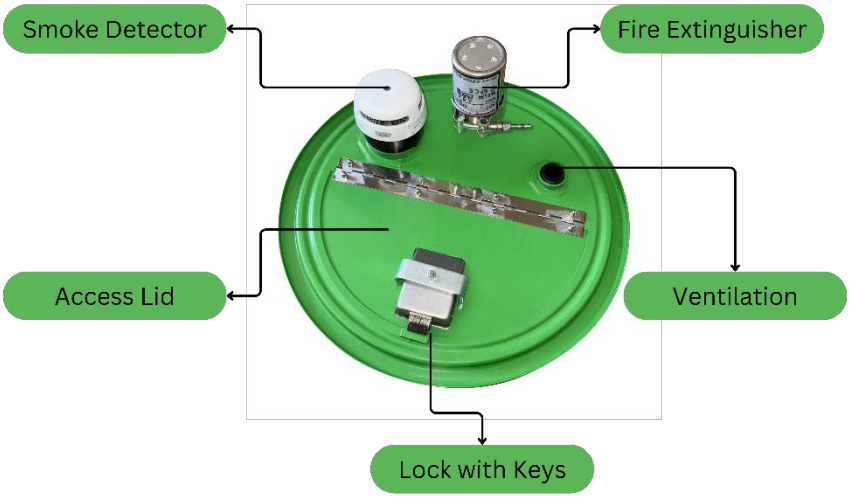
# Thermal Runaway Container

# Operation Manual



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# 1. INTRODUCTION

The LithiPlus Lithium Thermal Runaway Container is a cutting-edge solution designed to collect, store, and help manage damaged and spent lithium-ion batteries. Lithium battery failures—particularly thermal runaway events—pose significant risks, including fires incidents. This container is engineered to mitigate those risks by:

- Providing a secure containment vessel to reduce property damage in the event of a thermal runaway.
- Incorporating a Stat-X aerosol fire suppression device that activates at high temperatures.
- Ensuring compliance with relevant regulatory requirements, minimizing liability for facilities handling lithium batteries.

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# 2. SAFETY WARNINGS & PRECAUTIONS

## 2.1 Always Wear Protective Equipment

2.1.1 When handling damaged or spent lithium-ion batteries, wear appropriate PPE (personal protective equipment), including safety glasses, gloves, and flame-resistant clothing if possible.

## 2.2 Keep Away from Flammable Materials

2.2.1 Store and operate the container in a well-ventilated area away from combustible materials, high heat sources, and direct sunlight.

## 2.3 Avoid Unnecessary Vibration or Shock

2.3.1 Damaged lithium-ion batteries can be extremely unstable. Transport and handle them gently.

## 2.4 Read All Instructions Thoroughly

2.4.1 Failure to follow guidelines can result in improper operation, potential injury, or property damage.

## 2.5 Stat-X Activation Warning

2.5.1 The Stat-X device will automatically discharge if the internal temperature reaches above 200°F (93°C). Handle the device with extreme care during installation.

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# 3. PRODUCT OVERVIEW

## 3.1 Key Components

**3.1.1 LithiPlus Container Drum & Lid**

A robust steel drum designed to withstand internal pressure fluctuations caused by thermal runaway events.

3.1.2 **Stat-X Fire Suppression Device**

An aerosol fire suppressant designed to activate automatically at high temperatures. It includes:

3.1.2.1 Thermal Detector (heat-activated)

3.1.2.2 Pin & Shipping **"RED"** Cap



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**3.1.3 Smoke Detector**
A standard smoke alarm installed in the lid to provide early warning of smoke generation.

**3.1.4 Stat-X Mounting Bracket**
Located on the underside of the lid, designed to hold the Stat-X device in place.

3.1.5 **Drum Ring & Bolt**
A steel ring and bolt assembly to secure the lid onto the container drum.

### *3.2* Tools & Supplies Needed

3.2.1 13/16 in. Socket or Adjustable Wrench (for removing and tightening the drum ring bolt)
3.2.2 10 mm Deep Socket (for tightening the Stat-X mounting bracket)
3.2.3 Protective Gloves
3.2.4 Safety Glasses

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# 4. ASSEMBLY & ACTIVATION

## 4.1 Activating the Stat-X Device

(Fig. 1) (Fig. 2)

4.1.1 **Remove Shipping "RED" Caps**
Carefully remove the "RED" caps from both the Thermal Detector (Fig. 1) and the Stat-X Device (Fig. 2).

4.1.2 **Attach Thermal Detector**
Holding the Stat-X Device in a downward position away from the body, twist the Thermal Detector onto the device.

4.1.3 Ensure you do not cross-thread when installing. The threads should align smoothly.

4.1.4 **Confirm Activation**
Once the Thermal Detector is installed (Fig. 3), the Stat-X Device is considered fully activated.

**Important**: **Do not pull the pin at this stage**; premature activation can cause injury or property damage.

**Warning:** The Stat-X device may **automatically discharge** at temperatures above 200°F (93°C). Handle with care and avoid sources of excessive heat.


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## 4.2 Installing Stat-X in the Lid

4.2.1 **Remove the Lid**

4.2.1.1 Using a 13/16 in. socket or adjustable wrench, loosen and remove the bolt from the drum ring.

4.2.1.2 Carefully remove the steel drum ring and lift off the lid.

(Fig. 4)

4.2.2 **Mount Stat-X Device**

4.2.2.1 Flip the lid over to expose the Stat-X mounting bracket on its underside.

4.2.2.2 Insert the activated Stat-X Device so that the Thermal Detector is positioned toward the bottom of the lid and the discharge holes of the Stat-X Device face downward (Fig. 4).

4.2.3 **Secure Stat-X Device**

4.2.3.1 While holding the Stat-X Device in place, use a 10 mm deep socket to tighten the mounting bracket's bolt.

4.2.3.2 Caution: Tighten only enough to hold the device firmly. Overtightening may deform or damage the device, potentially causing premature or ineffective discharge.

4.2.4 **Reinstall the Lid**

4.2.4.1 Place the lid back onto the drum, align it properly, and reinstall the steel ring.

4.2.4.2 Tighten the bolt using the 13/16 in. socket or wrench.

4.2.4.3 Once these steps are complete, your LithiPlus Lithium Thermal Runaway Container is fully operational and ready for use.

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# 5. SMOKE DETECTOR

5.1 The integrated smoke alarm will sound an alarm and the light will flash when smoke is detected inside the container.

(Fig. 5)

5.2 Monthly Test: Press the test button (Fig. 5) on the smoke alarm to ensure it is functioning properly. Replace batteries or the entire alarm unit as recommended by the manufacturer (often annually).



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# 6. USING THE LITHIPLUS THERMAL RUNAWAY CONTAINER

## 6.1 Proper Placement & Storage

### 6.1.1 Location

6.1.1.1 Place the container on a stable, level surface in a well-ventilated area.

6.1.1.2 Keep the container away from direct sunlight, high temperatures, and flammable or explosive materials.

### 6.1.2 Ambient Conditions

6.1.2.1 For optimal performance, store in an environment ranging from 32°F to 100°F (0°C to 38°C).

6.1.2.2 Avoid placing the container in areas subject to extreme humidity or moisture.

## 6.2 Handling Thermal Runaway Battery Events

### 6.2.1 Immediate Response Only

6.2.1.1 The LithiPlus Thermal Runaway Container is designed primarily to contain a single lithium battery that is already in, or at imminent risk of, thermal runaway. It is not intended for long-term storage of undamaged batteries or for placing multiple batteries during a single thermal runaway event, as that could increase the risk of thermal propagation and overwhelm the suppression system.

### 6.2.2 Quick-Latch Flap Door

6.2.2.1 Fast Placement: In a thermal runaway emergency, remove the battery from its location (only if it is safe to do so) and quickly deposit it through the flap door rather than removing the entire lid. This flap door is specifically designed for rapid insertion to minimize exposure time and reduce further risks.

6.2.2.2 Latch Security: After dropping the battery in, make sure the flap door's latch is fully secured. A properly latched door helps maintain an effective seal and containment environment.

### 6.2.3 Safe Deployment

6.2.3.1 Minimal Handling: During a thermal runaway event, carefully move or slide the battery into the container through the flap door while wearing appropriate PPE. Avoid direct contact or excessive handling time.

6.2.3.2 Containment: Once the battery is inside and the door is latched, the container's fire suppression and containment features will help limit the spread of flames or off-gassing.

### 6.2.4 After an Event

6.2.4.1 Allow Cooling: If the Stat-X device discharges, wait until the container cools completely before opening or removing the battery.

6.2.4.2 Proper Disposal: Follow local regulations for battery disposal or recycling. Do not reuse or store other batteries in the container without first ensuring it is properly cleaned, recharged (if necessary), and outfitted with a fresh Stat-X unit (if the prior one was triggered).



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# 7. MAINTENANCE & INSPECTION

## 7.1 Visual Inspection

7.1.1 Regularly check the container for dents, corrosion, or other signs of damage.

7.1.2 Inspect the drum ring, bolt, and flap door for secure fit and any signs of wear.

## 7.2 Stat-X Device Check

7.2.1 Verify that the Thermal Detector and pin remain intact.

7.2.2 If the device discharges or is otherwise compromised, replace it immediately following the same activation and installation steps.

## 7.3 Smoke Alarm Maintenance

7.3.1 Replace the battery as directed by the smoke alarm's manufacturer.

7.3.2 Perform the monthly test to ensure the alarm is working.

## 7.4 Cleanliness

7.4.1 Wipe down the exterior and interior of the container with a dry cloth as needed.

7.4.2 Never use solvents or corrosive cleaning agents inside the container.

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# 8. EMERGENCY PROCEDURES

## 8.1 If the Container Activates (Thermal Event)

8.1.1 The Stat-X Device will discharge automatically once the internal temperature exceeds 200°F (93°C).

8.1.2 Do not open the container during or immediately after a discharge. Wait until it cools down and the fumes have dissipated.

8.1.3 Evacuate the area if significant smoke or fire is present and contact emergency services if necessary.

## 8.2 If the Smoke Detector Alarms

8.2.1 Investigate cautiously. If smoke is coming from within the container, assume the battery may be entering thermal runaway.

8.2.2 Ensure the immediate area is clear of people and flammable materials.

8.2.3 Monitor the container and be prepared to call the fire department if conditions worsen.

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# 9. DISPOSAL & REGULATORY COMPLIANCE

## 9.1 Damaged/Spent Batteries

9.1.1 Follow local and federal regulations (e.g., EPA, DOT, or equivalent authorities) for the disposal or recycling of lithium-ion batteries.

9.1.2 Many jurisdictions require transport of damaged or spent batteries by certified hazardous materials carriers.

## 9.2 Stat-X Device

9.2.1 If discharged or expired, dispose of the unit according to the manufacturer's guidelines and local regulations for aerosol fire suppression devices.

## 9.3 Container Disposal

9.3.1 When the container has reached the end of its service life, ensure all hazardous contents are removed or neutralized. Dispose of or recycle the drum per local metal recycling regulations.



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## 10. LIST OF DOS AND DON'TS

| | DO's | DON'Ts |
|---|---|---|
| 1 | Always Wear Appropriate PPE | Do Not Touch Container Post-Event |
| 2 | Use the Flap Door for Rapid Deployment | Do Not Store Healthy Batteries Long Term |
| 3 | Ensure the Flap Door Is Fully Latched | Never Force or Over-Tighten |
| 4 | Inspect and Maintain Regularly | Avoid Placing the Container Near Flammable Materials |
| 5 | Follow Local Regulations | Do Not Ignore Smoke Alarms or Possible Thermal Events |
| 6 | Replace Discharged or Expired Stat-X Devices | Never Leave the Container Unattended if a Battery Is Already in Runaway |
| 7 | Should be handled by Trained Personnel | Don't Modify or Tamper with the Container's Design |
| 8 | Clearly Mark and Identify Container | Do Not Use for Transportation |

## 11. DISCLAIMER

**The LithiPlus Thermal Runaway Container is designed to mitigate hazards associated with lithium battery failures; however, it does not guarantee the prevention of all injuries, burns, inhalation of potentially harmful substances, or property damage. Using this product in ways other than its intended purpose, or failing to follow the instructions provided, can result in serious injury, property damage, or death.**

- **Risk of Burns & Injuries**: Handling lithium batteries, especially those in thermal runaway, carries an inherent risk of burns or other physical harm.
- **Risk of Inhalation**: Toxic fumes or smoke may be released during a thermal runaway event. Always wear appropriate personal protective equipment (PPE) and ensure the area is well-ventilated.
- **Risk of Property Damage**: Fire, smoke, or explosion arising from lithium battery failures or misuse of the container can result in significant property damage.
- **No Guarantee of Absolute Safety**: While the container is designed to reduce risks, no product can fully eliminate all hazards associated with lithium battery failures.
- **User Responsibility**: The user assumes all responsibility for the proper use, inspection, and maintenance of the container, including following local and federal regulations regarding hazardous materials.
- **Manufacturer Liability**: The manufacturer is not liable for damages, injuries, or losses (including property damage) caused by improper or unintended use of the container, negligence in its upkeep, or failure to follow the guidelines in this manual.


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By using the LithiPlus Thermal Runaway Container, you acknowledge and accept these risks and agree to adhere to all safety instructions and local regulations pertaining to lithium battery handling, storage, and disposal.

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## 12. CONTACTS

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