



Vaccine Accountability: The Truth Behind Your Data Logger Display

Bureau of Infectious Disease, Immunization Section

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Learning Outcomes



Gain knowledge about how to read and interpret digital data logger (DDL) reports



Understand how to set up DDL alarms/notifications



Understand how to monitor storage unit performance



Understand how to *prevent* and respond to temperature excursions

Agenda

The Basics: Vaccine Storage and Handling Procedures

Vaccine Transport

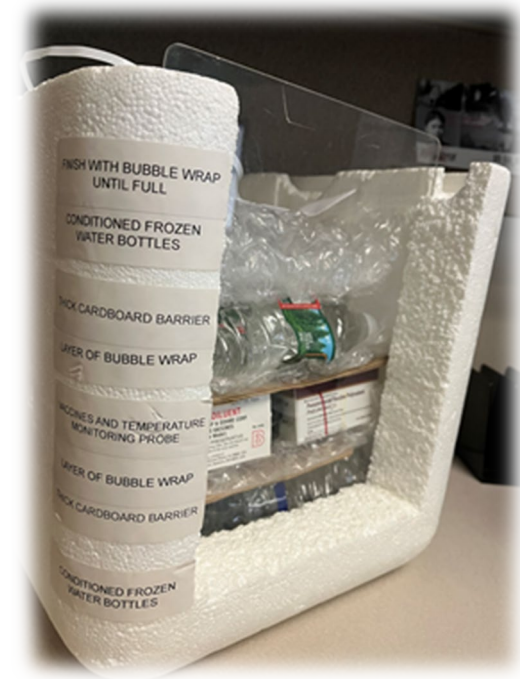
Temperature Monitoring Devices and Systems

- CDC Specifications
- Types of devices and systems
- Initial set up and alarm settings
- Data logger display
- Troubleshooting

Digital Data Logger Reports

Troubleshooting and Maintenance

Temperature Monitoring Changes at NHIP



The Basics: Vaccine Storage and Handling Procedures



Vaccine Storage Units

Stand-Alone Units

- Any newly acquired or purchased units must be stand-alone
- Purpose built or pharmaceutical grade recommended
- Stand-alone household grade is acceptable
- Enough space to accommodate largest inventory of the year without overcrowding.



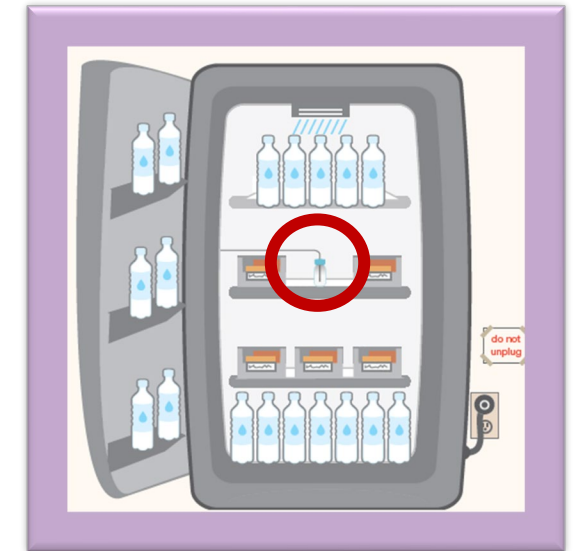
Existing Combination Units Only

- If a practice has had a combination unit in place since July 2019:
 - Only refrigerator portion can be used for vaccine storage
 - Must have dual freezer/refrigerator temperature control knobs

NO Dorm or Bar Style Units

Organizing Your Vaccine Storage Unit

- ✓ Wire shelving for air circulation
- ✓ Vaccine in ventilated baskets, not touching walls
- ✓ No vaccine storage in drawers, on the floor, or door of the unit
- ✓ Clearly labeled baskets
 - ✓ Separate state and private vaccine
- ✓ Keep vaccines in original boxes
 - ✓ Protect from light and for NDC/lot/expiration
- ✓ Earliest expirations at front of shelf
- ✓ Water bottles at top, bottom, sides, and back of shelving
- ✓ Glycol probe in center of unit
- ✓ No food/drink
- ✓ Do not unplug sticker next to outlet or front of unit
- ✓ Label circuit breaker to alert people not to turn off power to vaccine storage units
- ✓ Do NOT plug units into GFI outlets or surge protectors



Continuous Monitoring of Vaccine Storage Units



A continuous temperature monitoring device, or digital data logger (DDL) is required for each vaccine storage unit



Each provider must have at least one portable backup DDL for emergency transport, or in case a primary device breaks, malfunctions, or is being re-calibrated.



Each data logger should have a different calibration expiration date!



Storage Unit Temperature Ranges



Refrigerators must maintain temperatures between 2°C to 8°C

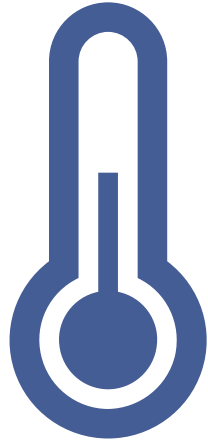
- Any excursion **above 8°C** for longer than **10 minutes** requires calling manufacturers and submitting a completed Cold Chain Incident Report to NHIP
- Any excursion **below 2°C** for **any** length of time requires calling manufacturers and submitting a completed Cold Chain Incident Report to NHIP



Freezers must maintain temperatures between -50°C to -15°C

- Any excursion warmer than -15°C for longer than 10 minutes requires calling manufacturers and submitting a completed Cold Chain Incident Report to NHIP

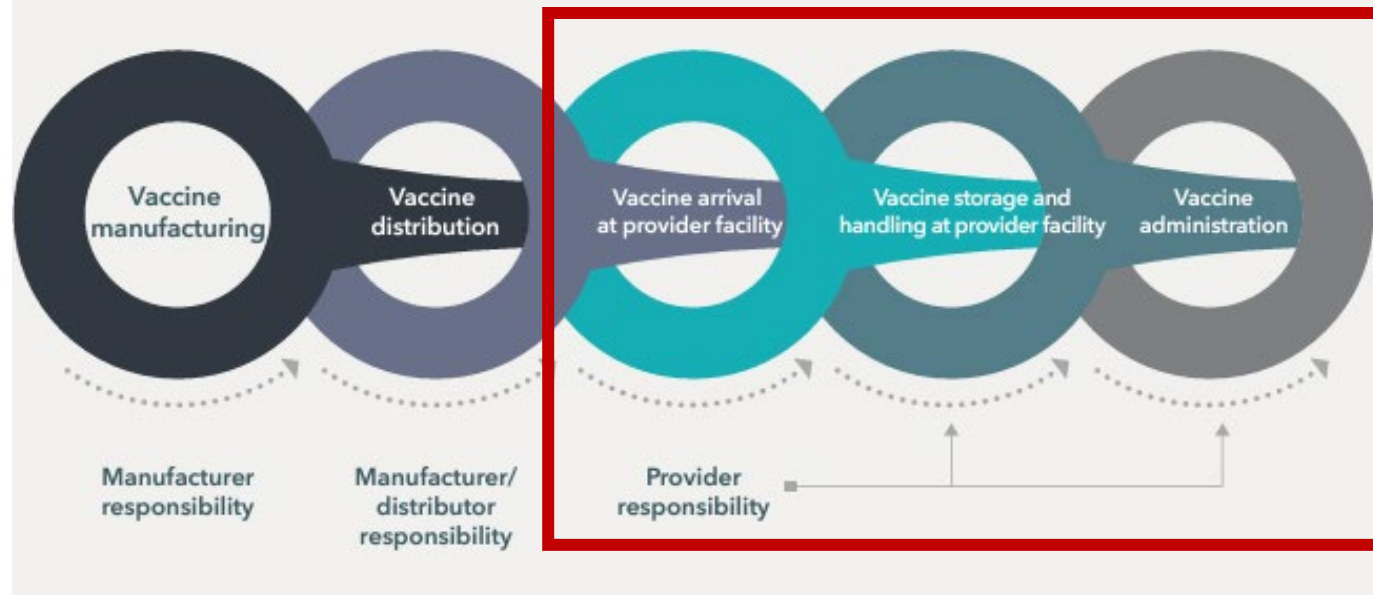
NHIP Temperature Monitoring Requirements



- ✓ Actual temperatures of each storage unit need to be read and recorded at the **beginning** and **end** of each workday
- ✓ The **Min/Max** need to be recorded each workday morning
 - **If you have a Fridge-tag device, remember to press the read button a total of 3 times each time you read and record temperatures
- ✓ Download and review your data logger report at the end of every month
- ✓ Submit your manual temperature logs to NHIP by the 10th of every month
- ✓ All temperature documentation must be saved for a minimum of 3 years per CDC (along with all VFC related documentation). Electronic storage is okay.

Maintaining the Cold Chain

Cold Chain Flowchart



The cold chain is the system of transporting and storing vaccines at recommended temperatures from the point of manufacturing to administration.

The responsibility of the provider begins when vaccine arrives at your practice.

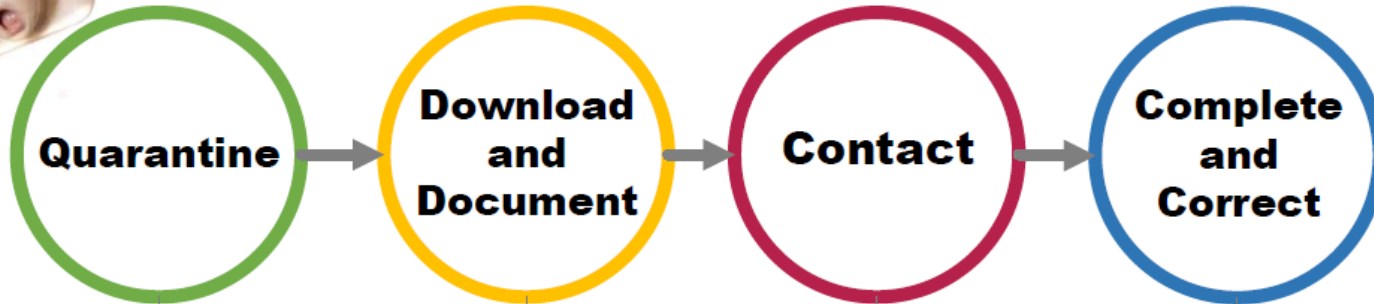
Vaccines exposed to temperatures outside the recommended ranges can have reduced potency and protection.

Errors in storage and handling/administration can also result in the loss of patient confidence when repeat doses are required.

May result in significant financial loss if the vaccine cannot be used OR if the provider has shown negligence in the storage or handling of a vaccine, the provider may be asked to replace the wasted vaccine.



Handling Temperature Excursions in Your Vaccine Storage Unit



If you see an out of range temperature, notify the primary or backup vaccine coordinator immediately

Quarantine vaccine: Label exposed vaccines/unit, "DO NOT USE"



Download your DDL report to determine highest/lowest temperature reached and the number of minutes/hours out of range

Determine if vaccine has been involved in a previous excursion

Start documenting the incident on the NHIP Cold Chain Incident Report

Contact NHIP to make them aware of the excursion and ask for additional guidance if needed

If after hours, enact your emergency plan for temporary storage

Call manufacturers to determine vaccine viability

If manufacturer deems vaccine non-viable, remove from storage unit and prepare for return

Complete and submit Cold Chain Incident Report to NHIP. Don't forget to attach your DDL report!

Address and correct the issue, such as checking the door seal, hinges, have unit serviced, etc.

Manufacturer Contacts

GSK: 1-877-356-8368
 Merck: 1-800-672-6372
 Pfizer: 1-800-438-1985
 Sanofi: 1-800-822-2463

Seqirus: 1-855-359-8966
 Dynavax: 1-844-889-8753
 AstraZeneca: 1-800-236-9933
 Moderna: 1-866-663-3762
 Novavax: 1-855-239-9174

Phone: 603-271-4463 Fax: 603-271-4932 immunization@dhhs.nh.gov

Had a temperature excursion?



Don't panic!
 Call NHIP if you need help!



Vaccine Transport and Emergency Pack-Out



Transport: Maintaining the Cold Chain

Be prepared. Always have the following items ready and available:

- ✓ Frozen water bottles
- ✓ Insulated container
- ✓ Cardboard, bubble wrap
- ✓ Back up DDL



Don't Forget to Condition Your Water Bottles!

Use one of the following methods until the ice block inside moves when rotated in your hand

- Leave out on the counter for approx. 25-30 minutes
- Place frozen bottles in a sink filled with several inches of lukewarm water
- Place under running tap water



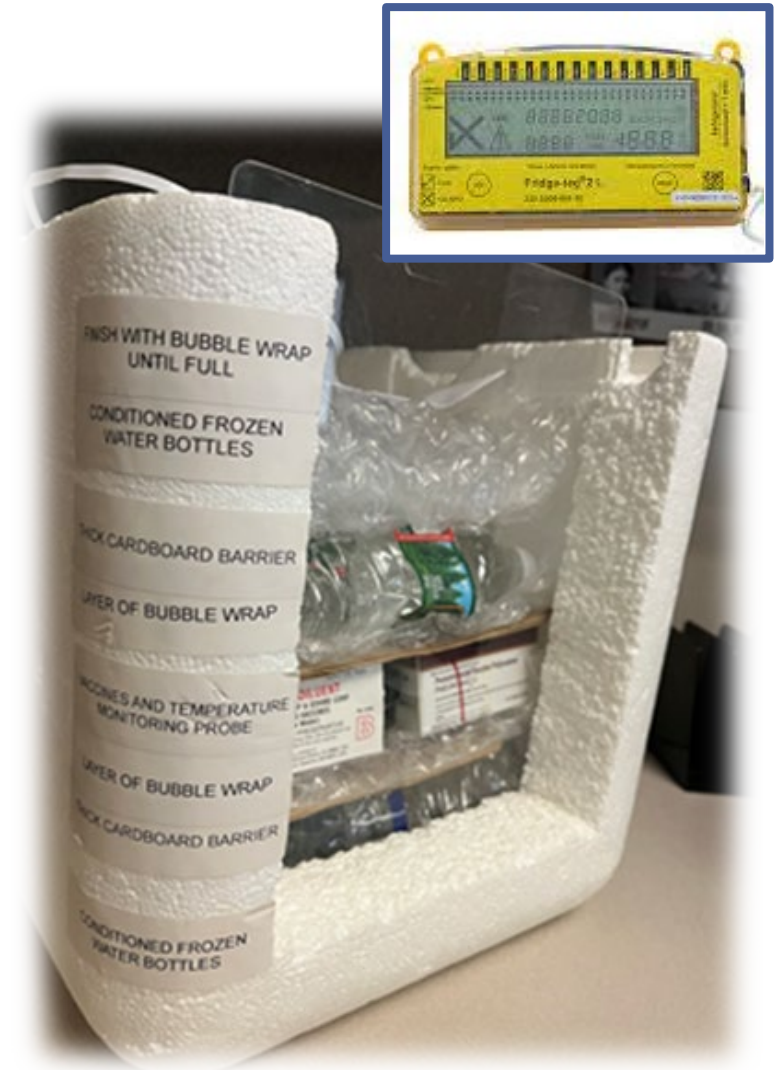
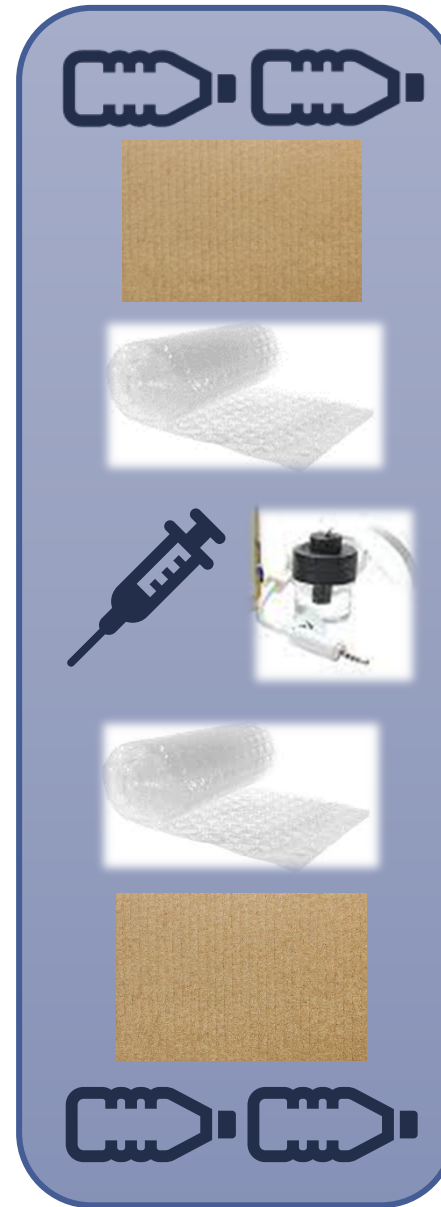
Transport: Pack Out

Packing Up Your Refrigerated Vaccine

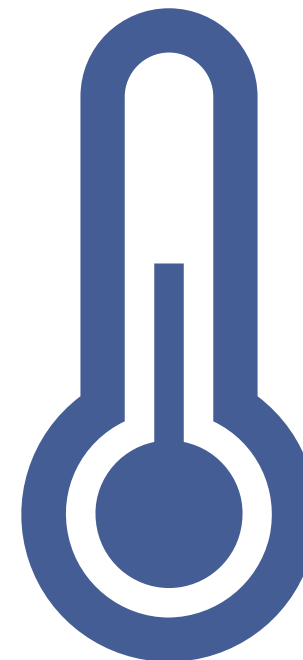
- Layer 1: Water bottles
- Layer 2: Insulating Material (**cardboard**)
- Layer 3: Insulating Material (**bubble wrap**)
- Layer 4: Vaccines and DDL probe
- Layer 5: Insulating Material (**bubble wrap**)
- Layer 6: Insulating Material (**cardboard**)
- Layer 7: Water bottles
 - If there is space left in your container, add extra bubble wrap for added insulation

Frozen Vaccine

- ✓ Last out, first in
- ✓ Do NOT condition water bottles!



Temperature Monitoring Devices and Systems



CDC Digital Data Logger Specifications



Data loggers must meet or exceed the following

- ✓ **Detachable Bio safe glycol-probe** or similar buffered solution
- ✓ **Continuous Monitoring:** The ability to record and save temperature information 24 hours a day with at least one reading every 15 minutes.
- ✓ A **digital display** on the outside of the unit.
- ✓ The ability to **display the minimum and maximum temperatures** between readings.
- ✓ A **Hi/Lo alarm**, audible or visual for out- of- range temperatures.
- ✓ The ability to **download and transmit temperature information** by email or fax.
- ✓ **Low battery** indicator.
- ✓ A **current certificate of calibration** that is traceable to the National Institute of the Standards and Technology (NIST) with accuracy of +/- 1°F (0.5°C).

Types of Temperature Monitoring Devices

Stand-Alone Loggers - \$

Advantages:

- Simple, inexpensive, easy set-up, built-in memory, download stored data for review and save data to a computer
- Ideal for staff that aren't tech/computer savvy
- Data is transferred via internal memory/USB connection, thumb drive, or memory card
- Manufacturers typically provide "Quick Start Guides"
- Portable – can be used as back-up device

Disadvantages:

- Some (not all) devices may require software
- Must manually disconnect loggers from each storage unit to download data (limited storage)
 - Some provide Bluetooth pairing, but you may be limited to viewing data on mobile devices if office computers do not allow Bluetooth connectivity
- After hours/weekend temperature excursions won't be found until back in office
- Limited memory available on device. If data isn't downloaded and backed up, data is lost.



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Types of Temperature Monitoring Devices

Wi-Fi and Ethernet Loggers - \$\$

Advantages:

- Ability to monitor multiple devices from a single computer in real time
- No need to manually disconnect loggers to download temperatures
- Ability to set up email/text notifications to select staff for alarms
 - Allows you to take-action when the office is closed
- Peace of mind knowing data is backed up via Wi-Fi and/or cloud technology

Disadvantages:

- Can lead to complacency: Daily min/max and twice daily actual temperature checks are still required and must be logged and submitted to NHIP monthly
- Devices will require software to be installed to computers to download reports
- Additional set up (text/email notifications) and technical assistance for proper installation may be needed
- Most have added and recurring costs for subscription service plans



Types of Temperature Monitoring Devices

Enterprise Level Monitoring Systems - \$\$\$\$

- Same pros/cons of Wi-Fi and Ethernet data loggers
- Has the ability to scale to support large healthcare organizations, hospitals, etc.
 - Can monitor multiple devices/units at multiple locations
- Requires dedicated staff to monitor and transmit temperature data from multiple sites
- Vendor and on-site IT resources needed for set up
- Subscriptions for cloud space and accounts required for setup
- May require additional equipment for multiple units
- **If your organization uses an enterprise system:**
 - Know who you need to contact to get reports and relay what information is needed on a monthly-basis and in the event of a temperature excursion!



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Other Considerations



Is software required?

- Most temperature monitoring devices/systems require software to download data or configure settings
- Need to check that software is compatible with computers in use and that your IT dept will allow the software to be installed



Re-Calibration

- Can the device be re-calibrated?
- How often does your device need to be re-calibrated?
- Process for re-calibration and how will temperatures be monitored in the interim



Power source

- What type of batteries are required? How long do they last? Replaceable or Re-chargeable?



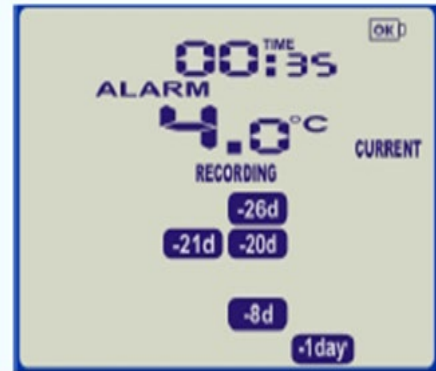
Total recurring costs: subscriptions, batteries, re-calibration

Your Data Logger Display

Display explanation



- | | |
|---|--|
| <ul style="list-style-type: none"> 1 OK (✓) or Alarm (X) indicator 2 HIGH / LOW alarm indicators showing history of the last 30 days 3 Power on indicator (double point is flashing) 4 Battery low indicator (approx. up to 1 month remaining) 5 Additional warning symbol (indicates when a new alarm was observed, will disappear after checking details) | <ul style="list-style-type: none"> 6 Time, duration and text indicator 7 Date and text indicator 8 Indicator of measured minimum / maximum temperature 9 Temperature display 10 Indicator of the temperature measurement unit (°F / °C) 11 Indicator of activated sensor:
Int. = internal sensor (inside the Fridge-tag® 2)
Ext. = external sensor (cable with temperature sensor) |
|---|--|



What is your DDL display telling you?

Your display will always show:

1. Current actual temperature
2. Min/max temps
3. Battery life
4. *If/when* an alarm occurred



What is your DDL display *not* telling you?

I think my alarm settings might be wrong.



Take a closer look...

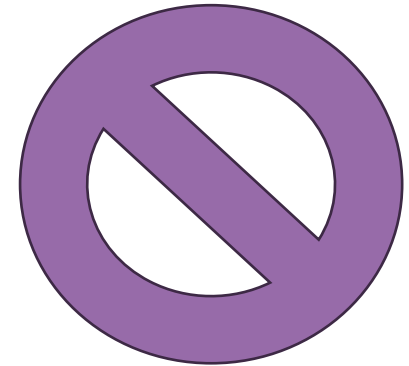
- What day did the excursion happen? For how long?
- The temperature is *in range*, but the alarm is going off
- The temperature is out of range, but the alarm *didn't* go off
- The alarm didn't go off, were there other excursions?

If you can't find this information on the display, download a report!



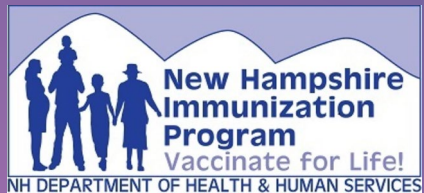
DDL Practices that Lead to Excursions

- × **Incorrect set up of DDL alarm interval**
- × **Lack of staff training**
- × Incorrect DDL set up or placement of the probe
- × Turning off/ignoring DDL alarms
- × Use of DDL devices with expired calibration dates
- × Incorrect download of DDL Report or not downloading at regularly
- × Failing to charge OR replace DDL battery
- × No back-up calibrated DDL device or all expiring at the same time



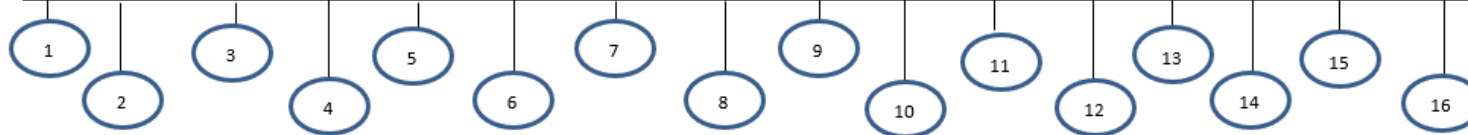


Digital Data Logger Reports



Fridgetag 2L Refrigerator Temperature Report
 Download the data logger report via USB if there is an alarm on the monitoring device

No	Date (mm/dd/yyyy)	Events	Average Temp.	Lower Alarm Limit				Upper alarm limit				Ext sensor connection error			Signature/notes Action taken
				Status	Min Temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max Temp	Cumulative daily time above the limit	Alarm Trigger Time	Status	Duration	Alarm Trigger Time	
1	Today		+5.6c	In progress	+5.0c	0min		In progress	+6.4c	0min			0min		
2	02/15/2019	08:16	+5.7c	ok	+4.9c	0min		ok	+6.7c	0min		ok	0min		
3	02/14/2019	06:59	+6.0c	ok	+5.3c	0min		ok	+7.1c	0min		ok	0min		
4	02/13/2019	07:05,18:08	+5.0c	ok	+4.4c	0min		ok	+6.7c	0min		ok	0min		
5	02/12/2019	06:51,21:25	+5.4c	ok	+4.6c	0min		ALARM	+10.5	5h 21min	04:15h	ok	0min		
6	2/12/2019	7:21	+5.8c	ok	+5.0c	0min		ok	+7.1c	0min		ok	0min		



DAILY EVENTS INFORMATION

- No-**The number of readings with 1 being the current day report was run
- Date-** Must be set in correct format Month/Day/Year
- Events-** Time stamp for the Minimum and Maximum temp check (morning check is a requirement, end of day recommended)
- Average Temp-** Overall average temperature for 24 hours

LOWER ALARM LIMIT- TOO COLD!
BELOW 2°C FOR MORE THAN 10 MINUTES

- Status-** ok means just that- all is ok
- Min Temp-** The coldest the unit has gotten in 24 hours
- Duration out of range-** How long was the temp below 2° during last 24 hours
- Alarm trigger time-** If alarm is triggered this is the time it went off "after" being out of range for 10 minutes.



UPPER ALARM LIMIT- TOO WARM!
ABOVE 8°C FOR MORE THAN 10 MINUTES

- Status-** ok means just that- all is ok
- Max Temp-** The warmest the unit has gotten in 24 hours
- Duration out of range-** How long was the temp above 8°c during last 24 hours
- Alarm trigger time-** If alarm is triggered this is the time it went off "after" being out of range for 10 minutes.

EXT SENSOR CONNECTION ERROR- BE SURE SECURELY CONNECTED!
LISTEN FOR THE "CLICK"

- Status-** ok means just that- all is ok. Probe is correctly connected to the data logger
- Duration-** If not connected properly- how long it has been disconnected
- Alarm trigger time-** If alarm is triggered this is the time it went off "after" probe has been disconnected for more than 10 minutes

COMMUNICATION IS IMPORTANT

- Use this area to communicate notes to self or NHIP

What Information is Important?

What information are you looking for?



It's not just for alarms!

Device and Set-Up Details: alarm limits, logging intervals

Daily audits, alarms, connection errors

Large range between min/max temps (ex: min = 2 and max = 7)

Fluctuating temperatures when the office is closed

Sudden spike in cold temperatures

Temperature is too high, followed by a temperature that is too cold

Frequent high alarms

PDF document of the Fridge-tag® 2 L

Identification number: 190500015402
 Date and time of report creation: 07/05/2022 06:31h
 Activation date: 12/17/2021 16:13h
 Upper alarm limit:
 Lower alarm limit:
 Measurement interval:¹⁾
 Logging interval:

Above +18.0°C for 1h
 Below +2.0°C for 2h 15min
 1min (fixed)
 5min

No.	Date (MM/dd/yy)	Events ²⁾	Average temp.	Lower alarm limit			Upper alarm limit			Ext. sensor connection error			Signature / notes Action taken		
				Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status		Duration	Alarm trigger time
1	Today		+4.5°C	In progress	+2.5°C	0min		In progress	+6.2°C	0min		In progress	1min		
2	07/04/2022		+4.6°C	ok	+3.1°C	0min		ok	+6.3°C	0min		ok	0min		
3	07/03/2022		+4.7°C	ok	+3.1°C	0min		ok	+6.3°C	0min		ok	0min		
4	07/02/2022		+4.6°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
5	07/01/2022		+4.6°C	ok	+2.6°C	0min		ok	+6.3°C	0min		ok	0min		
6	06/30/2022		+4.6°C	ok	+2.5°C	0min		ok	+6.3°C	0min		ok	0min		
7	06/29/2022		+4.7°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
8	06/28/2022		+4.7°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
9	06/27/2022		+4.7°C	ok	+2.9°C	0min		ok	+6.3°C	0min		ok	0min		
10	06/26/2022		+4.6°C	ok	+2.5°C	0min		ok	+6.3°C	0min		ok	0min		
11	06/25/2022		+4.7°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
12	06/24/2022		+4.6°C	ok	+2.8°C	0min		ok	+6.3°C	0min		ok	0min		
13	06/23/2022		+4.8°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
14	06/22/2022		+4.7°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
15	06/21/2022		+4.9°C	ok	+3.1°C	0min		ok	+7.6°C	0min		ok	0min		
16	06/20/2022		+4.8°C	ok	+3.2°C	0min		ok	+6.2°C	0min		ok	0min		
17	06/19/2022		+4.7°C	ok	+2.9°C	0min		ok	+6.3°C	0min		ok	0min		
18	06/18/2022		+4.8°C	ok	+2.6°C	0min		ok	+6.3°C	0min		ok	0min		
19	06/17/2022		+4.7°C	ok	+2.7°C	0min		ok	+6.3°C	0min		ok	0min		
20	06/16/2022		+4.6°C	ok	+2.8°C	0min		ok	+6.3°C	0min		ok	0min		
21	06/15/2022		+4.7°C	ok	+2.9°C	0min		ok	+6.3°C	0min		ok	0min		
22	06/14/2022		+4.7°C	ok	+2.8°C	0min		ok	+6.3°C	0min		ok	0min		
23	06/13/2022	06:14	+4.6°C	ok	+2.3°C	0min		ok	+6.3°C	0min		ok	0min		
24	06/12/2022		+4.7°C	ok	+3.1°C	0min		ok	+6.3°C	0min		ok	0min		
25	06/11/2022		+4.8°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		
26	06/10/2022		+4.7°C	ok	+2.7°C	0min		ok	+6.3°C	0min		ok	0min		
27	06/09/2022		+4.6°C	ok	+2.7°C	0min		ok	+6.3°C	0min		ok	0min		
28	06/08/2022		+4.7°C	ok	+3.0°C	0min		ok	+6.3°C	0min		ok	0min		

¹⁾ Sampling and data analysis every minute
²⁾ 1 = time / date channel, 2 = alarm configuration channel, 3 = error channel

No.	Date (MM/dd/yyyy)	Events ²⁾	Average temp.	Lower alarm limit				Upper alarm limit				Ext. sensor connection error			Signature / notes Action taken
				Status	Min. temp.	Cumulative daily time below the limit	Alarm trigger time	Status	Max. temp.	Cumulative daily time above the limit	Alarm trigger time	Status	Duration	Alarm trigger time	
1	Today	05:57	+5.1°C	In progress	+4.6°C	0min		In progress	+5.5°C	0min		In progress	0min		
2	04/01/2024	06:48	+5.2°C	ok	+4.8°C	0min		ok	+5.6°C	0min		ok	0min		
3	03/31/2024		+5.1°C	ok	+4.7°C	0min		ok	+5.5°C	0min		ok	0min		
4	03/30/2024	07:06	+5.1°C	ok	+4.5°C	0min		ok	+5.5°C	0min		ok	0min		
5	03/29/2024		+5.3°C	ok	+4.6°C	0min		ok	+5.8°C	0min		ok	0min		
6	03/28/2024	06:25	+5.3°C	ok	+4.9°C	0min		ok	+5.7°C	0min		ok	0min		
7	03/27/2024	06:43	+5.2°C	ok	+4.2°C	0min		ok	+7.6°C	0min		ok	0min		
8	03/26/2024	06:25	+4.4°C	ok	+3.6°C	0min		ok	+5.8°C	0min		ok	1min		
9	03/25/2024	05:59	+3.8°C	ok	+3.6°C	0min		ok	+4.2°C	0min		ok	0min		
10	03/24/2024		+3.7°C	ok	+3.5°C	0min		ok	+4.0°C	0min		ok	0min		
11	03/23/2024		+3.7°C	ok	+3.5°C	0min		ok	+4.0°C	0min		ok	0min		
12	03/22/2024	11:50	+3.9°C	ok	+3.6°C	0min		ok	+4.3°C	0min		ok	0min		
13	03/21/2024		+4.5°C	ok	+3.8°C	0min		ok	+10.0°C	11min		ok	2min		
14	03/20/2024		+5.3°C	ok	+4.3°C	0min		ok	+5.7°C	0min		ok	0min		
15	03/19/2024		+5.3°C	ok	+4.5°C	0min		ok	+7.8°C	0min		ok	0min		
16	03/18/2024		+5.3°C	ok	+4.3°C	0min		ok	+9.6°C	9min		ok	0min		
17	03/17/2024		+5.3°C	ok	+4.3°C	0min		ok	+5.7°C	0min		ok	0min		
18	03/16/2024		+5.3°C	ok	+4.3°C	0min		ok	+5.7°C	0min		ok	0min		
19	03/15/2024	06:08	+4.2°C	ok	+1.2°C	1h 6min		ok	+8.7°C	6min		ok	7min		
20	03/14/2024	07:42	+3.9°C	ok	+1.7°C	9min		ok	+5.1°C	0min		ok	0min		
21	03/13/2024	06:41	+4.0°C	ok	+2.0°C	0min		ok	+5.1°C	0min		ok	0min		
22	03/12/2024	07:06	+4.0°C	ok	+2.0°C	0min		ok	+5.1°C	0min		ok	0min		
23	03/11/2024	06:23	+4.0°C	ok	+1.8°C	8min		ok	+5.4°C	0min		ok	0min		
24	03/10/2024		+3.7°C	ok	+1.7°C	22min		ok	+5.1°C	0min		ok	0min		
25	03/09/2024	08:29	+3.9°C	ok	+2.1°C	0min		ok	+5.1°C	0min		ok	0min		
26	03/08/2024	08:02	+4.0°C	ok	+1.6°C	50min		ok	+5.9°C	0min		ok	0min		
27	03/07/2024	09:02	+4.4°C	ok	+2.1°C	0min		ok	+7.6°C	0min		ok	1min		
28	04/05/2024	08:18	+5.2°C	ok	+4.0°C	0min		ok	+5.9°C	0min		ok	0min		

Vaccines moved during unit repairs

PDF document of the Fridge-tag® 2 L

Identification number 160500015432
 Date and time of report creation 02/01/2022 09 23h
 Activation date 08/26/2020 09 48h
 Upper alarm limit Above +8 0°C for 1h
 Lower alarm limit Below +2 0°C for 25min
 Measurement interval ¹⁾ 1min (fixed)
 Logging interval 5min

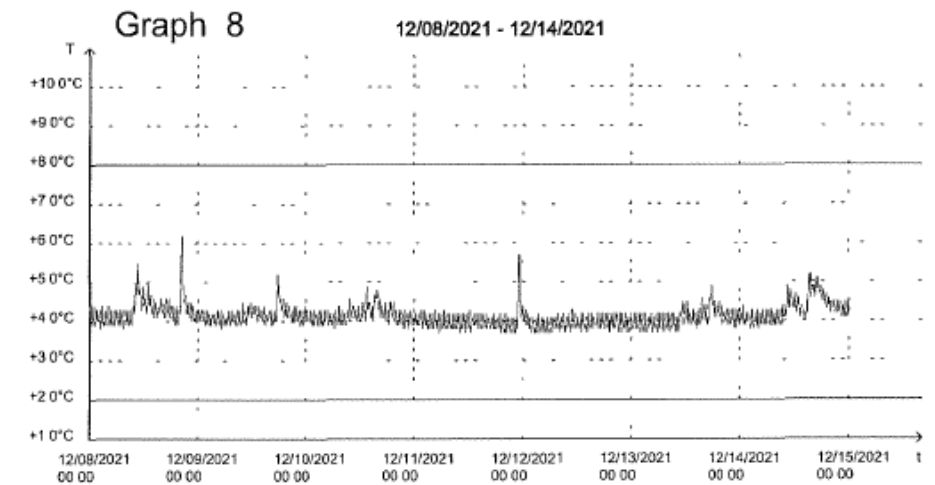
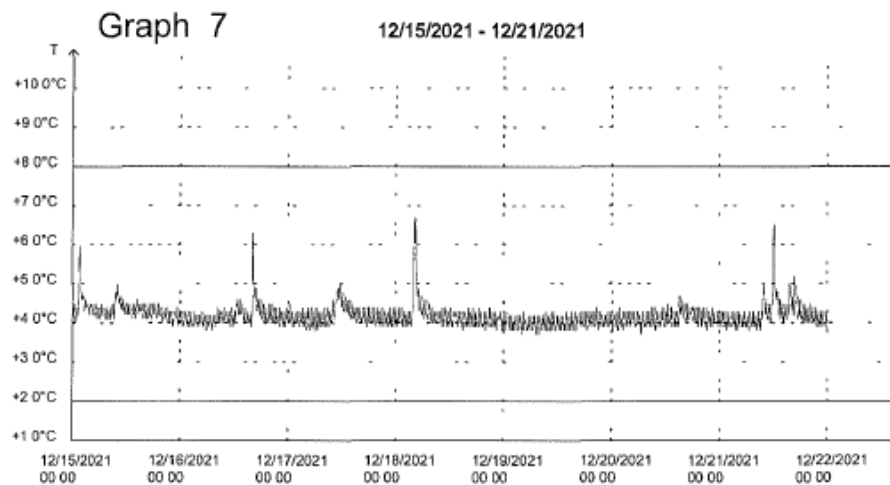
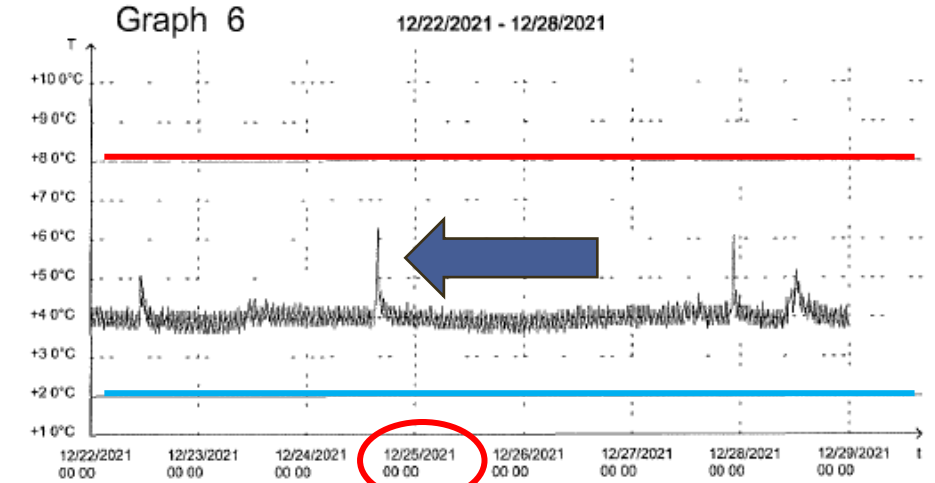
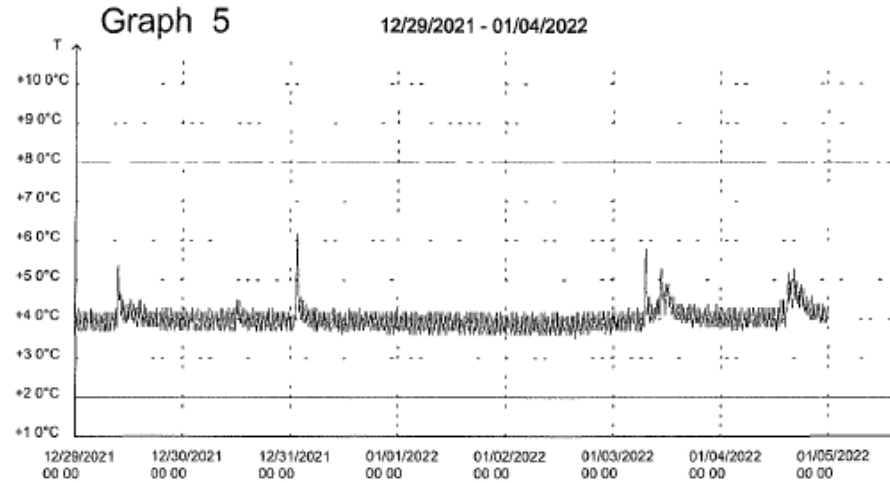
No	Date (MM/dd/yyyy)	Events ²⁾	Average temp	Lower alarm limit				Upper alarm limit				Ext sensor connection error			Signature / notes Action taken
				Status	Min temp	Cumulative daily time below the limit	Alarm trigger time	Status	Max temp	Cumulative daily time above the limit	Alarm trigger time	Status	Duration	Alarm trigger time	
29	01/04/2022	08 56	+4 1°C	ok	+3 7°C	0min		ok	+5 3°C	0min		ok	0min		
30	01/03/2022	09 01	+4 1°C	ok	+3 6°C	0min		ok	+5 8°C	0min		ok	3min		
31	01/02/2022		+3 8°C	ok	+3 5°C	0min		ok	+4 3°C	0min		ok	0min		
32	01/01/2022		+3 8°C	ok	+3 6°C	0min		ok	+4 3°C	0min		ok	0min		
33	12/31/2021		+3 9°C	ok	+3 6°C	0min		ok	+6 2°C	0min		ok	0min		
34	12/30/2021	09 53,18 14	+3 9°C	ok	+3 6°C	0min		ok	+4 6°C	0min		ok	0min		
35	12/29/2021	09 33	+4 0°C	ok	+3 6°C	0min		ok	+5 4°C	0min		ok	0min		
36	12/28/2021	08 59,18 18	+4 0°C	ok	+3 7°C	0min		ok	+5 2°C	0min		ok	0min		
37	12/27/2021	18 21	+4 0°C	ok	+3 7°C	0min		ok	+6 1°C	0min		ok	0min		
38	12/26/2021		+3 9°C	ok	+3 6°C	0min		ok	+4 3°C	0min		ok	0min		
39	12/25/2021		+3 8°C	ok	+3 6°C	0min		ok	+4 3°C	0min		ok	0min		
40	12/24/2021		+4 0°C	ok	+3 7°C	0min		ok	+6 3°C	0min		ok	0min		
41	12/23/2021	08 35	+3 9°C	ok	+3 5°C	0min		ok	+4 6°C	0min		ok	0min		
42	12/22/2021	09 22,18 27	+3 9°C	ok	+3 6°C	0min		ok	+5 2°C	0min		ok	0min		
43	12/21/2021	09 13,18 12	+4 2°C	ok	+3 7°C	0min		ok	+6 7°C	0min		ok	0min		
44	12/20/2021	09 24,18 36	+4 1°C	ok	+3 7°C	0min		ok	+4 8°C	0min		ok	0min		
45	12/19/2021		+4 0°C	ok	+3 7°C	0min		ok	+4 4°C	0min		ok	0min		
46	12/18/2021		+4 1°C	ok	+3 8°C	0min		ok	+6 8°C	0min		ok	0min		
47	12/17/2021	08 39	+4 1°C	ok	+3 8°C	0min		ok	+5 0°C	0min		ok	0min		
48	12/16/2021	09 47	+4 1°C	ok	+3 8°C	0min		ok	+6 4°C	0min		ok	0min		
49	12/15/2021	09 03,17 53	+4 3°C	ok	+3 9°C	0min		ok	+6 0°C	0min		ok	0min		
50	12/14/2021	09 29	+4 2°C	ok	+3 8°C	0min		ok	+5 4°C	0min		ok	0min		
51	12/13/2021	09 12,17 59	+4 0°C	ok	+3 7°C	0min		ok	+4 9°C	0min		ok	0min		
52	12/12/2021		+3 9°C	ok	+3 6°C	0min		ok	+4 3°C	0min		ok	0min		
53	12/11/2021		+3 9°C	ok	+3 6°C	0min		ok	+5 8°C	0min		ok	0min		
54	12/10/2021	10 12	+4 1°C	ok	+3 8°C	0min		ok	+4 9°C	0min		ok	0min		
55	12/09/2021	09 20	+4 1°C	ok	+3 8°C	0min		ok	+5 2°C	0min		ok	0min		
56	12/08/2021	09 42	+4 2°C	ok	+3 8°C	0min		ok	+6 2°C	0min		ok	0min		

All within acceptable temp ranges! All good, right?



PDF document of the Fridge-tag® 2 L

Identification number 160500015432
Date and time of report creation 02/01/2022 09 23h

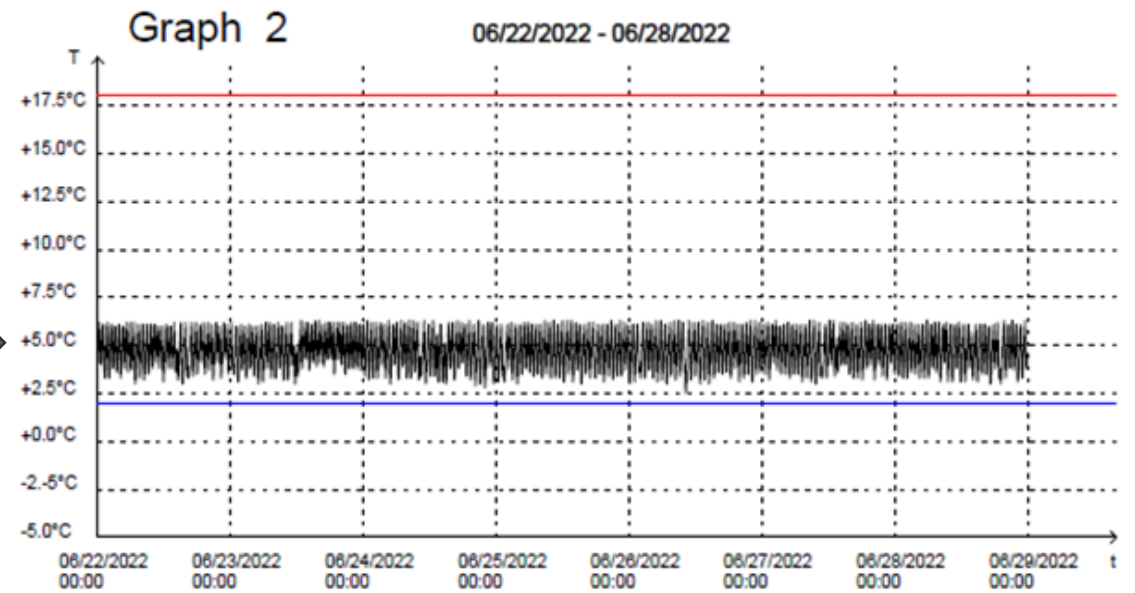
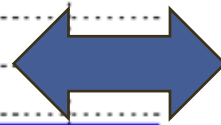
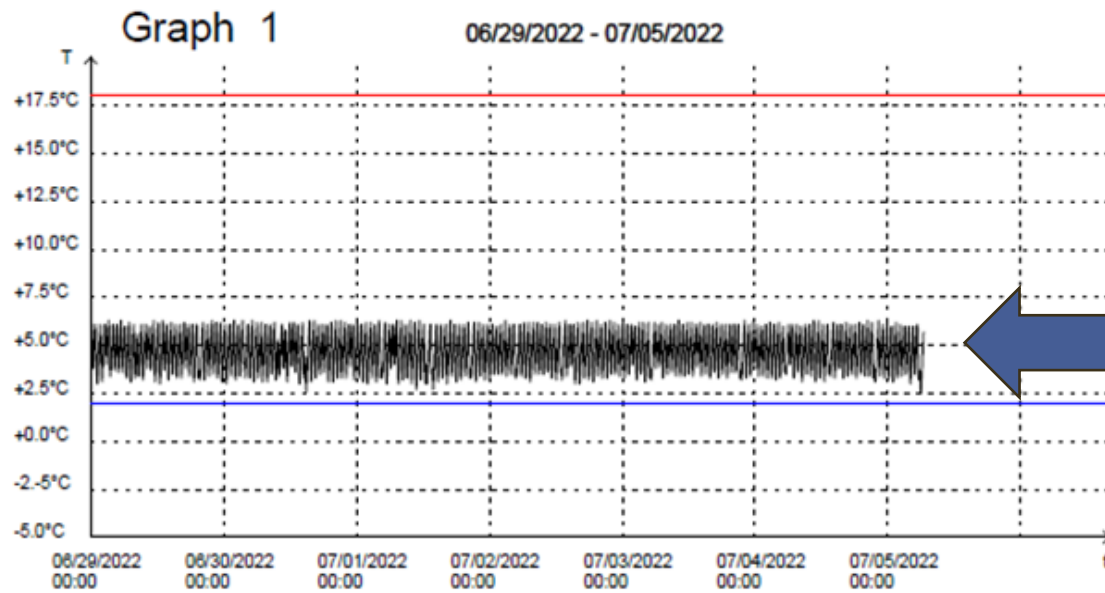


Not Exactly.
Graphs can visualize
trends of concern!

What Does a Healthy Refrigerator Look Like?

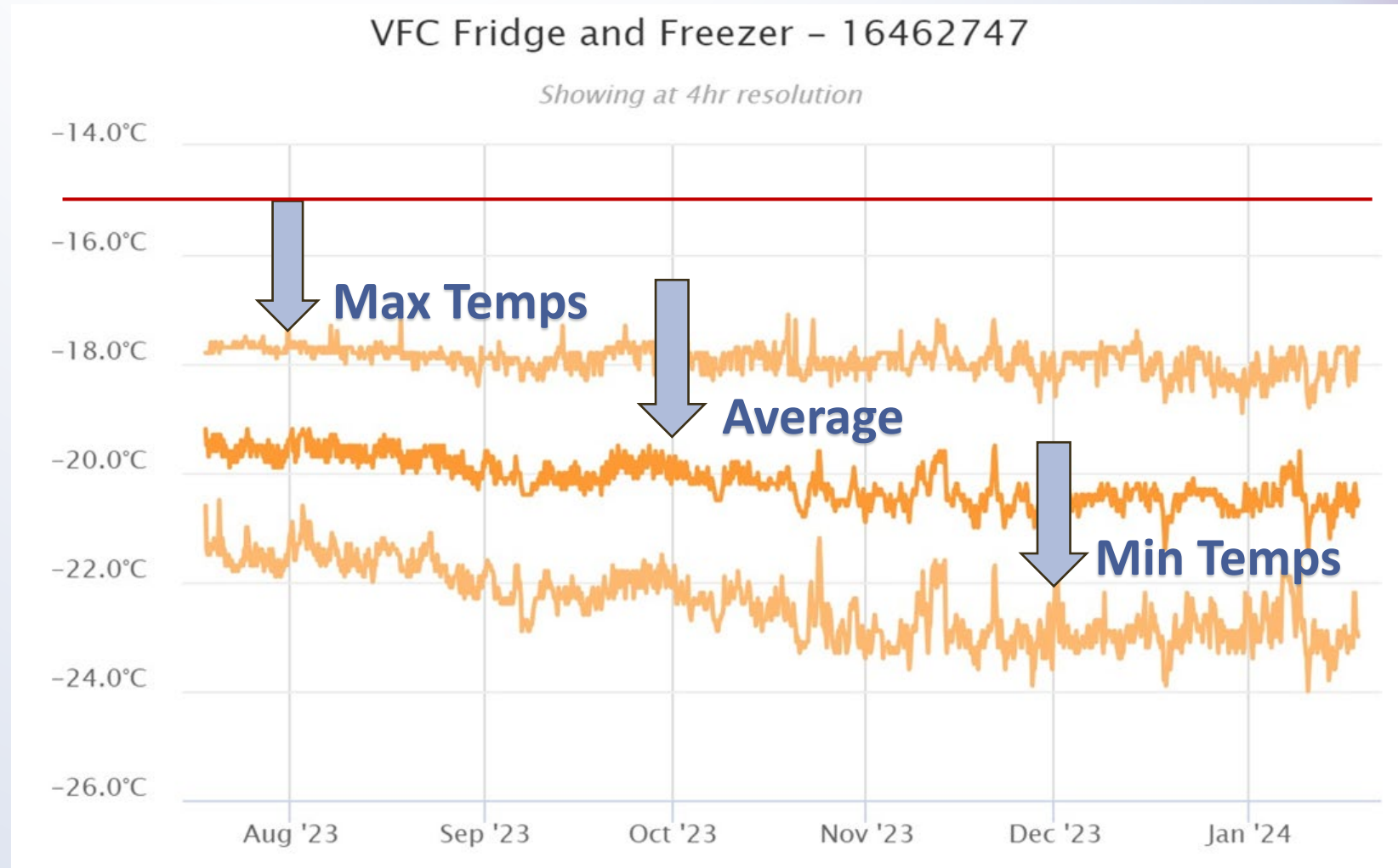
PDF document of the Fridge-tag® 2 L

Identification number: 190500015402
Date and time of report creation: 07/05/2022 06:31h



Freezer Units

Freezers typically have more fluctuation due to defrost cycles. This is normal!



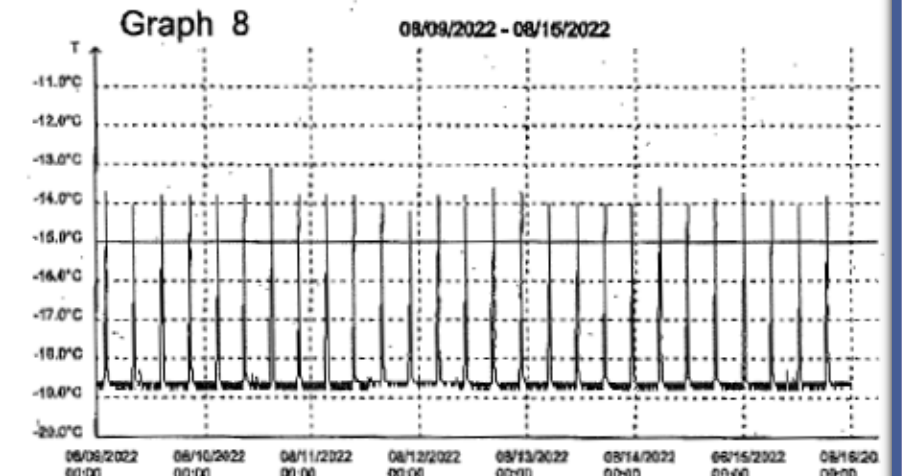
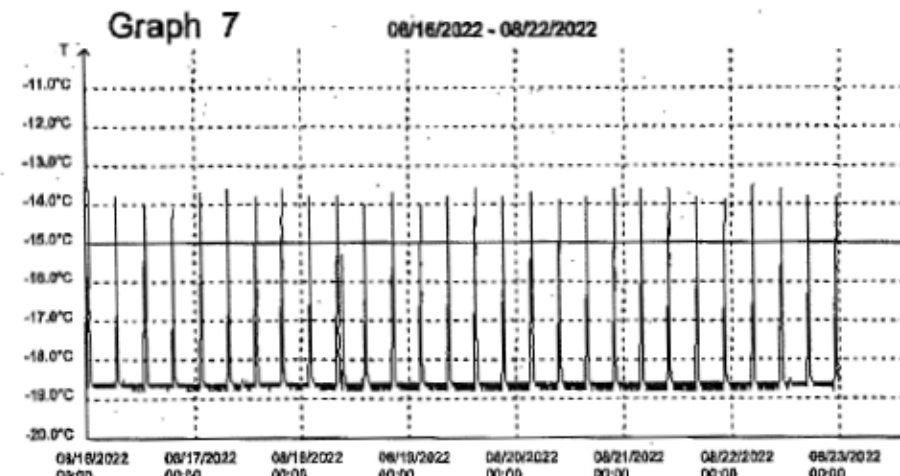
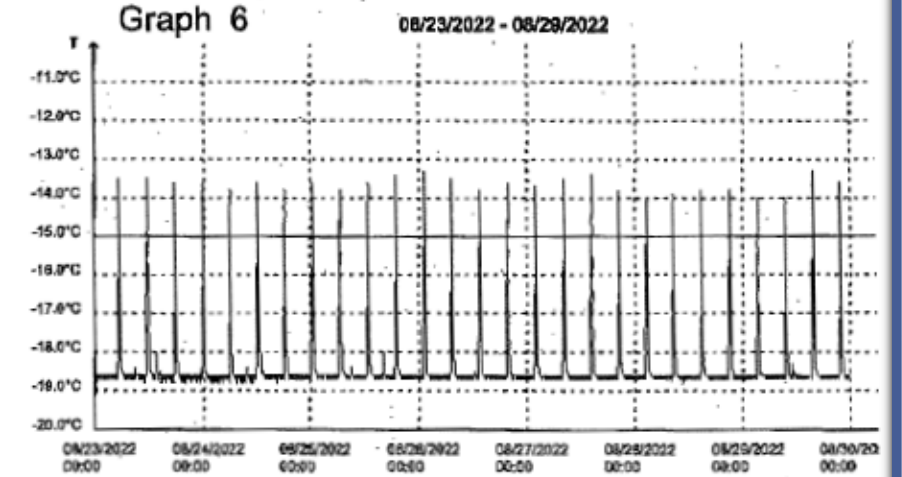
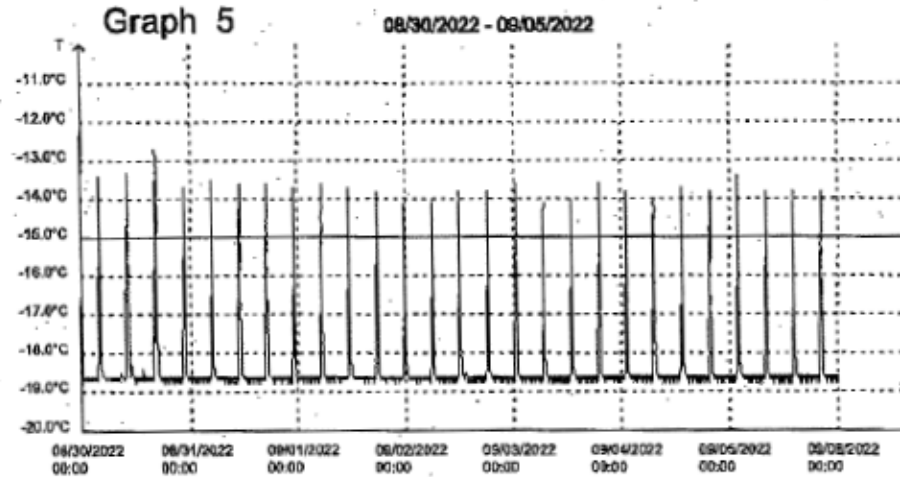
PDF document of the Fridge-tag® 2 L

Identification number: 130500102890
 Date and time of report creation: 10/03/2022 08:09h
 Activation date: 02/28/2022
 Upper alarm limit: Above 18.0°C
 Lower alarm limit: —
 Measurement interval:¹⁾ 1min
 Logging interval: 5min

No.	Date (MM/dd/yyyy)	Events ²⁾	Average temp.
29	09/05/2022		-18.3°C
30	09/04/2022		-18.4°C
31	09/03/2022	07:45	-18.4°C
32	09/02/2022	07:10,14:03	-18.4°C
33	09/01/2022	07:26,14:08	-18.4°C
34	08/31/2022	07:24,14:30	-18.3°C
35	08/30/2022	07:11,14:16	-18.3°C
36	08/29/2022	07:11,14:31	-18.3°C
37	08/28/2022		-18.3°C
38	08/27/2022	07:55	-18.3°C
39	08/26/2022	07:28	-18.3°C
40	08/25/2022	07:24,13:49	-18.3°C
41	08/24/2022	07:28,14:07	-18.4°C
42	08/23/2022	07:13,14:28	-18.3°C
43	08/22/2022	07:28,14:10	-18.3°C
44	08/21/2022		-18.4°C
45	08/20/2022	07:44	-18.4°C
46	08/19/2022	07:19,13:45	-18.4°C
47	08/18/2022	07:28,14:55	-18.3°C
48	08/17/2022	07:16,14:05	-18.3°C
49	08/16/2022	07:19,13:59	-18.3°C
50	08/15/2022	07:14,14:14	-18.4°C
51	08/14/2022		-18.4°C
52	08/13/2022	07:47	-18.4°C
53	08/12/2022	07:21,13:53	-18.3°C
54	08/11/2022	07:19,14:27	-18.3°C
55	08/10/2022	07:14,13:46	-18.3°C
56	08/09/2022	07:26,14:05	-18.4°C

PDF document of the Fridge-tag® 2 L

Identification number: 130500102890
 Date and time of report creation: 10/03/2022 08:09h



PDF document of the Fridge-tag® 2 L

Identification number: 130500102890
 Date and time of report creation: 10/03/2022 08:09h
 Activation date: 02/14/2022 12:53h
 Upper alarm limit: Above -15.0°C for 1h
 Lower alarm limit: —
 Measurement interval: 1 min (fixed)
 Logging interval: 5min

Site Name:

PIN:

No.	Date (MM/dd/yyyy)	Events ²⁾	Average temp.	Lower alarm limit			Upper alarm limit			Alarm trigger time	Ext. sensor connection error			Signature / note Action taken.
				Status	Mln. temp.	Cumulative daily time below the limit	Status	Max. temp.	Cumulative daily time above the limit		Status	Duration	Alarm trigger time	
29	09/05/2022		-18.3°C	ok	-18.8°C	0min	ok	-13.2°C	43min		ok	0min		
30	09/04/2022		-18.4°C	ok	-18.8°C	0min	ok	-13.6°C	42min		ok	0min		
31	09/03/2022	07:45	-18.4°C	ok	-18.8°C	0min	ok	-13.5°C	41min		ok	0min		
32	09/02/2022	07:10,14:03	-18.4°C	ok	-18.8°C	0min	ok	-13.6°C	32min		ok	0min		
33	09/01/2022	07:26,14:08	-18.4°C	ok	-18.6°C	0min	ok	-13.5°C	43min		ok	3min		
34	08/31/2022	07:24,14:30	-18.3°C	ok	-18.8°C	0min	ok	-13.3°C	47min		ok	0min		
35	08/30/2022	07:11,14:16	-18.3°C	ok	-18.8°C	0min	ok	-12.6°C	51min		ok	0min		
36	08/29/2022	07:11,14:31	-18.3°C	ok	-18.8°C	0min	ok	-13.3°C	44min		ok	0min		
37	08/28/2022		-18.3°C	ok	-18.8°C	0min	ok	-13.6°C	43min		ok	0min		
38	08/27/2022	07:55	-18.3°C	ok	-18.7°C	0min	ok	-13.3°C	45min		ok	0min		
39	08/26/2022	07:28	-18.3°C	ok	-18.7°C	0min	ok	-13.3°C	48min		ok	0min		
40	08/25/2022	07:24,13:49	-18.3°C	ok	-18.8°C	0min	ok	-13.4°C	45min		ok	0min		
41	08/24/2022	07:28,14:07	-18.4°C	ok	-18.8°C	0min	ok	-13.6°C	34min		ok	0min		
42	08/23/2022	07:13,14:26	-18.3°C	ok	-18.8°C	0min	ok	-13.4°C	47min		ok	0min		
43	08/22/2022	07:28,14:10	-18.3°C	ok	-18.8°C	0min	ok	-13.4°C	45min		ok	0min		
44	08/21/2022		-18.4°C	ok	-18.6°C	0min	ok	-13.4°C	46min		ok	0min		
45	08/20/2022	07:44	-18.4°C	ok	-18.8°C	0min	ok	-13.5°C	45min		ok	0min		
46	08/19/2022	07:19,13:45	-18.4°C	ok	-18.8°C	0min	ok	-13.5°C	42min		ok	0min		
47	08/18/2022	07:28,14:55	-18.3°C	ok	-18.8°C	0min	ok	-13.5°C	43min		ok	0min		
48	08/17/2022	07:16,14:05	-18.3°C	ok	-18.8°C	0min	ok	-13.3°C	45min		ok	0min		
49	08/16/2022	07:19,13:59	-18.3°C	ok	-18.8°C	0min	ok	-13.4°C	43min		ok	0min		
50	08/15/2022	07:14,14:14	-18.4°C	ok	-18.8°C	0min	ok	-13.5°C	38min		ok	0min		
51	08/14/2022		-18.4°C	ok	-18.8°C	0min	ok	-13.3°C	36min		ok	0min		
52	08/13/2022	07:47	-18.4°C	ok	-18.8°C	0min	ok	-13.7°C	42min		ok	0min		
53	08/12/2022	07:21,13:53	-18.3°C	ok	-18.8°C	0min	ok	-13.4°C	43min		ok	0min		
54	08/11/2022	07:19,14:27	-18.3°C	ok	-18.8°C	0min	ok	-13.6°C	40min		ok	0min		
55	08/10/2022	07:14,13:46	-18.3°C	ok	-18.8°C	0min	ok	-12.6°C	46min		ok	0min		
56	08/09/2022	07:26,14:05	-18.4°C	ok	-18.8°C	0min	ok	-13.5°C	45min		ok	0min		

MMRV CDC Cost

Per Dose: \$165.09

Box of 10: \$1,650.90

MMRV Private Cost

Per Dose: \$270.15

Box of 10: \$2,701.50

Cost Increase: 64%

DDL Alarm Settings

✓ NHIP Recommended DDL alarm settings:

Refrigerator Unit	↑	High Alarm	Above 8° after 10 minutes
	↓	Low Alarm	Below 2° after 5 minutes
Freezer Unit	↑	High Alarm	Above -15° after 10 minutes
	↓	Low Alarm	Below -50 after 10 minutes

*Temperatures are recorded, tracked and reported in Celsius ONLY



How to Correct Errors on Fridge-tags



8.1. Initial menu (read and change settings)

To change the date format, the date, the time, the temperature measurement unit or the alarm settings or to read the preset alarm limits please proceed as follows:



1. Press and hold SET ...
2. ... then press READ shortly ...
3. ... then release both buttons simultaneously.

SET DATE (internal sensor) is now displayed on the screen.
OUTSIDE (external sensor) is now displayed on the screen.

You entered the menu mode and may choose which entry to see or change.

You can access the following 4 menus:

OUTSIDE (external sensor): first screen, shows the temperature measured with the internal sensor of the Fridge-tag (normal ambient temperature).
Press READ once to get to SET DATE.

SET DATE (internal sensor): Configuration with internal sensor,
SET DATE is directly shown.

1. SET DATE: change date and/or time settings
2. READ CONF: read the alarm settings
3. CELS FAHR: change the temperature unit
4. SET CONF: change the alarm settings (only if enabled in factory setting)

Use the READ button to scroll through the menu.
Use the SET button to access the corresponding menu.

Select 4. SET CONF

For Fridge

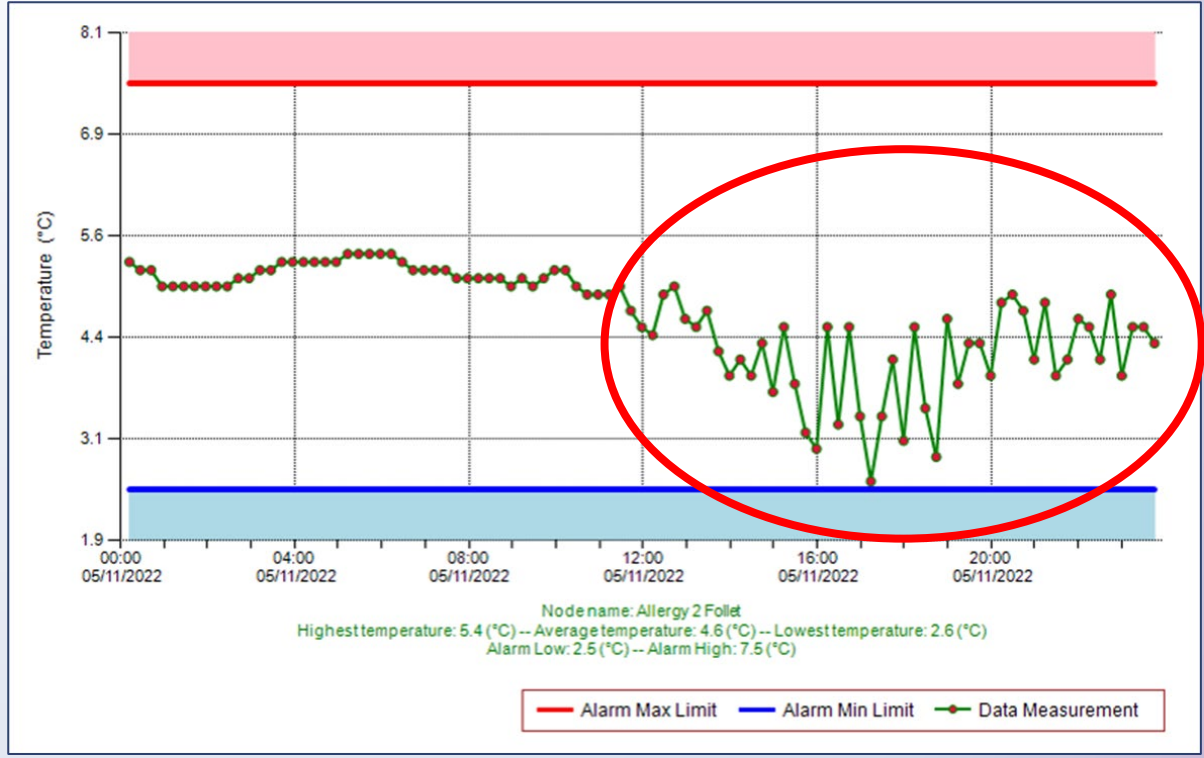
- 0:10, 8.0
- 0:05, 2.0

For Freezer

- 0:10, (after entering 0:05 press set one time, press read until you see a negative symbol, then press set) -15
- 0:10, (after entering 0:10 press set one time, press read until you see a negative symbol, then press set) -25

These instructions can be used to change the date and time too.

Signs of Imminent Storage Unit Failure



Avoid Expensive Mistakes!

Average Family Practice: Monthly Inventory Cost Example

Vaccine	# of Doses	CDC Price Per Dose	Private Cost Per Dose	Total Cost to NHIP	Total Private Cost to Replace
DTaP (Daptacel)	10	\$ 20.76	\$ 29.31	\$ 207.60	\$ 293.10
DTaP-Hib-IPV (Pentacel)	5	\$ 68.25	\$ 114.52	\$ 341.25	\$ 572.60
DTaP-IPV-Hib-HepB	10	\$ 95.07	\$ 150.85	\$ 950.70	\$ 1,508.50
Hib (PRP-T)	5	\$ 10.78	\$ 12.92	\$ 53.90	\$ 64.60
HPV9	10	\$ 224.63	\$ 287.54	\$ 2,246.30	\$ 2,875.40
MMR	10	\$ 24.96	\$ 92.49	\$ 249.60	\$ 924.90
MMRV	10	\$ 165.09	\$ 270.15	\$ 1,650.90	\$ 2,701.50
PCV20	10	\$ 178.00	\$ 253.21	\$ 1,780.00	\$ 2,532.10
Polio-IPV	20	\$ 15.98	\$ 42.64	\$ 319.60	\$ 852.80
Tdap Adsorbed	10	\$ 36.01	\$ 46.08	\$ 360.10	\$ 460.80
Varicella	10	\$ 132.42	\$ 174.32	\$ 1,324.20	\$ 1,743.20
Influenza Quad Inj P	20	\$ 15.22	\$ 19.73	\$ 304.40	\$ 394.60
Total	130	-	-	\$ 9,788.55	\$ 14,924.10

Average Pediatric Practice: Monthly Inventory Cost Example

Vaccine	# of Doses	CDC Price Per Dose	Private Cost Per Dose	Total Cost to NHIP	Total Private Cost to Replace
Influenza Quad Inj P	300	\$ 15.22	\$ 19.73	\$ 4,566.00	\$ 5,919.00
DTaP (Infanrix)	50	\$ 21.09	\$ 28.02	\$ 1,054.50	\$ 1,401.00
DTaP-Hib-IPV (Pentacel)	5	\$ 68.25	\$ 114.52	\$ 341.25	\$ 572.60
DTaP-IPV	40	\$ 46.96	\$ 59.39	\$ 1,878.40	\$ 2,375.60
DTaP-IPV-Hib-HepB	100	\$ 95.07	\$ 150.85	\$ 9,507.00	\$ 15,085.00
Hep A ped/adol 2D	100	\$ 23.00	\$ 36.92	\$ 2,300.00	\$ 3,692.00
Hep B ped/adol	10	\$ 16.89	\$ 27.36	\$ 168.90	\$ 273.60
Hib (PRP-T)	50	\$ 10.78	\$ 12.92	\$ 539.00	\$ 646.00
HPV9	60	\$ 224.63	\$ 287.54	\$ 13,477.80	\$ 17,252.40
MenACWY-TT	75	\$ 107.84	\$ 166.98	\$ 8,088.00	\$ 12,523.50
Meningococcal B OMV	50	\$ 141.71	\$ 211.32	\$ 7,085.50	\$ 10,566.00
MMR	80	\$ 24.96	\$ 92.49	\$ 1,996.80	\$ 7,399.20
MMRV	20	\$ 165.09	\$ 270.15	\$ 3,301.80	\$ 5,403.00
PCV20	180	\$ 178.00	\$ 253.21	\$ 32,040.00	\$ 45,577.80
Polio-IPV	10	\$ 15.98	\$ 42.64	\$ 159.80	\$ 426.40
Rotavirus (RotaTeq)	100	\$ 79.24	\$ 95.96	\$ 7,924.00	\$ 9,596.00
RSV mAb 0.5 mL < 24 mo	20	\$ 395.00	\$ 495.00	\$ 7,900.00	\$ 9,900.00
RSV mAb 1.0 mL < 24 mo	40	\$ 395.00	\$ 495.00	\$ 15,800.00	\$ 19,800.00
Tdap Adsorbed	20	\$ 36.01	\$ 46.07	\$ 720.20	\$ 921.40
Varicella	60	\$ 132.42	\$ 174.32	\$ 7,945.20	\$ 10,459.20
Total	1370	-	-	\$126,794.15	\$ 179,789.70



Troubleshooting Equipment Problems

1. Confirm the unit has electrical power
2. Confirm the door is closed properly
3. Confirm thermometer probe is place in the center of the middle shelf in unit
4. Check ambient room temperature and circulation both inside/outside the unit
5. Check the temperature inside the unit
6. Wait 30 minutes to allow the temperature to stabilize

If the temperature still out of range, it's time to adjust the thermostat...



Thermostat Adjustments: Other considerations

Adjustments should be:

- ✓ Made by the Primary or Backup Vaccine coordinator
- ✓ Performed during non-business hours OR during slower operations
- ✓ Made *slowly*, in *small* increments.
- ✓ Re-check temperatures every 30 minutes and repeat as needed.



Keeping Your Vaccine Storage Units Healthy!

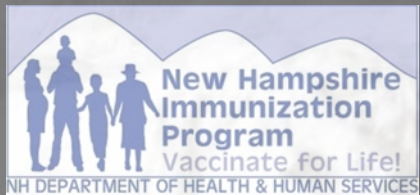
Schedule routine maintenance of vaccine storage units to ensure they function at maximum efficiency:

- ✓ Check seals and door hinges for signs of wear and tear
- ✓ Clean coils and other components per manufacturer directions
- ✓ Defrost manual-defrost freezers when the frost exceeds 1cm or the manufacturer's suggested limit
- ✓ Clean the interior of each unit to discourage bacterial and fungal growth
- ✓ Conduct quarterly testing and annual service of backup generator

REMEMBER! Move your vaccines to a back-up unit when defrosting or cleaning your storage unit!



Coming Soon to NHIP!



The Future of Temperature Monitoring at NHIP


New digital data loggers for all vaccine storage units holding state supplied vaccine!

Still Required on Every Open Business Day:

- Observe minimum and maximum temperatures every morning
- Observe current temperatures at the beginning and end of each day

What is Changing?

- The NHIP will eventually transition to reviewing temperature data directly in the NHIS
- To ensure a smooth transition, conformity in data logger reports will be necessary.
- Once functionality is available in the NHIS, this change will replace the need for paper temperature logs!
- When the calibration expires (every 2 years), providers will purchase replacement probes at NHIP's discounted rate (Full Price is \$79).



CONTROL SOLUTIONS INC
VFC 311-USB

CONTROL SOLUTIONS

- TEMPERATURE DATA LOGGER**
Stores over 1,000,000 readings from -40 °F to +257 °F
- NO SOFTWARE REQUIRED**
Plug and play on PC and MAC
- CALIBRATED DIGITAL PROBES**
Avoid data loss due to calibration downtime
- CONFIGURABLE ALARMS**
Audible and visual alarm notification
- DATA-RICH DISPLAY**
All the information you need, at a glance
- SMART PROBE TECHNOLOGY**
No more mail-in calibrations, offers flexibility

Questions??





NEW HAMPSHIRE
DHHS
DEPARTMENT OF
HEALTH & HUMAN SERVICES

Thank You!!!

