SUN FROST

OPERATING INSTRUCTIONS FOR THE RF-16
16 CUBIC FOOT REFRIGERATOR-FREEZER

Installation

The cooling system on the RF-16 is located on top of the unit. Heat is given off by this system, making ventilation above the unit necessary. Allow at least 8" of clear space above the refrigerator for this purpose. For more convenient access, we recommend the SUN FROST RF-16 be mounted on a cabinet approximately 12-14 inches (30-35 cm) high. This height may be varied according to individual preference.

You will also notice a pair of brackets located on top of the refrigerator, mounted towards the rear of the "shroud." These allow the unit to be secured to the wall, and will prevent tipping if a child climbs or pulls on the open door.

Power Supply -- A.C. Models

To start the unit, simply plug the unit into an 115 volt A.C. wall outlet, and set the thermostat to the appropriate temperature. *(See Thermostat Adjustment)*

Power Supply -- D.C. Models

SUN FROST units operating on Direct Current ***must*** be connected directly to a battery, which may then be charged by photovoltaics, wind power, a battery charger, or other appropriate energy source. It is important to ***check polarity*** when connecting the batteries. Reversing the polarity will cause the fuse to blow, and may permanently damage the electronic unit. In general, red indicates the positive lead, and black indicates the negative lead. *(See Thermostat Adjustment)*

Proper system voltage must be maintained at all times: Between 11.0 V to 15.5 V for the 12 volt systems, and 22.0 V to 31.0 V for 24 volt systems. Always install a charge controller between battery bank and the power source (PV panels, wind generator, etc.)

Fuses

The compressors used on Sun Frost DC models require the use of an electronic control unit, which is the black box located on top of the refrigerator next to the compressor. The electronic units come equipped with two-prong automotive "blade" fuses -- 12 volt models use a 15 amp fuse, and 24 volt models use a 7.5 amp fuse. Extra fuses are shipped with the refrigerator, and may also be obtained at any auto supply store.

In addition, the interior light for the refrigerator compartment is protected by a 2 amp "fast blow" fuse, which is housed in a black in-line fuse holder located on top of the refrigerator. This is a low voltage light on all models: On AC models a 12 volt transformer is used, while on 12 and 24 volt models the light is direct-wired.

Electrical Requirements

System voltage must be maintained at proper levels (see accompanying table). Failure to do so may result in damage to batteries or the electronic control unit. In order to assure that proper system voltage is maintained at all times, a charge controller ***must be installed*** between battery bank and power source (photovoltaic panels, generator, etc.)

Electrical Specifications
DC dual-compressor models

	12V Model	24V Model
System Voltage	11.0 - 15.5 VDC	22.0 - 31.0 VDC
Max. Current Draw (Running)	9.0 - 10.0 amp	4.5 - 5.0 amp
Max. Current Draw (Starting)	20.0 amp	10.0 amp

In order to keep voltage loss to a minimum, it is essential to use wire of sufficient size when connecting the refrigerator to battery bank. The table below gives the maximum lead lengths allowable for any particular wire size.

Lead Dimensions
dual-compressor models

Wire Gauge	Max Length 12V Model	Max Length 24V Model
#16	3 ft.	6 ft.
#14	5	10
#12	8	16
#10	13	26
#8	21	41
#6	33	65
#4	52	104
#3	65	131
#2	83	165

Thermostat Adjustment

To locate the temperature controls, open the top door and look up under the shroud. The two grey boxes are the thermostats. In the RF-16 the cooling systems for the refrigerator and freezer compartments function independently of each other, and are each controlled by a separate thermostat. The one on the left regulates the temperature in the refrigerator section, and the one on the rights controls the freezer.

The thermostat dials are turned clockwise to the warmest setting before leaving the factory. To "turn on" the unit, first connect the power supply (plug in AC models), then rotate the dial counter-clockwise until the blue line is between the two prongs. (The inner scale reads degrees Celsius, and the outer scale reads degrees Fahrenheit.)

The refrigerator section should typically be run between 35°F and 44°F (2°C and 7°C). The freezer thermostat is adjusted so that the freezer section will maintain 10°F (-12°C). If frozen food is to be stored for long periods (several months or longer) you may want to lower the freezer temperature. Use a thermometer to more precisely determine the temperature in the refrigerator and freezer compartments. It will take about six (6) hours from the time the unit is turned on for interior temperatures to stabilize.

NOTE: In units manufactured after June 1990, provisions have been made to allow for the installation of a replacement electronic thermostat in the event that the original thermostat fails. The leads for the

electronic thermostat sensor are located in the mechanical thermostat cover. ***In AC models it is important to unplug the unit before taking off the thermostat cover. Failure to do so may result in electric shock.***

Condensation

A small amount of condensation will form on the back wall of the refrigerator, which then drains out the tube located at the back of the refrigerator compartment. Before installing the unit, insert the drain tube extension into the outlet tube which extends from the bottom of the refrigerator, and run it to a convenient collection point or drain. A 44" x ¼" drain hose extension is provided for this purpose.

The easiest method of inserting the drain tube extension is to stand on the hinge side of the unit, and push against it so that one side lifts off the floor. Do not lift the side up more than five inches, and be sure that the weight of the refrigerator is not resting on the door. Support the refrigerator in this position with a block of wood. The drain tube outlet is located on the bottom of the unit, centered towards the back. Insert the drain tube extension provided into drain tube outlet.

Small amounts of moisture may collect in the gutter before draining, and occasionally mold may begin to grow. This problem can be prevented by placing one or two **drops** of household bleach into the gutter and down the drain tube each time it is cleaned. This tiny amount of bleach will not affect stored food.

Defrosting

Defrosting is advisable when frost on the ceiling of the freezer section becomes over ½ inch (1.5 cm) thick. This will generally be necessary once or twice a year, although you will find that the rate of build-up slows after the first ¼ inch of ice is formed.

The freezer section may be shut off by turning the freezer thermostat clockwise to 90°F. As the freezer section warms, ice will separate from the ceiling of the freezer section and may then be removed in large pieces. Do not pry off the ice with sharp metallic instruments. While the freezer is defrosting, the food from that section may be placed in the refrigerator compartment, which will still be running.

Frost in the Refrigerator Section

The refrigerator cooling elements are located in the back wall, and should not frost up under normal conditions. Some frost may form if the thermostat is set too low, however this will not affect the operation of the refrigerator unless it is becomes fairly thick.

To eliminate frost formation, try setting the thermostat 2-4° warmer. Defrosting may not be necessary, as the ice will melt and drain off in a matter of days.

Storage Conditions

The shelf life of fruits and vegetables will often be more than doubled in a Sun Frost because of the high humidity storage conditions maintained in the refrigerator section. This reduces wilting in vegetables and fruits, and keeps bread and other foods from drying out as rapidly.

In conventional refrigerators, vegetables are often kept in sealed drawers or plastic containers. This is unnecessary in a Sun Frost since there is adequate humidity present in the refrigerator section. Because fruits and vegetables store better if their oxygen supply is not cut off by a sealed container, we recommend storing food in breathable containers, such as paper bags.

The freezer compartment of the RF-16 also boasts higher humidity levels than conventional freezers, resulting in reduced freezer burn.

Energy Conservation

During conditions of reduced power production (extended cloudy weather, etc.) total energy consumption may be reduced significantly by shutting off either the refrigerator or freezer sections, as they operate independently. When both sections are operating, the freezer uses about two-thirds of the total energy, and the refrigerator one-third.

In regions where winter temperatures drop below freezing, the refrigerator section may be passively cooled by placing several gallon containers of frozen water inside. It is most effective to alternate two sets of containers, so that one is freezing while the other cools the refrigerator.

Note that lowering the thermostat setting will increase the energy consumption. The 10°F setting marked on the freezer thermostat dial represents an excellent compromise between energy conservation and optimal food storage. (As a reference, ice cream freezes at 15°F.)

Door Seal

A squeaking sound may occasionally be heard after the freezer door is closed, especially in hot weather. This sound is due to the air-tight construction of the RF-16. Warm air enters the freezer when the door is opened, and then contracts as it cools. This draws room air past the door seals, creating the sound you hear.

Shelves

The glass shelves in the refrigerator and freezer section are 3/16 inch tempered glass, and are adjustable. Additional shelves may be added to either section, and extra brackets are supplied for this purpose. Note the glass is tapered; the front is slightly wider than the back.

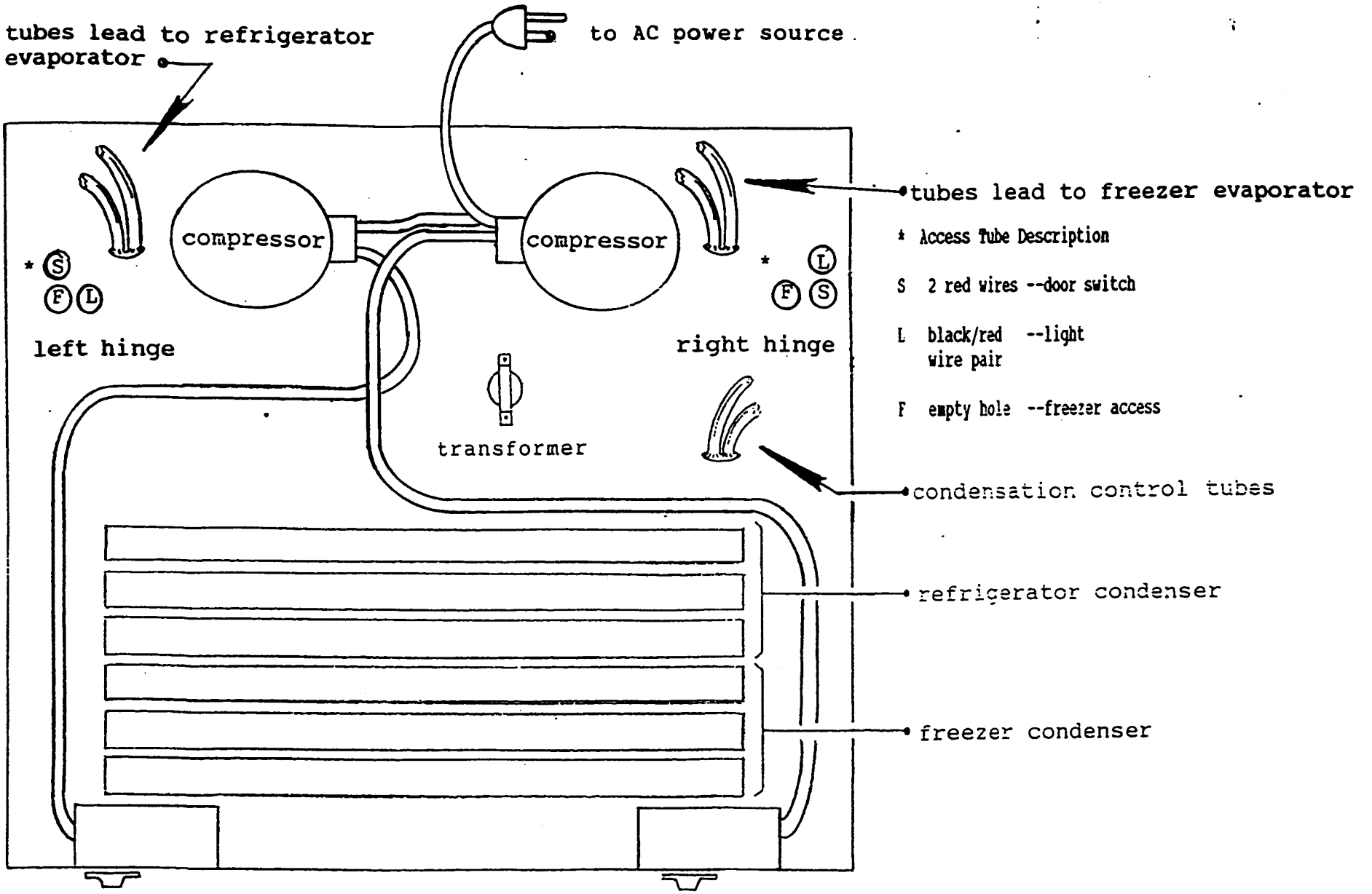
Door Catch Adjustment

The mounting holes on both the male and female parts of the door catches are slotted so that they may be positioned for best alignment.

Cleaning

Clean with a non-abrasive, Formica friendly cleanser. We recommend "Hope's Premium Couter Top Polish".

SUN FROST
P.O. Box 1101
Arcata, California 95521 USA
Tel. 1-707-822-9095
FAX 1-707-822-6213



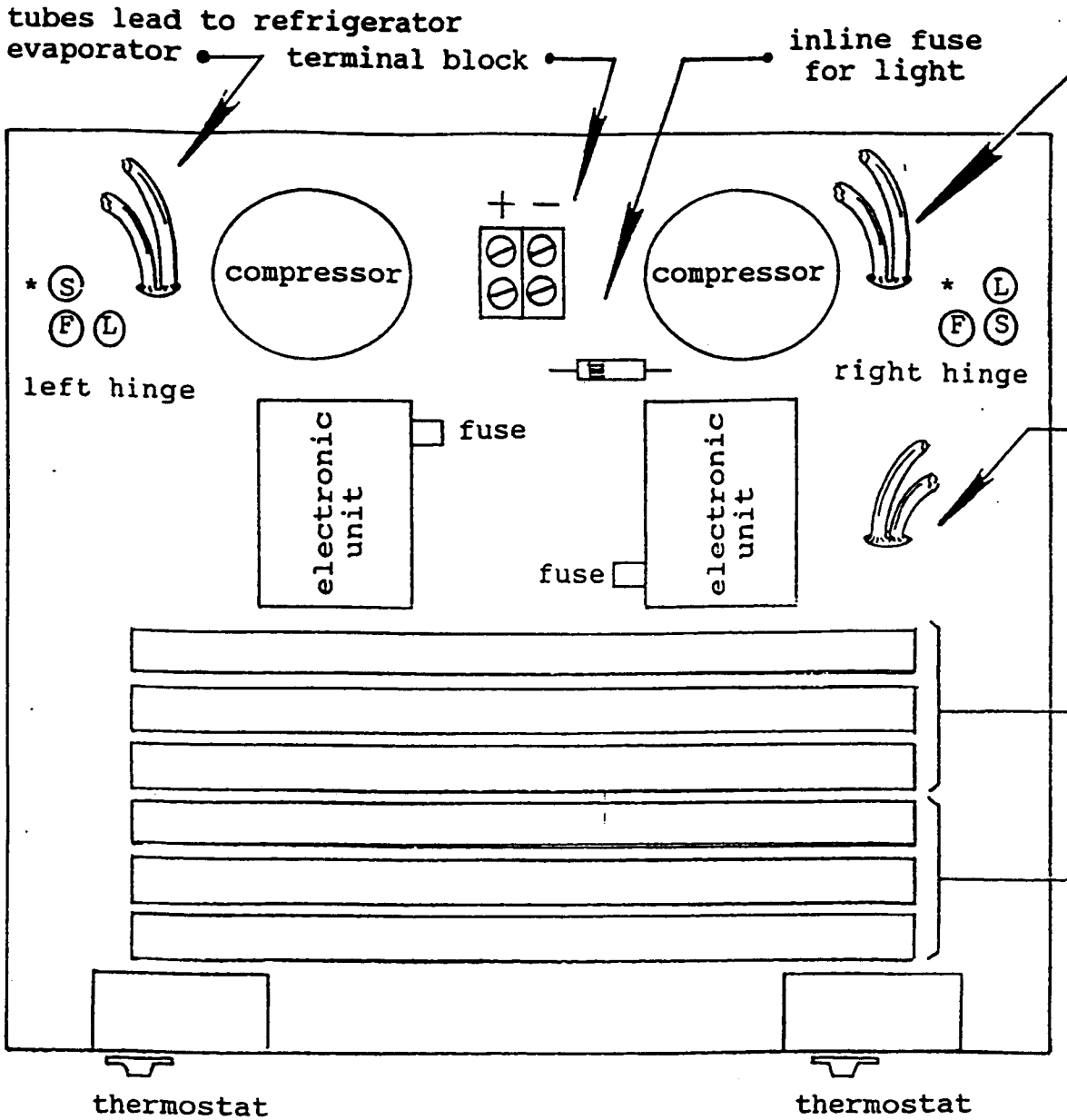
Extra gray and white wires inside of thermostats are connected to spare thermistors.

Freezer components right side
Refrigerator components left side

SUN FROST

Energy Efficient Refrigeration

Top View
RF 16 AC Model



* Access Tube Description

S 2 red wires --door switch

L black/red --light wire pair

F empty hole --freezer access

condensation control tubes

Fuse Ratings:
Electronic controller
24V system, 7.5 Amp
12V system, 15 Amp
Inline fuse for light, 2 Amp

refrigerator condenser

freezer condenser

Extra gray and white wires inside of thermostats are connected to spare thermistors.

Freezer components right side
Refrigerator components left side

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Energy Efficient Refrigeration

Top View RF16, DC models