

Temperature Monitoring of Medication Cold Storage

Site Applicability

All Providence Health Care clinical areas with medication cold storage

Practice Level

Nursing, Pharmacy and Biomedical Engineering, or delegate as per procedure

Requirements

- Medication refrigerator temperatures must be maintained within the temperature range of 2°C and 8°C.
- Medication freezer temperatures must be maintained within the temperature range of -15°C and -30°C.
- The temperature of externally temperature monitored refrigerators must be recorded once a day.
- The temperature of all medication refrigerators (externally, internally or remotely temperature monitored) must be documented on the Medication Refrigerator Daily Temperature Log twice per day when the refrigerator contains vaccines. ([Appendix B](#)).
- The daily temperature logs recorded when the refrigerator contains vaccines must be retained on the unit for 3 years.

Need to Know:

Refrigerator temperatures are to be recorded on the Medication Refrigerator Daily Temperature Log ([Appendix B](#)). This form is available on [SHOP](#) or through Printing Services.

Patient/Resident care areas and service departments are responsible for monitoring medication refrigerator temperatures and/or responding to temperature alarms (Appendices).

Procedure

Monitoring Externally Monitored Refrigerators

1. Record the following information at the same time(s) daily, or twice daily when vaccines are in the refrigerator:
 - a. current date and time
 - b. current temperature reading in degrees Celsius
 - c. minimum temperature reading in degrees Celsius
 - d. maximum temperature reading in degrees Celsius
 - e. initials
2. After recording the information, clear both the minimum and maximum temperature memory. ([Appendix A](#))

Monitoring Internally and Remotely Monitored Refrigerators

1. Record the following information at the same times twice daily when vaccines are in the refrigerator.
 - a. current date and time
 - b. current temperature reading
 - c. initials

Responding to an Out of Range Temperature:

If the refrigerator temperature is or has been out of the range of 2°C to 8°C in the past 24 hours, refer to the applicable algorithm in Appendices D through H for step by step procedures.

Replacement of a refrigerator or freezer

If a refrigerator or freezer is non-functional, and Facilities Maintenance and Operations (FMO) determines it cannot be repaired FMO will provide the unit Clinical Nurse Leader (CNL)/Care Management Leader (CML) with a written report.

1. The CNL/CML or delegate will notify the unit's Patient Care Manager (PCM) or Resident Care Manager (RCM).
2. The unit's PCM/RCM will order an approved replacement refrigerator/freezer in consultation with the Practice Consultant, Medication Management.

Pharmacy Contact Information:

St. Paul's Hospital: local 62173

Mount St. Joseph Hospital: local 78515

Long Term Care: local 22640

Documentation:

Medication Refrigerator Daily Temperature Log, [PHC-PH442](#)

[Physical Plant Requisition](#)

Related Documents and Resources:

1. [Appendix A](#) - Traceable Thermometer Instructions (e-PRO: 00086039)
2. [Appendix B](#) - Medication Refrigerator Daily Temperature Log (PHC-PH442)
3. [Sanyo SR-L6111 Refrigerator Instruction Manual](#)
4. [Helmer Refrigerator Instruction Manual](#)
5. [Helmer Undercounter Freezer Operating Manual](#)
6. [Haier HYC – 68A Manual](#)

References:

1. BC Centre for Disease Control (2015). *Communicable Disease Control Manual*. Chapter 2: Immunization; Appendix E. Management of Biologicals Provincial Health Services BC. Accessed at <http://www.bccdc.ca/>
2. Accreditation Canada (2020). Managing Medications Standards. *Qmentum Program*. Standard 12.3, 12.10.
3. Traceable Thermometer Instructions, Control Company, 2008 92-4227-10 Rev 2
4. Sanyo SE-L6111 Refrigerator Instruction Manual; Part No. 8336460149300; 08/01/2006
5. Helmer Refrigerator Manual
6. Haier HYC – 68A Manual

Definitions:

Externally Monitored Fridge: temperature monitored using a Traceable Thermometer. A probe is placed inside the center of the fridge with the thermometer and digital display on the outside of the fridge. It is pre-set to trigger an alarm below 3 degrees and above 7 degrees Celsius.

Internally Monitored Fridge: temperature monitored through a built-in internal thermometer with an integrated temperature display on the external surface of the fridge (usually front) pre-set to trigger an alarm below 3 degrees and above 7 degrees Celsius.

Remotely Monitored Fridge: an internally monitored fridge that has a remotely monitored alarm that is pre-set to trigger an alarm below 3 degrees and above 7 degrees Celsius.

Appendices

[Appendix A](#) – Traceable Thermometer Instructions

[Appendix B](#) - Appendix B: Medication Refrigerator Daily Temperature Log (Documentation)

[Appendix C](#) – Daily Temperature Monitoring

[Appendix D](#) – Alarm Management – Long Term Care/Rehab/Tertiary Mental Health

[Appendix E](#) – Alarm Management - MSJ 24 Hour Operated Units

[Appendix F](#) – Alarm Management – MSJ Non-24 Hour Operated Units

[Appendix G](#) – Alarm Management – SPH Non-24 Hour Operated Units

[Appendix H](#) - Alarm Management –SPH Non-24 Hour Operated Units

Appendix A

TRACEABLE THERMOMETER INSTRUCTIONS

SPECIFICATIONS

Range: -58.0 to 158.0 °F / -50.0 to 70.0 °C
Resolution: 0.1°
Update Rate: 10 seconds
Battery: AAA (1.5V)
Probe Supplied:

Model 4727-- Supplied with a standard probe sensor with cable. Both sensor and cable may be immersed in liquid. Probe sensor may be mounted using the supplied sensor holder and mounting screw.

Model 4227 & 4627-- Supplied with a bottle sensor and cable. Bottle sensor is filled with a patented nontoxic glycol solution that is GRAS (Generally Recognized As Safe) by the FDA (Food and Drug Administration) eliminating concerns about incidental contact with food or drinking water. The solution filled bottle simulates the temperature of other stored liquids. Velcro® and a magnetic strip are provided to mount the bottle to the inside of a refrigerator/freezer and to mount the display on the outside. The micro-thin probe cable permits refrigerator/freezer doors to close on it.

TEMPERATURE DISPLAY MODES

Ambient Temperature Display Mode (IN):

Indicated by "IN" appearing on the display, displays the current ambient temperature and either the ambient temperature memory (MIN/MAX) or the ambient temperature alarm limits (LO/HI).

Probe Temperature Display Mode (OUT):

Indicated by "OUT" appearing on the display, displays the current probe temperature and either the probe temperature memory (MIN/MAX) or the probe temperature alarm limits (LO/HI).

To change between ambient (IN) and probe (OUT) temperature display modes, press the IN/OUT button located on the back of the unit.

To change between displaying the memory (MIN/MAX) and the alarm limits (HI/LO), press the MODE button.

DISPLAYING °F OR °C

To display the temperature readings in Fahrenheit or Celsius, press the °C/°F button located on the back of the unit.

MINIMUM AND MAXIMUM MEMORY

There are four points that are automatically recorded into memory:

Minimum (MIN) Ambient Temperature Achieved
Maximum (MAX) Ambient Temperature Achieved
Minimum (MIN) Probe Temperature Achieved
Maximum (MAX) Probe Temperature Achieved

All four memories are independent of each other.

Minimum and maximum temperature memories are NOT programmable. The minimum temperature recorded into memory is the minimum temperature achieved since the last time the memory was cleared. The maximum temperature recorded into memory is the maximum temperature achieved since the last time the memory was cleared. The minimum and maximum temperature memories are maintained over the period since the memory was cleared.

Minimum and maximum memories are recorded for both ambient and probe temperatures regardless of the display mode.

CLEARING THE PROBE (OUT) TEMPERATURE MEMORY

1. Select the Probe Temperature Display Mode by pressing the IN/OUT button located on the back of the unit until "OUT" appears on the display.
2. Press the MODE button until "MIN" and "MAX" appears on the display.
3. Press the MIN-RESET button to clear the minimum temperature memory. The display will show "BB.B" under MIN and will then display the new minimum temperature memory.
4. Press the MAX-RESET button to clear the maximum temperature memory. The display will show "BB.B" under MAX and will then display the new maximum temperature memory.

CLEARING THE AMBIENT (IN) TEMPERATURE MEMORY

1. Select the Ambient Temperature Display Mode by pressing the IN/OUT button located on the back of the unit until "IN" appears on the display.
2. Press the MODE button until "MIN" and "MAX" appears on the display.
3. Press the MIN-RESET button to clear the minimum temperature memory. The display will show "BB.B" under MIN and will then display the new minimum temperature memory.
4. Press the MAX-RESET button to clear the maximum temperature memory. The display will show "BB.B" under MAX and will then display the new maximum temperature memory.

ALARMS

Both ambient (IN) and probe (OUT) temperature alarm limits may be set in 1° increments.

With the alarm enabled (🔊), the unit will sound an alarm when the temperature being displayed is outside the alarm limits that have been set for that display mode (equal to or lower than the low alarm set point, or equal to or greater than the high alarm set point). Example: If the unit is displaying the ambient temperature (IN) and the probe temperature (OUT) is outside the probe temperature alarm limits, no alarm will sound.

SETTING PROBE (OUT) TEMPERATURE ALARM LIMITS

1. Select the Probe Temperature Display Mode by pressing the IN/OUT button located on the back of the unit until "OUT" appears on the display.
2. Press MODE button until "LO" and "HI" appears.
3. To set the low temperature alarm limit (LO), press the LO ALM SET button to advance the display until the desired low temperature is displayed. Press and hold the LO ALM SET button to rapidly advance the display.
4. To set the high temperature alarm limit (HI), press the HI ALM SET button to advance the display until the desired high temperature is displayed. Press and hold the HI ALM SET button to rapidly advance the display.

SETTING AMBIENT (IN) TEMPERATURE ALARM LIMITS

1. Select the Ambient Temperature Display Mode by pressing the IN/OUT button located on the back of the unit until "IN" appears on the display.
2. Press MODE button until "LO" and "HI" appears.
3. To set the low temperature alarm limit (LO), press the LO ALM SET button to advance the display until the desired low temperature is displayed. Press and hold the LO ALM SET button to rapidly advance the display.
4. To set the high temperature alarm limit (HI), press the HI ALM SET button to advance the display until the desired high temperature is displayed. Press and hold the HI ALM SET button to rapidly advance the display.

ENABLE/DISABLE ALARMS

To enable the alarm to sound when the temperature being displayed is outside the alarm limits, press the 🔊 button located on the back of the unit until 🔊 appears on the display. Each successive press of the 🔊 button will enable (🔊) or disable the alarm.

ALARM SOUNDING

With the alarm enabled (🔊), the unit will sound an alarm when the temperature being displayed is outside the alarm limits that have been set for that display mode (equal to or lower than the low alarm set point, or equal to or greater than the high alarm set point). If the alarm is sounding based on the low alarm limit, "LO" will flash on the display. If the alarm is sounding based on the high alarm limit, "HI" will flash on the display.

The unit will continue to alarm and flash the corresponding "LO" or "HI" until the temperature being displayed is within the alarm limits. Once the temperature being displayed is within the alarm limits, the alarm will stop sounding and the corresponding "LO" or "HI" will no longer flash.

To silence an alarm manually, press any button. When manually silenced, the corresponding "LO" or "HI" will continue to flash on the display until the temperature is within the alarm limits.

When enabled (🔊), the alarm will only sound if the temperature being displayed is outside the alarm limits that have been set for that display mode (IN or OUT). *Example: If the unit is displaying ambient temperature (IN) and the probe temperature (OUT) is outside the probe temperature alarm limits, no alarm will sound.*

RESET BUTTON

The RESET button located on the back of the unit may be used to simultaneously reset the memory and alarm limits for both the ambient (IN) and probe (OUT) sensor.

To reset the unit, use a pointed object to press the RESET button.

When the reset button is pressed, the following will occur:

- The display will show all segments for approximately 5 seconds.
- The ambient (IN) and probe (OUT) minimum/maximum memory will be cleared.
- The ambient (IN) and probe (OUT) alarm limits will be returned to the factory default value of 10°C (LO) and 30°C (HI).
- The unit will display the ambient (IN) temperature in °C.



ON/OFF BUTTON

The ON/OFF button located on the back of the unit may be used to turn the unit off when the thermometer is not being used. The minimum/maximum memory and alarm limits are not cleared when the unit is turned off. To turn the unit off, press the ON/OFF button. Each successive press of the ON/OFF button will turn the unit on or off.

No alarms will sound and no minimum/maximum memory will be recorded when the unit is off.

BENCH STAND

The unit is supplied with a bench stand that is a part of the back of the unit. To use the bench stand, locate the small openings on either side of the bottom of the unit. Place your fingernail into one of the openings and flip the stand out. To close the stand, simply snap it shut.

WALL MOUNTING THE UNIT

Set a screw into the wall at the desired location. Do not set the screw flush to the wall, the head of the screw will need to slip into the receptacle on the back of the unit. Once the screw has been properly set, hang the unit in place by sliding the receptacle on the back of the unit over the head of the screw.

USING THE ALARM AND MEMORY TO MONITOR A REFRIGERATOR/FREEZER

Following is an example of how to use the alarm and memory to monitor the temperature inside a refrigerator or freezer. This example is provided only as a helpful guide and is not intended to replace existing facility requirements or procedures.

In this example, the refrigerator temperature must be monitored and logged for each 24 hour period and certain actions must be taken if temperature falls below 0°C or rises above 5°C at any time during the 24 hour period.

Unit Setup Example

1. Plug the probe into the unit.
2. Install the battery.
3. Place the probe sensor inside the refrigerator.
4. Place the display outside the refrigerator.
5. Select the Probe Temperature Display mode. (See the "Temperature Display Modes" section.)

At this point, if using a bottle probe, allow sufficient time for the bottle probe to reach equilibrium with the true current temperature inside the refrigerator.

6. Set the probe temperature low alarm limit to 0°C. (See the "Setting Probe (OUT) Temperature Alarm Limits" section.)

7. Set the probe temperature high alarm limit to 5°C. (See the "Setting Probe (OUT) Temperature Alarm Limits" section.)
8. Enable the alarms. (See the "Enable/Disable Alarms" section.)
9. Clear the minimum and maximum memory. (See the "Clearing the Probe (OUT) Temperature Memory" section.)
10. Select the probe temperature with Min/Max memory display mode. (See the "Temperature Display Modes" section.)

The alarm limits have been set and the alarm has been enabled. The display has been set to show the current temperature inside the refrigerator along with the minimum and maximum temperature that has been achieved inside the refrigerator.

If the temperature inside the refrigerator goes outside the alarm limits (equal to or lower than the low alarm set point, or equal to or greater than the high alarm set point), the alarm will sound.

If no one is available to hear the alarm sounding (overnight), and the temperature returns to an in-range condition, the memory will provide a record of the single lowest and highest temperature achieved. When the temperatures are recorded into the manual log, the memory will allow the user to see that the temperature inside the refrigerator had gone outside of the acceptable range.

Monitoring Procedure Example

Keep a notebook or spreadsheet as a manual log.

1. At the same time every day, record the following into the manual log:
 - Current Date and Time
 - Current Temperature Reading
 - Minimum Temperature Reading (MIN)
 - Maximum Temperature Reading (MAX)
2. Once the above items have been manually recorded, clear both the minimum and maximum temperature memory. (See the "Clearing the Probe (OUT) Temperature Memory" section.)

By clearing the memory each day, the minimum and maximum temperature memory will provide a record of the minimum and maximum temperature that has been achieved inside the refrigerator over the past 24 hour monitoring period. The memory will also allow the user to see if the temperature inside the refrigerator went outside of the acceptable range when there was no one available to hear the alarm (overnight).

ALL OPERATIONAL DIFFICULTIES

If this unit does not function properly for any reason, replace the battery with a new high-quality battery (see the "Battery Replacement" section). Low battery power can occasionally cause any number of "apparent" operational difficulties. Replacing the battery with a new fresh battery will solve most difficulties.

BATTERY REPLACEMENT

Erratic readings, a faint display, no display, or a battery symbol appearing on the display are all indications that the battery must be replaced. Open the battery compartment by depressing the tab located at the top of the battery cover and lifting it out. The battery cover is hinged at the bottom so that the battery compartment may be opened without completely removing the battery cover. Remove the exhausted battery and replace with a AAA alkaline battery. Make certain to insert the new battery with the proper polarity as indicated in the illustration in the battery compartment. Close the battery cover.

Replacing the battery has the same affect as pressing the RESET button. (See the "RESET BUTTON" section.)

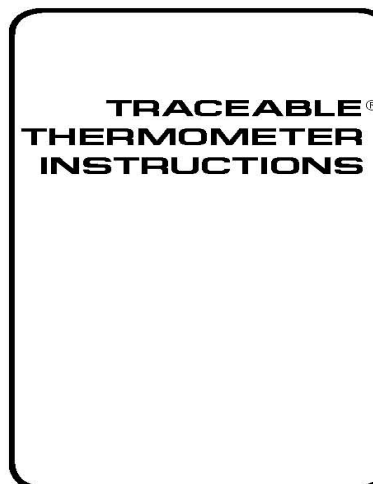
WARRANTY, SERVICE, OR RECALIBRATION

For warranty, service, or recalibration, contact:

CONTROL COMPANY

4455 Rex Road
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Control Company is ISO 9001 Quality-Certified by DNV and ISO 17025 accredited as a Calibration Laboratory by A2LA.



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Appendix B: Medication Refrigerator Daily Temperature Log (Documentation)



MEDICATION REFRIGERATOR DAILY TEMPERATURE LOG

Record on this log at standardized unit specific time(s): **Recording time(s):** _____, _____.

Externally temperature monitored refrigerators (Traceable Thermometer):

Record the temperature **ONCE** daily, or **TWICE** daily if vaccines are kept in the refrigerator.

After recording the temperatures, clear the **MEMORY**.

Remotely and/or Internally temperature monitored refrigerators (Helmer, Haier HYC – 68A or Sanyo SR-L6111): Record the temperature **TWICE** daily if vaccines are kept in the refrigerator, otherwise no need to record.

If medications have been subjected to temperatures less than 2°C or greater than 8°C, complete the following actions:

1. Contact Physical Plant
2. Fill out maintenance requisition for refrigerator
3. Notify CNL/Charge Nurse of above actions taken

Month: _____ **Year:** _____ **Unit:** _____

Day of the month	TIME	Refrigerator Temperature			✓ Persons Notified and Action			INITIALS
		MIN	Actual	MAX	CNL	Pharmacy	Maintenance	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

TURN OVER and record temperatures for the remainder of the month on the reverse.

~ NO FOOD OR SPECIMENS IN THIS FRIDGE ~

Appendix C


Daily Temperature Monitoring

Using the Daily Medication Refrigerator Temperature Log:

At the same time every day, record the following:

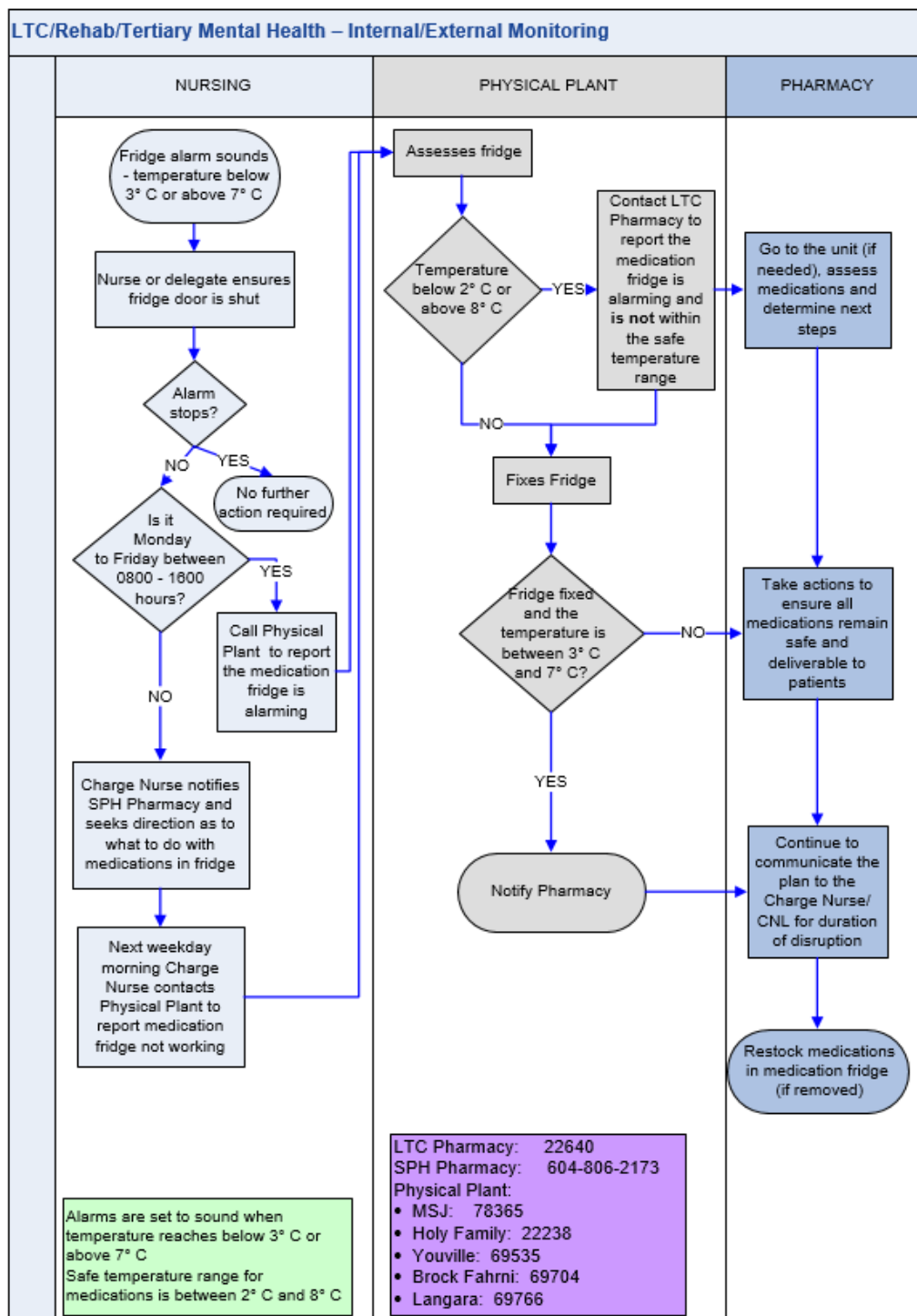
1. Current date and time,
2. Current temperature reading,
3. Minimum temperature reading and maximum temperature reading.

The minimum and maximum temperature MEMORY must then be CLEARED by completing the following four steps:



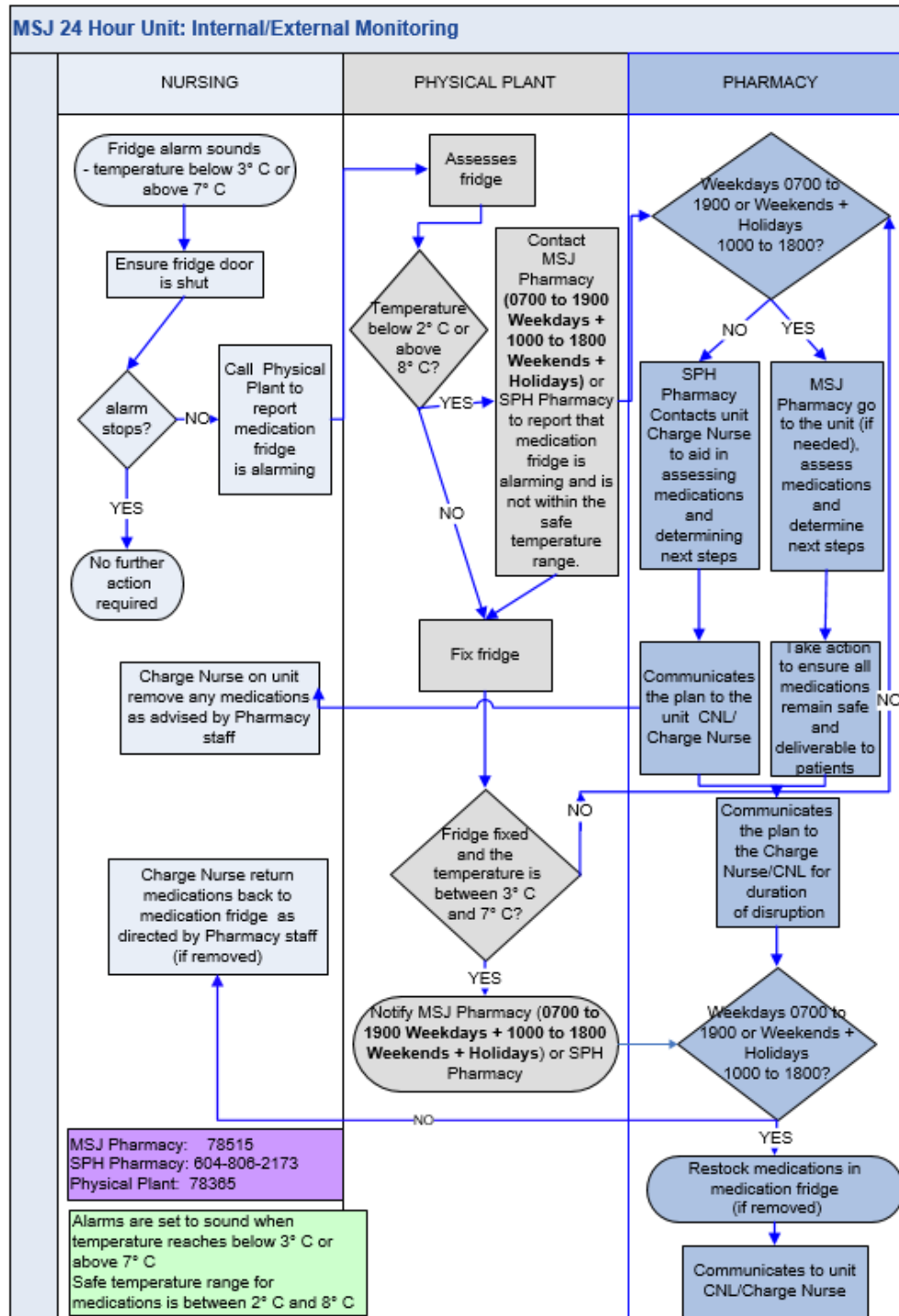
- 1 Select the Probe temperature display mode by pressing the **IN/OUT** button located on the back of the unit until "OUT" appears on the display.
2. Press the **MODE** button until "MIN" and "MAX" appears on the display.
3. Press the **MIN-RESET** button to clear the minimum temperature memory. The display will show "88.8" under MIN and will then display the new minimum temperature memory.
4. Press the **MAX-RESET** button to clear the maximum memory. The display will show "88.8" under MAX and will then display the new maximum temperature memory.

Appendix D: Alarm Management LTC/Rehab/Tertiary Mental Health



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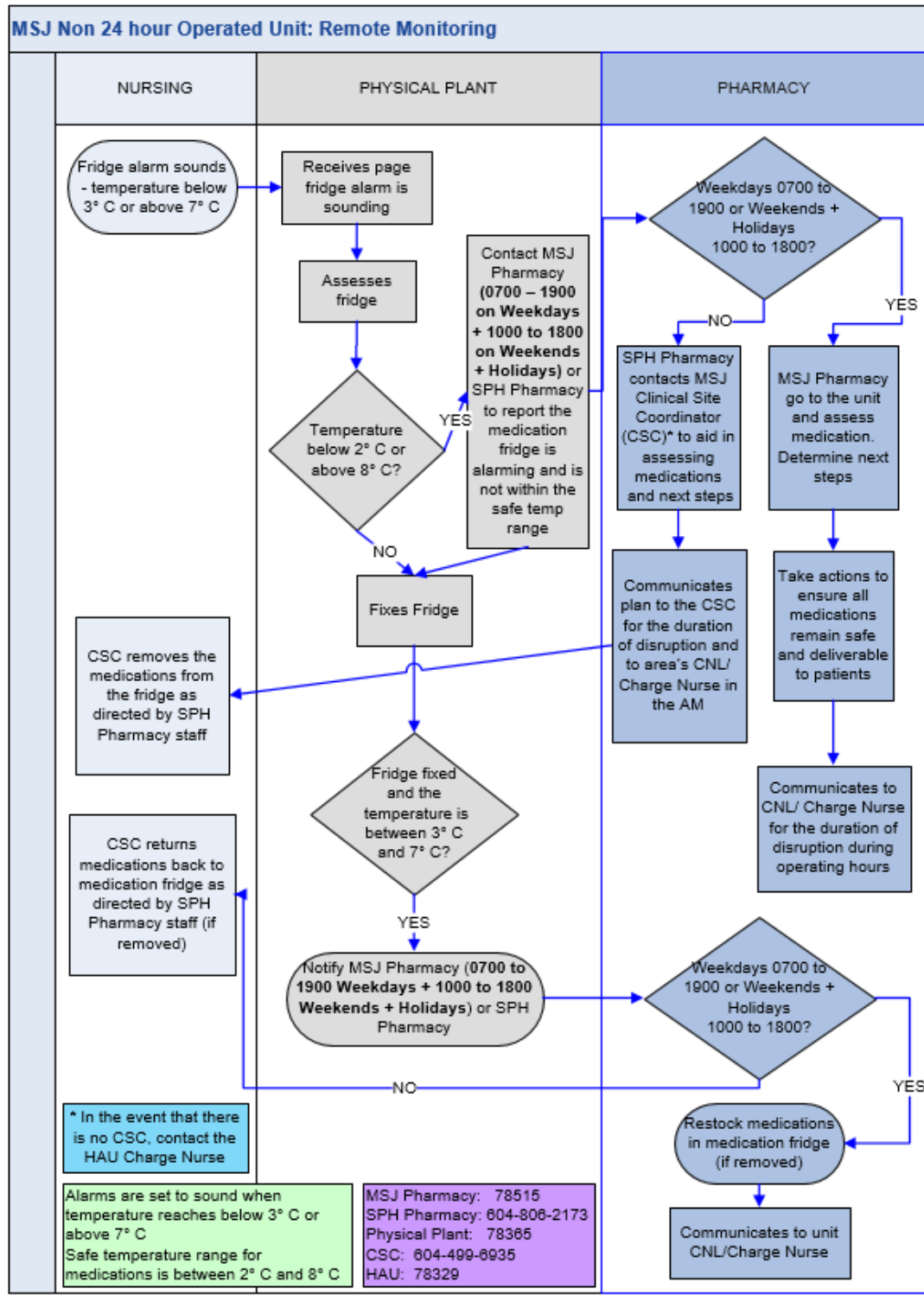
Appendix E: Alarm Management MSJ 24 Hour Operated Units



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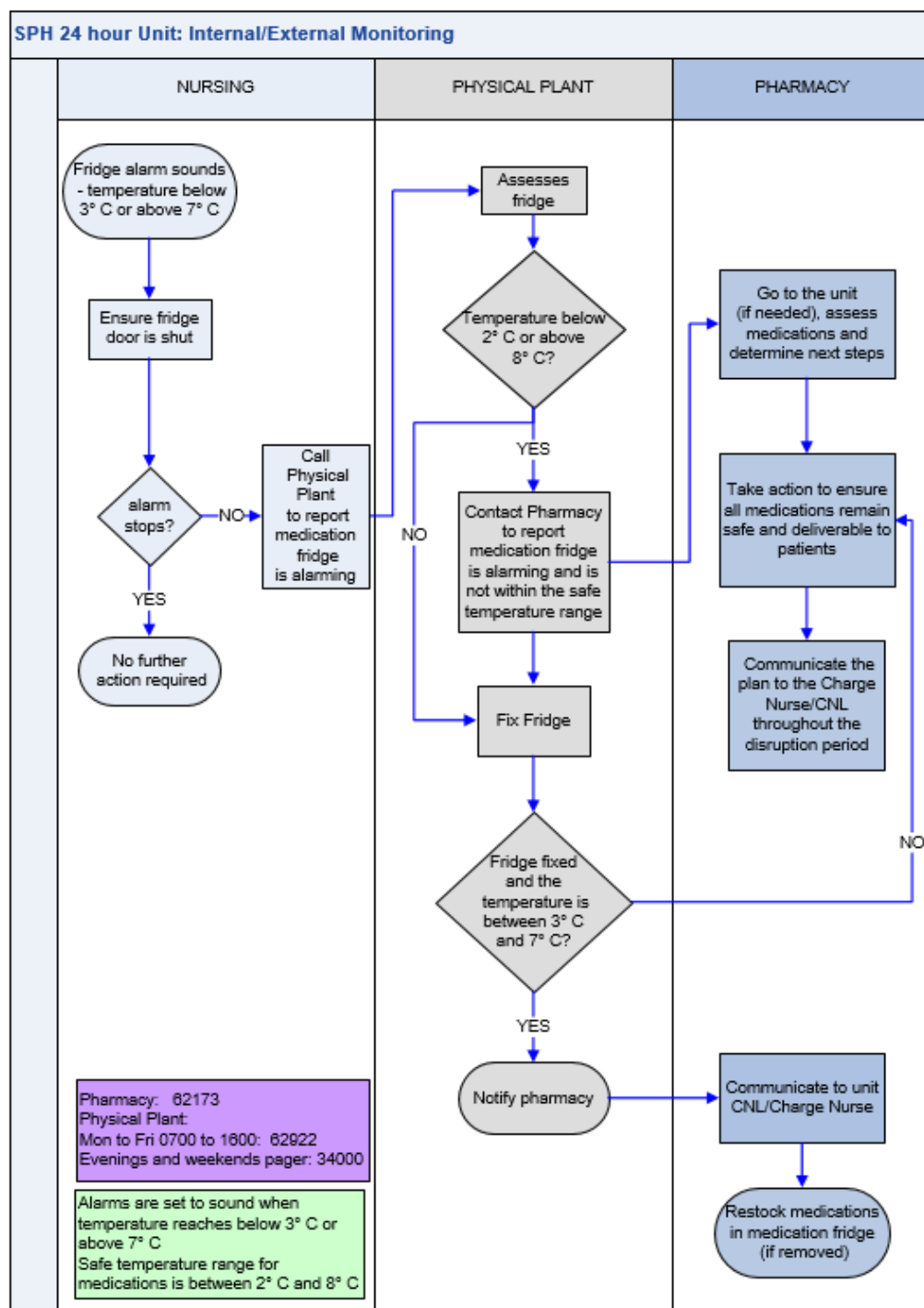


Appendix F: Alarm Management MSJ Non-24 hour Operated Units



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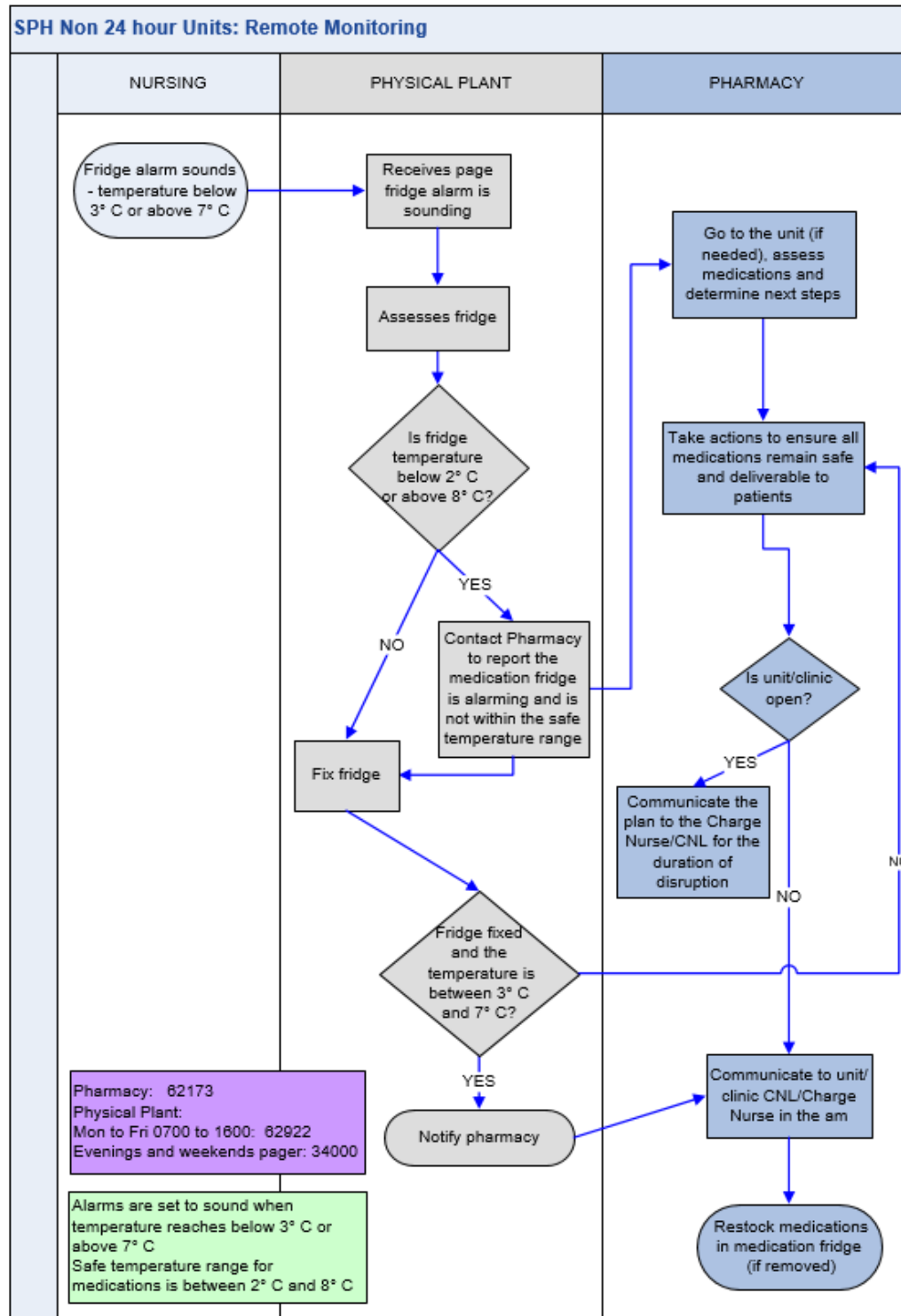
Appendix G: Alarm Management SPH 24 Hour Operated Units



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Appendix H: Alarm Management SPH Non 24 Hour Operated Units



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Persons/Groups Consulted:

Nurse Educators, Acute and Long Term Care, PHC Patient Care Managers
 Clinical Resource Committee, MSJ and Long Term Care
 Coordinator, Distribution Pharmacy Services SPH/MSJ, PHC
 Coordinator, Pharmacy Operations Support
 Coordinator, PHC long Term Care, Rehab Medicine and Tertiary Mental Health
 Director, Lower Mainland Pharmacy Services Medication Use Evaluation and PHC Acute Care
 PHC Acute Care Pharmacy-Nursing Committee
 PHC Residential Pharmacy-Nursing Committee
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 Practice Consultants

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Initial Effective Date:	OCT 2011
Posted Date:	07-NOV-2023
Last Reviewed	07-NOV-2023
Last Revised:	07-NOV-2023
Approved By:	PHC
	Professional Practice Standards Committee
Owners:	PHC
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