



# LIVING ENERGY LIGHTS

## User Manual for SunStar Solar Direct refrigerator/freezer

The SunStar 8cuft Solar Direct Refrigerator/Freezer was custom made by Solar Freeze LLC for Living Energy Lights. Contact LEL at any time for support at 540-205-0433 or [info@livingenergylights.com](mailto:info@livingenergylights.com).

### Notices and Routine Maintenance

**1. After the unit has been moved, wait at least a half an hour before running the compressor.**

2. This unit is SOLAR DIRECT and as such, the compressor will NOT run at night or during periods of consistent heavy overcast. (Depending on the wattage, the compressor will run during light overcast and passing clouds.) For best performance:

a) Maintain sufficient cold THERMAL MASS in the cabinet to stabilize the temperature when the compressor is not running. Any dense material- such as jugs of water- will work, if there is not enough food in the cabinet.

b) Allow any hot food to cool to room temperature before placing in the cabinet.

c) Whenever possible, food should be added to the cabinet EARLY IN THE DAY to ensure that the ambient temperature of the unit does not rise at night, when the compressor cannot run.

d) Do not open the door more than necessary, particularly at night and during periods of heavy overcast.

3. Acids, alkaline, corrosive substances, volatile, or flammable materials should not be stored in case of damage to the cabinet of the unit.

4. How to clean your SunStar unit:

a) Turn dial on control panel to stop position and unplug the unit from the wall.

b) Wipe down the interior walls with a soft cloth dipped in neutral detergent.

c) Drain the condensed water or wipe it off with a dry clean cloth.

d) The outside of the unit can be cleaned with thin soda water or alcohol and then wiped clean with a damp cloth.

5. Every six months, wipe off the dust that has accumulated on the condenser, fan, and compressor.

LEL Tech Support: 540 205 0433

## Disclaimer and Safety Considerations

1. The manufacturer, Solar Freeze LLC, and the designer and distributor, Living Energy Lights, are not liable for incidental or consequential damages that occur as a result of the use of this product. The user assumes all responsibility and risk connected to the use or misuse of this product.
2. The user acknowledges that this product is SOLAR DIRECT and as such, product performance depends upon solar conditions and management by the user.
3. This unit is designed for direct connection to a photovoltaic (PV) supply of 100-250W and 10-45V DC. **Do not connect the unit to an outlet that supplies AC electricity, or DC electricity over 45V; as this will destroy the compressor.** Grid power is 120V AC and will destroy the unit if used.
4. Unplug the unit if it is to be left unused for a long period of time.

## Packing list

1. Refrigerator/Freezer
2. User Manual
3. Suspending Basket

## External Appearance



## Technical Parameters

Product Model: SunStar ST-8CF-SD

Input Voltage: 10V-45V, 30-40VMP is recommended

Minimum Input Wattage: 100-250W, higher in cloudy climates

Power Draw: 60W

Available Capacity: 8 cu ft, 225L

Refrigerant Type: R134A

Compressor/controller: Secop BD35F 101N0420

Net weight: 153lb, 70kg

External dimensions: 41in x 28.6in x 37in, 103cm x 78cm x 93cm

## Installation

### Mounting the Solar Panel

SunStar ST-8CF-SD should be connected directly to a PV supply of 10-45V and at least 100W. **Do not connect the unit to any electric supply this is not DC, or over 45V; as this will destroy the compressor.** In most locations, 200W of PV input is recommended. More wattage will allow the compressor to run in overcast conditions.

Panels should be fastened securely to a roof or other structure in full sun. Panels should face approximately south when mounted. The angle of the panel is relative to the ground determined by your latitude. In Virginia, the optimal solar angle for fixed solar panels is around 30 degrees from horizontal. Most of the Caribbean has an optimal angle for solar panels close to 20 degrees from horizontal. A good calculator for solar panel angles based on zip code can be found at <https://footprinthero.com/solar-panel-angle-by-zip-code>. Tilting the panels seasonally will improve the performance of your system. The solar panel must be kept clean and free of obstruction. Even a slight obstruction on the panel can reduce the energy output of the panel by a large amount.

LEL may provide a cable that is custom cut for your system. One end of this cable has MC4 connectors, which connect to the PV panel. The cable should then run into your house and connect to the unit. When setting up your cable, be sure that it is securely mounted in such a way as to protect the cable and its insulation from damage. We do not recommend running the cable through a door or window, where it is likely to be damaged.

### Transportation and Setup

Whenever the unit is moved, the angle of inclination should not be more than 45 degrees. Keep the unit steady while in transit.

The unit should be placed in a well ventilated, dry place. Avoid exposure to direct sunlight. Place the unit on a sturdy and level floor. **After the unit has been moved, wait at least a half an hour before running the compressor.**

Remove the packaging material from inside and outside the unit before use. Arrange for the unit to be no less than six inches from the wall at the back and side. Note, the refrigerator dissipates heat on the right side. Make sure there is adequate air circulation on the right side of the unit.

## Startup and Temperature Control

Turn the control dial from the stop position to the desired number 1-7. If there is sun on the panel, compressor will start up and the machine will begin to refrigerate or freeze. If dial is set to 2 or below, the unit will refrigerate and will not freeze. If the dial is set to 3 or above, the unit will run as a freezer.

If the dial is set to 7 (“fast freeze”), the compressor will run whenever possible. It is not recommended to leave the unit at the setting for extended periods of time.

Note that it takes sufficient thermal mass AND several sunny days for the unit to effectively maintain freezing temperatures. In periods of clouds or insufficient thermal mass, food items may need to be stored at the bottom of the cabin to avoid thawing.

## Red Indicator Light

Protection signal of the controller is a red indicator light next to the temperature dial. It will flash a number of times if a fault occurs. Count the number of flashes and compare with the chart below.

Number of flashes	
1	<b>Voltage cut-out.</b> The voltage is too low for the unit to run, likely because of low light conditions.
2	<b>Too many start attempts or fan over current.</b> Too many compressor or fan starts in short time or fan current higher than 0.5Aavg.
3	<b>Motor start error.</b> The rotor is blocked or the differential pressure in the refrigeration system is too high (>5 bar).
4	<b>Minimum motor speed error.</b> If the refrigeration system is too heavily loaded, the motor cannot maintain minimum speed at approximately 1,850 rpm.
5	<b>Thermal cut-out of electronic unit.</b> If the refrigeration system has been too heavily loaded, or if the ambient temperature is high, the electronic unit will run too hot.
6	<b>TOOL4COOL® Thermostat failure.</b> If the NTC thermistor is short-circuit or has no connection.

## Grounding and Lightening Protection

While not required, we strongly recommend installing a surge arrester on the circuit that powers your refrigerator/freezer. A surge arrester will provide protection from electrical surges that can happen during thunderstorms, which might damage the controller/ compressor.

For a surge arrester to work, it must be grounded. To do this, an electrical connection must be made between the green ground wire extending from the surge arrester, and a ground rod or network of ground rods. We also recommend grounding your PV panel by connecting the frame of your panel to a ground rod or network of ground rods. Consult an electrician for more guidance on effective grounding.

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