## RECORD OF REVISION

### REVISION

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### REVISED

- Torpor mode explained (implemented in chapter 7.1.4 and 8.1).
- Yellow alert for high temp in Control unit type 4 explained (implemented in chapter 7.2.3).
- List of operations centers updated (implemented in chapter 1.1).
- Red alarms for deep frozen shipments explained (implemented in new chapter 2.5).
- The table for suitable aircrafts (chapter 11 — Technical Specification) in the manual have been updated to include the text "For other aircrafts, alternative operating procedures may apply."
- Added Chapter 1.2 Symbols for explanation of the safety levels used. At the same time the safety levels were revised. The safety level “Important” has been deleted. The safety level “Caution” has been added. The safety levels “Warning” and “Note” have been updated with new symbols and definitions.

### EDITORIAL UPDATES

- Added text about battery charging level in chapter 1.4
- Deleted intro text in chapter 2
- Simplified text in chapter 2.1, 2.2
- Created new subchapter 5.5.1, 5.5.2, 5.6.1, and 5.6.2, to better distribute text in Cargo loading chapter.
- Created new chapter “7. Control unit operation”. Then inserted previous chapter 7 + 8 to new chapter 7.1 (Control unit type 1) and 7.2 (Control unit type 2).
- Added alert “Change Batteries! (Fans stopped)” in chapter 8.1.
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1. INTRODUCTION

1.1 SCOPE OF THE MANUAL

This manual provides information for personnel involved in the handling and transport of Envirotainer container series RAP t2 and is published by Envirotainer AB without warranty. If there are questions regarding this manual or the container, send an e-mail to customercare@envirotainer.com.

To get in contact with one of our operations centers, please refer to our website www.envirotainer.com.

1.2 SYMBOLS

DANGER!
Indicates an immediate danger that will lead to death or serious injury if necessary measures are not taken.

WARNING!
Indicates a possible danger that can lead to death or serious injury if necessary measures are not taken.

CAUTION!
Indicates a possible hazard that can lead to injury or material / equipment damage if necessary measures are not taken.

NOTE!
Practical information or tips on how to perform a procedure.

1.3 SAFETY INSTRUCTIONS

• The design minimizes hazards to personnel and equipment during use. No material used in the construction constitutes a risk to the health of the personnel involved. All structural and mechanical components are free of sharp edges. Every attempt has been made to anticipate potential dangers and build in protections to prevent injury to personnel.

• Normal precautions should be observed when handling locks, doors and lids. Wherever necessary, warning stickers or texts will be attached to the container as a warning to users and ground handler personnel.

• Always follow the "IATA Dangerous Goods Regulations" when loading the container. For example, due to low battery level, malfunction, etc., the container may not maintain the temperature in the container cargo space. Special consideration should be given to this fact if dangerous goods such as liquids with a low boiling point are to be transported.

(PROCEED ON NEXT PAGE!)
1. INTRODUCTION

- The dry ice used as a refrigerant is considered a Class 9 dangerous cargo with the UN identification number 1845 and is described as “Carbon Dioxide, Solid”.

- Do not allow any exposed skin or body part to make physical contact with dry ice. Given the extreme cold temperature of dry ice (-78.5°C / -109°F), severe frostbite can occur within seconds. Personnel handling dry ice must use gloves or other insulating material.

- Dry ice sublimates into large amounts of CO2 gas. This colorless, odorless gas is heavier than air and can accumulate and displace oxygen in low areas. Do not enter areas where CO2 may have accumulated without ventilating the space.
1.4 THE CONTAINER

**CAUTION!**
*The RAP t2 can be moved with a forklift only when empty, and must be moved with a rollerbed system when it is loaded.*

**CAUTION!**
*Place cargo on a pallet to allow air to flow under the cargo. Placing the product directly on the floor will block airflow and allow heat transfer between the container floor and the product. It is also important to keep the area in front of the fans clear to allow airflow.*

- The RAP t2 container is a temperature controlled air cargo container used to transport temperature sensitive cargo in the refrigerated (2-8°C / 36-47°F), do not freeze (2-25°C / 36-77°F) and deep frozen (below -18°C / -1°F) product temperature ranges. In general, the product temperature to be maintained must be less than the ambient temperature.

- The RAP t2 is an LD-9 air cargo container designed to hold four (4) US-pallets 1220 x 1016 mm (48 x 40”) or five (5) EURO-pallet 1200 x 800 mm (47.3 x 31.5”) of cargo.

- The container maintains product temperature by using two fans to circulate conditioned air in the cargo space (refer to [Fig. 1](#)). The container temperature is set using the control unit. A temperature sensor in the cargo space sends a signal to the thermostat in the control unit which turns the fans on or off to maintain the set temperature.

- The container uses dry ice as refrigerant and D-Cell alkaline batteries to power the control unit and fans.

- The dry ice is contained in a separate bunker, which prevents carbon dioxide gas from entering the cargo space and allows personnel to add dry ice to the container without disturbing the cargo area.
1.5 CONTROL UNIT

- The control unit is the user interface for starting the container, setting the temperature, reading the actual air temperature inside the cargo space and other information.
- The control unit also has battery charging level, alert and alarm indicators.
- The control unit is located outside the container on the left side (Fig. 1).

Refer to chapter 7, Control unit operation

- The control unit has a system indicator (green light) that is lit when the container system is operating.
- The alert indicator (yellow light) flashes to indicate that the container needs attention. If the alert indicator is flashing, measures can be taken to continue with the shipment.
- The alarm indicator (red light) flashes to indicate that a technical part of the refrigerating system is not functioning properly. If the alarm indicator is flashing, refer to chapter 8. Alerts and alarms.

![Diagram of RAP t2 Container with control unit and other components]
2. LIMITS, AMBIENT CONDITIONS

The following conditions must apply for the container to work properly:

2.1 PRE-CONDITIONING OF CARGO

The container does not have battery capacity to cool down or heat up a large quantity of cargo. It is therefore very important that the cargo is pre-conditioned properly.

2.2 MAXIMUM OPERATING TIME WITHOUT CHANGING BATTERIES

The maximum operating time for the container without changing the batteries is 72 hours. If the container is operated in extreme heat, the fans may operate continuously which reduces the maximum operating time before batteries must be changed.

2.3 EXPOSURE TO EXTREME HEAT; 25°C (45°F) ABOVE THE SET TEMPERATURE

Avoid exposure to extreme heat or direct sunshine as it increases the dry ice consumption rate. Exposure to temperatures 25°C (45°F) above the set temperature should be limited. Take into account exposure to such conditions when calculating the required amount of dry ice.

2.4 EXPOSURE TO TEMPERATURES NEAR OR BELOW THE SET TEMPERATURE

Since the container does not heat, exposure to temperatures near or below the set temperature must be avoided.

The container must be stored in an environment where the temperature is at least 5°C (9°F) higher than the container set temperature (not applicable to deep frozen cargo).

2.5 EXPOSURE TO HIGH HUMIDITY

When a container is loaded in high humidity, the container fans could freeze, causing a red alarm. To reduce the risk of fans freezing, turn on the container control unit and fans before loading dry ice. Refer to chapter 7, Control unit operation. It is also important to keep the container doors closed as much as possible, to prevent humid air from reaching the fans.
3. **PRE-CONDITIONING**

The cargo and container must be pre-conditioned to the container set temperature prior to loading. Improper pre-condition will affect the container’s ability to maintain cargo temperature.

3.1 **CARGO PRE-CONDITIONING**

The cargo must be pre-conditioned to the temperature that is to be maintained during transport.

**CAUTION!**

*If pre-conditioning is not carried out correctly, the risk for temperature deviations during shipment is high.*
3.2 CONTAINER PRE-CONDITIONING

Prior to pre-conditioning, a functional test of the container should be performed. Refer to chapter 7, Control unit operation.

There are three recommended practices for container pre-conditioning:

3.2.1 PRECONDITION WITH A TEMPERATURE-CONTROLLED ROOM
1. Turn off the control unit or remove the batteries from the holder.
2. Place the container in a temperature-controlled room that is set to the desired temperature.
3. Open the doors to the cargo space.
4. Allow at least one hour for container preconditioning before loading the cargo.

3.2.2 PRECONDITION WITH DRY ICE (FOR REFRIGERATED CARGO)
1. Calculate the total amount of dry ice required for preconditioning and shipment. Refer to chapters 9, Dry ice calculation and 10, Dry ice tables.
2. Place batteries in the control unit and set the temperature. Refer to chapter 7, Control unit operation.
3. Load the dry ice in the bunker. Refer to chapter 5, Cargo / Dry ice loading.
4. Close the doors to the cargo space.
5. Allow at least one hour for container preconditioning before loading the cargo.
3.2.3 PRECONDITION WITH DRY ICE (FOR DEEP FROZEN CARGO)

1. Calculate the total amount of dry ice required for preconditioning and shipment. Refer to chapters 9. Dry ice calculation and 10. Dry ice tables.

2. Place batteries in the control unit and set the temperature. Refer to chapter 7. Control unit operation.

3. Load 20% of total amount of dry ice in the bunker. The remaining dry ice will be loaded with the cargo. Refer to chapter 5. Cargo / Dry ice loading.

4. Close the doors to the cargo space.

5. Allow at least one hour for container preconditioning before loading the cargo.
4. CARGO TEMPERATURE RECORDING

- If cargo temperature records must be kept, Envirotainer strongly recommends that temperature recorders are placed inside cargo boxes.

- The temperature displayed on the control unit is the temperature of the air at the sensor in the container and will fluctuate more than the temperature of the product.

- It is also recommended to record ambient temperatures by placing a temperature monitor in the container document pouch.
5. CARGO / DRY ICE LOADING

5.1 DRY ICE

NOTE!

Dry ice shall be used wrapped or unwrapped as stated in chapter 10. Dry ice tables.

- **Wrapped dry ice**
  - Dry ice in paper/plastic bags. Note that the paper/plastic bag shall not be removed when wrapped dry ice is used. Also note that cardboard boxes should not be put into the dry ice bunker.

- **Unwrapped dry ice**
  - Dry ice without any wrapping.

CAUTION!

Avoid using dry ice that has been exposed to ambient conditions for several days before use since the humidity in the air condensates and freezes on the dry ice blocks, creating a crust of ice and thereby reducing the effectiveness of the dry ice.

5.2 DRY ICE LOADING

To load dry ice in the container bunker:

1. Unlatch and open the dry ice bunker lid.
2. Evenly distribute dry ice blocks weighing between 2 kg and 7 kg on the bottom of the bunker. Recommended size is 5 kg. Smaller size blocks should be bundled to make blocks of about 5 kg.
3. Close and secure the dry ice bunker lid.

5.3 RE-ICING THE CONTAINER

NOTE!

For re-icing of deep frozen shipments it is not allowed to open the container doors without authorization from the shipper. If allowed to open the container doors by the shipper, place 80 % of the required ice on top of the cargo and 20 % in the bunker.

Refer to chapter 5.6 Cargo loading — Deep frozen.

If not allowed to open the container doors, place all of the ice in the dry ice bunker.

There are two types of re-icing — scheduled and unscheduled.
5.3.1 SCHEDULED RE-ICING

Scheduled re-icing is calculated in the online dry ice calculation tool: dryice.envirotainer.com. In scheduled re-icing, all dry ice is removed and replaced with new dry ice as calculated.

5.3.2 UNSCHEDULED RE-ICING

Unscheduled re-icing is used when there is a delay, not taken into account in the dry ice calculation. Amount used for every 24 hour delay is stated in the dry ice calculation. This amount should be added (top up) to the dry ice already inside the bunker.

5.4 CARGO LOADING — GENERAL GUIDELINES

Observe the following general guidelines when loading the container:

1. Use the door straps (Fig. 2) to hold the doors open when loading.

2. Load the cargo on a pallet to allow a proper airflow.

3. Do not load cargo between the spacers on the container walls.

4. Ensure that the fans are not blocked by the cargo.

5. Do not position the cargo outside the loading area (indicated with red lines).

6. Ensure proper weight distribution.

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Fig. 2
7. Secure the cargo to the tie-down brackets using straps. (Fig. 3).

CAUTION!

Always follow the "IATA Dangerous Goods Regulations" when loading the container.
5.5 CARGO LOADING — REFRIGERATED / DO NOT FREEZE

5.5.1 WHEN THE CONTAINER IS PRECONDITIONED WITH A TEMPERATURE-CONTROLLED ROOM

Container loading takes place in the temperature-controlled room used for preconditioning.

1. Ensure that the container is preconditioned to the required cargo temperature.

2. Load the container.
   Refer to chapter 5.4 Cargo loading — General guidelines.

3. Close and lock the doors. Secure the right door with a seal (Fig. 4) if applicable. The left door cannot be opened before the right door has been opened.

   ![Fig. 4](image)

4. Move the container from the temperature-controlled room.

5. Immediately reinstall batteries, check battery voltage and set the temperature.
   Refer to chapter 7. Control unit operation.

6. Immediately load the dry ice in the bunker. Calculate the total amount of dry ice required for shipment.
   Refer to chapters 9. Dry ice calculation, 10. Dry ice tables, and 5. Cargo / Dry ice loading.

7. Place any shipping documents or check sheets in the container document pouch.
5.5.2 WHEN THE CONTAINER IS PRECONDITIONED WITH DRY ICE

Dry ice is in the ice bunker of the container prior to cargo loading, which takes place at warehouse or ambient conditions.

1. Ensure that the container is preconditioned to the required cargo temperature.

2. Open the doors to the cargo space. Minimize the time the container doors are open during loading.

3. Load the container.
   Refer to chapter 5.4 Cargo loading — General guidelines.

4. Close and lock the doors. Secure the right door with a seal (Fig. 4) if applicable. The left door cannot be opened before the right door has been opened.

5. Place any shipping documents or check sheets in the container document pouch.
5.6 CARGO LOADING — DEEP FROZEN

For shipments with frozen cargo dry ice is placed in the cargo space. This keeps the cargo frozen when ambient temperatures exceed the specified temperature limits, however a lower temperature limit can not be controlled.

NOTE!

The lower temperature range for the sensor is -45°C (-49°F). Therefore the display might show odd temperatures if the actual temperature in the cargo space is below -45°C (-49°F).

5.6.1 WHEN THE CONTAINER IS PRECONDITIONED WITH A TEMPERATURE CONTROLLED ROOM

Container loading takes place in the temperature-controlled room used for preconditioning.

1. Ensure that the cargo and all packing material is preconditioned for at least one week prior to loading.
2. Ensure that the container is preconditioned to the required cargo temperature.
3. Reinstall batteries, check battery voltage and set the temperature. Refer to chapter 7. Control unit operation.
4. Load the container. Refer to chapter 5.4 Cargo loading — General guidelines.

- Calculate the total amount of dry ice required for shipment. Refer to chapters 9. Dry ice calculation and 10. Dry ice tables.
- Load the cargo on a pallet\(^1\) and distribute 80% of the dry ice on top of the cargo using one of the following methods:
  - Put dry ice in boxes and secure on top of the cargo with plastic wrap or by other means.
  - Distribute dry ice on top of the cargo and secure with plastic wrap or by other means.
- Put the pallet into the container (if the product was loaded on a pallet outside the container).
- Put any remaining dry ice in boxes and load around the cargo on a pallet to allow air flow.

\(^1\) If the product is to be hand loaded directly in the container: Put pallet(s) on the floor of the container to allow air flow, then hand load product on the pallet.

(PROCEED ON NEXT PAGE!)
5. **CARGO / DRY ICE LOADING**

5. Close and lock the doors. Secure the right door with a seal (Fig. 4) if applicable. The left door cannot be opened before the right door has been opened.

6. Move the container from the temperature-controlled room.

7. Load remaining 20% of the dry ice in the bunker. Refer to chapter **5.2 Dry ice loading**.

8. Place any shipping documents or check sheets in the container document pouch.

5.6.2 **WHEN THE CONTAINER IS PRECONDITIONED WITH DRY ICE**

1. Ensure product and all packing material is preconditioned for at least one week prior to loading.

2. Ensure that the container is preconditioned to the required cargo temperature.

3. Open the doors to the cargo space. Minimize the time the container doors are open during loading.

4. Load the container. Refer to chapter **5.4 Cargo loading — General guidelines**.

   • Load the cargo on a pallet) and distribute 80% of the dry ice on top of the cargo using one of the following methods:

   • Put dry ice in boxes and secure on top of the cargo with plastic wrap or by other means.

   • Distribute dry ice on top of the cargo and secure with plastic wrap or by other means.

   • Put the pallet into the container (if the product was loaded on a pallet outside the container).

   • Put any remaining dry ice in boxes and load around the cargo on a pallet to allow air flow.

   1) If the product is to be hand loaded directly in the container: Put pallet(s) on the floor of the container to allow air flow, then hand load product on the pallet.

5. Close and lock the doors. Secure the right door with a seal (Fig. 4) if applicable. The left door cannot be opened before the right door has been opened.

6. Place any shipping documents or check sheets in the container document pouch.

5.7 **AFTER LOADING ANY TYPE OF CARGO**

1. Confirm set temperature is correct on the control unit. Refer to chapter **7. Control unit operation**.

2. Allow up to one hour for the container temperature to stabilize around the set temperature.

**(PROCEED ON NEXT PAGE!**)
3. Confirm that all doors and covers are closed and latched.

4. Ensure that the container is stored in accordance with the specified limits and ambient conditions.
   Refer to chapter 2. Limits, Ambient Conditions.
6. CONTAINER HANDLING GUIDELINES

6.1 GENERAL GUIDELINES

Observe the following guidelines when handling the container:

1. The container can be forklifted only when empty; the use of slave pallets is recommended.
2. Use the straps outside the corners of the container to handle the container on roller beds.
3. Ensure that the container is handled in accordance with the specified limits and ambient conditions.
   Refer to chapter 2. Limits, Ambient Conditions.
4. If delays occur during transit, it may be necessary to add additional dry ice to the bunker.
5. Do not wrap the container. If the container is wrapped the air outlets are blocked and the container cannot work properly.

6.2 GROUND TRANSPORT PRECAUTIONS

This section is not applicable to deep frozen cargo.

Ensure that the container is transported in an environment where temperatures are between 5°C (9°F) to 25°C (45°F) higher than the set temperature or limit exposure to cold/warm temperatures.

Refer to chapter 2. Limits, Ambient Conditions.

If a temperature-controlled truck is used, it is recommended to set the temperature of the truck 10°C (18°F) higher than the set temperature of the container.

NOTE!

Do not use the ambient temperature displayed by the control unit as a reference for verifying ambient temperature conditions.

Refer to chapter 7.1.3 Setting temperature (Control unit type 1) and 7.2.3 Setting temperature (Control unit type 2).

6.3 AIRCRAFT TRANSPORT PRECAUTIONS

Observe the following guidelines when handling the container:

1. Store the container at airport warehouse temperatures at least 5°C (9°F) higher than the set temperature.
2. Limit time on the tarmac during aircraft loading (to avoid temperature extremes and direct sunlight).

(PROCEED ON NEXT PAGE!)
6. CONTAINER HANDLING GUIDELINES

3. Provide Notice to Captain (NOTOC) and note on the Air Way Bill (not applicable to frozen cargo): "Maintain 15-20°C aircraft cargo hold. Do not position container near the cargo door."

4. The shipper should comply with airline regulations for shipping dry ice.

6.4 UNLOADING

Before unloading the container, check for damage. Unload the container by unlocking and opening the doors. After unloading:

1. Remove the batteries and follow local regulations for disposal.
2. Remove and dispose of any remaining dry ice.
   If local regulations allow it, the dry ice may be placed outdoors. It will dissolve quickly.

6.5 STORAGE

It is recommended that the RAP t2 container be stored on flat ground. The storage temperature should be between -40°C (-40°F) and +50°C (+122°F).

CAUTION!

No container, cargo or other shall be stored on top of an RAP t2.
7. CONTROL UNIT OPERATION

There are two types of control unit. Refer to chapters 7.1 Control unit type 1 (Type 1) and 7.2 Control unit type 2 (Type 2) below.

7.1 CONTROL UNIT TYPE 1

7.1.1 MOUNTING BATTERIES

1. Open the door to the control unit.
2. Place 16 "D-cell" alkaline batteries in the holder.

   | Voltage   | 1.5V       |
   | IEC / JIS | LR 20      |
   | ANSI / NEDA | 13A      |

3. Ensure proper battery polarity (Fig. 6).
7.1.2 START THE CONTROL UNIT

1. Press On/Off.
2. Make sure the default mode is visible on the display (Fig. 7). The default mode shows "Container temp" and "Set temp".

The control unit type 1 has two buttons for settings and information.

- The set temperature mode is reached via Set (refer to 7.1.3 Setting temperature).
- The control unit menu is reached via Menu/Enter and includes settings and information. Use , , and Menu/Enter to navigate in the menu (Fig. 8).

**DEFAULT MODE**

<table>
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<tr>
<th>Button</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
<td>Set temp</td>
</tr>
<tr>
<td>&quot;Menu/Enter&quot; button</td>
<td>View info (ambient temp &amp; battery level)</td>
</tr>
<tr>
<td></td>
<td>Change to °F / Change to °C</td>
</tr>
<tr>
<td></td>
<td>Fan status</td>
</tr>
<tr>
<td></td>
<td>Connect T. Tale (not in use)</td>
</tr>
<tr>
<td></td>
<td>Temp Tale info (not in use)</td>
</tr>
<tr>
<td></td>
<td>Adjust contrast</td>
</tr>
<tr>
<td></td>
<td>Exit</td>
</tr>
<tr>
<td>&quot;Service&quot; button</td>
<td>Manufacturer settings (Login)</td>
</tr>
</tbody>
</table>

**Fig. 8**
7.1.3 SETTING TEMPERATURE

NOTE!

For containers stored in warm places without dry ice inside the ice bunker, a yellow alert ("Ambient temp out of spec") can sometimes be triggered when batteries are installed and the control unit is powered on. The yellow alert is normally only triggered if the ambient temperature exceeds +40°C, but due to an adjustment factor, to compensate for the dry ice, the alert can be triggered even if the actual ambient is below +40°C. To resolve the alarm, load dry ice and/or move the container to an area with lower temperature. Shortly thereafter, the alert will disappear automatically.

1. To change between Celsius and Fahrenheit:
   - Press \( \text{Main Enter} \) to enter the main menu; the display shows "View info".
   - Use \( \text{+} \) or \( \text{-} \) to step to "Change to °F" or "Change to °C" (depending on current setting).
   - Press \( \text{Main Enter} \) to confirm the change and return to default mode.

2. Press the \( \text{Set} \) button to enter set temperature mode.

NOTE!

The set temperature mode is activated for ten seconds. If the display returns to default mode before new set temperature has been confirmed by pressing \( \text{Set} \), the new set temperature was not saved.

3. Use \( \text{-} \) and \( \text{+} \) to change the set temperature. Hold down the buttons to speed up the change.

4. Press \( \text{Set} \) to confirm the new set temperature and return to default mode.

5. Check that the set temperature is correct in the default mode.
7.1.4 BATTERY VOLTAGE CHECK

1. Press to enter the main menu; the display shows “View info”.
2. Press to confirm.
3. Check the battery voltage for the two battery packs. New batteries should read at least 11 V. The minimum allowed battery voltage when the container is in use is 9 V; change the batteries as necessary.

NOTE!

If the battery voltage is above 15 V the control unit is malfunctioning and the container should be repaired.

4. Press again to return to default mode.
7. CONTROL UNIT OPERATION

7.1.5 FUNCTIONAL TEST

1. Set temperature 3°C (5.4°F) lower than actual temperature, the fans shall start.

2. Check for air discharge from air guides in the ceiling (Fig. 9).

3. Set temperature 3°C (5.4°F) higher than actual temperature, the fans shall stop.

4. If the fan alarm is displayed (Fig. 10) either one or both of the fans are malfunctioning and the container should be repaired.
7.2 CONTROL UNIT TYPE 2

7.2.1 MOUNTING BATTERIES

1. Open the door to the control unit and the battery lid.

2. Place 16 "D-cell" alkaline batteries in the holder.

   Voltage: 1.5V
   IEC / JIS: LR 20
   ANSI / NEDA: 13A

3. Ensure proper battery polarity (Fig. 11).

Fig. 11

7.2.2 START THE CONTROL UNIT

1. Press  

   During the start-up, the four indicators are lit one by one (yellow-red-blue-green) to test the function of the indicators.

   The display shows "System On". If the indicators are not lit during start-up, the container must be subject to repair.

   (PROCEED ON NEXT PAGE!)
2. Ensure the indicators are switched off, except from the green indicator, and that the default mode is visible on the display (Fig. 12).

The default mode (CONTAINER INFO) shows "Container temp", "Set temp" and battery status for the two battery packs.

If any alert/alarm is activated the display toggles between default mode and showing activated alert/alarm.

The control unit menu is reached via and includes settings and information.

Use , , and to navigate in the menu (Fig. 13).

### 7.2.3 SETTING TEMPERATURE

**NOTE!**

For containers stored in warm places without dry ice inside the ice bunker, a yellow alert ("Ambient temp out of spec") can sometimes be triggered when batteries are installed and the control unit is powered on. The yellow alert is normally only triggered if the ambient temperature exceeds +40°C, but due to an adjustment factor, to compensate for the dry ice, the alert can be triggered even if the actual ambient is below +40°C. To resolve the alarm, load dry ice and/or move the container to an area with lower temperature. Shortly thereafter, the alert will disappear automatically.

1. To change between Celsius and Fahrenheit:
   - Press to enter the main menu; the display shows "TEMP MENU".
   - Press to enter the "TEMP MENU"; the display shows "SET TEMP".
   - Use or to step to "Current unit F Set changes to C" or "Current unit C Set changes to F" (depending on current setting).
   - Press to confirm the change.
   - Press to return to default mode.

(Proced on next page)
2. Press to enter the main menu; the display shows "TEMP MENU".
3. Press to enter the "TEMP MENU"; the display shows "SET TEMP".
4. Press to enter the "SET TEMP"; the display shows "SET NEW TEMP".

**NOTE!**
The "SET NEW TEMP" mode is activated for 30 seconds. If the display returns to default mode before new set temperature has been confirmed by pressing , the new set temperature was not saved.

5. Use and to change the set temperature. Hold down the buttons to speed up the change.
6. Press to confirm the new set temperature.
7. Press to return to default mode.
8. Check that the set temperature is correct in the default mode.

### 7.2.4 BATTERY VOLTAGE CHECK

1. The current battery status for the two battery packs is continuously shown in the default mode (CONTAINER INFO).
2. Check the battery voltage for the two battery packs. New batteries should read at least 11 V.
   The minimum allowed battery voltage when the container is in use is 9 V; change the batteries if necessary.

**NOTE!**
There will be a battery alert at 8.9 V. The alert is to be seen as information that the battery level is going towards 8.0 V and that a change of batteries should be considered depending on remaining shipping time. The batteries can still be used down to 8.0V.
Refer to chapter 8. Alerts and alarms.

**NOTE!**
If the battery voltage is above 15 V the control unit is malfunctioning and the container should be repaired.

### 7.2.5 SEAL CONTROL UNIT AND INFO BUTTON

Use the rectangular opening in the latch to seal the control unit. Use a seal with a x-section of at least 2 mm (0.08 in).
After the control unit has been sealed it is still possible to view information on the display using the info button.

(PROCEED ON NEXT PAGE!)
7. CONTROL UNIT OPERATION

7.2.6 CALIBRATION STICKER

In order to ensure that the control unit is calibrated within a 12 month period, there is a calibration sticker placed on the control unit. Calibration must be performed prior to the month indicated on the sticker (Fig. 14).

7.2.7 FUNCTIONAL TEST

1. Set temperature 3°C (5.4°F) lower than actual temperature, the fans shall start.

2. Check for air discharge from air guides in the ceiling (Fig. 15).

3. Set temperature 3°C (5.4°F) higher than actual temperature, the fans shall stop.

(PROCEED ON NEXT PAGE!)
4. Check that no alerts are activated. If any alert is activated the yellow alert indicator is flashing and the alert is shown on the display. If so, check what alert that has been activated and perform recommended actions. Refer to chapter 8. Alerts and alarms. It is also possible to view activated alert in the control unit menu.

- Press \( \rightarrow \) to enter the main menu; the display shows "TEMP MENU".
- Use \( \uparrow \) or \( \downarrow \) to step to "SYSTEM MENU" and press \( \rightarrow \) to confirm; the display shows "ALARM VIEW".
- Use \( \uparrow \) or \( \downarrow \) to step to "ALERT VIEW" and press \( \rightarrow \) to confirm; the display shows activated alerts. The activated alert is shown as ALERT 1/1. If more than one alert is activated, ALERT 1/2 is shown.
- Press \( \rightarrow \) to scroll between activated alarms.

5. Check that no alarms are activated. If any alarm is activated the red alarm indicator is flashing. If so, abort shipment, check what alarm that has been activated and report failure to Envirotainer. The container should be replaced. Refer to chapter 8. Alerts and alarms. It is also possible to view activated alarm in the control unit menu.

- Press \( \leftarrow \) to enter the main menu; the display shows "TEMP MENU".
- Use \( \uparrow \) or \( \downarrow \) to step to "SYSTEM MENU" and press \( \rightarrow \) to confirm; the display shows "ALARM VIEW".
- Press \( \leftarrow \); the display shows activated alarms. The activated alarm is shown as ALARM 1/1. If more than one alarm is activated, ALARM 1/2 is shown (Fig. 16).
- Press \( \rightarrow \) to scroll between activated alarms.
8. ALERTS AND ALARMS

8.1 ALERTS

If any alert is activated the yellow indicator is flashing on the control unit and the alert is shown on the control unit display.

Refer to chapter 7. Control unit operation.

"Change Batteries! (Fans stopped)"

Reason: The battery voltage is 8.0 V or lower.

Action: Change batteries. If the voltage goes below 7.0V the control unit display will switch off.

Refer to chapter 7. Control unit operation.

"Battery below 8.9 V"

Reason: The battery voltage is below 8.9 V.

Action: Check the battery voltage level immediately. The purpose of the alert is to inform that the battery level is getting low and that a change of batteries should be considered depending on remaining shipping time (the control unit and fans operate down to 8.0 V).

Refer to chapter 7. Control unit operation.

"Fan 1 Warning"

Reason: If the control unit has detected a "Fan 1 Error" it will be indicated as an alarm. However, if the fans subsequently are detected by the system as working, the fan alarm is cleared and replaced by this "Fan 1 Warning" alert. This alert is raised permanently as a need-for-inspection indication (after shipment) and can only be cleared by authorized personnel.

Action: The shipment can proceed as normal. After shipment it is recommended to inspect the container and have the alert cleared by authorized personnel.
"Fan 2 Warning"

**Reason:** If the control unit has detected a "Fan 2 Error" it will be indicated as an alarm. However if the fan subsequently is detected as working, the fan alarm is cleared and replaced by this "Fan 2 Warning" alert. This alert is raised permanently as a need for inspection indication (after shipment) and can only be cleared by authorized personnel.

**Action:** The shipment can proceed as normal. After shipment it is recommended to inspect the container and have the alert cleared by authorized personnel.

"Ambient Temp Out of Spec"

**Reason:** The ambient temperature is out of specification (above +40°C / +104°F).

**Action:** Move the container to an area with temperature within the specifications. Refer to chapter 2, Limits, Ambient Conditions.

**NOTE!**
*Do not use the ambient temperature displayed by the control unit as a reference for verifying ambient temperature conditions.*

8.2 ALARMS

If any alarm is activated the red indicator is flashing on the control unit and the alarm is shown on the control unit display.

Refer to chapter 7, Control unit operation.

"FAN 1 Error"

**Reason:** Fan 1 is out of order. The container cannot work properly.

**Action:** The current shipment must be stopped and the container must be repaired. Contact Envirotainer for advice.

"FAN 2 Error"

(PROCEED ON NEXT PAGE!)
<table>
<thead>
<tr>
<th>Reason</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan 2 is out of order. The container cannot work properly.</td>
<td>The current shipment must be stopped and the container must be repaired. Contact Envirotainer for advice.</td>
</tr>
</tbody>
</table>

"Temp Probe Error"

<table>
<thead>
<tr>
<th>Reason</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The temperature sensor is out of order. The container cannot work properly.</td>
<td>The current shipment must be stopped and the container must be repaired. Contact Envirotainer for advice.</td>
</tr>
</tbody>
</table>
9. DRY ICE CALCULATION

9.1 CALCULATE DRY ICE AMOUNT FOR CONTAINER PRECONDITIONING

NOTE!

Only authorized persons should perform dry ice calculations. It is strongly recommended to have Envirotainer perform the calculation.

The dry ice amounts are estimations and for exact amounts, depending on time of year, please refer to the online dry ice calculation tool: dryice.envirotainer.com.

To calculate the amount of dry ice needed to precondition the container:

1. Note the container temperature (in Celsius) prior to preconditioning. Although using the actual container temperature is preferred, an estimate based on the ambient temperature is acceptable.
2. Determine the set temperature (in Celsius) of the product.
3. Subtract "set temperature" from "container temperature" to obtain the "temperature difference".
4. Refer to graph (Fig. 17) and locate the "temperature difference" on the horizontal axis.
5. Read up vertically on the graph until reaching the line that corresponds to the container type.
6. Read across to the left to obtain dry ice quantity (in Kilograms) from the vertical axis.
7. This is the amount of dry ice required to precondition the container and should be added to the dry ice necessary to maintain the product temperature, which is obtained from the Dry Ice Tables.
9.2 CALCULATE EXAMPLE — DRY ICE PRECONDITIONING

An RAP container needs preconditioning with dry ice before loading cargo that has a 5°C temperature requirement. The current ambient temperature is 25°C.

1. The container temperature is 25°C
2. The set temperature is 5°C
3. Container Temp - Set Temp = 20°C
4. Read up from 20°C to the line and out to the left
5. The amount of dry ice for preconditioning the container is 23 kg.

![Graph showing the calculation of dry ice quantity based on container starting temperature and set temperature. The graph has a line indicating the calculation steps, and a label showing the result of 23 kg for the given example.]
9.3 CALCULATE DRY ICE AMOUNT FOR CONTAINER SHIPMENT

NOTE!

Only authorized persons should perform dry ice calculations. It is strongly recommended to have Envirotainer perform the calculation.

The dry ice amounts are estimations and for exact amounts, depending on time of year, please refer to the online dry ice calculation tool: dryice.envirotainer.com.

To calculate the amount of dry ice needed to maintain temperature during container shipment:

1. Determine the transportation time from container preconditioning to the time the cargo is unloaded.
2. Determine the time for each activity in the transportation schedule.
3. Estimate the ambient temperature for each activity by checking the weather forecast.
4. Multiply the time and temperature of each activity to determine the product.
5. Add the products of all the activities to obtain the product sum.
6. Divide the product sum by total hours to determine the average ambient temperature.
7. Locate the appropriate dry ice table based on set temperature.
8. Locate the corresponding Temperature column & Time row, rounding the values as required.
9. Read across & down to determine the dry ice amount in kilograms.
10. Use wrapped or unwrapped dry ice as specified in the dry ice table.
11. If the required amount of dry ice exceeds the bunker capacity, plan to re-ice the container.
9.4 CALCULATION EXAMPLE — CONTAINER SHIPMENT

NOTE!

1 kg = 2.2 lbs

Depending on the size and type (wrapped/unwrapped) of the dry ice blocks it is not always possible to load the specified amount of dry ice in the dry ice bunker.

NOTE!

For cargo to be shipped at set temperatures for which no dry ice table is included in this manual, please contact Envirotainer for advice in dry ice calculation.

To calculate the amount of dry ice needed in a container, imagine that we have an RAP container with a 5°C temperature requirement with the transportation schedule noted below. Also assume dry ice is used to precondition the container.

NOTE!

Many variables, such as weather conditions, delays and handling, are beyond control. Envirotainer makes no guarantee that the amount of dry ice indicated in the tables is correct for any specific shipment. It is recommended that the proper procedures to determine the appropriate amount of dry ice are implemented.

Table 1

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time (Hrs)</th>
<th>Temp (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading / truck to airport</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Tarmac / aircraft loading</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Flight time</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Aircraft unloading</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Warehouse at destination</td>
<td>11</td>
<td>23</td>
</tr>
</tbody>
</table>

Next, multiply the time and temperature of each activity ("product") and add the products of all the activities to obtain the product sum. In this example the product sum is 519:
Table 2

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time (Hrs)</th>
<th>Multiply</th>
<th>Temp (°C)</th>
<th>= Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading / truck to airport</td>
<td>2</td>
<td>X</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Tarmac / aircraft loading</td>
<td>2</td>
<td>X</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Flight time</td>
<td>8</td>
<td>X</td>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>Aircraft unloading</td>
<td>2</td>
<td>X</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Warehouse at destination</td>
<td>11</td>
<td>X</td>
<td>23</td>
<td>253</td>
</tr>
</tbody>
</table>

TOTAL TIME 25

PRODUCT SUM 519

Divide the product sum by total hours to determine the average ambient temperature:

\[
\frac{519}{25} = 20.7°C
\]

From the appropriate dry ice table (Table 3), locate the corresponding Temperature column & Time row. In this example, 63 kg of wrapped dry ice is required to maintain the cargo temperature. Referring to the container preconditioning example, an additional 23 kg is required to precondition the container, so the total amount of dry ice required is 63 kg + 23 kg = 86 kg.

Set Temperature +5°C

Dry Ice Quantity (in Kilograms)

Ambient temperatures from +10°C to +25°C, use wrapped dry ice.
Ambient temperatures from +25°C to +30°C, use unwrapped dry ice.

Table 3

<table>
<thead>
<tr>
<th>AMBIENT TEMPERATURE</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10°C (50°F)</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>30</td>
<td>25</td>
</tr>
</tbody>
</table>
10. DRY ICE TABLES

10.1 SET TEMPERATURE +5°C

NOTE!
The dry ice amounts are estimations and for exact amounts, depending on time of year, please refer to the online dry ice calculation tool: dryice.envirotainer.com.

<table>
<thead>
<tr>
<th>AMBIENT TEMPERATURE</th>
<th>Hours</th>
<th>10°C (50°F)</th>
<th>15°C (59°F)</th>
<th>20°C (68°F)</th>
<th>25°C (77°F)</th>
<th>30°C (86°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10°C</td>
<td>8</td>
<td>17</td>
<td>25</td>
<td>34</td>
<td>42</td>
</tr>
<tr>
<td>15</td>
<td>15°C</td>
<td>13</td>
<td>25</td>
<td>38</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>20</td>
<td>20°C</td>
<td>17</td>
<td>34</td>
<td>50</td>
<td>67</td>
<td>84</td>
</tr>
<tr>
<td>25</td>
<td>25°C</td>
<td>21</td>
<td>42</td>
<td>63</td>
<td>84</td>
<td>105</td>
</tr>
<tr>
<td>30</td>
<td>30°C</td>
<td>25</td>
<td>50</td>
<td>76</td>
<td>101</td>
<td>126</td>
</tr>
<tr>
<td>35</td>
<td>35°C</td>
<td>29</td>
<td>59</td>
<td>88</td>
<td>118</td>
<td>147</td>
</tr>
<tr>
<td>40</td>
<td>40°C</td>
<td>34</td>
<td>67</td>
<td>101</td>
<td>134</td>
<td>168</td>
</tr>
<tr>
<td>45</td>
<td>45°C</td>
<td>38</td>
<td>76</td>
<td>113</td>
<td>151</td>
<td>189</td>
</tr>
<tr>
<td>50</td>
<td>50°C</td>
<td>42</td>
<td>84</td>
<td>126</td>
<td>168</td>
<td>210</td>
</tr>
<tr>
<td>55</td>
<td>55°C</td>
<td>46</td>
<td>92</td>
<td>139</td>
<td>185</td>
<td>231</td>
</tr>
<tr>
<td>60</td>
<td>60°C</td>
<td>50</td>
<td>101</td>
<td>151</td>
<td>202</td>
<td>252</td>
</tr>
<tr>
<td>65</td>
<td>65°C</td>
<td>55</td>
<td>109</td>
<td>164</td>
<td>218</td>
<td>273</td>
</tr>
<tr>
<td>70</td>
<td>70°C</td>
<td>59</td>
<td>118</td>
<td>176</td>
<td>235</td>
<td>294</td>
</tr>
<tr>
<td>75</td>
<td>75°C</td>
<td>63</td>
<td>126</td>
<td>189</td>
<td>252</td>
<td>N/A</td>
</tr>
</tbody>
</table>

NOTE!
If the required amount of dry ice exceeds the bunker capacity (300 kg), plan to re-ice the container. Refer to chapter 5. Cargo / Dry ice loading.
10.2 SET TEMPERATURE +15°C

NOTE!

The dry ice amounts are estimations and for exact amounts, depending on time of year, please refer to the online dry ice calculation tool: dryice.envirotainer.com.

Dry Ice Quantity (in Kilograms)

Ambient temperatures from +20°C to +30°C, use wrapped dry ice.
Ambient temperatures from +30°C to +40°C, use unwrapped dry ice.

<table>
<thead>
<tr>
<th>AMBIENT TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>25</td>
</tr>
<tr>
<td>30</td>
</tr>
<tr>
<td>35</td>
</tr>
<tr>
<td>40</td>
</tr>
<tr>
<td>45</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>55</td>
</tr>
<tr>
<td>60</td>
</tr>
<tr>
<td>65</td>
</tr>
<tr>
<td>70</td>
</tr>
<tr>
<td>75</td>
</tr>
</tbody>
</table>

NOTE!

If the required amount of dry ice exceeds the bunker capacity (300 kg), plan to re-ice the container.

Refer to chapter 5. Cargo / Dry ice loading.
10.3 SET TEMPERATURE -20°C

**NOTE!**

The dry ice amounts are estimations and for exact amounts, depending on time of year, please refer to the online dry ice calculation tool: dryice.envirotainer.com.

**Dry Ice Quantity**

For all ambient temperatures, use unwrapped dry ice

(in Kilograms)

<table>
<thead>
<tr>
<th>AMBIENT TEMPERATURE</th>
<th>10°C (50°F)</th>
<th>15°C (59°F)</th>
<th>20°C (68°F)</th>
<th>25°C (77°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>97</td>
<td>113</td>
<td>129</td>
<td>145</td>
</tr>
<tr>
<td>15</td>
<td>145</td>
<td>169</td>
<td>193</td>
<td>217</td>
</tr>
<tr>
<td>20</td>
<td>193</td>
<td>225</td>
<td>258</td>
<td>290</td>
</tr>
<tr>
<td>25</td>
<td>242</td>
<td>282</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>290</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
11. TECHNICAL SPECIFICATION RAP T2

COOLING SYSTEM
Thermostat-controlled heat exchanger powered by 16 D-cell alkaline batteries and uses dry ice as refrigerant.
Max ice bunker capacity when using block ice (up to 50% less capacity if dry ice pellets are used) 300 kg (660 lbs)

Set temperature range -20°C to +20°C (-4°F to +68°F)
Temperature tolerance in cargo space
at set temp +5°C (+41°F)* +/- 3°C (+/- 5.4°F)
at set temp +15°C (+59°F)* +/- 5°C (+/- 9°F)
* Provided that the ambient temperature is between 5°C (9°F) to 25°C (45°F) higher than the set temperature.

DIMENSIONS
External cube (volume) 11.2 m³ (395.4 foot³)
External dimensions (L x W x H) 3170 x 2230 x 1620 mm (124.8 x 87.8 x 63.8 in)
Main loading space (L x W x H) (please note free space requirements in front of the fan area — refer to chapter 11.1 External dimensions.) 2535 x 2065 x 1420 mm (99.8 x 81.3 x 55.9 in)
Additional loading space below dry ice bunker (L x W x H) 460 x 2065 x 925 mm (18.1 x 81.3 x 36.4 in)
Door opening (L x H) 2065 x 1420 mm (55.9 x 81.3 in)
Internal cube (volume) 8.22 m³ (290.2 foot³)

WEIGHT
Tare weight¹ 450 kg (992 lbs)
Max gross weight (including dry ice) 6,033 kg (13,300 lbs)
Max net weight² 5,583 kg (12,308 lbs)

OTHER INFORMATION
Suitable for use on aircraft A300, A310, A330, A340, A380, B747, B767, B777, DC10, IL86, MD11, L1011. For other aircrafts, alternative operating procedures may apply.
Forkliftable when empty.

1. The tare weight (and thereby the max net weight) may change due to repairs.
2. The max net weight may change due to repairs.
11.1 EXTERNAL DIMENSIONS

![Diagram of RAP t2 Container with dimensions: 1620 mm height, 3170 mm width, 2230 mm depth]
11.2 INTERNAL DIMENSIONS

Note free space requirements in front of the fan

Profile of loading space
12. TROUBLESHOOTING

12.1 NO CONTROL UNIT DISPLAY

NOTE!
The control unit system indicator (green light) can sometimes be lit even though control unit display is blank. This is normal and the container is still operating.

1.1 Are 16 D-cell Alkaline batteries in the container?  →  no  Insert batteries

1.2 Is the battery polarity correct?  →  no  Re-insert batteries

1.3 Replace batteries. Is there a display?

1.4 Is there contact between all batteries and connectors?  →  no  Adjust contact spring tension. Is there a display?

1.5 Is the battery holder malformed?  →  no  Repair battery holder. Is there a display?

1.6 Adjust contact spring tension. Is there a display?

1.7 Adjust contrast (only for Control unit Type 3):
- Press "Menu/Enter"
- Press "plus" twice
- Hold "plus"
- Is there a display?

1.8 Repair battery holder. Is there a display?

Replace container

Go to step 1.7
12.2  CONTROL UNIT DOES NOT OPERATE CORRECTLY

2.1 Is there a display?  
   yes  
   no  Go to:  
   1. No control unit display

2.2 Is the battery voltage above 9V in both circuits?  
   yes  
   no  Replace batteries

2.3 Do the buttons operate, and can the set temperature be adjusted?  
   yes  
   no  Replace container (see note 1)

2.4 Remove and replace the batteries to reset unit. Does it operate correctly?  
   yes  
   no  Replace container

NOTE!

If the fans are operating and the container temperature is set to the desired temperature, the container is able to maintain set temperature, but should be used only in emergency situations.
12. TROUBLESHOOTING

12.3 FAN DOES NOT OPERATE

3.1 Is there a display?  
\[ \text{no} \Rightarrow \text{Go to: 1. No control unit display} \]

\[ \text{yes} \]

3.2 Is the temperature in the container at least 3°C (5.4°F) above the set point?  
\[ \text{no} \Rightarrow 3.3 \text{ Reduce set temperature to confirm that the fan turns on (perform fan operation test)} \]

\[ \text{yes} \]

3.4 Is the battery voltage above 9V in both circuits?  
\[ \text{no} \Rightarrow 3.5 \text{ Replace batteries} \]

\[ \text{yes} \]

3.6 Is there a fan alarm on the display? (Figure 19)  
\[ \text{no} \Rightarrow \text{Replace container} \]

\[ \text{yes} \]

3.7 Has the fan frozen?  
\[ \text{no} \]

\[ \text{yes} \Rightarrow 3.8 \text{ Loosen the fan by rotating the wheel using a screwdriver or pen.} \]

3.9 Has the fan guard been damaged?  
\[ \text{no} \Rightarrow \text{Replace container} \]

\[ \text{yes} \Rightarrow 3.10 \text{ Adjust fan guard position. Fan operating?} \]

\[ \text{no} \Rightarrow \text{Replace container} \]

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Figure 19

Cooling fan alarm (type 1)

Alarm, cooling fan or other (type 2)
12.4 CONTAINER TEMPERATURE TOO WARM (REFRIGERATED PRODUCT)

4.1 Sufficient amount of dry ice in bunker (30kg)? 
   → no Add dry ice

   → yes

4.2 Container recently exposed to sun/high temperatures? 
   → yes Monitor container temperature returns to range? 
     → no 4.4 Redistribute dry ice in bunker or unwrap some ice

   → no

4.5 Container stored at a temp >25°C (45°F) above set point? 
   → yes Move container to cooler area, at least 5°C (9°F) above set point

   → no

4.6 Is there a control unit display? 
   → no Go to: 1. No control unit display

   → yes

4.7 Is the battery voltage above 9V in both circuits? 
   → no Replace batteries

   → yes

4.8 Is the container set to the correct temperature? 
   → no Adjust set temperature

   → yes

4.9 Is the unit of measure (°C or °F) correct? 
   → no Change unit of measure

   → yes

4.10 Is there a fan alarm on the display? (Figure 20) 
   → yes Go to: 3. Fan does not operate

   → no

4.11 Is the fan operating? 
   → no Go to: 3. Fan does not operate

   → yes

4.12 Product may not be precooled to set temperature. Stop shipment.

Figure 20
12.5 CONTAINER TEMPERATURE TOO COLD (REFRIGERATED PRODUCT)

5.1 Container recently exposed to temperatures lower than 5°C (49°F) above set point? Yes → Monitor container temperature returns to range?

   No

5.2 Is container stored at temperatures lower than 5°C (9°F) above set point? Yes → Move container to warm area, at least 5°C (9°F) above set point

   No

5.3 Is there excessive ice in the bunker? Yes → Remove some of the dry ice

   No

5.4 Is pellet dry ice used? Yes → Reice with wrapped slices

   No

5.5 Is the container set to the correct temperature? Yes → Adjust set temperature

   No

5.6 Is the unit of measure (°C or °F) correct? Yes → Change unit of measure

   No

5.7 Does the fan turn off when the set temperature is increased? Yes

   No → Replace container

   Yes → Product may not be precooled to set temperature. Stop shipment.
13. RAP T2 CONTAINER CHECKLIST

13.1 FOR REFRIGERATED AND DO NOT FREEZE PRODUCTS

Container pre-conditioning

**Using a cold room**
- Put 16 Alkaline D-cell batteries in the battery holder.
- Check the battery voltage.
- Perform fan(s) operational check.
- Turn off the control unit or remove the batteries from holder.
- Place container in a cold room set at the desired product temperature.
- Open the container doors and wait at least one hour before loading cargo.

**Using dry ice**
- Put 16 Alkaline D-cell batteries in the battery holder.
- Check the battery voltage.
- Perform fan(s) operational check.
- Set the container to the desired temperature.
- Load the required amount of dry ice in the bunker.
- Close the container doors and wait at least one hour before loading cargo.

Container loading

**Using a cold room**
- Load the cargo in the cold room, preferably on a pallet.
- Secure the cargo using the container’s tie-down brackets.
- Close and secure the container doors and remove from the cold room.
- Reinstall batteries and check the battery voltage.
- Set container temperature to the desired temperature.
- Load the required amount of dry ice in the bunker.

**Using dry ice**
- Load the cargo, preferably on a pallet.
- Secure the cargo using the container’s tie-down brackets.
- Close and secure the container doors.

Transport/Handling/Storage

- Limit exposure to temperatures within 5°C (9°F) of the set point.
- Comply with specified limits and ambient conditions.
13.2 FOR DEEP FROZEN PRODUCTS

Container pre-conditioning

**Using a cold room**
- Put 16 Alkaline D-cell batteries in the battery holder.
- Check the battery voltage.
- Perform fan(s) operational check.
- Turn off the control unit or remove the batteries from holder.
- Place container in a cold room set at the desired product temperature.
- Open the container doors and wait at least one hour before loading cargo.

**Using dry ice**
- Put 16 Alkaline D-cell batteries in the battery holder.
- Check the battery voltage.
- Perform fan(s) operational check.
- Set the container to the desired temperature.
- Load 20% of the total amount of dry ice in the bunker and save the remaining dry ice for loading with the cargo.
- Close the container doors and wait at least one hour before loading cargo.

Container loading

**When the container is preconditioned with a temperature controlled room**
- Ensure product and all packing material is preconditioned for at least one week prior to loading.
- Load the cargo including 80% of the dry ice preferably on a pallet.
- Secure the cargo using the container’s tie-down brackets.
- Close and secure the container doors and remove from the cold room.
- Reinstall batteries and check the battery voltage.
- Set container temperature to the desired temperature.
- Load remaining 20% of the total required amount of dry ice in the bunker.

**When the container is preconditioned with dry ice**
- Ensure that the product and all packing material is preconditioned for at least one week prior to loading.
- Remove the pallet with dry ice used for preconditioning.
- Load the cargo including 80% of the dry ice preferably on a pallet.
- Secure the cargo using the container’s tie-down brackets.
- Close and secure the container doors.

Handling/Storage
- Change the batteries every 24 hours.