

QUALITY ASSURANCE

This product and all products sold by IVYX Scientific are covered by a one-year warranty against defects in materials and workmanship.

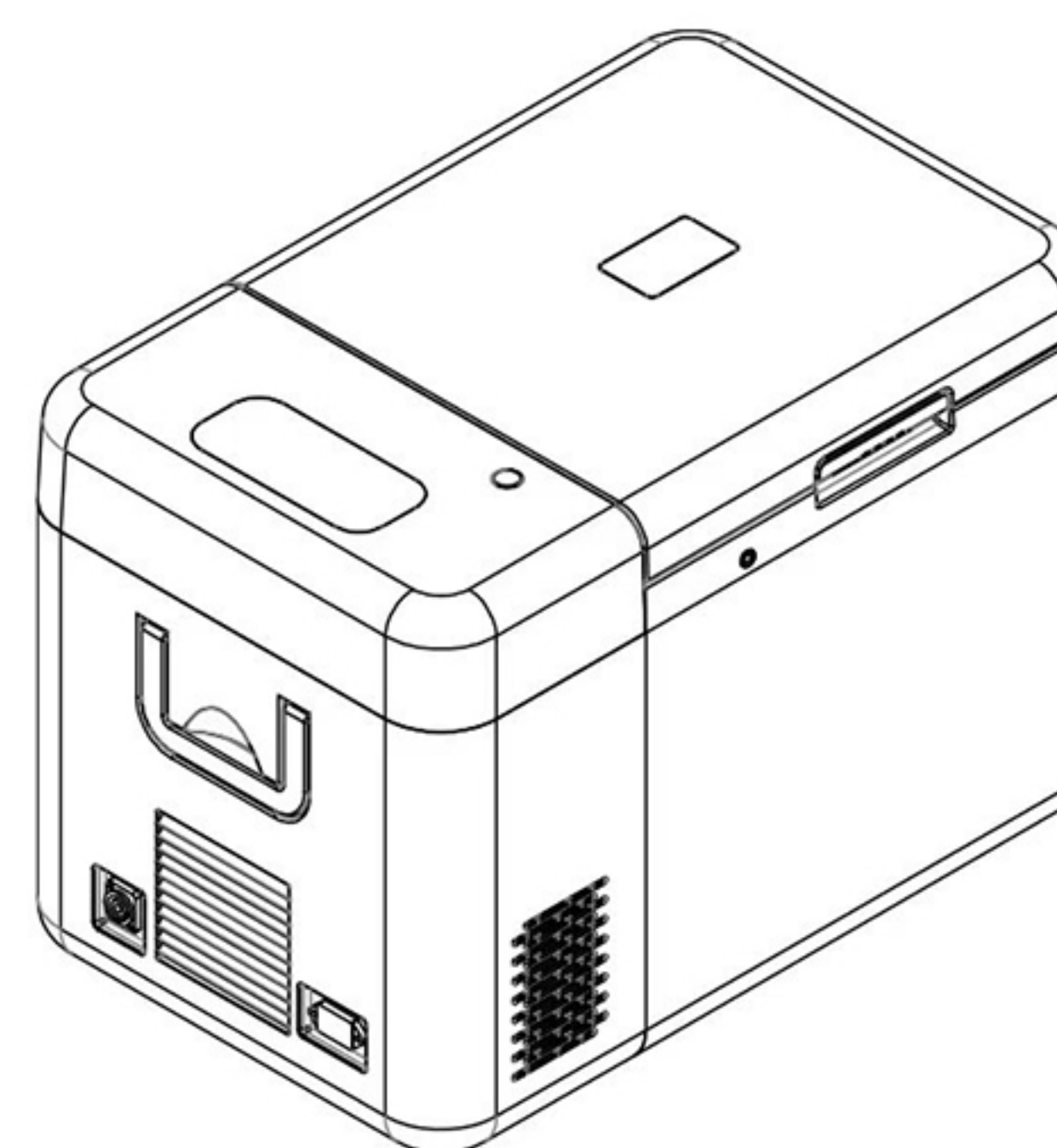
If you encounter issues with our product, please contact us at support@ivyxscientific.com. If we are unable to fix your problem, we will send you a replacement unit free of charge or a full refund.



**TYPE: DW-4525
DW-6025
DW-8625**

**PORTABLE ULTRA LOW
TEMPERATURE FREEZER**

OPERATING MANUAL



To prevent personal injury, injury to others, or damage to property read these safety precautions carefully before using.










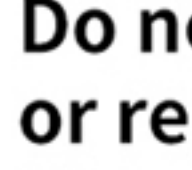
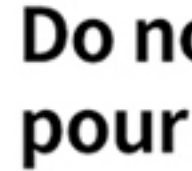
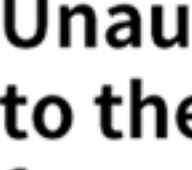
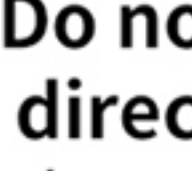
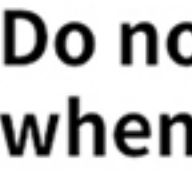
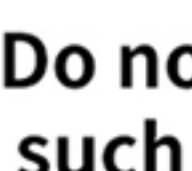
TABLE OF CONTENTS

SAFETY PRECAUTIONS	1
UNPACKING AND SET-UP	2-5
DIAGRAMS	6-7
SPECIFICATIONS	8
OPERATION	9-10
(1) TO TURN THE FREEZER ON	9
(2) TO TURN THE FREEZER OFF	9
(3) SET TEMPERATURE	9
(4) TO SEE THE TEMPERATURE	10
(5) OVER-TEMPERATURE ALARM	10
(6) HOW TO SWITCH BETWEEN POWER SUPPLIES	10
CAR-OPERATION CAUTIONS	11
TROUBLESHOOTING	12-13
STORAGE, CLEANING AND MAINTENANCE	14
WARRANTY	15

SAFETY PRECAUTIONS

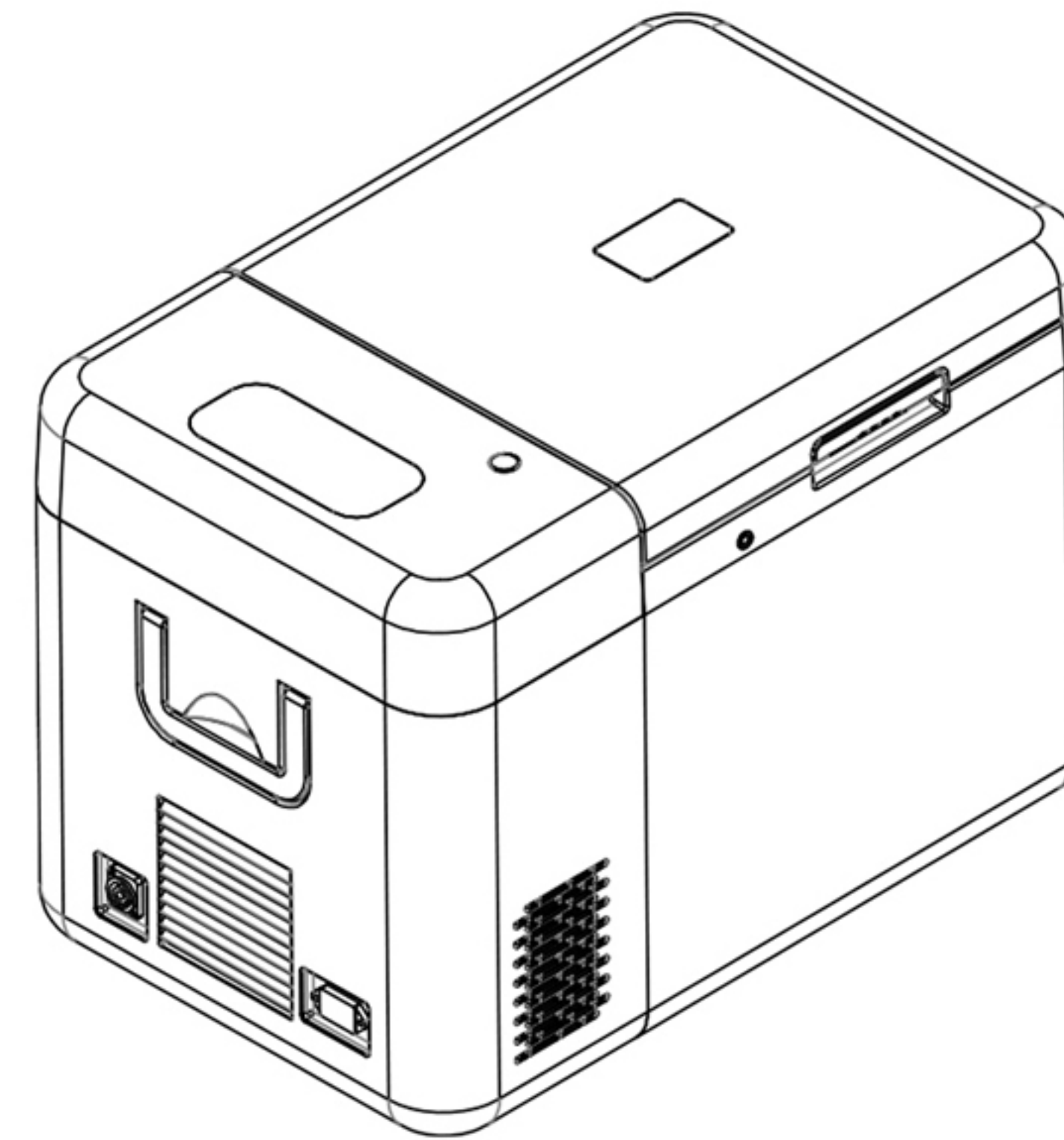
To prevent personal injury, injury to others, or damage to property, read these safety precautions carefully before use.

⚠ Attention

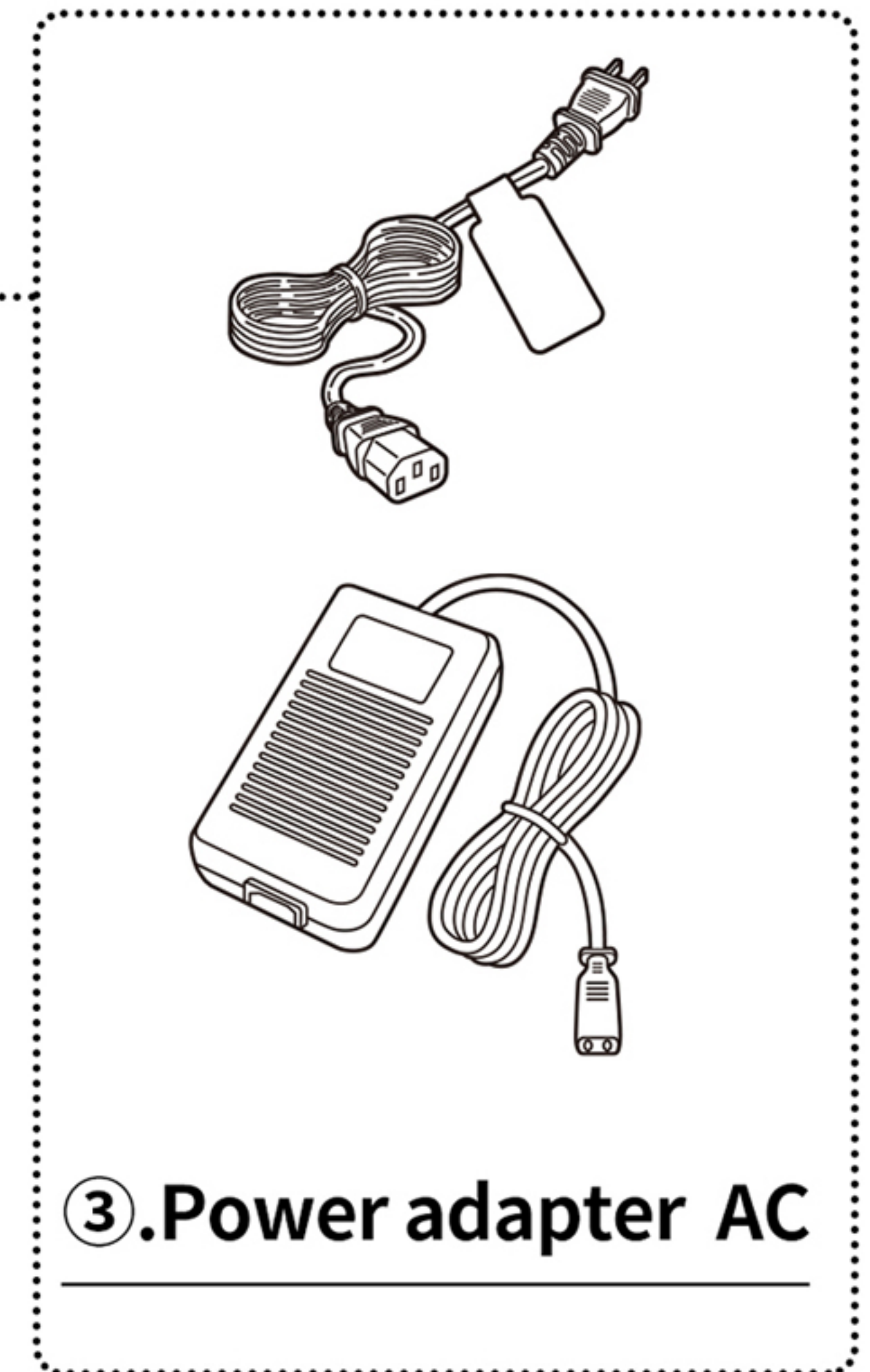
-  **Do not disassemble, modify or repair.**
There are no user serviceable parts inside the freezer unit.
-  **Do not immerse in water or pour water on the unit.**
-  **Unauthorized modification to the cabinet, controls or free-piston Stirling engine is prohibited and will void all warranty provisions.**
-  **Do not put ice or liquid water directly in the freezer box.**
always use suitable containers.
-  **Do not drop, throw or abuse the freezer.**
-  **Do not use glass containers when the contents might freeze and break.**
-  **Do not operate under extreme environmental conditions**
such as in a car trunk, in very high humidity environments, in rain or other severe weather.
-  **Do not store flammable items such as gasoline, thinner or solvents in the freezer.**
The freezer is NOT rated as an explosion-proof freezer.
-  **Do not use solvents to clean the control panel or the outside or inside of the freezer.**
-  **Do not cut, change or modify the power cable.**
-  **When removing the plug, hold onto the plug and not the cord.**
-  **Do not block the air intake or air discharge vents.**
-  **Do not drop, throw or abuse the freezer.**
-  **Do not operate under extreme environmental conditions**
such as in a car trunk, in very high humidity environments, in rain or other severe weather.
-  **Do not use hard and/or sharp objects, such as knives or screwdrivers, to remove ice build up on the inside of the freezer.**
The inside panels are heat exchangers and can be damaged.

UNPACKING AND SET-UP

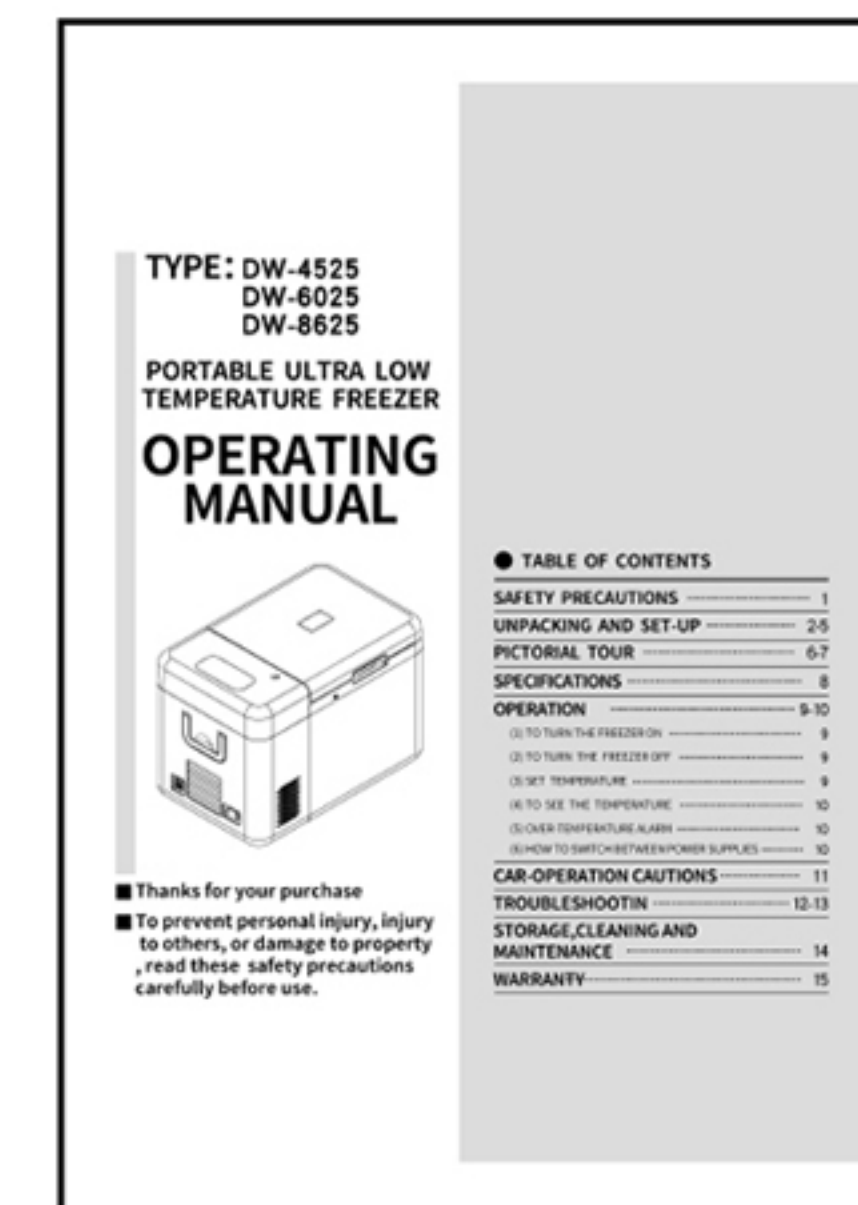
1. Remove the freezer and all accessories from the box. Carefully inspect the freezer and all accessories for any shipping damage.
2. Check the packing list to verify that the shipment is complete.
3. Place the freezer on a level surface.
4. Make sure that the air inlets and outlets are not blocked.
5. Connect to a power source. While the freezer can be used with either the AC Power Cord for lab, home or office use, or the DC Power Cord for mobile use, it is recommended that the initial pull-down to Setpoint be completed via AC power.



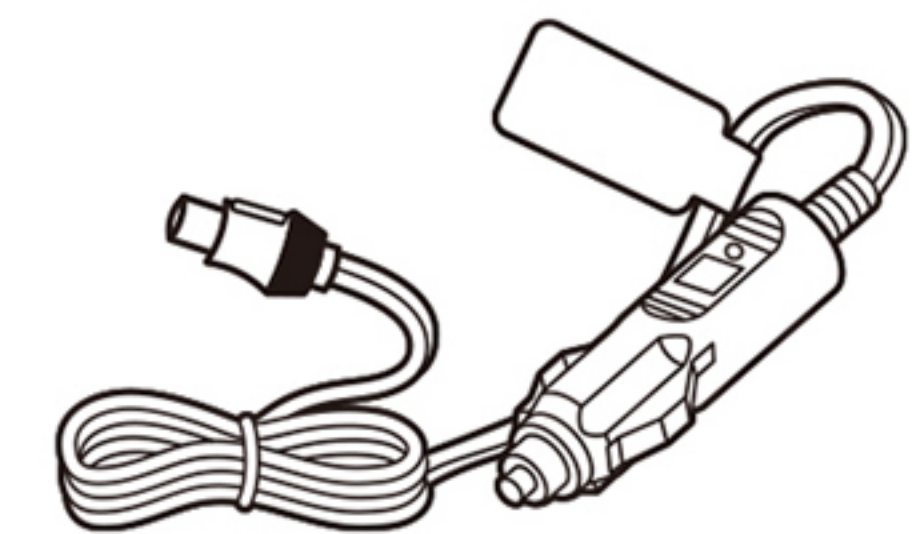
①. Freezer body



③. Power adapter AC



②. Operating Manual



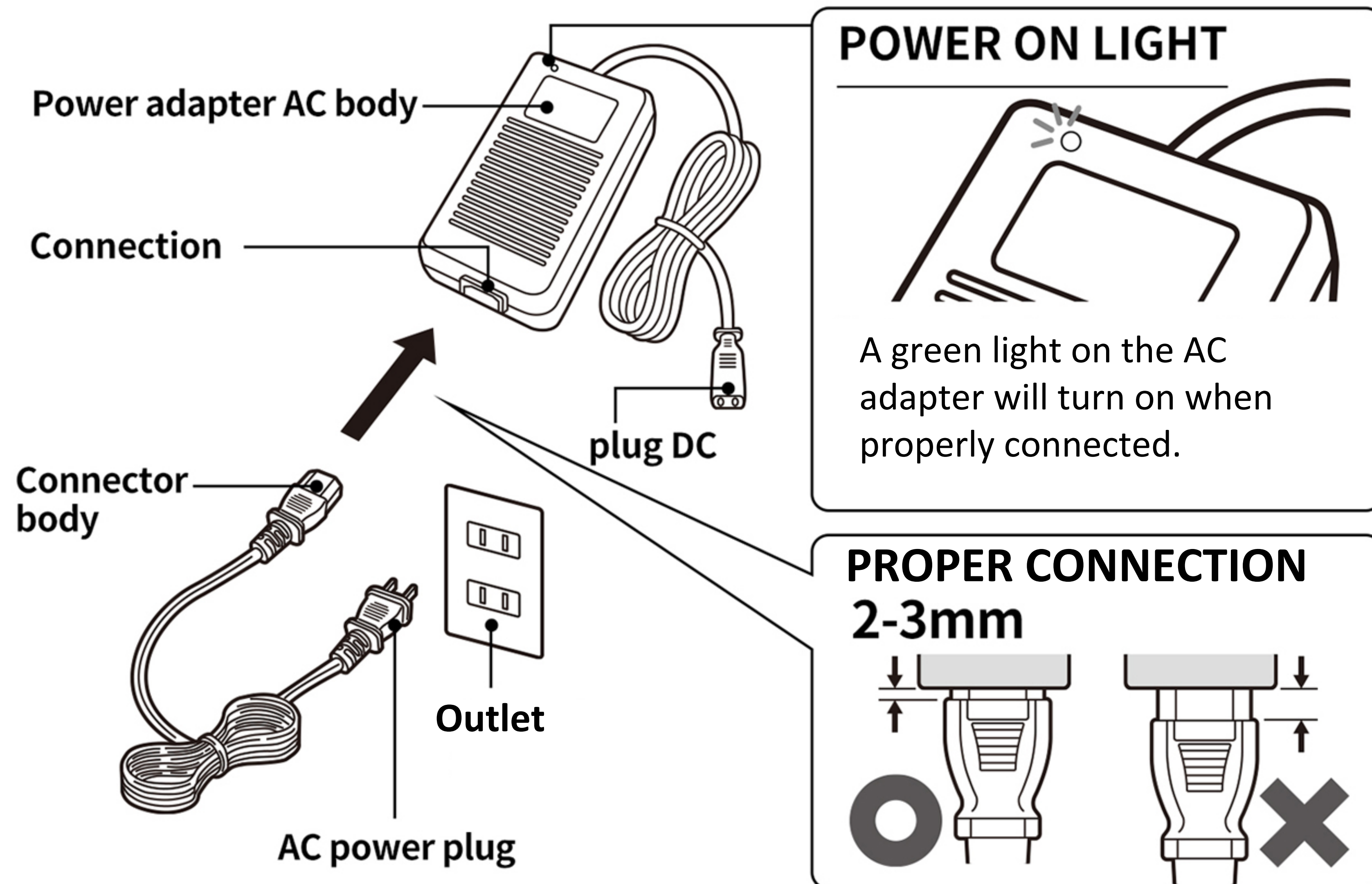
④. DC power supply cord

Suitable for 12V/24V vehicle power supply

UNPACKING AND SET-UP

A. TO USE THE AC POWER SUPPLY

During setup, identify the service power and plug configuration available and then locate the appropriate line cord for the service type you will be using. If the appropriate line cord is not currently installed, simply unplug the line cord from the unit and then plug the appropriate line cord in its place. Plug the other end of the line cord into the power source and then attempt to power on the unit.



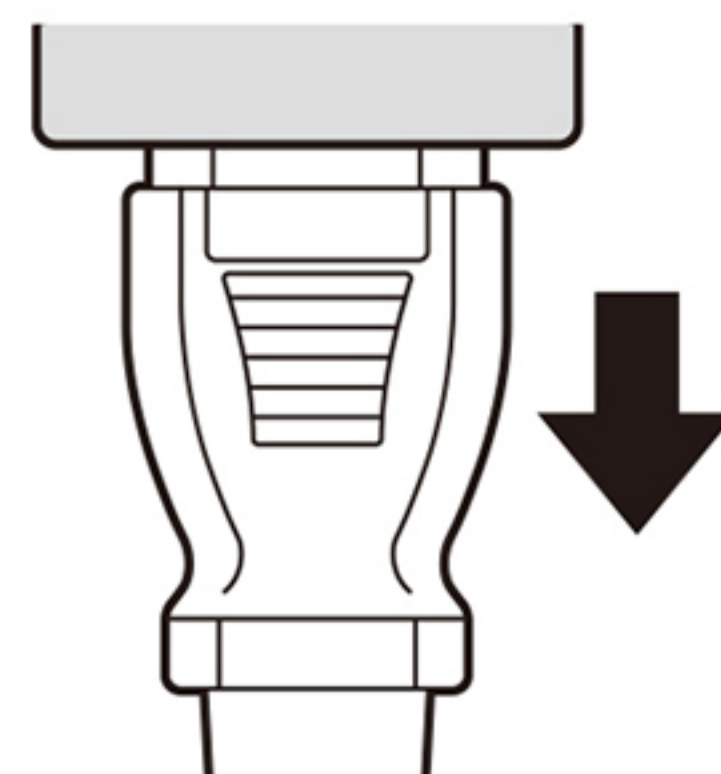
NOTE

- Use 15 amp or greater grounded outlet
- Make sure cables are not damaged

When removing the plug, hold onto the plug and not the cord.

⚠ Attention

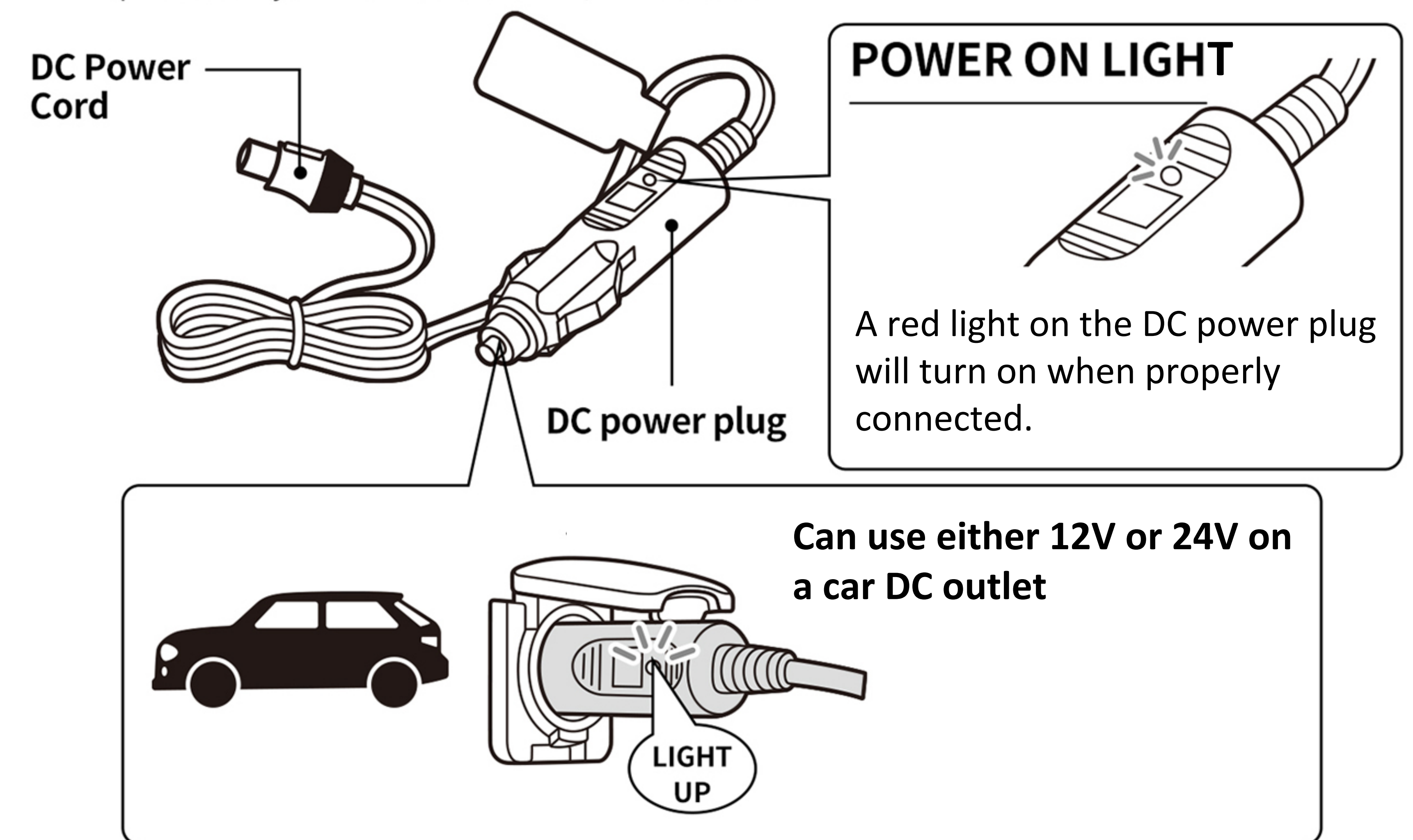
Please do not drag the cord when you remove the connector body or AC power plug. it may damage the cord and plug.



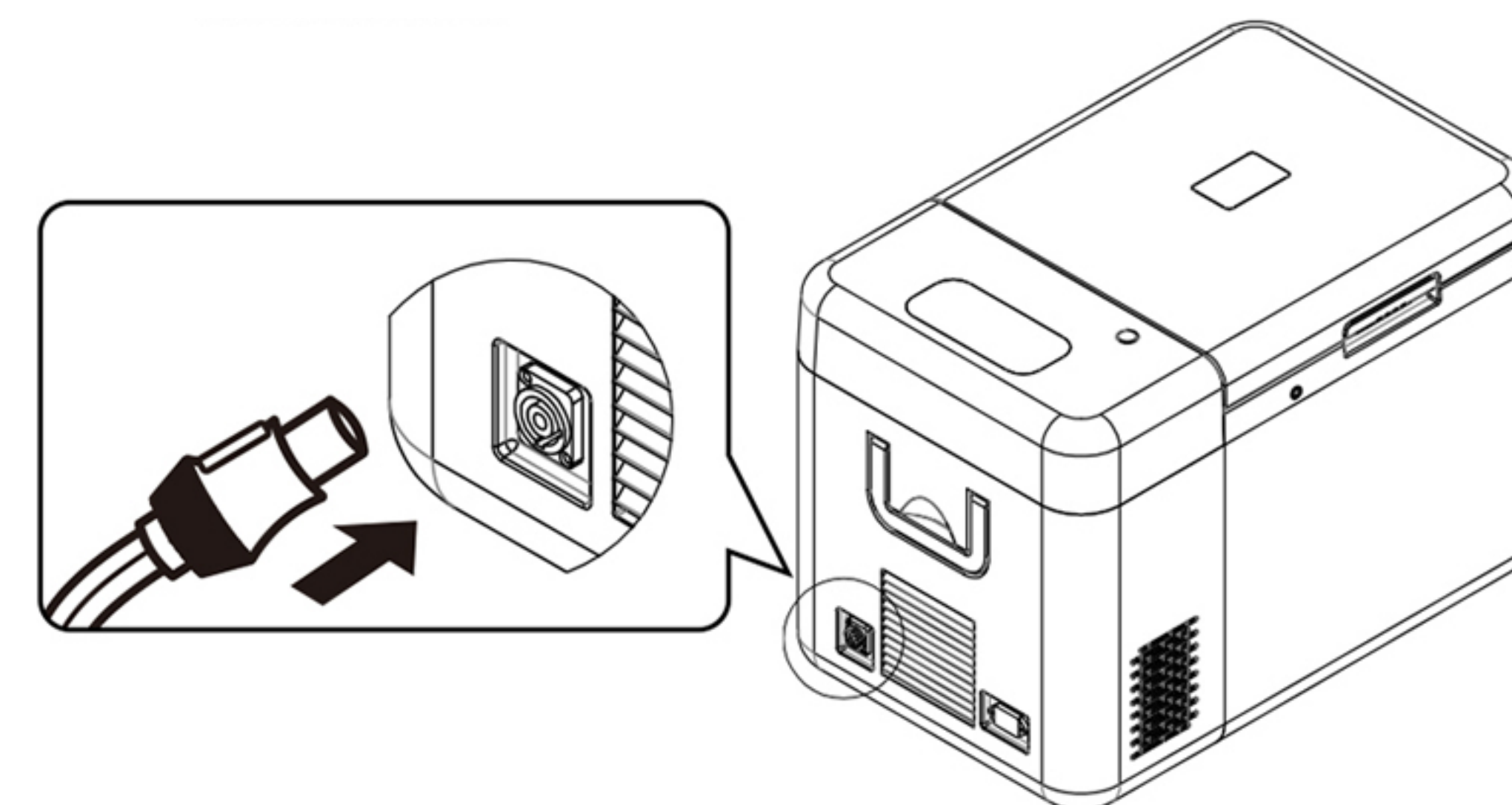
UNPACKING AND SET-UP

B. TO USE THE DC POWER CORD IN A MOTOR VEHICLE

- Make sure the freezer remains level. Exceeding an angle of 12 degrees may cause loss of cooling.
- Plug the DC Power Cord into a 12V/15A or 24V/10A outlet (Consult your automotive specialist if your vehicle lacks 12V/15A outlets.



- Plug the opposite end of the cord into the freezer, by pressing it firmly into the connection port and turning clockwise until a click is heard.



⚠ Attention

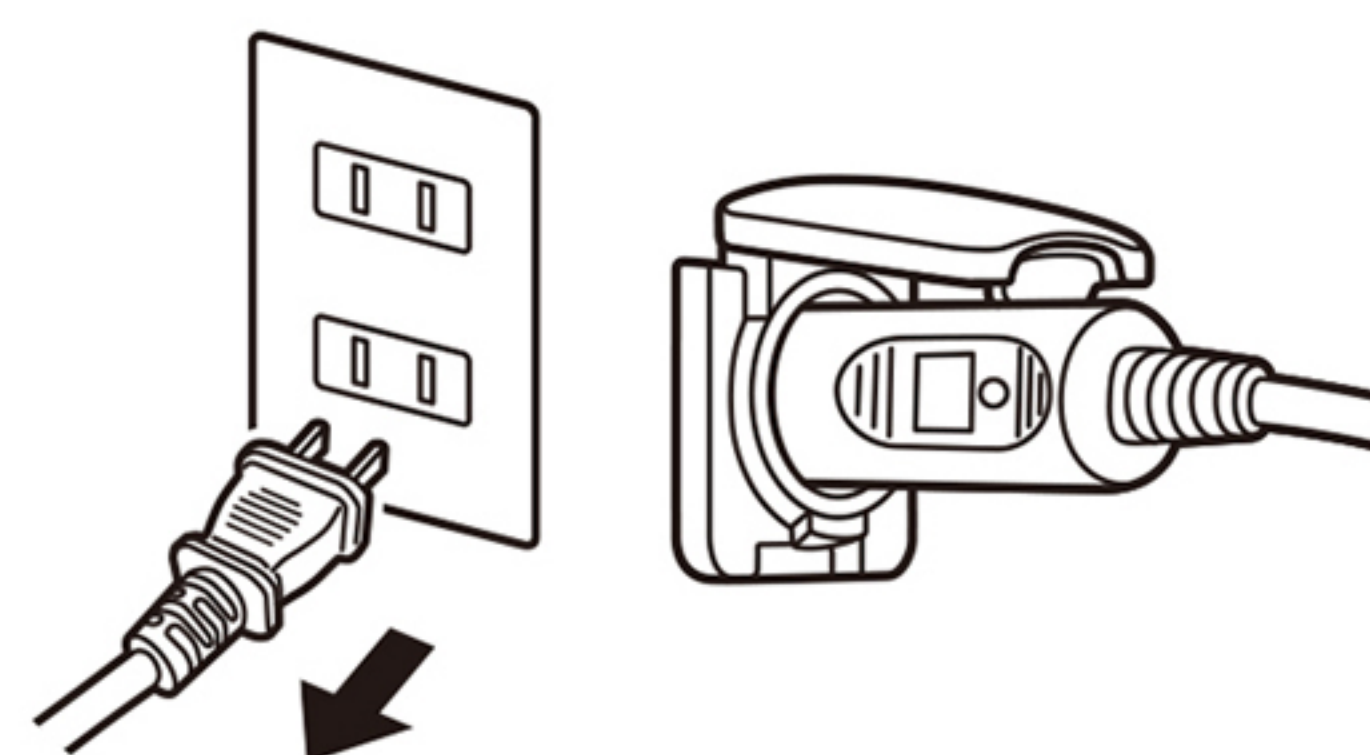
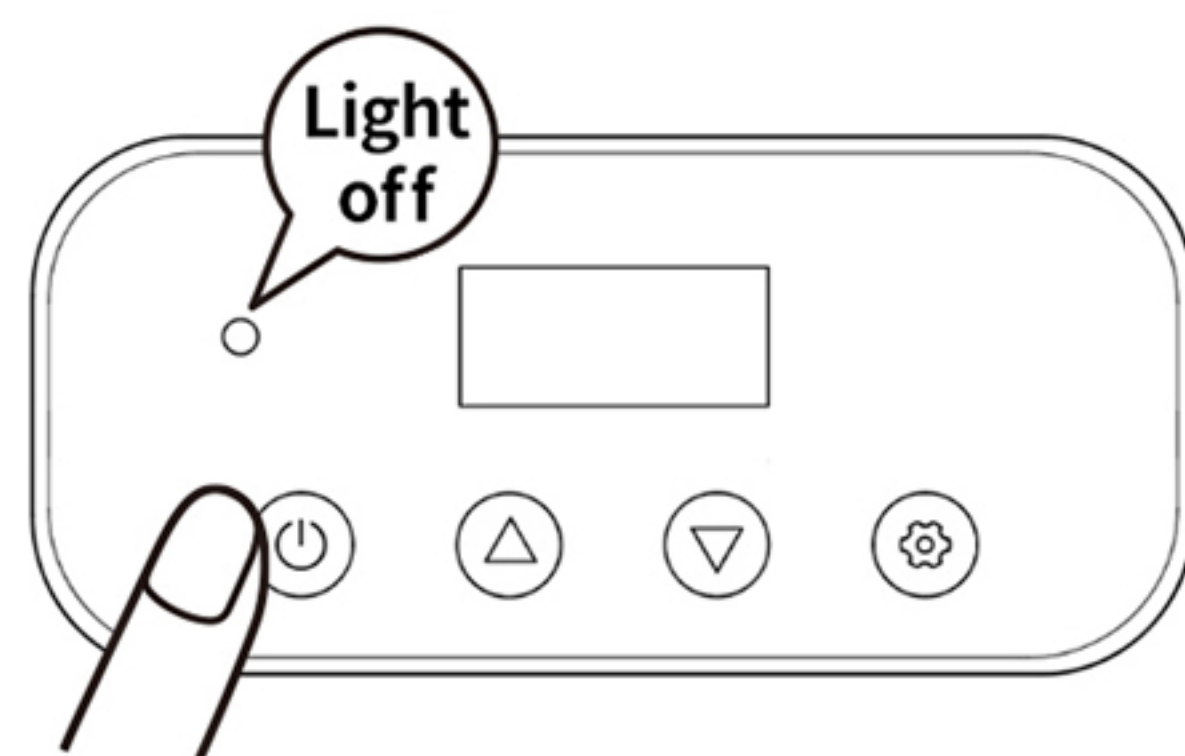
Make sure the connection is tight and secure

UNPACKING AND SET-UP

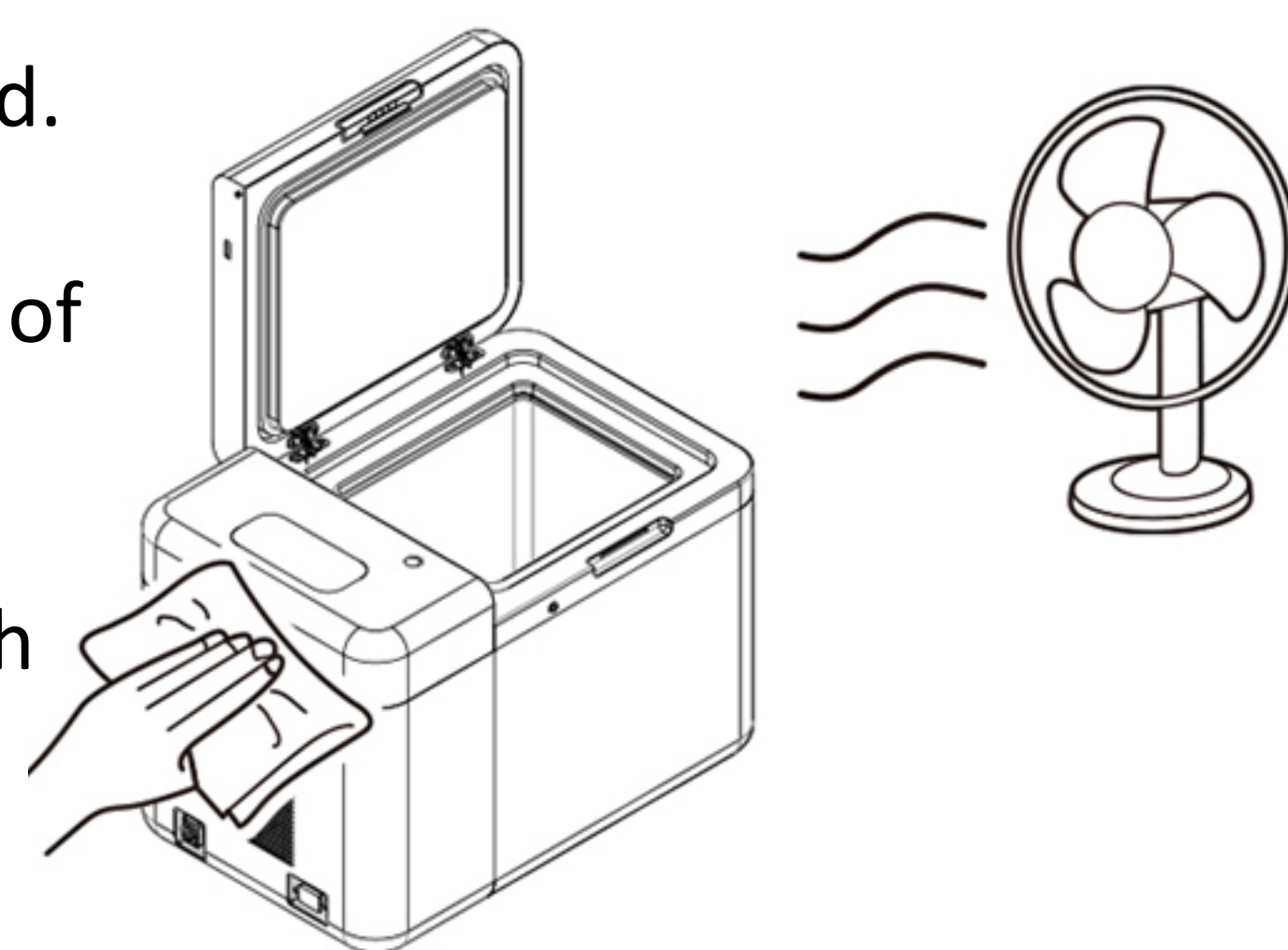
! Attention

DISCONNECTING FROM POWER

1. To turn off the freezer, press the Power button. The light will turn off.
2. Unplug the freezer after the Power light has turned off.

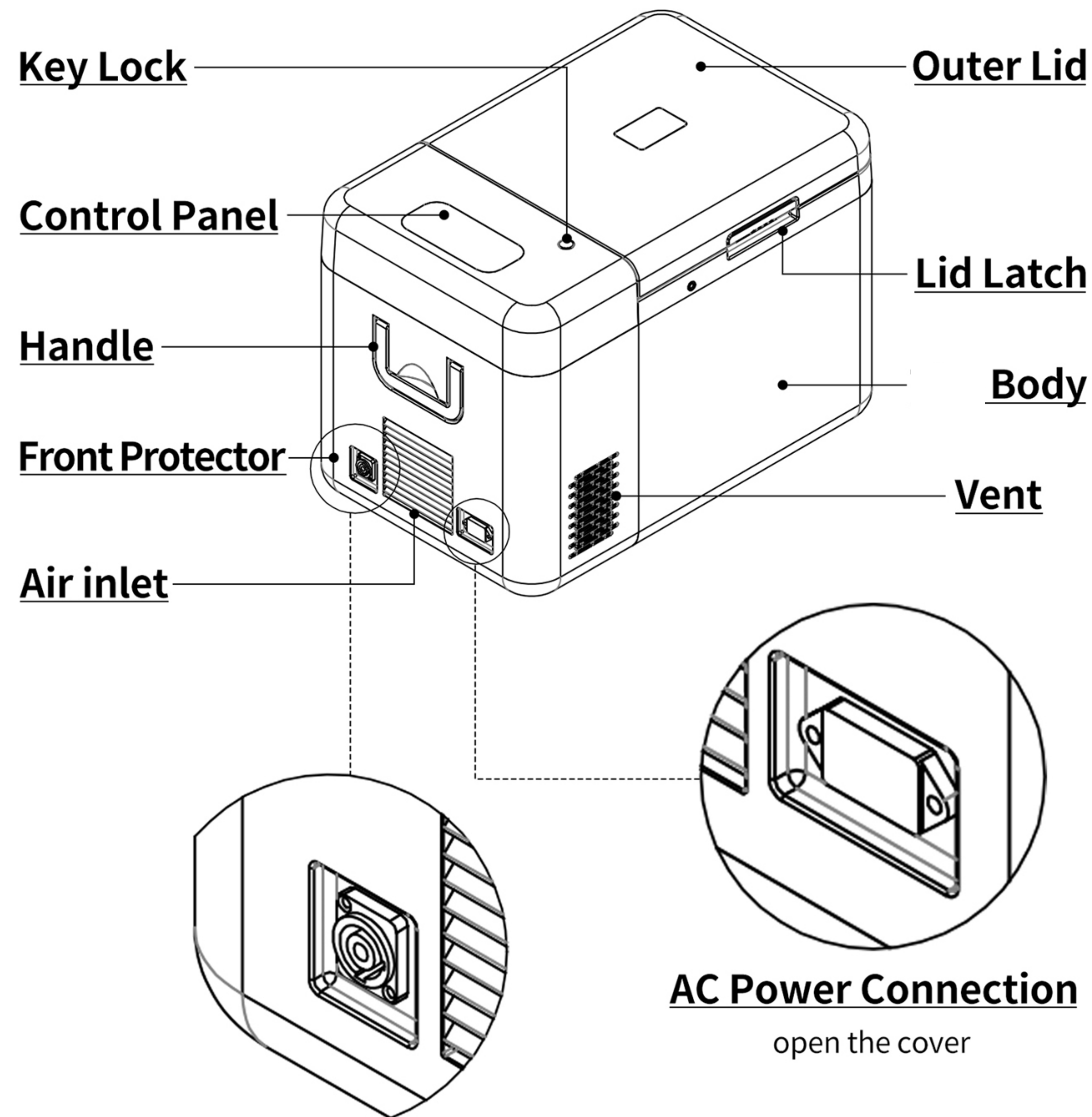


3. If the power is interrupted while running, a sharp noise may be heard. This is due to the Stirling engine shutting down and is not indicative of damage.



4. Clean the freezer with a soft cloth after it has returned to room temperature. Store in a well ventilated space.

FEATURES OF THE FREEZER

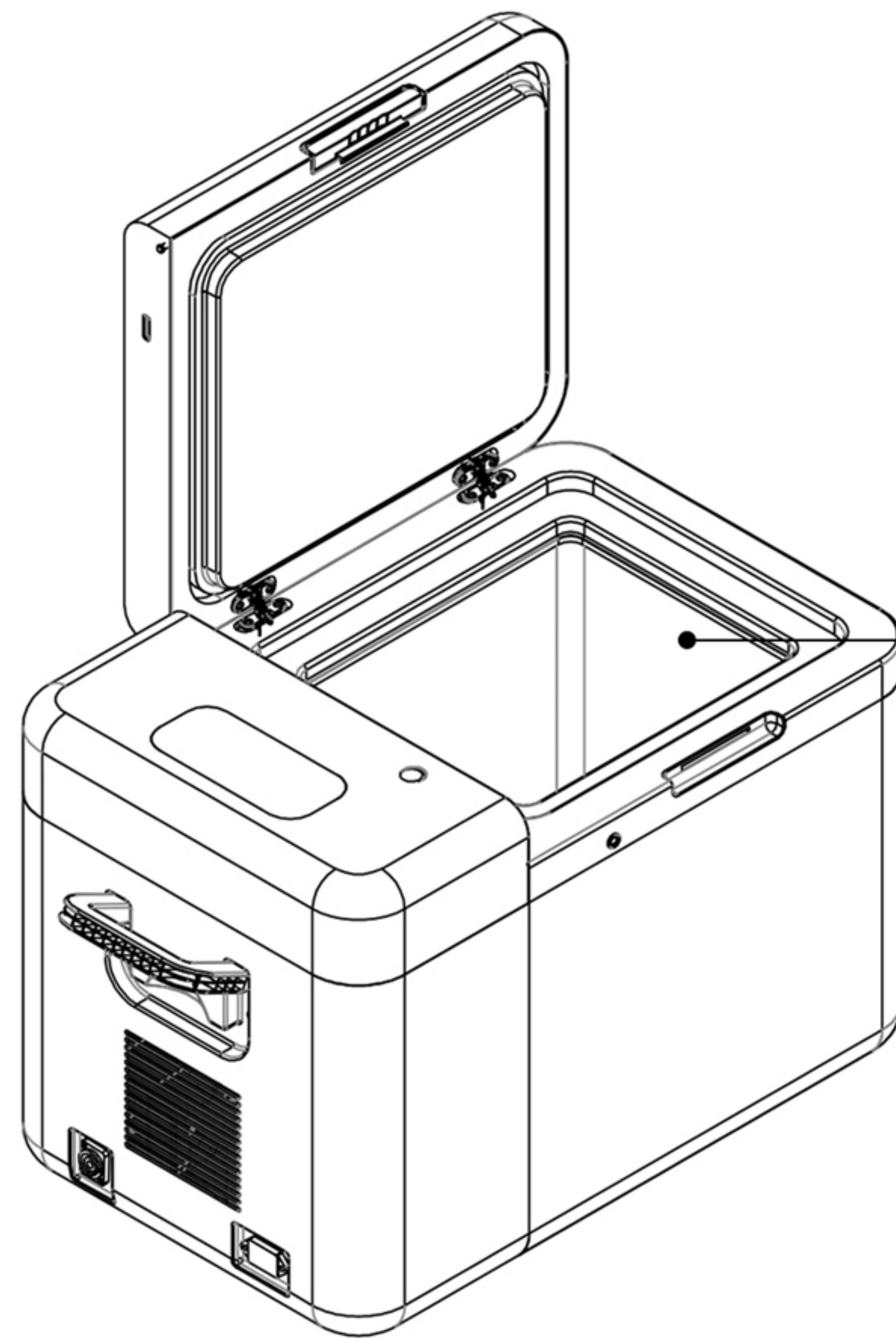


DC Power Connection

AC Power Connection

open the cover

DIAGRAMS



Freeze Chamber

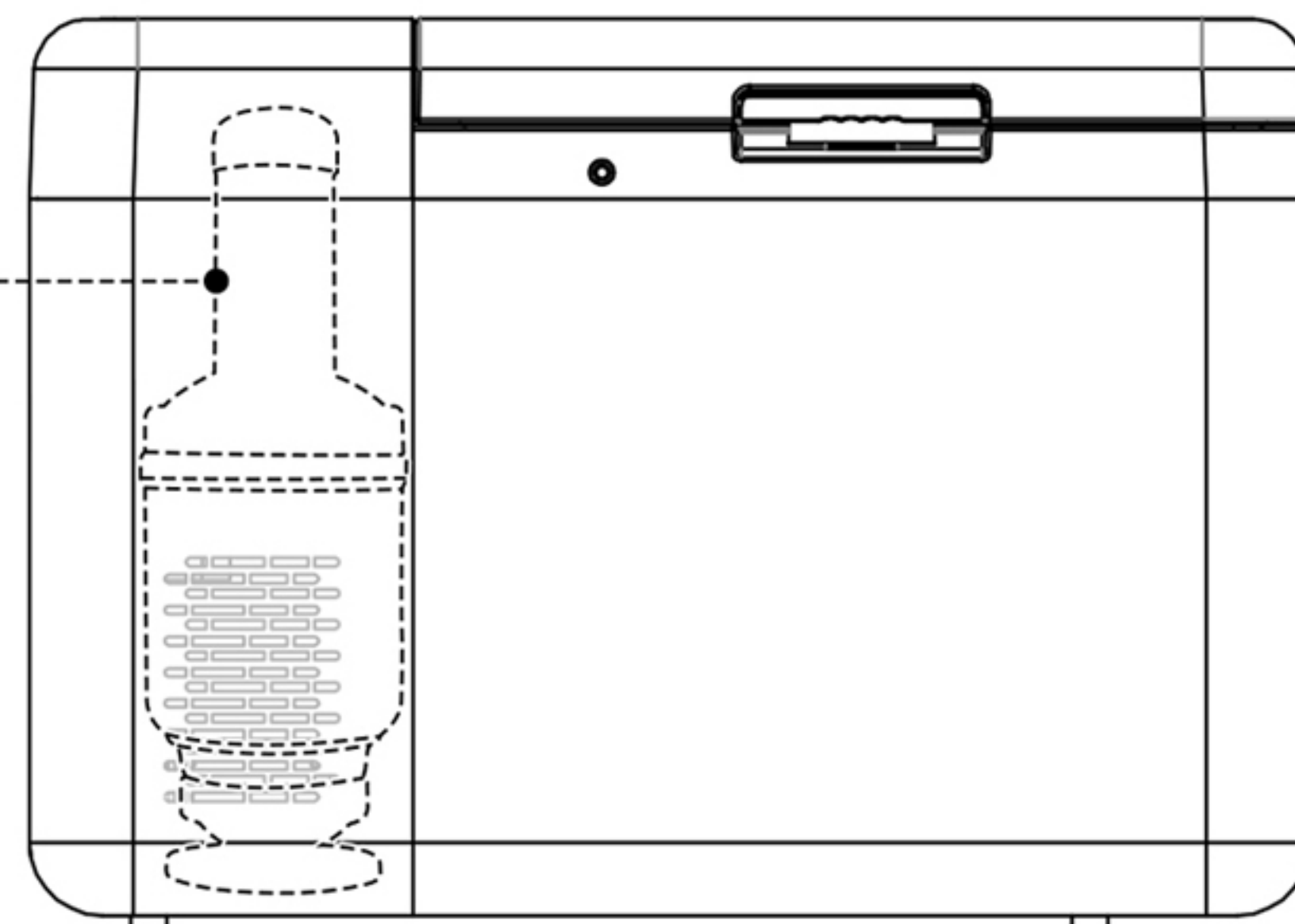
⚠ Attention

Never handle samples or freezer accessories with bare hands.
At -86°C frostbite can occur instantly.

Free-piston Stirling engine

This freezer is driven by a Free-piston Stirling engine for reduced weight and increased efficiency.

A Stirling engine is a heat engine that is operated by the cyclic compression and expansion of a gas between different temperatures, resulting in a net conversion of heat energy to mechanical work.



SPECIFICATIONS

Electric Power	100V-240V ($\pm 10\%$) AC; 50Hz; 12V/24V DC from mobile source
Maximum Power (Current)	110W(0.5A@220V,4.6A@24V)
Electric Power Range	110V-264V,50Hz
Electric Supply Rating	8 amp or greater grounded circuit
Cooling Engine	Free-piston Stirling engine
Type	DW-4525, DW-6025, DW-8625
Refrigerant	R-170 (Ethane)
Temperature Range	DW-4525, +25°C to -45°C DW-6025, +25°C to -60°C DW-8625, +25°C to -86°C temperature coherence $\pm 1^\circ\text{C}$, adjustable in 1°C increments
Work ambient Temperature	+5°C to +32°C
Environmental Conditions	Non-corrosive, non-flammable, non-explosive
Storage Volume	25L
Interior Dimensions	300x 250x 300 mm (L x W x D)
Exterior Dimensions	616x 392x 455 mm (L x W x D)
Net Weight, Empty	17.5kg
Insulation	High performance vacuum insulated panels and polyurethane foam
Noise	<55 dB(A) at 1 meter
Control Sensor	One RTD (PT100 Class A)
Refrigerating medium	helium (He)
Pull-Down from 25°C Ambient	DW-4525, 3 hours at -45°C (Empty Cabinet) DW-6025, 4 hours at -60°C (Empty Cabinet) DW-8625, 6 hours at -86°C (Empty Cabinet)
Steady State Energy Use 25°C Ambient	DW-4525, average power 30 watts at -45°C (Empty Cabinet) DW-6025, average power 40 watts at -60°C (Empty Cabinet) DW-8625, average power 70 watts at -86°C (Empty Cabinet)
Temperature Alarm	DW-4525, NO; DW-6025, NO; DW-8625, Over set temperature $\pm 10^\circ\text{C}$;

FREEZER OPERATION

● How to turn the freezer on

The freezer will automatically turn on when connected to the power supply.

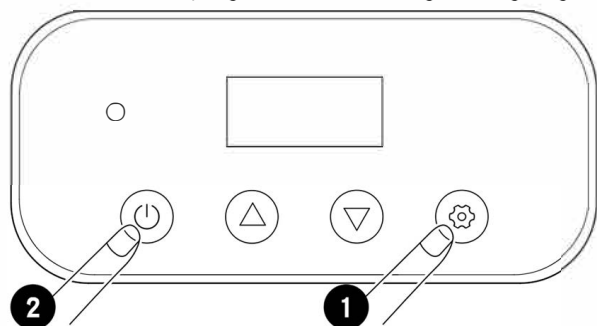
● How to power on/off Stirling engine

1. Power on Stirling engine

Press 「☸」 button, then hold 「⏻」 button for 3~5 seconds. The operation light will light up with a beeping sound, indicating Stirling engine start.

2. Power off Stirling engine

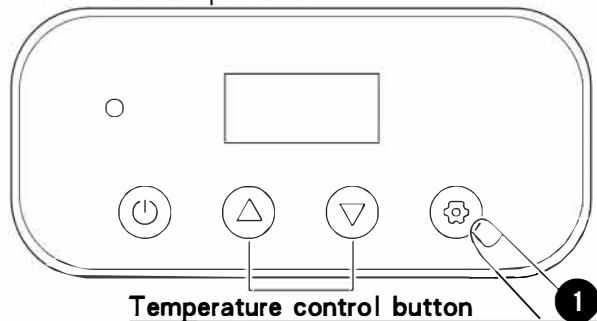
Press 「☸」 button, then hold 「⏻」 button for 3~5 seconds. The operation light will turn off with a beeping sound, indicating Stirling engine stop.



● How to change the temperature

Press 「☸」 button, the display then shows the current set temperature. Press 「▲」 button to increase by 1°C, press 「▼」 button to decrease by 1°C.

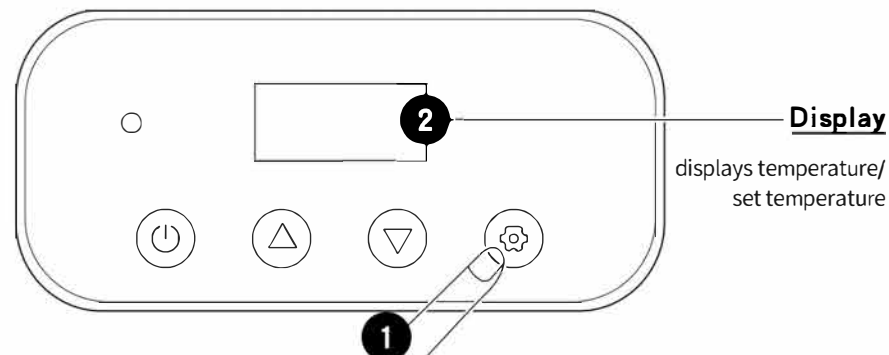
Press 「☸」 button once the desired Setpoint is achieved. The display will then show the current freezer temperature.



FREEZER OPERATION

● To see the set temperature

Press the 「☸」 button, the display will show the set temperature.



● Over-temperature alarm

If the freezer compartment temperature is 10°C warmer or colder than the Set point for five minutes, it will go into temperature alarm mode.

✓ The freezer will make a double beeping sound every 10 seconds.

✓ Situations which can affect the freezer's ability to maintain a steady state or cooling rate include:

- The lid is ajar
- The air vents are blocked
- Power supply problems
- Addition of a large relatively warm mass
- Mechanical and/or electrical problems

✓ Press the 「⏻」 button to turn off the audible alarm for 1 hour.

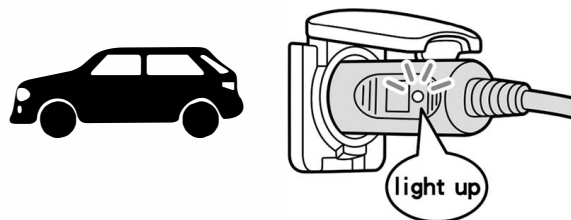
● How to switch between power supplies

The freezer should be turned off when you need to switch between power supplies.

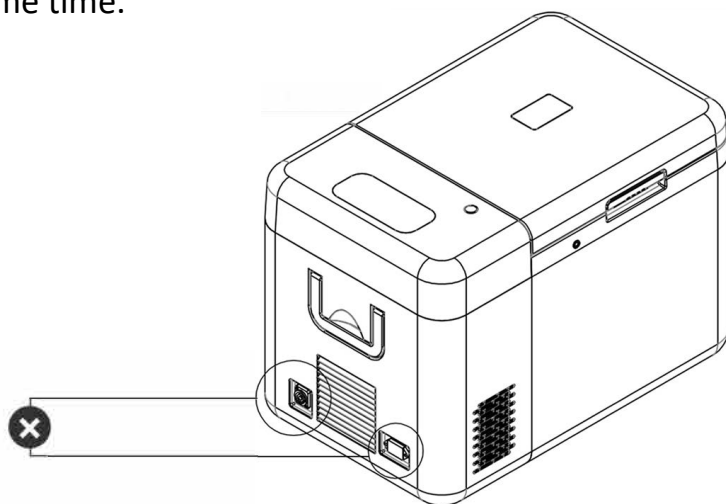
- Turn OFF the freezer (Press 「⏻」 button).
- Wait for the free-piston Stirling engine to slow and stop (10 seconds).
- Unplug the freezer from the current power source and plug into the new power source.
- The freezer can be restarted immediately, no wait time is necessary.

NOTES ON OPERATION IN A VEHICLE

- The freezer can run on either 12V or 24V DC power.



- The freezer will shut down automatically if the DC power supplies less than 9V, to avoid damaging the vehicle battery system.
- Do not operate in an unattended vehicle. This may lead to overheating if left in the sun.
- The DC and AC Power connections cannot be used at the same time.



TROUBLESHOOTING

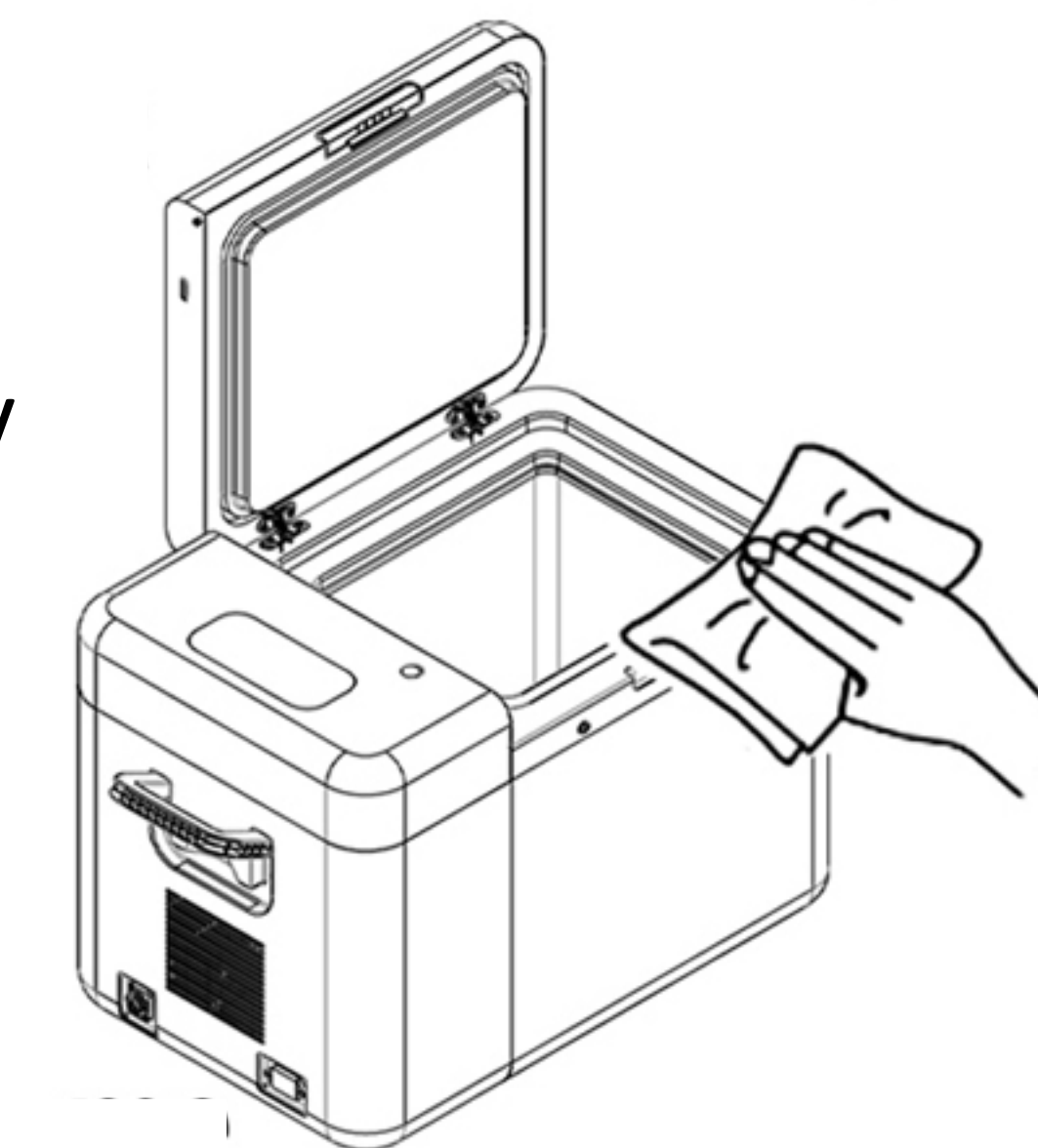
Problem	Possible Cause	Solution
Freezer does not power on	Power is not getting to the freezer from the AC input	Check the connections to the power supply Assure that the wall plug is firmly seated
	Power is not getting to the freezer from the DC input	Reseat the connections to the DC power cord Assure that the DC input has live power Replace any blown automobile fuses
Freezer does not achieve desired temperature	Inadequate air circulation	Clean the Air inlet
		Remove air flow obstructions
	Inadequate power supply	Assure that the wall plug is firmly seated
		Remove any dirt or debris inside the automotive DC socket or on the plug Operate freezer only when automobile is running
Improper environment	Remove freezer from direct sunlight, hot room, etc	
	Check that freezer is level. Tilts of more than 12 degrees in some directions will degrade performance	
Freezer cools slowly	Overloading of freezer	Remove some items from freezer
	Lid is not completely closed	Check for ice buildup, remove if necessary, and properly close lid
	Lid is open and closed too often	Minimize opening and closing of lid
	Inadequate air circulation	Clean and unblock air vents
12V plug becomes unusually hot	Dirt or corrosion in the DC socket	Clean the socket

ERROR CODES

Problem	Possible Cause	Solution
EC01	Input voltage is too low	Check the power supply voltage
EC02	Input voltage is too high	Check the power supply voltage
EC03	The compressor temperature is too high	Shut down the freezer and let it cool down, then restart the freezer.
EC04	Compressor temperature monitoring module damage	Return to the factory for repairing.
EC05	Temperature control sensor anomaly	Return to the factory for repairing
EC06	Current too high	Check the power supply current and use the customized power adapter
EC07	Control system short circuit	Shut down the freezer immediately and return to the factory for repairing
EC08	Fan failed	Shut down the freezer immediately and return to the factory for repairing

STORAGE, CLEANING AND MAINTENANCE

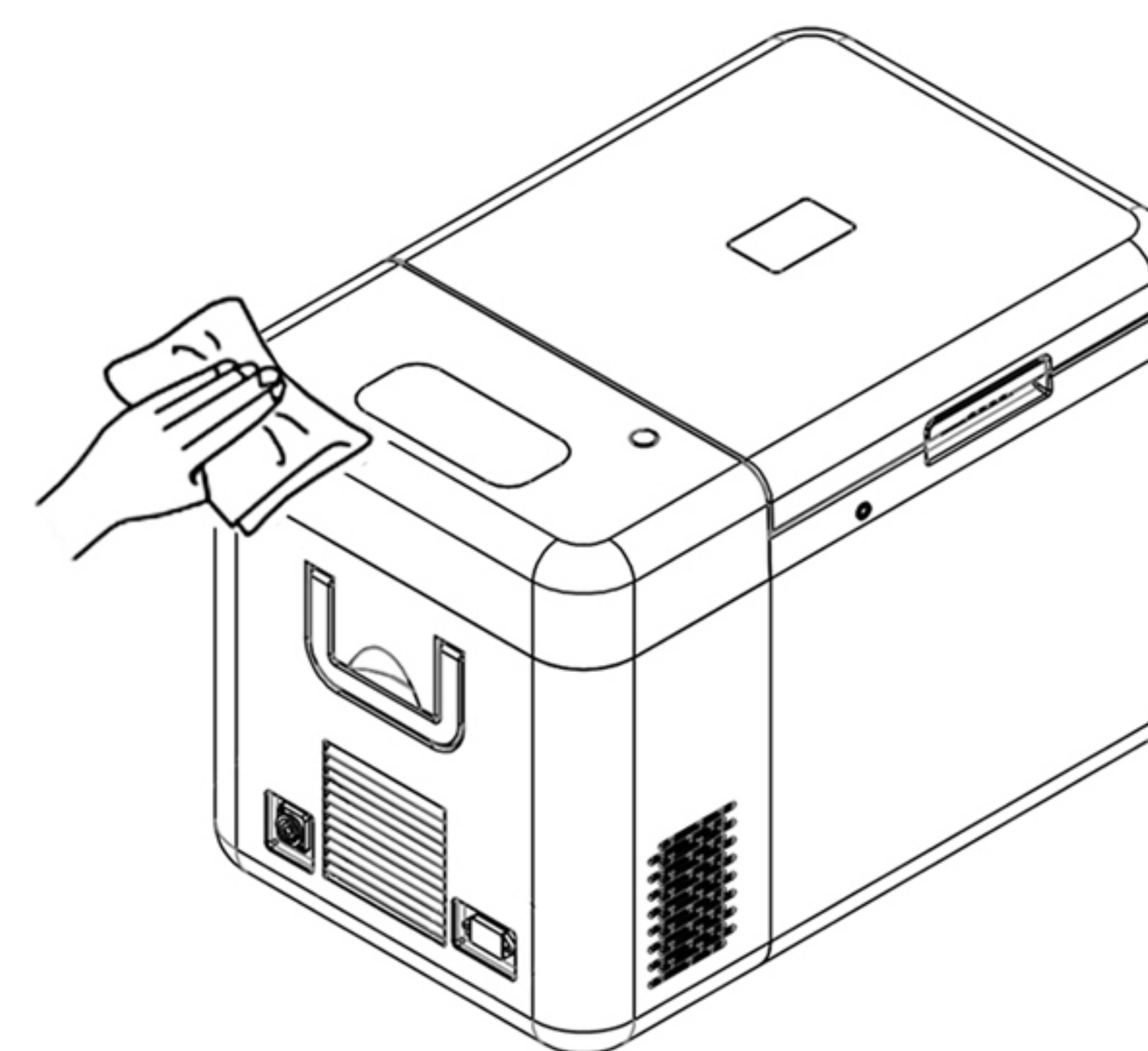
Moisture can form near the door due to the large temperature difference between the ambient temperature and the inside of the freezer. Wipe any water near the openings to prevent ice accumulation. Do not use sharp instruments to scrape ice from the surface.



To clean the inside chamber:

- Turn off the power and allow the freezer to come to room temperature.
- Dry the inside chamber and clean any spills using a soft cloth.

The exterior surfaces can be cleaned as needed by using a soft cloth and mild detergent. Do not use solvent or harsh abrasive cleansers or pads.



⚠ Attention

Do not immerse in water or washing the unit.

Do not use solvents to clean.

