thermogenesis

TECHNICAL SERVICES BULLETIN

010-025

MP2200 Freezer Black Canister

November 30, 2009

2711 Citrus Road ➢Rancho Cordova, CA 95742 ➢(916) 858-5100

Purpose:

The purpose of this Technical Service Bulletin is to inform the customer of a change to the filtration canister and to provide an updated Chapter 5 for replacement in their Operators Manual (6-07-036B).

Scope:

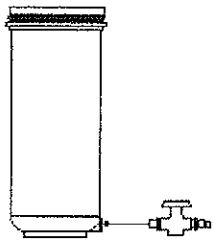
The scope of this bulletin covers all users of ThermoGenesis Corp.'s MP2200 Freezers.

Background:

Due to material availability, the filtration canister has been changed from clear to black resulting in a change to how to check the silica gel indicator.

Procedure:

1. Please refer to pages 5-4 thru 5-9 in the attached Chapter 5 document for an updated defrost procedure due to the change of canister color.
2. If the filtration canister is purchased as a replacement part (70023) it will need to be assembled by screwing the stopcock valve into the canister housing as shown below.



Canister and stopcock valve

Contact Information:

If you have any questions, contact THERMOGENESIS CORP. Technical Service at 1-800-783-8357 (U.S. and Canada) or +1-916-858-5100 (non-U.S./Canada). You may also send a fax to +1-916-858-5199, or email at support@thermogenesis.com for assistance.

Chapter 5
Maintenance

TABLE OF CONTENTS

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	• Clean the deck • Check and clean the pockets
Weekly	• Clean the unit
Monthly	• Check desiccant filters • Check pump motor cooling fans
Quarterly	• 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 THERMOGENESIS CORP.

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

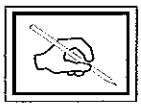
1. Open all three lids.
2. Inspect the membrane deck to ensure that all screws are tight. Tighten the screws if needed.

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 $^{11}/_{32}$" 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:

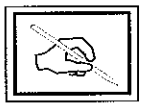
1. Turn the right filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked or wiggled to remove.
2. Pull the right filter canister down out of the housing and set it aside.
3. Turn the left filter canister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

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.

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 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 $^{11}/_{32}$" 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:

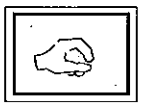
1. Turn the right filter canister lid clockwise. The black plastic threaded fitting will become loose. The canister is sealed with a rubber o-ring and may have to be rocked or wiggled to remove.
2. Pull the right filter canister down out of the housing and set it aside.
3. Turn the left filter canister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

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.