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Document Contact	Teresa Lovins: Supv, Laboratory
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Preventative Maintenance of the Helmer Double Door Refrigerator

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This document provides the Blood Bank Medical Technologist with guidelines and directions when performing preventative maintenance of the Helmer® Double Door Refrigerator.

II. CLINICAL SIGNIFICANCE:

A. Temperature monitored equipment must be preventatively maintained to safeguard the storage of blood products for a safe transfusion.

B. Blood Bank reagents also follow strict guidelines for storage as directed by their manufacturer. This monitoring follows a defined schedule at least as frequent as specified by the manufacturer. This attachment aids in this process specific for the Helmer® Double Door Refrigerator and these actions are recorded on a corresponding form.

III. DEFINITIONS:

A. HOME: the home screen displays current information and is the starting screen for all interaction with the monitoring system. If the Home screen is not displayed the Home screen can be located after pushing the farthest left button (HOME) on the monitoring system.

B. UPS: Uninterruptible Power Supply outlet

IV. SUPPLIES:

A. Chart Paper (Item #220366)

B. Stop watch
C. Independent calibrated thermometer
D. Cleaning supplies
E. Batteries (1-9volt and 6-1.5V D-cell non-rechargeable alkaline)
F. Helmer® probe bottles and Glycerin kit #400922-1
G. Fluorescent lamp: T5, 13W

V. PROCEDURE:

A. Quarterly Maintenance

I. **Chamber Temperature Calibration**

a. Verify the temperature probe is reading correctly by comparing the chamber probe reading to the temperature read by an independent thermometer. If the chamber temperature probe is not reading correctly, change the value displayed on the temperature monitoring system using the following steps. Start with upper probe.

i. Obtain an independent thermometer, document thermometer serial number on the form.
ii. Remove the upper probe bottle (located in the upper part of refrigerator between the two doors) from the bracket.
iii. Unscrew the cap and insert the independent thermometer in the bottle with the other probes. The probes and thermometer should be immersed at least 2” in the liquid. The cap will stay unscrewed at this time.
iv. Secure the bottle back in the bracket, close the door.
v. Set a timer for stabilizing 10 minutes.
vi. Record the temperature of the independent thermometer.
vii. Locate the Home screen on the display by pressing the far left button.
viii. Press the MAIN button.
ix. Press DOWN button to highlight Edit Configuration. Press SELECT.
x. Enter the password when prompted.
xi. Press the DOWN button to Temperature Calibration. Press SELECT.
xii. Press the INC or DEC button to select the probe (upper or lower).
xiii. Record the current temperature of the probe (upper or lower).
xiv. An adjustment is needed if the independent thermometer and the current temperature of the probe are not within 0.5C.

a. If no adjustment is needed proceed to step the next step, if an adjustment is needed go to the section, Probe Calibration.

xv. Repeat these steps for the lower probe (located on the left lower side of the refrigerator just above the lowest shelf).

xvi. Remove the independent thermometer from the probe bottle, tighten the cap and return bottle with probes to bracket.

II. **Probe Calibration: Enter the new calibration value**

a. Go to Temperature Calibration.

b. Select Temperature Calibration.

c. Select correct probe.

d. Press Down button to highlight Temperature.

e. Press INC or DEC to increase or decrease the value to match the measured value in Chamber calibration step from Chamber Temperature Calibration.

f. Record adjustment value.

g. Press DOWN button to highlight Store Calibration.

h. To save the new value press ENTER, a message appears “Calibration Memorized”. New setting is saved.

i. To discard the new value press BACK or HOME to exit. New setting is not saved.

III. **Door Ajar Test**

a. Record initial temperatures of sensor (display), upper shelf, and lower shelf thermometers on form.

b. Change Door Ajar Timeout setting to 0 minutes

i. Press the MAIN button

ii. Press the DOWN button to highlight Edit Configuration. Press the SELECT button.

iii. Enter the password when prompted.

iv. Press the DOWN button to highlight Alarm Setpoints. Press SELECT.

v. Press the DOWN button to highlight Door Ajar Timeout.

vi. Press the DEC button to change the setting to 0.

vii. Press the BACK button to return to the Edit Configuration screen, or press the HOME button to exit. New settings are saved.

viii. Open the door. Door ajar alarm will activate immediately.

ix. Close the door. Door ajar alarm will clear and audible alarm will cease.

x. Repeat ajar alarm test for any additional door.

xi. Change the Door Ajar Timeout setting to the original setting (3 min.).

c. Record post open door test temperatures of sensor (display), upper shelf, and lower shelf thermometers.

d. Document if the open door test passed as indicated in Expected Results.

IV. **Automatic Chamber Alarm Test: Test the Low and High Alarm**

a. The alarm setpoint is recorded in the expected result section of the form.

b. On the HOME screen on the refrigerator monitor.

c. Select MAIN.

d. Press the DOWN button to and SELECT System Alarm Test and Status.

e. The System Alarm Test and Status screen appears.

f. Press the DOWN button and SELECT Start Low Alarm Auto Test.

g. Press ENTER.

i. The “Low Alarm Test in Progress” message appears.

ii. The alarm will activate when the alarm setpoint is reached.

iii. When the test is complete, the message clears.

h. Record sensor temperature when audible alarm activates.

i. Record an internal thermometer temperature.

j. Document if the alarm test passed as indicated in the Expected Results section of the form.

k. Repeat these steps to perform the high alarm testing by selecting Start High Alarm Auto Test.

V. **Cleaning the Refrigerator**

a. The exterior, interior, and door gaskets are cleaned with a soft cloth and mild detergent.

b. The condenser grill is cleaned by Facilities Management.

c. Facilities Management will inspect electrical components and wiring terminals in the electrical box for discoloration and for secure connection.

d. Note: Contact Helmer® Technical Services if any wiring discoloration is found. Facilities Management can tighten wiring terminal connections as necessary.

VI. **Chart Recorder Graph Battery Check/Replace**

a. Replace alkaline 9V battery found in the graph compartment of the refrigerator in the months of Jan and July. Date and initial the battery.

b. Check the status of the alkaline 9V battery in the months of April and

October.

c. In the graph compartment in the upper left area above the graph there is a light to the right of a button with > arrow. This light should be green if battery is ok. If light is red replace battery.

B. Annual Maintenance

I. **Power Failure Alarm Test**

a. Confirm the refrigerator is connected to AC power.

b. Ensure the monitoring system backup batteries are installed.

c. Change the Power Failure Timeout setting to 0 minutes.

i. Press MAIN button.

ii. Press DOWN button to highlight Edit Configuraton. Press Select.

iii. Enter password when prompted.

iv. Press DOWN button to highlight Alarm Setpoints. Press Select.

v. Press DOWN button to highlight Power Failure Timeout.

vi. Press the DEC button to change setting to 0.

d. Disconnect the refrigerator from AC power. Power failure alarm will activate immediately.

e. Reconnect the refrigerator to AC UPS outlet power. Power failure alarm will clear and audible alarm will cease.

f. Change the Power Failure Timeout setting to the original setting.

g. NOTE: When AC power is disconnected the display screen should continue to display information without back-light. If the display is blank replace the batteries.

II. **Probe Bottle Maintenance**

a. Failure to fill probe bottles or keep probe bottles filled to the appropriate level may not allow the chamber temperature to stabilize at the refrigerator setpoint or the chamber temperature to display higher or lower than the actual temperature.

i. Probe bottles and glycerin will be replaced annually with the Helmer® Probe Bottle and Glycerin/Glycerol kit for refrigerators.

ii. Follow the manufacturer instructions described on the Glycerin packet for use.

iii. Probes must be immersed at least 2 inches the glycerin solution.

iv. Affix a sticker to the replacement bottles to indicate the date replaced and initials.

III. **Monitor Backup Battery Replacement**

a. Six non-rechargeable 1.5V D-cell alkaline back up batteries will be replaced annually by Facilities Management.

b. Contact Facilities Management prior to due date and once batteries have been obtained.

IV. **Document Inspection Sticker Date**

a. A yearly Inspection sticker is affixed to each unit by Facilities Management (FM), document the date of Inspection.

V. **As Needed Maintenance**

a. Temperature Controller Setpoint is programmed at the factory and should only be changed when instructed by Helmer® Technical Services.

b. All Refrigerator light bulbs should be changed when not illuminating.

c. Refrigerant will be added as Facilities Management determines.

VI. LIMITATIONS:

A. If the Helmer double door refrigerator is temporarily out of service for preventative maintenance (PM), or if any of the PM described in this document is unacceptable and cannot be corrected as described in this document, then proceed as follows:

1. Attach the green *Out of Service Tag* if not operational.
2. Document Transfusion Medicine form, *Storage Equipment Alarms and Temperature Deviations.*
3. Document Transfusion Medicine form, *Log of Blood Bank Reagent or Equipment Problems.*
4. Notify supervisor, lead medical technologist or designee.

VII. REFERENCES:

1. *Helmer® Refrigeration Operation Manual 360078-1/L*
2. *Helmer® Refrigerator Service Manual 360077-1/O*
3. American Association of Blood Banks *Technical Manual,* current edition.
4. College of American Pathologists *CAP Checklist*, current edition.

Attachments

Equipment Alarms and Temp Deviations.pdf

Glycerol Probe Sticker.pdf

Helmer Dbl Door.docx

Out of Service Notice.pdf

Storage Equipment Temperature Monitoring.pdf

Approval Signatures

Step Description	Approver	Date
	Vaishali Pansare: Chief, Pathology	2/13/2024
	Ryan Johnson: OUWB Clinical Faculty	2/9/2024
Policy and Forms Steering Committe (if needed)	Teresa Lovins: Supv, Laboratory	2/2/2024
	Teresa Lovins: Supv, Laboratory	2/2/2024

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