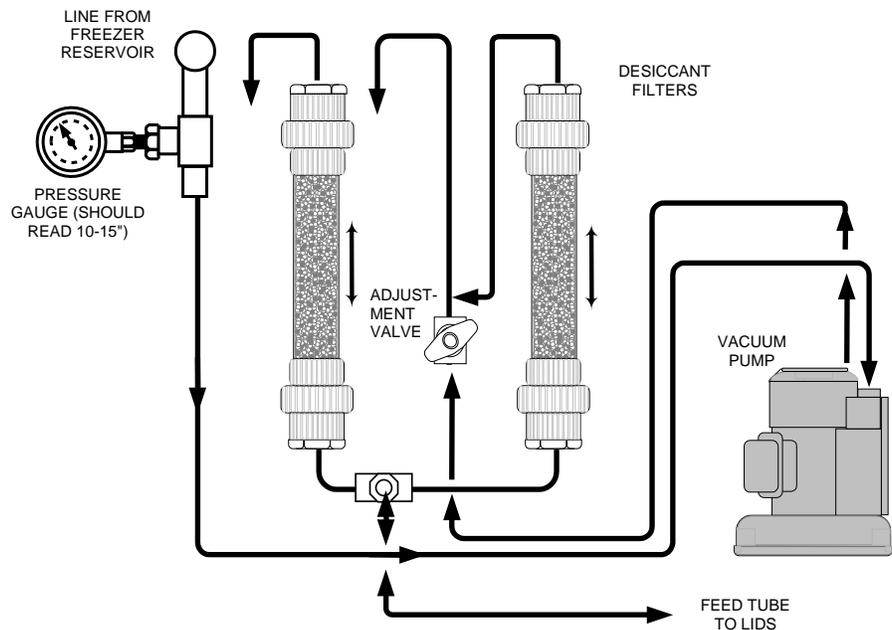
Vacuum System and Desiccant Filter



NOTE: Vacuum System for model 8-2200-23 only.

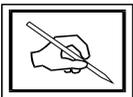
Located in the housing on the right side of the MP2200, the vacuum system and desiccant filter assembly act to expand the pockets for easy insertion and removal of the blood components before and after a freeze cycle. They also dry the air present under the lid covers. The gauge should be adjusted to read between 10 and 15" of vacuum when the vacuum system is on.

Figure 6: Desiccant filter assembly schematic for the MP2200



Placing the Freezer in Position

The MP2200 Freezer must be located on a level floor, and in a room where the ambient temperature is within a range of 15°C to 30°C (59°F to 86°F) and the relative humidity is within a range of 10% to 80%. Under no circumstances is the MP2200 to be located in an outdoor environment.



NOTE: DO NOT ADD the InstaCoolant IV before placing the freezer in its final location. If it is necessary to move the freezer, always remove the InstaCoolant IV before moving the unit.

For ease of movement and accessibility to the place of installation, allow at least 4" (11 cm) clearance on both sides of the freezer when passing through passageways and doorways.

To allow adequate ventilation, the freezer must be at least 18" (46 cm) of clearance from the back and front of the freezer and at least 6" (16 cm) on the left side of the freezer. There must be at least 36" (92 cm) of clearance from the right side of the freezer to change the filter, defrost and move the control arm to access the motor box cover.

Make sure the main power switch is in the "Off" position before plugging the power cord into the electrical outlet.



NOTE: Once the freezer is in position, lower the leveling feet. Level the freezer, both side to side and front to back by placing a level on the top of the freezer and adjusting the leveling feet up or down.

Electrical Installation and Specifications

The power source of the freezer must be wired by a qualified electrician. The unit may be wired directly to a supply circuit, or a locally approved plug and socket may be used. For freezers sold to North American customers, a NEMA 6-20P plug is pre-installed on the unit.

Electrical supply lines with the freezer's power cord are colored as follows:

- L1 = Blue (Neutral)
- L2 = Brown (Line)
- L3 = Yellow/Green (Ground)

The MP2200 Freezer requires a 20 Amp dedicated line.



CAUTION: A qualified electrician must survey the existing power availability at your facility to verify your electrical capabilities.

CAUTION: Mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage

Mounting the Housing

The housing contains the desiccant filter assembly, refrigeration lines and internal filtration system. For model 8-2200-23, the vacuum pump is also in the housing. It also provides a mounting support for the control arm. Mounting of housing is as follows:

1. Remove the perforated side grill from the housing.
2. Remove any packaging material from inside the housing.

3. Installation

3. Remove the top of the housing by removing the two screws on the side of the top cover and slide the top out to the right.
4. Position the housing against the right side of freezer chassis with the power panels facing out.
5. Using the hardware provided, align four slots of chassis bracket with holes of housing and install four each ¼-20x1" socket cap screws, ¼" flat washers, and ¼-20 Nylock nuts. Do not tighten the screws at this time.
6. Align and install 5 each ¼-20x1" hex cap screws, ¼" flat washers, and ¼" spring washers through housing slots (located at top) into the chassis bezel. Tighten the screws until the spring lock washers are completely compressed.
7. Align the 1" union located at the bottom of the left side of the pump in the housing.
8. Tighten all the screws, then tighten union from the pump.
9. Connect ¾" line hose of return line and tighten clamps.
10. Tighten the four chassis bracket screws installed in step 5 and 6.
11. Screw the plastic union attached to one 1" desiccant hose onto the mate located in upper left corner of chassis inside housing. Be sure the o-ring between the mating flanges of union is installed.
12. *(For model 8-2200-23 only)* Connect the clear vacuum hose from the back of the freezer to the port at the right side of the housing.

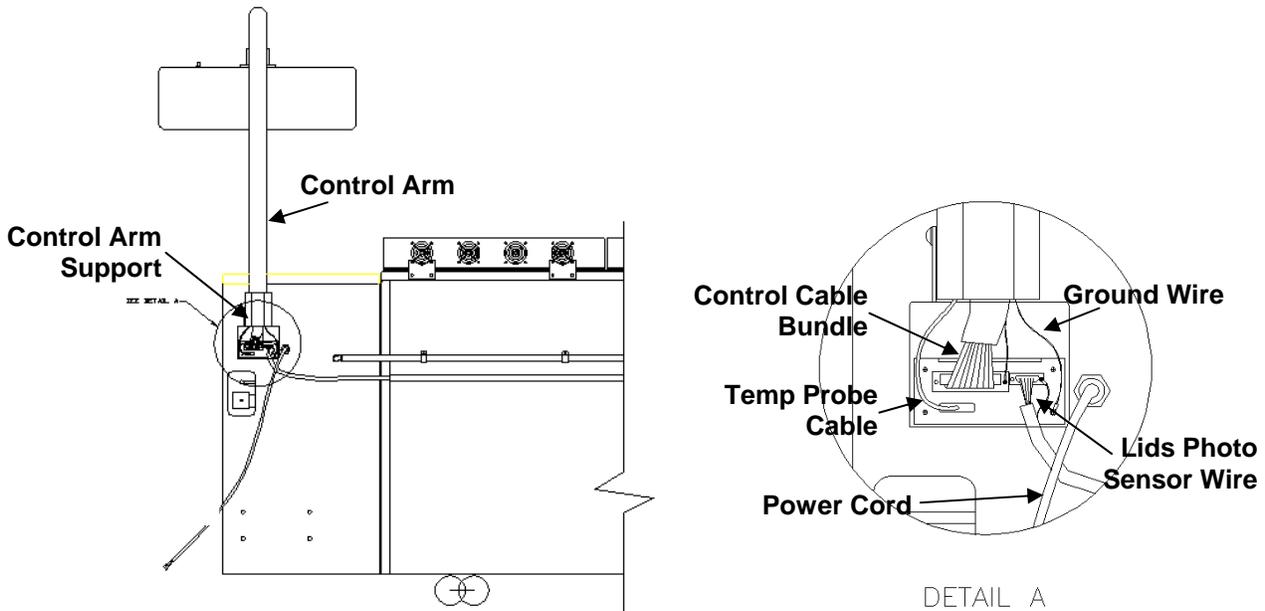
Installing the Control Panel

The control panel for the MP2200 is located on a control arm that holds the panel at eye level for easy viewing. The control arm can rotate out of the way to provide access to the motor box cover.

To install the control arm and control panel:

1. Remove the plastic wrap from the control arm.
2. Make sure the wiring bundle extends out each end of the control arm.
3. At the rear of the freezer, thread the wiring bundle through the support. Slide the control arm in the bracket located at the rear of the housing (Figure 7).
4. Tighten the setscrew in the bracket so that it engages the slot in the control arm. This limits movement of the control arm.
5. Unwrap the control panel housing, slide it on to the control arm, and tighten the setscrew to hold the panel in place (Figure 8).

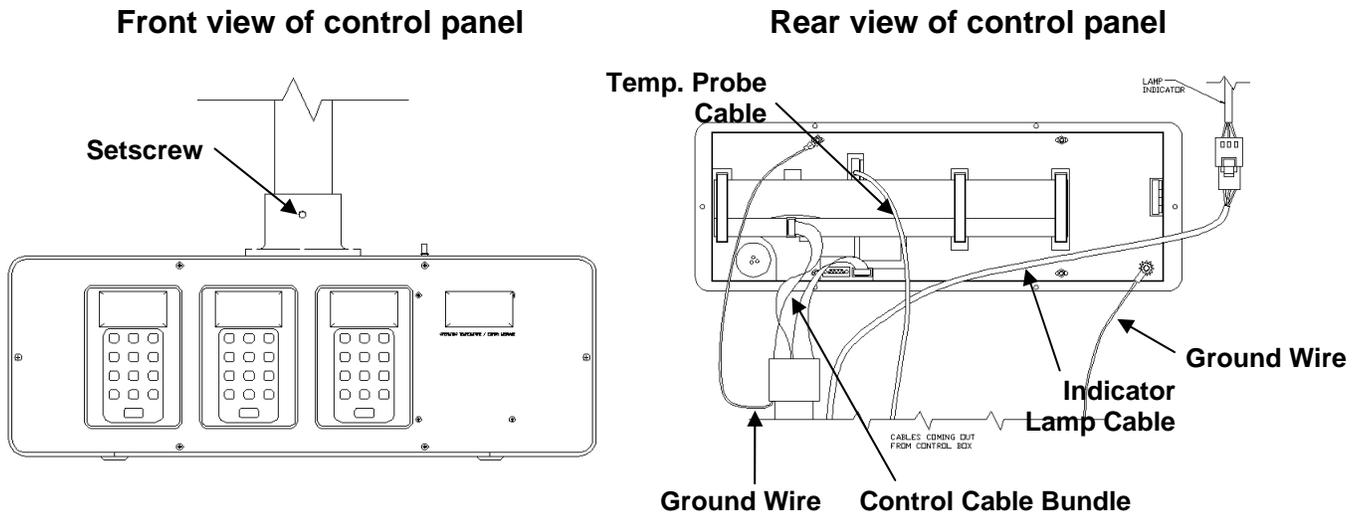
Figure 7: Control arm wiring detail



6. Connect the wires to the back of the control panel (Figure 8) making sure that all ribbon connectors and cables are pressed firmly in place and locked.
7. Place the control panel on the housing and secure it with the screws (Figure 8).
8. At the rear of the freezer near the control arm support, remove the screws holding the wiring cover in place, remove the cover and connect the wiring (Figure 7) making sure all ribbon connectors and cables are pressed firmly in place.
9. Replace the wiring protective cover using the screws and tighten the screws in place.

3. Installation

Figure 8: Display panel wiring detail



Solenoid Valve Wiring

The following wiring connects the refrigerant solenoid valve coil to the primary power panel. This should be done by the refrigeration technician installing the remote condensing unit.

1. Once the refrigeration piping is complete and the liquid line solenoid valve body has been installed in the liquid line just outside the freezer chassis, set the solenoid coil assembly (P/N 7-34-058) in place.
2. Insert the flex conduit through the back of the housing.
3. Remove the primary power panel by removing the four screws and turn upside down to expose the connectors.
4. Thread the solenoid coil flex conduit through the opening for the primary power panel and snap the connector in place next to the label showing "Solenoid Valve". The solenoid coil assembly must be wired in parallel with the control wiring running from the condensing unit to the freezer.
5. Replace the primary power panel and secure with the screws.

Adding the InstaCoolant IV

The MP2200 takes 130 gallons (492 liters) of InstaCoolant IV silicone based coolant. The coolant is added to the machine in 53 gallon (200 liter) drums and 4.5 gallon (17 liter) containers using the following method:

1. Open the lid to the left freezing chamber.
2. Remove a pocket closest to the left side of the chamber. (See *Removing and Replacing a Pocket – Chapter 5*).

3. Installation

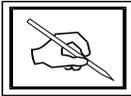
3. Insert the hose from the transfer pump through the pocket opening and between the outside of the left hand chamber wall and the inside of the reservoir.
4. Add 130 gallons (492 liters) coolant to the freezer. Check that the level is about 2-3" (5-7.5 cm) above the bottom of each chamber.



CAUTION: Never store InstaCoolant IV in direct sunlight. InstaCoolant IV must be stored in a room where the temperature does not exceed 29.4°C (85°F).

Starting the MP2200 Freezer

1. Make sure the unit is properly plugged into the wall, then turn on the main power switch located on the primary power panel.
2. The MP2200 Freezer will begin to chill the InstaCoolant to the set operating temperature.



NOTE: It is recommended to record the temperature approximately every 10 minutes after the unit drops in temperature.

3. The far left chamber pump will come on to circulate the coolant. It will turn off when the freezer reaches the set operating temperature.
4. When the freezer reaches the set operating temperature, the MP2200 is now ready for validation and operation.

Chapter 4

Operating Instructions

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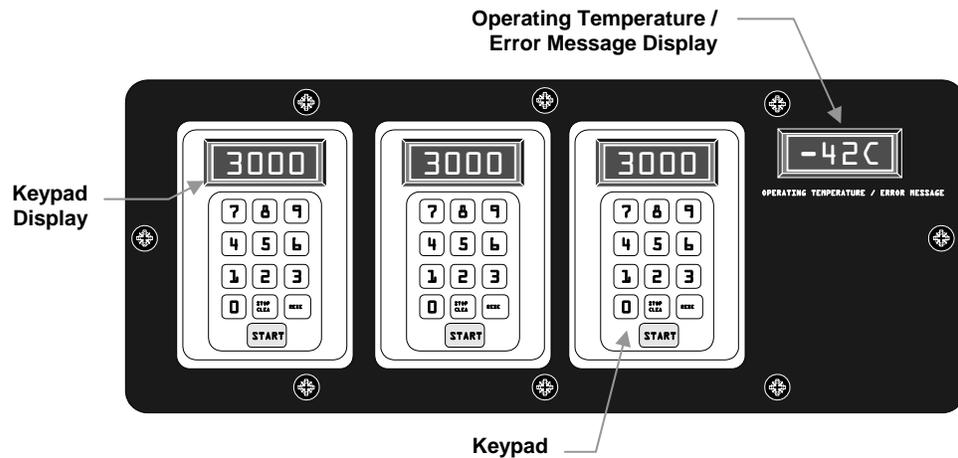
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Introduction

This chapter outlines the following operations of the freezer using the Control Panel Keypads (Figure 9):

- Setting the Operating Temperature
- Calibrating the Operating Temperature
- Setting the Freeze Cycle Time
- Running a Freeze Cycle
- Setting the MP2200 Freezer for Night Cycle Operation

Figure 9: MP2200 Control Panel



Setting the Operating Temperature

The operating temperature is the set temperature of the InstaCoolant IV during normal freezer operation. During a freeze cycle, the actual coolant temperature may raise a few degrees for a period of time as it absorbs heat from the blood component.

From any keypad, the MP2200 Freezer software allows the user to set the operating temperature from -25°C to -42°C . The default operating temperature is -42°C .

To set a new operating temperature:

1. Enter **100** on a keypad.
2. Press the **RESET** key.
3. The current operating temperature setting will flash on the temperature display and the display above the keypad will show "**TEMP**".

4. Operating Instructions

4. Enter the desired operating temperature on the keypad. For example, enter **42** to set the operating temperature to -42°C. The new temperature is displayed on the keypad. The temperature range to be entered must be between -25°C and -42°C.
 - a. To erase any entry, press the **RESET** key.
 - b. To exit without saving, press the **STOP/CLEAR** key.
5. To save the new setting, press the **START** key within 10 seconds of the entry. The new setting will flash on the temperature display for 10 seconds and "**TEMP**" will be displayed above the keypad.
6. The coolant operating temperature is now set.

Verifying Operating Temperature Calibration

Anytime the freezer has been turned off for a period of time, or if the freezer has been relocated, it is recommended to calibrate the operating temperature. Calibrating the operating temperature of the coolant verifies that the digital temperature display is reading the actual coolant temperature around the pocket. THERMOGENESIS CORP. calibrates the operating temperature of the MP2200 Freezer at the factory before shipment. However, it is possible that during shipment, the calibration may be out of adjustment.

To verify the temperature calibration:

1. The temperature of a freeze cycle must be measured. On one of the keypads, set a 5-minute freeze cycle (See *Setting the Freeze Cycle Time – Chapter 4*).
 - a. Press **RESET** on an idle keypad.
 - b. Enter **500** on the same keypad.
 - c. Press **START** within 10 seconds to save the setting.
2. Lift lid on the chamber corresponding to the keypad where the 5-minute freeze cycle was set. The display will alternate between "**LID**" and "**OPEN**".
3. Insert a calibrated thermometer (capable of reading to -60°C) into a middle pocket of the chamber corresponding to the keypad being used.
4. Close the lid. The display will change to "**500**".
5. Press **START** on the corresponding keypad to initiate the freeze cycle. The chamber will fill and "**FILL**" will flash on the display. When the filling of the chamber is completed, the timer will count down.
6. When the timer reaches "**100**" lift the lid. Keeping the thermometer close to the pocket, read and record the temperature. This will prevent false reading due to exposure to ambient temperature. Remove the thermometer from the pocket and close the lid. When the countdown is completed, the chamber begins to drain. "**DRN ▼**" will flash on the keypad. An alarm will sound and the display will change to "**500**".

4. Operating Instructions

7. If the recorded temperature of the thermometer is not within $\pm 3^{\circ}\text{C}$ of the temperature displayed on the control panel, the freezer should be calibrated.

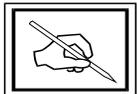
Calibrating the Operating Temperature

1. To recalibrate the temperature, enter **200** on an idle keypad.
2. Press the **RESET** key.
3. The current bath temperature will flash on the temperature display and "**CAL .**" will be displayed on the keypad.
4. On the keypad, enter the temperature obtained from the thermometer. The new temperature will be displayed on the keypad. For example, if the calibrated thermometer reading was -35°C and the display showed **-42.0C**, enter 35 to set the operating temperature to the calibrated temperature.
 - a. To exit without saving, press the **STOP/CLEAR** key.
 - b. To erase any entry and start over, press the **RESET** key.
5. Press the **START** key **within 10 seconds** to save the new setting. The new setting will flash on the display panel for 10 seconds.
6. The operating temperature is calibrated. To recalibrate the operating temperature at anytime repeat the steps above.

Setting the Freeze Cycle Time

The freeze cycle time can be adjusted from 1 second to 99 minutes and 59 seconds, depending upon the user's requirements. It is important to follow the validation requirements set by your company to determine the freeze time required to produce the desired final core temperature of the product.

Perform the following steps to set the freeze cycle time:



NOTE: Setting the time on one keypad does not affect the setting on the other keypads.

1. Press the **RESET** key on the keypad corresponding to the freezing chamber being used. The chamber must be idle and the lid closed.
2. The current cycle time will flash on the display, alternating with the word "**TIME**". The default is 12 minutes.
3. Enter the desired cycle time on the keypad. The new time is displayed (non-flashing) on the display. For example, enter **1230** to set the time to 12 minutes and 30 seconds. The maximum time that can be entered is 99 minutes and 59 seconds.
 - a. To erase an entry and start over, press the **RESET** key.
 - b. To exit without saving, press the **STOP/CLEAR** key.

4. Operating Instructions

4. Press the **START** key within 10 seconds to save the new setting. The new setting will be displayed flashing for 10 seconds, alternating with the word "**TIME**".
5. The new freeze cycle time is now set. To change the freeze cycle time for another chamber, repeat the steps listed above on the appropriate keypad. Each chamber can have different freeze cycle times depending on customer requirements.

Running the Freeze Cycle

Perform the following steps to run a freeze cycle on the MP2200:

1. Open a lid. The corresponding display will alternate between "**LID**" and "**OPEN**". (For model 8-2200-23 only: Wait for the vacuum indicator light to turn on located on top of the control panel.)
2. Place blood components in the pockets.



CAUTION: To prevent pocket damage, do not drop or force blood components in the pockets.

3. Close the lid and press **START**. The Keypad Display will flash "**FILL**" for one minute, indicating that coolant is filling the chamber.
4. Once the chamber is full, the corresponding display will begin a countdown.



CAUTION: Unless absolutely necessary, do not raise the lid during the freeze cycle. Do not add blood components at any time during the freeze cycle without restarting the freeze cycle from the beginning, as this will result in those blood components being incompletely frozen.

5. If the lid is opened during the countdown, the chamber will drain, the display will flash "**DRN ▼**", and then a 5-second alarm will sound. After the lid is closed, the chamber will fill, the display will flash "**FILL**", and then the freeze cycle will resume at the point before the lid was opened.
6. During the freeze cycle, the countdown is displayed.
 - a. To stop the cycle, press **STOP/CLEAR**. The chamber will drain, the display will flash "**DRN ▼**" and an alarm will sound.
7. The freeze cycle is complete when the countdown on the Time/Function Display reaches **0**. The Keypad Display will display "**DRN ▼**".
8. When the 75-second drain cycle is completed, an alarm will sound.
9. Lift the lid. While the lid is open, the display will alternate between "**LID**" and "**OPEN**". (For model 8-2200-23 only: Wait for the vacuum indicator light to turn on.)
10. Remove the frozen blood components from the pockets.

Running the Night Cycle

The Night Cycle Operation allows the user to place a load of blood components in a chamber (or all chambers) before leaving for the night or a weekend. When the Night Cycle is activated, the unit performs a normal freeze cycle for the length of time last set on the Keypad Display. Upon completion of the freeze cycle, the freezer will then cycle the pumps for five minutes every half-hour to maintain the temperature of the frozen blood components.

Perform the following steps to run a Night Cycle:

1. Open the lid to an idle chamber and place the blood components in the pockets. The corresponding keypad will alternate between "**LID**" and "**OPEN**". *(For model 8-2200-23 only: Wait for the vacuum indicator light to turn on.)*
2. Close the lid. The display will change back to the cycle time.
3. Enter **300** on keypad corresponding to the chamber where the blood components have been loaded.
4. Press **RESET**. The corresponding display will flash "**NITE**".
5. The Night Cycle is in operation. While the pumps are running, the display will flash "**NITE**" and when the pumps are not running, "**NITE**" will not flash.
6. The user can return to normal operating mode by simply pressing the **STOP/CLEAR** button on the keypad.
7. To run a Night Cycle in more than one chamber, repeat these steps on each keypad corresponding to the chamber being used.

Chapter 5

Maintenance

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The following are the minimum recommended maintenance periods. Maintenance may be performed more frequently if required. Forms are included in Appendix A of this Manual. The table below outlines the maintenance schedules to be performed by the blood center. The sections following the table provide detail for the routine maintenance schedules listed.

Maintenance Schedule

SCHEDULE	MAINTENANCE DESCRIPTION
Daily	<ul style="list-style-type: none">• Clean the deck• Check and clean the pockets
Weekly	<ul style="list-style-type: none">• Clean the unit
Monthly	<ul style="list-style-type: none">• Check desiccant filters• Check pump motor cooling fans
Quarterly	<ul style="list-style-type: none">• Check coolant level• Check lid gasket seals• Check hinges• Check deck screws• Verify operating temperature calibration• Defrost the freezer and run filter cycle

Checking and Cleaning Pockets



NOTE: If there is a blood component leak, dispose of biohazardous waste in a biohazardous waste container in accordance with local and national regulations.

1. If there is liquid inside the pocket, it indicates a leak where coolant has entered the pocket. Replace the pocket.
2. (*For model 8-2200-23 only*) Check the membrane pockets for leaks using the vacuum test gauge (P/N 7-47-068) provided with the freezer. If the gauge registers any value greater than 0, the pocket has a leak and needs to be replaced. If not immediately replaced, a pocket plug can be inserted into the broken pocket temporarily.



CAUTION: Do not vacuum out the coolant.

3. If ice or frost is inside the pocket, remove it with the wet/dry shop vac.
4. Dry the lids and deck with a soft cloth and close the lids.

5. Maintenance

Cleaning the Deck

1. Raise all three lids allowing ice to melt off the deck (approximately 15-20 minutes). *(For model 8-2200-23 only: Turn off the vacuum disable switch on the secondary power panel.)*
2. Once ice is melted, use a wet/dry vacuum cleaner to remove water from the deck and around the pockets. *(For model 8-2200-23 only: Turn on the vacuum disable switch on the secondary power panel.)*

Removing and Replacing a Pocket

Each pocket has two seams down the sides. The top of the pocket has a snap seal which is used to attach it to the deck.

To remove a pocket:

1. Remove the pocket springs by reaching in the pocket and grasping the ends and pressing them slightly together as the spring is removed. *(For model 8-2200-23 only: Turn off the vacuum disable switch on the secondary power panel.)*
2. Grab the inside front seam of the pocket approximately 1 inch below the snap seal.
3. Lift up to pop the snap seal loose from the deck lip.
4. Remove the pocket.

To replace a membrane pocket:

1. Holding the top of the pocket, push the new pocket through the opening in the deck.
2. Seams of the pocket should always be aligned toward the front and rear of the freezer.
3. Place the snap seal onto the deck lip.
4. Press the snap seal into place on the deck lip. Starting at the front seam, work around both sides of the snap seal, going toward the opposite side.
5. Replace the pocket spring. Make sure the pocket spring is firmly in place under the snap seal of the pocket. *(For model 8-2200-23 only: Turn on the vacuum disable switch on the secondary power panel.)*

Cleaning the Freezer

On a weekly basis, clean the freezer. Using a mild detergent in warm water, wipe all outer surfaces, the control panel, the inner surfaces of the lid and gasket and the membrane deck.

Checking Desiccant Filters

1. Remove housing access panel on the right side of the freezer.
2. The two desiccant filter tubes are located in the housing.
3. There are blue indicating pellets in the desiccant material. The desiccant material needs to be replaced when the blue pellets fade to a gray color in both of the clear desiccant filter assemblies.

To replace desiccant:

1. Remove the top coupling on the desiccant filter that holds the desiccant beads.
2. Remove the bottom coupling on the desiccant filter.
3. Unsnap the clips holding the desiccant filter and remove the tube of desiccant.
4. Dispose of contents according to local regulations.
5. Fill clear tube completely with new desiccant (P/N 7-01-038).
6. Place the clear tube back into the clips.
7. Tighten bottom coupling.
8. Tighten top coupling.
9. Snap clips holding the desiccant filter.
10. Repeat for the other desiccant filter.

Checking the Pump Motor Cooling Fans

1. Hold a piece of paper against the intake fans on the right side of the motor box cover. The paper should be drawn into the fans indicating a good airflow.
2. Hold a piece of paper against the exhaust fans at the back of the motor box cover. The paper should be blown away from the cover.
3. If there is no airflow, turn the freezer off immediately and contact Helmer Technical Service.

Checking the Coolant Level

1. No chambers should be in use and it should be at least 5 minutes from the last freeze cycle. *(For model 8-2200-23 only: Turn off the vacuum disable switch on the secondary power panel.)*
2. Open a lid and remove one of the front pockets.
3. Look down into the chamber. The coolant level should be about 2-3" (5-7.5 cm) above the bottom of the chamber. Use a ruler or other measuring device to check the level.
4. Add coolant if level is less than 2 inches (5 cm). Pour coolant into the chamber through the removed pocket opening using a funnel until coolant level is at 2.5" (6.4 cm).
5. Replace the pocket and close the lid. *(For model 8-2200-23 only: Turn on the vacuum disable switch on the secondary power panel.)*

5. Maintenance

Checking the Lid Gasket Seals

1. Close all lids.
2. Visually inspect to make sure there are no gaps between the lid and the gasket.

Checking the Hinges

1. Open the lids.
2. Visually inspect the hinges to make sure they are not broken.

Checking the Deck Screws

1. Open all three lids.
2. Inspect the membrane deck to ensure that all screws are tight. Tighten the screws if needed.

Verifying the Operating Temperature Calibration

See *Operating Instructions – Chapter 4*.

Defrosting the MP2200 Freezer

Pockets that are not sealed tightly or torn allow warm air to enter the freezer reservoir chamber. When this happens, moisture in the air condenses and turns to ice. Ice buildup in the reservoir will eventually clog the pump inlets and cause improper filling, resulting in unfrozen product. Ice buildup can also cause pump breakage and costly repairs.



NOTE: THERMOGENESIS CORP. recommends, as a minimum, defrosting the freezer every 90 days. If humidity in the room where the freezer is located is higher than the specified humidity range or the freezer pockets have not been properly maintained, the freezer may require more frequent defrost and filter cycles.

Adding Silica Gel to the Coolant Filter



WARNING: Rotating Hazard while the filtration pump is running. Do not put hand near Filtration Pump or injury may occur.

The coolant filters are used to remove moisture from the coolant. The silica gel mixture used to remove the moisture from the coolant contains clear pellets and blue pellets. The blue pellets indicate when the silica gel needs to be replaced.



CAUTION: Gloves and eye protection should be worn. The silica gel and coolant will cause drying of the skin with prolonged contact.



WARNING: If there is a membrane pocket leak combined with a blood component leak, the coolant and silica gel should be treated as a possible biohazard. Follow standard practices for handling and clean up.

Materials required

The following items are necessary to add the silica gel:

1. MP2200 Silica Gel Replacement Kit, P/N 7-01-211 (contains two 5-lb. (2.26 kg) bags of silica gel and two filters)
2. High Vacuum Grease, P/N 5-41-005
3. One large bucket
4. A large funnel
5. An $1\frac{1}{32}$ " socket driver

Draining coolant:

1. Remove the clear plastic hose from the left filter canister's nozzle.
2. Place one end of the hose in the plastic bucket and turn on the nozzle on the right filter canister. The right filter canister will begin draining.
3. Loosen the valve on top of the right filter canister by turning it counterclockwise three times. Do not remove it completely.
4. After about three minutes the right filter chamber will stop draining. Close the nozzle and transfer the hose to the left canister.
5. Turn on the nozzle on the left filter canister and drain coolant into the bucket.
6. Loosen the valve on top of the left filter canister by turning it counterclockwise three times. Do not remove it completely.
7. After about three minutes the left filter canister will stop draining.
8. Close the left filter canister nozzle and set aside the clear plastic hose.
9. Close the valves on top of both canisters.

5. Maintenance

Removing filter canisters:

1. Turn the right filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked or wiggled to remove.
2. Pull the right filter canister down out of the housing and set it aside.
3. Turn the left filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked/wiggled to be removed.
4. Pull the left canister down out of the housing and set it aside.

Adding the silica gel:

1. Pour five pounds (2.26 kg) of silica gel into each filter canister.
2. Replace the coolant filters (P/N 7-03-134) using the $1\frac{1}{32}$ " socket driver.

Replacing filter canisters:

1. Remove the rubber o-ring from a canister. Wash the o-ring with soap and water and dry completely. Grease the o-ring using the vacuum grease. Replace the o-ring, being careful not to stretch the o-ring.
2. Remove the rubber o-ring from the other canister. Wash the o-ring with soap and water and dry completely. Grease the o-ring using the vacuum grease. Replace the o-ring, being careful not to stretch the o-ring.
3. Lift a canister up to the black fitting.
4. Seat the canister by lifting it straight up into the black fitting. It should seat cleanly and not be crooked.
5. Lift up the threaded black clamp. Tighten it by turning counterclockwise.



NOTE: The clamp/fitting tightening should not require an unusual amount of force. If it does, make sure that the black clamp is not cross threaded, the canister o-ring is greased, and the canister is properly seated in the fitting.

6. Turn the black clamp until the stop on the threads meets the stop on the fitting.
7. Take the other canister. Lift the canister up to the black fitting.
8. Seat the canister by lifting it straight up into the black fitting. It should seat cleanly and not be crooked.
9. Lift up the threaded black clamp. Tighten it by turning counterclockwise.
10. Turn the clamp until the stop on the threads meets the stop on the fitting.
11. Attach the clear plastic hose to both canister nozzles.

Running the Defrost Cycle

The MP2200 Freezer is equipped with an electric defrost heater to warm the coolant to a temperature above 3°C. This is not a timed cycle and the freezer will idle until the user ends the process.

Perform the following steps to complete a defrost cycle:

Before starting defrost

Before starting a defrost cycle, make sure there is sufficient coolant in the freezer. The coolant level in each chamber should be about 2-3" (5-7.5 cm) above the bottom of the chamber when the unit is at rest. Insufficient coolant may cause the sensing bulb of the safety thermostat to be above coolant and cause the termination of the defrost cycle. Power to the freezer will be shut off and the red light on the right side of the freezer will light.



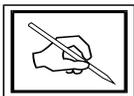
WARNING! FIRE DANGER: Do not place an electric immersion heater in the coolant (See *Safety Precautions – Chapter 1*).

Initiating defrost cycle:

1. Enter **400** on any idle keypad. No freeze cycles can be running and all lids must be closed.
2. Press the **RESET** key. The displays will show "**DEFROST MODE**". The pumps begin circulating the coolant through the chambers, and the defrost heater starts to warm the coolant to 3°C. The freezer will take approximately 8 to 12 hours to warm the coolant from -42°C to final temperature.
3. During warm-up:
 - a. To abort the defrost cycle, press the **STOP/CLEAR** key. The freezer will return to the set operating temperature.
 - b. To turn off the alarm at the end of the cycle, press the **RESET** key.
4. When the temperature reaches 3°C or higher, the heater and pumps will shut off and all chambers will drain. The display will show "**DEFROST DONE**". The unit is now ready to perform a filter cycle.

Running the Filter Cycle

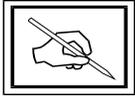
The MP2200 Freezer incorporates a filtration system to remove water from the coolant. The filter cycle takes one hour. Perform the following steps to complete a filter cycle:



NOTE: To run the filter cycle, no freeze cycles can be running and all lids must be shut. The coolant temperature must be above +2°C.

1. The display will show "**DEFROST DONE**".
2. Open the yellow handled ball valve, located in the lower left corner of the stainless steel housing. The valve is "Open" when the handle lines up in parallel with the piping.

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NOTE: Failure to open the valve before running the filter cycle may damage the filter pump.

3. Press **START** on any of the keypads to begin the filtration cycle.
4. The display will show "**FLTR MODE**" and the time remaining until completion of the filter cycle (in hours). The chamber pumps will cycle on for one minute every nine minutes.
5. To abort the filter cycle, press the **STOP/CLEAR** key.
6. The countdown will run until it reaches 0:00. After one minute, the displays will change to "**FILTER DONE**". The freezer will remain idle.
7. An alarm will sound every two minutes. Press the **RESET** key to turn the alarm off.
 - a. Check the silica gel. If there are no blue pellets in either canister, there may be additional moisture in the coolant indicating the need to run a second filtration cycle.
 - b. Follow instructions in *Checking Silica Gel and Replacing Silica Gel*.
 - c. Once silica gel is replaced, press **START** to run another filter cycle.
8. Close the yellow handled ball valve, located in the lower left corner of the stainless steel housing. The valve is "Closed" when the handle is at a 90° angle to the piping.
9. Press the **STOP/CLEAR** key to end the filter cycle and return the freezer to the set operating temperature.
 - a. If **STOP/CLEAR** has been pressed and another filter cycle needs to be run, enter **500** on any idle keypad.
 - b. Press the **RESET** key.
 - c. Refer to steps 3 – 7 above.

Automatic Defrost and Filter

Before starting defrost

Before starting a defrost cycle, make sure there is sufficient coolant in the freezer. The coolant level in each chamber should be about 2-3" (5-7.5 cm) above the bottom of the chamber when the unit is at rest. Insufficient coolant may cause the sensing bulb of the safety thermostat to be above coolant and cause the termination of the defrost cycle. Power to the freezer will be shut off and the red light on the right side of the freezer will light.

Open the yellow handled ball valve, located in the lower left corner of the stainless steel housing. The valve is "Open" when the handle lines up in parallel with the piping.

Add silica gel to both of the filter canisters.



CAUTION: Verify the valves on top of the silica gel canisters and the nozzles on the bottom of the canisters are closed. Large amounts of coolant can leak during the filter cycle if the canisters are not closed properly.

Initiating the automatic defrost and filter:

1. Enter **600** on any idle keypad. No freeze cycles can be running and all lids must be closed. Press the **RESET** key. The displays will show “**Auto Defrost**”. The pumps begin circulating the coolant through the chambers, and the defrost heater starts to warm the coolant to 3°C. The freezer will take approximately 8 to 12 hours to warm the coolant from -42°C to final temperature.
2. To abort the defrost cycle, press the **STOP/CLEAR** key. The freezer will return to the set operating temperature.
3. When the temperature reaches 3°C or higher, the heater and pumps will shut off and all chambers will drain. The display will show “**Auto Fltr**” and the time remaining until completion of the filter cycle (in minutes and seconds). The chamber pumps will cycle on for one minute every nine minutes.
4. To abort the filter cycle, press the **STOP/CLEAR** key.
5. When the filter cycle is complete, the freezer will return to the set operating temperature.
6. After the filter cycle is complete, check the silica gel located in the housing. If there are no blue pellets in either canister, there may be additional moisture in the coolant and you should run a second filtration cycle. This second cycle will need to be run within two weeks of the first cycle.

Checking Silica Gel for Coolant Filter



WARNING: Rotating Hazard while the filtration pump is running. Do not put hand near Filtration Pump or injury may occur.

The coolant filters are used to remove moisture from the coolant. The silica gel mixture used to remove the moisture from the coolant contains clear and blue indicator pellets.

Check the color of the indicating pellets by removing the canisters. Pour the contents of each canister into a bucket one at a time.

If blue pellets can be found in one or both of the canisters reinstall the empty filter canisters. Filtering process has completed successfully. Close yellow handled ball valve.

If the silica gel, removed from **both** canisters, have no blue indicating pellets, refill the canisters with fresh silica gel and repeat filter cycle. Your

5. Maintenance

system still may contain moisture. Repeat procedure until at least one of the canisters still has blue pellets.

Dispose of the silica gel from the two filter canisters according to local regulations.



CAUTION: Gloves and eye protection should be worn. The silica gel and coolant will cause drying of the skin with prolonged contact.



WARNING: If there is a membrane pocket leak combined with a blood component leak, the coolant and silica gel should be treated as a possible biohazard. Follow standard practices for handling and clean up.

Replacing Silica Gel

Materials required

The following items are necessary to add the silica gel:

1. MP2200 Silica Gel Replacement Kit, P/N 7-01-211 (contains two 5-lb. (2.26 kg) bags of silica gel and two filters)
2. High Vacuum Grease, P/N 5-41-005
3. One large bucket
4. A large funnel
5. An $1\frac{1}{32}$ " socket driver

Draining coolant:

1. Remove the clear plastic hose from the left filter canister's nozzle.
2. Place one end of the hose in the plastic bucket and turn on the nozzle on the right filter canister. The right filter canister will begin draining.
3. Loosen the valve on top of the right filter canister by turning it counterclockwise three times. Do not remove it completely.
4. After about three minutes the right filter chamber will stop draining. Close the nozzle and transfer the hose to the left canister.
5. Turn on the nozzle on the left filter canister and drain coolant into the bucket.
6. Loosen the valve on top of the left filter canister by turning it counterclockwise three times. Do not remove it completely.
7. After about three minutes the left filter canister will stop draining.
8. Close the left filter canister nozzle and set aside the clear plastic hose.
9. Close the valves on top of both canisters.

Removing filter canisters:

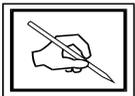
1. Turn the right filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked or wiggled to remove.
2. Pull the right filter canister down out of the housing and set it aside.
3. Turn the left filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked/wiggled to be removed.
4. Pull the left canister down out of the housing and set it aside.

Adding the silica gel:

1. Pour five pounds (2.26 kg) of silica gel into each filter canister.
2. Replace the coolant filters (P/N 7-03-134) using the ¹¹/₃₂" socket driver.

Replacing filter canisters:

1. Remove the rubber o-ring from a canister. Wash the o-ring with soap and water and dry completely. Grease the o-ring using the vacuum grease. Replace the o-ring, being careful not to stretch the o-ring.
2. Remove the rubber o-ring from the other canister. Wash the o-ring with soap and water and dry completely. Grease the o-ring using the vacuum grease. Replace the o-ring, being careful not to stretch the o-ring.
3. Lift a canister up to the black fitting.
4. Seat the canister by lifting it straight up into the black fitting. It should seat cleanly and not be crooked.
5. Lift up the threaded black clamp. Tighten it by turning counterclockwise.



NOTE: The clamp/fitting tightening should not require an unusual amount of force. If it does, make sure that the black clamp is not cross threaded, the canister o-ring is greased, and the canister is properly seated in the fitting.

6. Turn the black clamp until the stop on the threads meets the stop on the fitting.
7. Take the other canister. Lift the canister up to the black fitting.
8. Seat the canister by lifting it straight up into the black fitting. It should seat cleanly and not be crooked.
9. Lift up the threaded black clamp. Tighten it by turning counterclockwise.
10. Turn the clamp until the stop on the threads meets the stop on the fitting.
11. Attach the clear plastic hose to both canister nozzles.

Replacing the Coolant



CAUTION: Gloves and eye protection should be worn. The coolant will cause drying of the skin with prolonged contact.

5. Maintenance

1. Open the lid on one of the freeze chambers. Remove one of the front pockets (See *Removing and Replacing a Pocket – Chapter 5*).
2. Use a funnel to pour the coolant back into the freezer. Water in the coolant is heavier and will collect in the bottom of the bucket. If any water is in the bucket, do not pour it into the freezer. Water and excess coolant should be poured on top of the desiccant to be discarded.
3. Verify the coolant level (See *Checking the Coolant Level – Chapter 5*).
4. Replace the pocket and close the freeze chamber lid.

Maintenance forms are located in Appendix A of this Manual.

Chapter 6

Troubleshooting

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Introduction

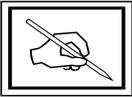
The following chart outlines common problems that could occur and solutions to those problems. The chart indicates repair and/or replacement procedures to accommodate the solutions indicated.

For further technical assistance, contact Helmer Technical Service:

Helmer Scientific
14400 Bergen Boulevard
Noblesville, IN 46060
Tel: 800.743.5637 (U.S./Canada)
Direct: +1.317.773.9092 (non-U.S./Canada)
Fax: +1.317.773.9082
Web: www.helmerinc.com



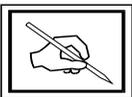
WARNING: Fuse replacement and troubleshooting the freezer's electrical system should only be performed by a qualified technician. Before servicing internal components of the MP2200, turn off all power to the freezer and unplug from the wall.



NOTE: During disassembly, keep all parts for later re-assembly.



NOTE: Check all hose and wiring connectors to make sure they are secure and correct.



NOTE: Special tools and service material may be required depending on the repair. Be sure to use these tools and materials and follow the proper work procedure.



NOTE: General ESD Control Practices should be utilized when servicing or repairing this equipment.

6. Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
No Power to Unit	Plug is not secured into the wall.	Secure plug into the wall. In the case of a twist lock plug, insert into wall and twist clockwise into position.
	Main power switch has been turned off.	Turn the main power switch on.
	Blown Fuse(s)	Remove primary power panel and replace fuse(s).
	Loose wires or snap connectors	Remove the motor box cover and check all wire connections and snap connectors to verify that they are secure.
	Coolant temperature is too high. Coolant temperature has exceeded the safety limit (26°C, 80°F) and the Safety Thermostat has shut off power to the freezer. If this is the case, the red light on the right side of the freezer will be on.	Turn off the main power switch and contact Helmer Technical Service.
Freezer display is lit, but pumps do not work.	Blown Fuse(s)	Remove primary power panel and replace fuse(s).
	Pump(s) is (are) iced up.	Defrost the freezer (See <i>Running the Defrost Cycle – Chapter 5</i>).
	Loss of control voltage	Remove the primary and secondary power panels and check the 5-Volt Power Supply.
Coolant Chamber fills initially, but during the cycle, the coolant level drops off.	Freezer has accumulated ice that is clogging the pump inlet(s).	Defrost the freezer (See <i>Running the Defrost Cycle – Chapter 5</i>).
Product is not completely frozen.	The freezing chamber is not completely filling with coolant. Freezer has accumulated ice that is clogging the pump inlet.	Defrost the freezer (See <i>Running the Defrost Cycle – Chapter 5</i>).
	Coolant pump is not running.	See <i>Freezer display is lit, but pumps do not work</i> .
	Coolant level is low.	Verify level of coolant in the MP2200 and add coolant if necessary (See <i>Checking the Coolant Level and Replacing the Coolant – Chapter 5</i>).

6. Troubleshooting

PROBLEM	PROBABLE CAUSE	SOLUTION
Product is not completely frozen (continued from previous page).	Pump coolant transfer hoses are loose on the connections or have broken.	Reconnect coolant hose to the fitting and tighten the clamps, or replace the coolant hose.  CAUTION: Always warm coolant to at least 0°C before working around the coolant.
	The freeze cycle is out of adjustment.	Adjust the freeze cycle time, according to facility-validated procedures.
Coolant temperature is too high.	The compressor is not running.	Have a qualified refrigeration technician check the refrigeration system.
Pockets tearing or ripping	Blood components are being dropped or forced into pockets.	Insert blood components smoothly into pockets.
Coolant filter pump is not running.	Float switch has tripped or is stuck.	Check for coolant leaks in the bottom of the housing. Make sure the switch is not stuck or obstructed.
	Fuse has blown.	Check fuse in the primary power panel and replace if necessary.
Coolant has leaked into housing.	O-ring on filter container is not installed properly.	Install the O-ring per procedure. Make sure to put grease on the O-ring.
	Valve is open.	Make sure top and bottom filter container valves are closed.
	Filter container(s) is(are) not properly installed.	Re-install filter container(s) (See <i>Replacing Silica Gel – Chapter 5</i>).

Chapter 7

Part List

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Parts List

Please Note:

Parts that are ordered but not listed here are considered a “Special Order” and are subject to availability and variable pricing. Although we will do everything in our power to expedite delivery there could be a lead time of **up to 6 weeks** to receive these parts. In the event that you frequently order parts not on this list we highly encourage you to maintain a small stock at your facility.

MP 2200’s Models -12/23/27/31	
Part Description	Part number
2” White Foam Tape	2-33-002
Breaker Switch	1-27-020
Coolant Filters (2 per pack)	7-03-134
Desiccant Pack Replacement (1 lb package)	5-31-001
Fan	1-15-001
Filtration Canister	70023
Gasket, Magnetic , Left Lid	2-42-031
Gasket, Magnetic , Right Lid	2-42-032
Gasket, Magnetic , Middle Lid	2-42-033
Hand Siphon Pump	2-72-026
High Vacuum Grease	5-41-005
Hinge, Lid	7-41-004
InstaCoolant IV 5 Gallon Drum (4.5 Gallons/17 Liters of coolant)	70024
InstaCoolant IV 55 Gallon Drum (53 Gallons/200.6 Liters of coolant)	70025
Keypad Membrane	1-61-008
Liquid Line Solenoid Valve Coil and Cable	7-34-058
Pocket Repair Kit	7-01-002
Primary Power Panel	7-51-019
Pump Coupler	2-00-008
Pump/Motor Box Assembly	7-65-101
Silica Gel Replacement Kit	7-01-211
Silica Gel (5.lb. bag (2.2 kg))	7-03-133
Strain Relief Fitting	1-46-023

Model Specific Parts	
MP 2200-12	Part Number
Control Panel	7-51-099
Fuse Kit	7-01-217
Manual, Operator/Maintenance (English)	6-07-036
Pocket	7-47-134
Pocket Spring	6-16-123
Secondary Power Panel	7-51-100

Continued on next page

7. Part List

Please Note:

Parts that are ordered but not listed here are considered a “Special Order” and are subject to availability and variable pricing. Although we will do everything in our power to expedite delivery there could be a lead time of **up to 6 weeks** to receive these parts. In the event that you frequently order parts not on this list we highly encourage you to maintain a small stock at your facility.

MP 2200-23	Part Number
Control Panel	7-51-099
Fuse Kit	7-01-209
Manual, Operator/Maintenance (English)	6-07-036
Pocket	7-47-141
Pocket Plug	7-47-098
Secondary Power Panel	7-51-096
Vacuum Test Gauge	7-47-114
MP 2200-27	
Control Panel	7-51-097
Fuse Kit	7-01-209
Manual, Operator/Maintenance (English)	6-07-035
Pocket	7-47-137
Pocket Plug	7-47-038
Secondary Power Panel	7-51-096
Vacuum Test Gauge	7-47-068
MP 2200-31	
Control Panel	7-51-099
Fuse Kit	7-01-217
Manual, Operator/Maintenance (English)	6-07-036
Pocket	7-47-135
Secondary Power Panel	7-51-100

Contact Helmer Technical Service at 800.743.5637 (U.S./Canada) or +1.317.773.9092 (non-U.S./Canada), or fax your purchase order to +1.317.773.9082. Use the form in Appendix A to itemize your order.

Appendix **A**

Forms

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Parts Order Form.....	A-6

MP2200 Freezer Installation Checklist



Company Name: _____

Date: _____

Location: _____

Freezer Model: _____

Freezer Serial No: _____

Unpacking and Inspection

Please check for shipping damage when the Freezer is received. If there is any apparent damage, notify the shipping company immediately. Contact Helmer Technical Service if there any problems.

Items Included

Circle the appropriate quantity and initial to indicate receipt.

QTY	DESCRIPTION	INITIALS
1	Freezer	
1	Operator and Maintenance Manual	
1	Membrane Repair Kit	
1	130 Gallons (492 liters) InstaCoolant IV	
5	Spare Membrane Pockets (<i>Six (6) Pockets on 8-2200-23</i>)	
1	Control Panel Housing and Control Panel	
1	Control Arm	
1	Coolant Hand Pump	

Task Description

Please follow and initial the installation instructions in the order listed below when setting up and installing the MP2200 Freezer. Confirm that the installing contractor has followed the refrigeration installation specifications provided prior to the installation.

STEP	DESCRIPTION	INITIALS
1.	Inspect shipping containers for any damage.	
2.	Unpack the Freezer and check for any damage.	
3.	Verify that the items listed above are included with the unit.	
4.	Verify the connections of the Desiccant Filter Tubing.	
5.	Place the MP2200 Freezer in position	
6.	Connect Freezer to power sources	
7.	Mount the housing	
8.	Install control arm	
9.	Wire electronics	
10.	Add coolant	
11.	Start up and temperature pulldown	

Employee Signature

Date

Installer Signature

Date

**MP2200 Freezer
Daily Maintenance Checklist**



Facility: _____
Location: _____
Operator: _____

Date: _____
Freezer Model: _____
Freezer Serial No: _____

Maintenance Description

MAINTENANCE DESCRIPTION	DATE	INITIALS
Clean ice from deck.		
Check pockets for leaks.		
Clean ice from pockets.		

Comments

Signature

Date

MP2200 Freezer Weekly Maintenance Checklist



Facility: _____
 Location: _____
 Operator: _____

Date: _____
 Freezer Model: _____
 Freezer Serial No: _____

Maintenance Description

MAINTENANCE DESCRIPTION	DATE	INITIALS
Thoroughly clean equipment using a mild detergent in warm water. Clean the following: <ul style="list-style-type: none"> • Outer surfaces • Control panel • Inner surface of lid • Inner surface of gasket • Inner surface of deck 		

Comments

 Signature

 Date

**MP2200 Freezer
Monthly Maintenance Checklist**



Facility: _____
Location: _____
Operator: _____

Date: _____
Freezer Model: _____
Freezer Serial No: _____

Maintenance Description

MAINTENANCE DESCRIPTION	DATE	INITIALS
Check the desiccant filter, replacing desiccant filter material if needed.		
Check the pump motor cooling fans for proper ventilation of pump motor heat.		

Comments

Signature

Date

MP2200 Freezer Quarterly Maintenance Checklist



Facility: _____
 Location: _____
 Operator: _____

Date: _____
 Freezer Model: _____
 Freezer Serial No: _____

Maintenance Description

MAINTENANCE DESCRIPTION	DATE	INITIALS
Check coolant level. Add coolant to bring to proper level.		
Check lid gasket seals to ensure an airtight seal when closed.		
Check hinges.		
Inspect the deck to ensure all screws are tight. Tighten if needed.		
Verify operating temperature calibration (See <i>Operating Instructions – Chapter 4</i>).		
Defrost freezer and run filtration cycle.		

Comments

Signature _____

Date _____

