RECORD OF REVISION

<table>
<thead>
<tr>
<th>VER. NO.</th>
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</tbody>
</table>

- Throughout the manual editorial changes have been made in order to correct, clarify and re-structure text. Images have been added or revised for clarification purposes.

- In the chapters 2.2 Minimum operating time — fully charged container, 2.3 Exposure to ambient temperature above +30°C (+86°F) and 9 Technical specification the ambient temperature ranges related to autonomy have been consolidated into one range for clarification and simplification: The minimum operating time without recharging the batteries is 30 hours provided that the ambient temperature is between -10°C and +30°C (+14°F and +86°F). The container can maintain the temperature in the loading area even if the ambient temperature is between +30°C and +40°C (+77°F and +104°F).

- The following information in chapter 6.10 Battery switch “the refrigeration system can still run and the batteries can still be charged when the container is connected to an electrical outlet” has been revised for clarification purposes and moved to chapter 3 Charging.

- Chapter 3.3 Charging with damaged cable or cable winder has been extended with more clear information how to bypass a damaged cable or cable winder.

- Chapter 5 General cargo loading guidelines has been clarified and images have been added.

- Chapter 7.6 Verification of the temperature control system has been revised.

- Chapter 10.2 Batteries do not charge has been revised.

ADDED:

- Chapter 1.2 Symbols has been introduced for explanation of the safety levels used. At the same time the safety levels have been 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.

- In chapter 3 Charging it has been added a note about potential risk of initial current peaks.

- Chapter 6.1.3 Lifting the container with electric pallet jacks has been added.

- Chapter 8.2 Infos has been added.

- Chapter 8.3.2 Alert “Container stopped, charging required” has been added.

- Chapter 8.3.3 Alert “System too warm, charging required” has been added.

- In chapter 8.4 Alarms the alarm MRU failure 3 has been added.
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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 e2 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. The container must not be connected to the electrical outlet inside an airplane.

• Normal precautions should be observed when charging the container. Do not charge the container outdoors or in a damp, moist environments because of the risk for electric shocks.
1.4 THE CONTAINER

- The RAP e2 container is a temperature controlled air cargo container used to transport temperature sensitive cargo in the refrigerated and controlled room temperature ranges.

- The container consists of two primary parts: the cargo space and the refrigeration system (refer to Fig. 1). The refrigeration system is controlled by a control unit and powered by internal, rechargeable batteries.

- The RAP e2 is a forkliftable LD-9 air cargo container designed to hold four (4) US-pallets 1220 x 1016 mm (48 x 40”) or five (5) EURO-pallets 1200 x 800 mm (47,3 x 31,5”) of cargo.
1.5     CONTROL UNIT

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

Refer to chapter 7. Control Unit Operation

- The system indicator (green light) is lit when the container system is operating.
- The charging indicator (blue light) flashes to indicate that charging is in progress and remains lit when the charging has been completed.
- 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 refrigeration system is out of order.

If the alarm indicator is flashing, the container is not functioning properly and the shipment must be stopped.

![Fig. 1](image)

1.6     CHARGING UNIT

- The charging unit is the user interface for charging the internal batteries of the container.
- The charging unit contains a charging cable and adapters for different countries.
- The charging unit is located outside the container on the rear side. (Fig. 1)

Refer to chapter 3. Charging
2. LIMITS, AMBIENT CONDITIONS

• The container is designed to maintain the temperature of the cargo shipped by cooling or heating the air inside the container.

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.

• The container is designed to maintain the temperature of the cargo. It is therefore important that the cargo is pre-conditioned correctly.

2.2 MINIMUM OPERATING TIME - FULLY CHARGED CONTAINER

• For a +5°C (+41°F) container set temperature the minimum operating time without recharging the batteries is 30 hours provided that the ambient temperature is between -10°C and +30°C (+14°F and +86°F). However, the operating time will increase if the ambient temperature is closer to the container set temperature of the cargo space.

• For other container set temperatures contact Envirotainers Customer Care team for advice: customercare@envirotainer.com

2.3 EXPOSURE TO AMBIENT TEMPERATURE ABOVE +30°C (+86°F)

The container can maintain the temperature in the loading area even if the ambient temperature is between +30°C and +40°C (+77°F and +104°F), but the battery consumption will increase, and the container operating time will therefore decrease.

For example, if the ambient temperature is +35°C (+95°F) and the container set temperature is +5°C (+41°F), the container can maintain the temperature but the container operating time will be reduced.

NOTE!

The container remains operational between +40°C and +50°C (+104°F and 122°F), but may not be able to maintain the container set temperature.
2.4 EXPOSURE TO AMBIENT TEMPERATURE BELOW -10°C (+14°F)

The container can maintain the temperature in the loading area even though the ambient temperature is between -10°C and -25°C (+14°F and -13°F), but the battery consumption will increase, and the container operating time will therefore decrease.

For example, if the ambient temperature is -20°C (-4°F) and the container set temperature is +5°C (+41°F), the container can maintain the temperature but the container operating time will be reduced.

NOTE!

*The container remains operational between -25°C and -30°C (-13°F and -22°F) but might not be able to maintain the container set temperature.*
3. CHARGING

WARNING!

- Charging must not take place inside an airplane!
- Do not charge the container outdoors or in damp and/or humid environments because of the risk for electric shocks.
- Caution should be exercised when the container is moved and the electrical cable is fully extended. In addition please visually inspect the electrical cable for any abnormalities before connecting it to a power source.

CAUTION!

Always pull out all of the cable when charging, approximately 10 meters (32 ft.). Charging with part of the cable inside the cable winder can cause damages to the cable winder.

NOTE!

- While charging, it is recommended to have the container switched on.
- The time required to charge the container will depend on the battery level at the start of charging.
- The maximum time needed for charging is 12 hours regardless if the container is operating while charging.
- During the first hour of charging, the battery level is not updated on the display. As long as the blue charge indicator is flashing, charging is in progress. The display will switch between showing "Container info" and "Info, Pre-charging, Please wait".
- Avoid use of additional extension cable as far as possible. If the use of extension cable is required, use as short cable as possible and make sure the cross-section of the wires is at least 2.5 mm² (0.0039 inch²).
- For optimal charging, make sure the ambient temperature is in range 0°C to +20°C (+32°F to +68°F). If charging is carried out in temperatures outside this range the charging capacity, and consequently the resulting battery energy, may be reduced.
- Charging shall not be performed if the ambient temperature is below -20°C (-4°F) or above +40°C (+104°F).
- When charging the container, the initial current peak may be high with additional strain on the supply fuses. Therefore, it shall not be connected to sensitive power grids as it then may cause flicker.
NOTE!

- To avoid overload of power supply fuse, only connect one container per single-phase. The charging requires 1200 W when the container is switched off and 1850 W when the container is operating during charging.

- 110V supply will as minimum require a 20A circuit capability.

- 230V supply will as minimum require a 10A circuit capability.
3.1 CHARGING PROCEDURE

NOTE!

It is recommended to keep the battery switch on, and the container running, during charging.

1. Open the cover of the charging unit.
2. Pull out the cable from the charging unit.

CAUTION!

Pull out all of the cable.

3. The container can be charged either by connecting the blue CEE industry plug to a suitable socket or by using one of the adapters.
   Follow step 4-5 if an adapter is to be used. Otherwise continue from step 6.

4. Pull out the adapter case and pick the appropriate type of adapter (Fig. 2).
   There are also additional adapters that can be ordered separately from Envirotainer.
   Refer to chapter 3.2 Additional Charging Adapters

Fig. 2

(PROCEED ON NEXT PAGE!)
5. Connect the adapter to the charging cable (as marked in Fig. 3).

6. Connect the adapter / blue CEE industry plug to the power supply. The charge indicator (blue light) on the control unit starts flashing to highlight that charging is in progress.

**NOTE!**
- It may take up to 30 seconds before the charge indicator starts flashing.
- During the first hour of charging, the battery level is not updated on the display. As long as the blue charge indicator is flashing, charging is in progress.
- During the first hour the display will switch between showing "Container info" and "Info, Pre-charging, Please wait".

7. When the charging is complete the blue charging indicator will illuminate (fixed light) to indicate that the charging has been completed.

**NOTE!**
*The charging indicator may illuminate (fixed light) at 95% battery status. If fixed light occurs at 95% the batteries are considered fully charged.*

8. Disconnect the adapter from the power supply and disconnect the adapter from the charging cable.

9. Ensure all five adapters and the cable for recharging have been properly stored in the charging unit.

10. Make sure the battery switch is on.
   **Refer to chapter 6.10 Battery Switch**
### 3.2 ADDITIONAL CHARGING ADAPTERS

Beside the adapters for different countries included within the charging unit; the following additional adapters can be ordered separately from Envirotainer.

<table>
<thead>
<tr>
<th>Adapter Description</th>
<th>Amperage</th>
<th>Volts</th>
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<tr>
<td>British Standard 546</td>
<td>15A</td>
<td>3 pins</td>
<td>P/N 807W</td>
</tr>
<tr>
<td>NEMA 6-15R</td>
<td>15A</td>
<td>250V</td>
<td>P/N 807X</td>
</tr>
<tr>
<td>NEMA L15-30P</td>
<td>30A</td>
<td>250V</td>
<td>P/N 807Y</td>
</tr>
<tr>
<td>Danish SRAF 1962/DB 16/87</td>
<td>10A</td>
<td>250V, K-plug</td>
<td>P/N 807Z</td>
</tr>
</tbody>
</table>

### 3.3 CHARGING WITH DAMAGED CABLE OR CABLE WINNER

In the event that the cable or cable winder has been damaged and can no longer be used, the cable winder may be bypassed for charging.

The recommended procedure is:

1. Open the cover of the charging unit.
2. Pull out the adapter case. When the adapter case reaches the stop, continue pulling the case to reach the CEE industry plug (Fig. 5).
3. Disconnect the charging cable and connect the appropriate type of adapter.
4. Connect an extension cable to the adapter.

**NOTE!**

Use as short cable as possible and make sure the cross-section of the wires is at least 2.5 mm² (0.0039 inch²).
4. 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.

4.1 CARGO PRE-CONDITIONING

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

NOTE!

To avoid the risk of temperature deviations, the cargo must be properly pre-conditioned to the container set temperature.

Cargo temperature recording

- If records must be kept of product temperature, Envirotainer strongly recommends that temperature recorders are placed as close to the product as possible, preferably inside product boxes, otherwise between product 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.
4.2 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 two recommended practices for container pre-conditioning:

4.2.1 PRE-CONDITIONING WITH CONTAINER OPERATING IN NON-TEMPERATURE CONTROLLED AREA

- It is recommended that this type of pre-conditioning is performed with the container connected to the power supply.
- When the container is connected to the power supply, the heating and cooling equipment will run on power from the power supply and no battery power is consumed.
- Pre-conditioning during charging does not affect charging time.

The recommended procedure is:
1. Make sure the container is operating and the container set temperature is correct.
   Refer to chapter 7, Control Unit Operation
2. Make sure the doors to the cargo space are closed.
3. Wait until set temp has been reached and the alert “Inside temp out of spec” and info “Pre-cooling” has disappeared (this can take up to 90 minutes) before loading cargo.

4.2.2 PRE-CONDITION WITH A TEMPERATURE-CONTROLLED ROOM

It is recommended to perform this type of pre-conditioning with the container switched off.

The recommended procedure is:
1. Place the container in a temperature-controlled room that is set to the desired temperature.
2. Open the doors to the cargo space.
3. Allow at least one hour for container pre-conditioning before loading the cargo.
5. GENERAL CARGO LOADING GUIDELINES

**NOTE!**

- Load the cargo on pallets to allow proper airflow.
- Do not load cargo between the spacers inside the container walls.
- Ensure that the air inlet at rear end of the cargo space is not blocked by the cargo.
- If the cargo is shrink-wrapped, the pallet base must not be covered in order to allow air flow along the floor beneath the cargo.
- Ensure proper weight distribution.
- Secure the cargo to the tie-down brackets inside the container as proposed in **Fig. 6**. Cargo which is not properly strapped may shift and obstruct the air flow as well as cause cargo and container damage.
5.1 CARGO LOADING

The recommended procedure is:

1. Switch on the container (if pre-conditioned without container operating) and ensure container set temperature is correct and container is pre-conditioned to the required cargo temperature.
   Refer to chapter 7. Control Unit Operation

2. Load the container (minimize the time the container doors are open during loading).

3. Close and lock the doors. Secure both doors with seals (Fig. 7) if applicable.

4. Place any shipping documents or check lists in the container placard holder.
5.2 AFTER CARGO LOADING

Refer to chapter 7. Control Unit Operation

The recommended procedure is:

1. Check that the battery level is 95% or above.
2. Confirm container set temperature is correct on the control unit.
   Refer to chapter 7. Control Unit Operation
3. Check that the yellow alert indicator on the control unit has not been activated.

NOTE!

The alert for inside temperature out of spec may appear due to the door opening during loading. Ensure that the temperature recovers and that the alert disappears within 30 minutes after the doors have been closed.

4. Check that the red alarm indicator on the control unit has not been activated.
5. Confirm that all doors and covers are closed and latched.
6. Ensure that the container is stored in accordance with the specified limits and ambient conditions. Refer to chapter 2. Limits, Ambient Conditions

5.2.1 AMBIENT TEMPERATURE RECORDING

If additional records must be kept of ambient temperature, a temperature recorder can be placed in a ventilated box (Fig. 8) in the charging unit.

---

Fig. 8
6. GENERAL CONTAINER HANDLING GUIDELINES

6.1 FORKLIFT REQUIREMENTS

- The container should be lifted using forklifts when empty and loaded.
- The distance between the pockets is 813 mm (32") (Fig. 9).

![Fig. 9](image)

**CAUTION!**
The container SHOULD NOT touch the ground when moved by forklift, as this may cause damage to the container.

6.1.1 LIFTING THE CONTAINER FROM THE LEFT OR RIGHT SIDE

- Minimum recommended distance between forks: 820 mm (32.5").
- Minimum length of forks when container is empty: 1,2 m (47.5").
- Minimum length of forks when container is loaded: 1,6 m (63").

6.1.2 LIFTING THE CONTAINER FROM THE AFT SIDE

**NOTE!**
Due to the weight of the refrigeration system on the aft side it is not recommended to lift the container from the door side, but it is possible.

- Minimum recommended distance between forks: 820 mm (32.5").
- Minimum length of forks when container is empty: 1,6 m (63").
- Minimum length of forks when container is loaded: 2,2 m (87").
6.1.3 LIFTING THE CONTAINER WITH ELECTRIC PALLET JACKS

NOTE!
Use an electric pallet jack or electric walkie rider with a minimum rated lifting capacity equal to the container total gross weight.

WARNING!
Due to tilting hazard: Always lift the container from AFT side. Do not lift the container higher than necessary.

NOTE!
Place the container on supports (see Fig. 10).

- Minimum recommended length of forks: 2.2 m (87”).

![Fig. 10](image-url)
6.2 ROLLER BEDS

Use the straps/handles (Fig. 11) outside the corners of the container to handle the container on roller beds.

6.3 AMBIENT CONDITIONS

Ensure that the container is handled in accordance with the specified limits and ambient conditions.

Refer to chapter 2. Limits, Ambient Conditions

6.4 SHIPMENT DURATION

If the duration of the shipment is longer than 35 hours charging of the container should be considered whenever it is in a warehouse.

6.5 WRAPPING

Wrapping MUST NOT be applied to the container. If the container is wrapped the air inlets and outlets are blocked and the container can not work properly.
6.6 GROUND TRANSPORT PRECAUTIONS

- Ensure that the container is transported in an environment where temperatures are between -10°C and +25°C (+14°F and +77°F) and limit exposure to other temperatures. 
  
  Refer to chapter 2. Limits, Ambient Conditions  

- Use the eyelets / tie-down brackets (Fig. 12) outside the container base when strapping the container. Avoid using straps on top of the container roof.

6.7 AIRCRAFT TRANSPORT PRECAUTIONS

Limit time on the tarmac during aircraft loading (to avoid temperature extremes and direct sunlight).

6.8 UNLOADING

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

6.8.1 AFTER UNLOADING

Switch off the container by pressing and holding down for about 3 seconds.

6.9 STORAGE

It is recommended that the RAP e2 container be stored on flat ground. The storage temperature should be between -40°C and +50°C (-40°F and +122°F).

NOTE!

It is not allowed to store containers, cargo or other items on top of a RAP e2.
6.10 BATTERY SWITCH

The battery switch disconnects the batteries from the container system, i.e. the container cannot run on battery power when the switch is off (Fig. 4).

6.11 LONG-TIME STORAGE (NOT IN SHIPMENT)

When the container is to be stored for more than seven days, the battery switch must be switched off.

**The recommended procedure is:**

1. Open the cover of the charging unit. (Fig. 1)

2. Pull out the adapter case (Fig. 13). When the adapter case reaches the stop, continue pulling the case to reach the battery switch behind the adapter case (Fig. 14).

3. Turn the battery switch to "STOP".

When switching on main switch: turn switch to "START".

During long-time storage the batteries must be fully charged every 30 days due to self-discharge.

Refer to chapter 3.1 Charging Procedure
7. CONTROL UNIT OPERATION

7.1 START THE CONTROL UNIT

1. Press \( \text{\textbullet} \)

**NOTE!**

During the start-up of the refrigeration system the four indicators are lit for about one second to check the function of the indicators.

2. Ensure the indicators switch off (after one second), except from the green indicator, and that the default mode is visible on the display (Fig. 15).

   The default mode shows "Container temp", "Set temp" and battery status.

   The control unit menu is reached via \( \text{\textbullet} \) and includes settings and information. Use \( \text{\textbullet} \), \( \text{\textcircled{v}} \), and \( \text{\textcircled{h}} \) to navigate in the menu (Fig. 16).

* Only to be used by Authorized personnel

Note that there may be small differences to the menu structure depending on software version.
7.2 SETTING TEMPERATURE

The recommended procedure is:

1. To change between Celsius and Fahrenheit:
   - Press \(\text{\textbullet}\) to enter the main menu; the display shows "TEMP MENU".
   - Press \(\text{\textbullet}\) to enter the "TEMP MENU"; the display shows "SET TEMP".
   - Use \(\text{\textbullet}\) or \(\text{\textbullet}\) to step to "Current unit F Set changes to C" or "Current unit C Set changes to F" (depending on current setting).
   - Press \(\text{\textbullet}\) to confirm the change.
   - Press \(\text{\textbullet}\) to return to default mode.
2. Press \(\text{\textbullet}\) to enter the main menu; the display shows "TEMP MENU".
3. Press \(\text{\textbullet}\) to enter the "TEMP MENU"; the display shows "SET TEMP".
4. Press \(\text{\textbullet}\) 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 \(\text{\textbullet}\), the new container set temperature was not saved.

5. Use \(\text{\textbullet}\) and \(\text{\textbullet}\) to change the container set temperature.
   Hold down the buttons to speed up the change.
6. Press \(\text{\textbullet}\) to confirm the new container set temperature.
7. Press \(\text{\textbullet}\) to return to default mode.
8. Check that the container set temperature is correct in the default mode.

7.3 CHECKING OPERATION MODE

The recommended procedure is:

1. Press \(\text{\textbullet}\) to enter the main menu; the display shows "TEMP MENU".
2. Use \(\text{\textbullet}\) or \(\text{\textbullet}\) button to step to "SYSTEM MENU" and press \(\text{\textbullet}\) to confirm; the display shows "ALARM VIEW".
3. Use \(\text{\textbullet}\) or \(\text{\textbullet}\) button to step to "OPER. MODE" and press \(\text{\textbullet}\) to confirm.
4. Check current operation mode.
   **Refer to chapter 8. Operation Modes, Infos, Alerts and Alarms.**
5. Press \(\text{\textbullet}\) twice to return to default mode.
7.4 BATTERY LEVEL CHECK

- The battery level is shown in the default mode.
- The battery percentage figure is continuously updated according to battery status.
  - 100% battery capacity is maximum and is achieved when charging starts from low battery voltage.
  - 95% battery capacity is considered fully charged if the blue light is fixed (not flashing).

7.5 FUNCTIONAL TEST

The recommended procedure is:

1. Disconnect the container from power supply (if connected).
2. Set temperature to +5°C (+41°F).
3. Check for air discharge from air guide in the ceiling (Fig. 17).

![Fig. 17](check-for-air.png)
4. Check that no alerts or alarms are activated.
   - If any alert or alarm is activated, the yellow or red LED indicator flashes and the alert or alarm is displayed (Fig. 18).
   - Note the alert or alarm and refer to chapter 8. Operation Modes, Infos, Alerts and Alarms for recommended actions.

It is also possible to view activated alerts or alarms in the control unit menu:
- Press \( \text{\textarrow{left}} \) to enter the main menu; the display shows "TEMP MENU".
- Use or to step to "SYSTEM MENU" and press \( \text{\textarrow{left}} \) to confirm; the display shows "ALARM VIEW".
- Use or to step to "ALERT VIEW" and press \( \text{\textarrow{left}} \) to confirm; the display shows activated alerts. The activated alert is shown as ALERT 1/1.

7.6 VERIFICATION OF THE TEMPERATURE CONTROL SYSTEM

The internal temperature control system is verified annually in accordance with FDA 21 CFR Part 211.68a. The verification is recorded by a verification sticker (Fig. 19).

Example: if a container was verified in October 2017 it must be re-verified before the start of October 2018.
If verification is not performed as scheduled, please contact the Envirotainer Customer Care team for advice: customercare@envirotainer.com
7.7 SEAL CONTROL UNIT AND INFO BUTTON

- Use the rectangular opening in the latch to seal the control unit (Fig. 20).
- Use a seal with a cross section of at least 2 mm (0.08”).

After the control unit has been sealed it is still possible to view information on the display using the info button.

The recommended procedure is:

1. Press the Info button (Fig. 20) to scroll between default mode, alarm status and alert status. The backlight will illuminate for 20 seconds when the button is pressed.

NOTE!

It is only possible to toggle through the menu with the Info button — no changes to the set temp or other can be made.
8. OPERATION MODES, INFOS, ALERTS AND ALARMS

8.1 OPERATION MODES

The following operation modes exist:

8.1.1 COOLING POWERSTEP X

- The container uses four different power steps for cooling, 1-4, depending on the required cooling performance. "Cool Pow 1" is the lowest power step for cooling and "Cool Pow 4" is the highest (i.e. maximum cooling).

- When the container has been cooling and there is no need for further cooling the power step "Cool Pow 0" is displayed. At this power step there is no cooling (or heating) but the air inside the cargo area continues to be circulated.

8.1.2 HEATING POWERSTEP X

- The container uses two different power steps for heating, 1-2, depending on the required heating performance. "Heat Pow 1" is the lowest power step for heating and "Heat Pow 2" is the highest (i.e. maximum heating).

- When the container has been heating and there is no need for further heating the power step "Heat Pow 0" is displayed. At this power step there is no heating (or cooling) but the air inside the cargo area continues to be circulated.

8.1.3 DEFROSTING POWERSTEP 2

- The container uses one power step, "Defrost Pow 2", for defrosting. At this power step the cooling system is shut down for a few minutes for defrosting of evaporator. The defrosting process does not affect the air temperature in the cargo space.
8.2 INFOS

8.2.1 INFO “PRECONDITIONING”

![CONTAINER INFO]

Container temp 5.5°C
Set temp 5.0°C

![Info]
Preconditioning

REASON:

• Inside temperature is outside the set tolerance at start up (≤ 10°C ± 3°C (50°F ± 5.4°F) and > 10°C ±5°C (50°F ±9°F)).

NOTE!
At start up the display will switch between showing ”Container info” and ”Info, Preconditioning” until the set temperature has been reached.

8.2.2 INFO “PRE-CHARGING, PLEASE WAIT”

![CONTAINER INFO]

Container temp 5.5°C
Set temp 5.0°C

![Info]
Pre-charging
Please wait

REASON:

• When the container is charged the battery level is not changed during the first hour since this is the “diagnose phase” of the charging process.

NOTE!
During the first hour the display will switch between showing ”Container info” and “Info, Pre-charging, Please wait”.
8.3 ALERTS

8.3.1 ALERT "BATTERIES AT 30% CHARGE LEVEL"

REASON:

• The battery capacity is below 30%.

ACTION:

• Check the battery level immediately to ensure that there is sufficient battery power for the remainder of the shipment. It is recommended that the batteries are charged.

Refer to chapter 3. Charging.

Fig. 23

8.3.2 ALERT "CONTAINER STOPPED, CHARGING REQUIRED"

REASON:

• The batteries are depleted (the cut out voltage for the batteries have been reached)

ACTION:

• Charge the batteries.

Refer to chapter 3.1 Charging Procedure.

Fig. 24

8.3.3 ALERT "SYSTEM TOO WARM, CHARGING PROLONGED"

REASON:

1. The batteries or chargers are too warm.
2. Interruption in battery temperature reading.

ACTION:

1. Disconnect the container from mains and if possible move the container to a cooler area.
2. Wait for the system to cool down (depending of ambient conditions) and reconnect the mains. If the system temperature is still to high the alert will appear again after a few minutes.
8.3.4 ALERT "INSIDE TEMP OUT OF SPEC"

**REASON:**
- The temperature of the air inside the cargo space is outside the following alert limits depending on container set temperature:
  - If container set temperature is < 10°C: ±3°C (50°F: ±5.4°F)
  - If container set temperature is ≥ 10°C: ±5°C (50°F: ±9°F)

The reason for this could be that the ambient temperature has been out of specification or that the doors have been opened recently.

**ACTION:**
1. Make sure the ambient temperature is within the specified limits.
   *If not, move the container to an area with an ambient temperature within the specified limits.*
2. Make sure the doors are closed properly.
   *If not, close the doors.*

8.3.5 ALERT "AMBIENT TEMP OUT OF SPEC"

**REASON:**
- The container is exposed to extreme ambient temperatures.

**ACTION:**
1. To safeguard the cargo, make sure the ambient temperature is within the specified limits.
   *If not, move the container to an area with an ambient temperature within the specified limits.*
8.4 ALARMS

- "MRU-FAILURE 0"
- "MRU-FAILURE 1"
- "MRU-FAILURE 2"
- "MRU-FAILURE 3"
- "MRU-FAILURE 4"
- "MRU-FAILURE 5"
- "MRU-FAILURE 6"
- "MRU-FAILURE 7"
- "MRU-FAILURE 8"
- "MRU-FAILURE 9"

REASON:
- One or more of the technical parts of the MRU (Mechanical Refrigerating Unit) 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: customercare@envirotainer.com
9. TECHNICAL SPECIFICATION

**REFRIGERATION SYSTEM**

- Thermostat-controlled air conditioning system with compressor cooling and electrical heating.
- Powered by rechargeable batteries.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recharging power supply</td>
<td>100-240 V AC, 50-60 Hz</td>
</tr>
<tr>
<td>Maximum power consumption during charging</td>
<td>1850 W</td>
</tr>
<tr>
<td>Maximum charging time</td>
<td>12 h</td>
</tr>
</tbody>
</table>

| Container set temperature range   | 0°C to +25°C (+32°F to +77°F)              |
| Temperature tolerance in cargo space; |                                             |
| at set temp ≤ 10°C (≤ 50°F)       | ± 3°C (± 5.4°F)                            |
| at set temp > 10°C (> 50°F)       | ± 5°C (± 9°F)                              |

| Autonomy at container set temperature +5°C (41°F) | 30 h¹ |
| Operation range at container set temperature +5°C (41°F), ambient conditions ² | -25°C to +40°C (-13°F to +104°F) |
| Storage temperature range          | -40°C to +50°C (-40°F to +122°F)           |

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>External cube (volume)</td>
<td>11.5 m³ (406.1 foot³)</td>
</tr>
<tr>
<td>External dimensions (L x W x H)</td>
<td>3175 x 2235 x 1626 mm (125 x 88 x 64 in)</td>
</tr>
<tr>
<td>Internal dimensions (L x W x H)</td>
<td>2465 x 2055 x 1260 mm (97 x 80.9 x 49.6 in)</td>
</tr>
<tr>
<td>Door opening (L x H)</td>
<td>2055 x 1260 mm (80.9 x 49.6 in)</td>
</tr>
<tr>
<td>Internal cube (volume)</td>
<td>6.38 m³ (224.2 foot³)</td>
</tr>
</tbody>
</table>

**WEIGHT**

<table>
<thead>
<tr>
<th>Weight Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tare weight</td>
<td>1,100 kg (2,425 lbs)</td>
</tr>
<tr>
<td>Max gross weight</td>
<td>6,033 kg (13,300 lbs)</td>
</tr>
<tr>
<td>Max net weight</td>
<td>4,933 kg (10,875 lbs)</td>
</tr>
</tbody>
</table>

**OTHER INFORMATION**

- Suitable for use on aircraft A300, A310, A330, A340, A380, B747, B767, B777, DC10, IL86, MD11, L1011
- Forkliftable with a slot-height of 102 mm (4 in), slot-width of 305 mm (12 in) and distance 813 mm (32 in).

¹. Minimum operating time if ambient temperature is between -10°C to +30°C (+14°F to +86°F).
². Refer to test report "TR100560" for load specification.
9.1 LOADING SPACE

Fig. 29
10. TROUBLESHOOTING

10.1 NO DISPLAY

1. Is the Display unit switched "on"?
   - yes
   - no Press the "On/Off" button

2. Is the container battery switch on?
   - yes
   - no Switch on the container battery switch.
     Refer to chapter "6.10. Battery Switch"

3. Have the batteries been charged?
   - yes
   - no Charge the container
     Refer to chapter "3.1. Charging Procedure"

4. Replace container.
   Make sure to put the cargo in temperature controlled area

Fig. 30
10.2 BATTERIES DO NOT CHARGE

1. Is the container connected to AC power?
   - yes: Connect to AC power.
   - no:

2. Is the blue charging indicator flashing?
   - yes: The container is charging, wait 1 hour and monitor % level.
   - no:

3. Has the fuse blown (at the facility's power central)
   - yes: Change fuse at the facility.
   - no:

4. Is the adaptor broken?
   - yes: If available, use spare adapter.
   - no:

5. Is the cable broken? (visually inspect the cable)
   - yes: Remove the adapter case.
     - Disconnect cable winder.
     - Connect domestic extension cable together with adapter.
     - Refer to chapter "3.3 Charging with damaged cable / cable winder".
   - no:

6. Replace container.
   Make sure to put the cargo in temperature controlled area

Fig. 31
10.3 ALERTS

10.3.1 TEMPERATURE TOO WARM

1. Has the container been properly pre-conditioned?  
   yes →  
   no → Ensure container temperature has been given time to reach the desired temperature range. In room temperature, +20 to +25 C (+68 to +77 F), it takes approximately 30 minutes to pre-condition to +5 C (+41 F)

2. Is the container stored at a temperature above +40 C (+104 F)?  
   yes → Move container to cooler area below +40 C (+104 F)
   no →  

3. Has the container recently been exposed to sun and/or high temperatures?  
   yes → Monitor container temperature returns to range.
   no →  

4. Has the door been open recently?  
   yes → Wait until temperature stabilizes.
   no →  

5. Has the door been properly closed?  
   yes →  
   no → Close the door.

6. Is there any battery capacity left?  
   yes → Charge the container Refer to chapter “3.1. Charging Procedure”
   no →  

7. Is the fan operating? (Is air blowing out of the air-guide at the roof of the container cargo space?)  
   yes → Replace container.
   no →  

8. Product may not be pre-conditioned to container set temperature. Check with shipper.

Fig. 32
10. TROUBLESHOOTING

10.3.2 TEMPERATURE TOO COLD

1. **Has the container been properly pre-conditioned?**
   - yes
   - no → **Ensure container temperature has been given time to reach the desired temperature range.**

2. **Is the container stored at a temperature below -25 C (-13 F)?**
   - yes → **Move container to warmer area above -25 C (-13 F).**
   - no

3. **Has the container recently been exposed to very cold temperatures?**
   - yes → **Monitor container temperature returns to range.**
   - no

4. **Has the door been open recently?**
   - yes → **Wait until temperature stabilizes.**
   - no

5. **Has the door been properly closed?**
   - yes
   - no → **Close the door.**

6. **Is there any battery capacity left?**
   - yes → **Charge the container. Refer to chapter “3.1. Charging Procedure”**
   - no

7. **Is the fan operating? (Is air blowing out of the air-guide at the roof of the container cargo space?)**
   - yes → **Replace container.**
   - no

8. **Product may not be pre-conditioned to container set temperature. Check with shipper.**

*Fig. 33*
10.3.3 AMBIENT TEMPERATURE OUT OF SPEC

1. Is the container exposed to extreme ambient temperatures?
   - yes: Move the container to an area with ambient temperatures within specification.
   - no: Has the container recently been exposed to ambient temperatures out of specification?

2. Has the container recently been exposed to ambient temperatures out of specification?
   - yes: Wait to see that the alert disappears.
   - no: Replace container.

Fig. 34

10.3.4 IF AN ADAPTER IS LOST

1. Is the needed adapter missing?
   - yes: Use the blue CEE plug to connect to the power supply.
11. RAP E2 CONTAINER CHECKLIST

For Refrigerated and Controlled Room Temperature Products

- Start the container by pressing without the container being connected to the electrical outlet. The indicators on the display unit are lit to test functionality. If the container does not start, ensure the container battery switch is on.

Container charging

- Connect container to AC power outlet to charge the batteries.
- Ensure the blue charging light is lit (flashing or fixed).

Container pre-conditioning

(If pre-conditioning is performed with container operating in non temperature-controlled area).

- Perform a functional test of container.
- Make sure container doors are properly closed.
- Set container temperature to the desired container set temperature.
- Wait at least 90 minutes before loading cargo.

(If pre-conditioning is performed with a temperature-controlled room).

- Perform a functional test of container.
- Place the container in a temperature-controlled room that is set to the desired temperature.
- Make sure container doors are open.
- Wait at least one hour before loading cargo.

Container loading

- Ensure product, packing material & container is pre-conditioned prior to loading.
- Minimize exposure of product to ambient temperatures during loading into the container.
- Place cargo on pallets to ensure sufficient airflow between cargo and floor.
- Make sure no boxes are loaded in a way that blocks the airflow between the spacers inside container walls.
- Secure the cargo using the container’s tie-down brackets.
- Close and secure the container doors.
- Check that no alerts are active.
- Make sure the blue charging light is fixed (not flashing) before disconnecting from AC power.
- Ensure all charging equipment is correctly stowed in the charging unit, and that all adapters are in place.

Transport / handling / storage

- Charge container whenever possible.
- Comply with specified limits and conditions.