



CARRIER COMMERCIAL REFRIGERATION, INC.

Providing BEVERAGE-AIR • FRIGIDAIRE • KELVINATOR • UNIVERSAL NOLIN Products/Services

SERVICE & INSTALLATION MANUAL

Chest Freezers

If additional information is necessary, call the factory.

Our toll free number is **1-800-684-1199**. Technical assistance engineers are willing to assist you in any way possible. Office hours are from 7:30 a.m. to 5:30 p.m., Eastern Standard Time.

Important information is contained in this manual which should be retained in a convenient location for future reference.

All data and information in this manual is subject to change without notice.

MODEL DESIGNATION INFORMATION	
115V, 60HZ	
PART NO.	MODELS
52-1904-21	2SF-13
52-1904-22	4SF-13
52-1904-23	4DF-13
52-1904-24	6DF-13
52-1904-25	8DF-13
52-1904-33	8FR-13
52-1904-26	10DF-13
52-1904-27	14DF-13
52-2034-01	DI4-2
EXPORT 220V, 50HZ	
PART NO.	MODELS
52-1904-34	E2SF-13
52-1904-35	E4SF-13
52-1904-36	E4DF-13
52-1904-37	E6DF-13
52-1904-38	E8DF-13
52-1904-39	E8FR-13

SECTION I

General Maintenance & Repair

Ice Cream Cabinets

Except for routine cleaning, these chest freezers require little maintenance. In the unusual event that repair should be necessary, this manual presents information that is helpful in maintaining, diagnosing, and repairing these cabinets.

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Installation & Operation Instructions

These instructions include information which is intended to assure the operator of correct installation, operation, and service. Before attempting installation, adjustment or maintenance, be certain of the following:

1. That you have read and fully understand the instructions.
2. That you have all the tools required and are trained to use them.
3. That you have met all installation and usage restrictions and are familiar with the functions and operation of the unit.
4. That you follow all instructions exactly as given.

All fittings, measurements, procedures and recommendations are significant. Substitutions and approximation must be avoided. Improper handling, maintenance, installation and adjustment or service attempted by anyone other than a qualified technician, may void the future warranty claims and cause damage to the unit and/or result in injury to the operator and/or bystanders.

Important information is contained in these instructions which should be retained in a convenient location for future reference.

Record for Service

Model No. _____

Serial No. _____

Installation Date _____

Invoice Date _____

Start-up Date _____

Telephone for Service _____

INSTALLATION INSTRUCTIONS

Thermostat will maintain approximately zero degrees on the original factory setting. Turn the adjusting screw clockwise for colder and counterclockwise for warmer. **IMPORTANT:** Turning control counterclockwise to the stop shuts cabinet "OFF".

For storage of package ice cream, turn thermostat to coldest position. Limit top layer of package to a height consistent with cabinet usage and turn over of product.

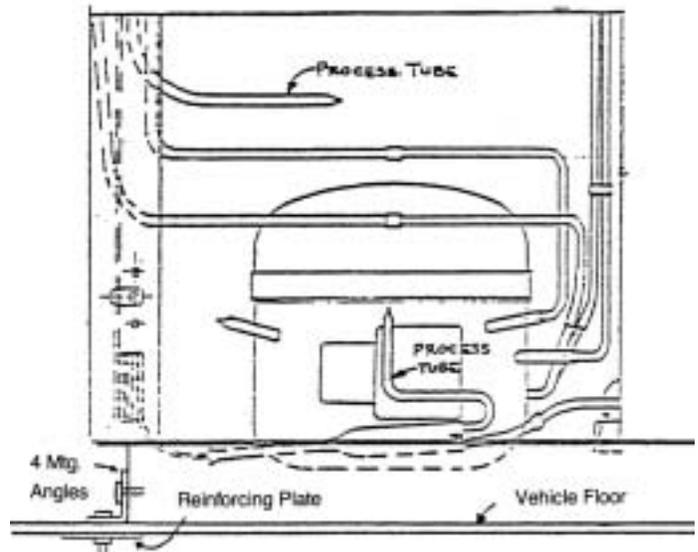
LOCATION

Select a location for the cabinet which will be most convenient for the customer and which will allow adequate air circulation. Restricted air flow will result in higher condensing pressures and operating costs.

Provide at least a 1-inch space around the exterior of the cabinet. The outside shell is the condenser and depends on the natural convection of room air for dissipation of its heat. Stainless or formica facing sheets applied to the cabinet exterior should be in tight contact with the cabinet's outer walls to improve the heat flow.

When a cabinet is built into a counter or back-bar and space is allowed between the counter and the cabinet walls, provide holes or louvers along the top edge for hot air to escape. Holes should be screened to keep insects and rodents out.

IMPORTANT: Before building any piece of equipment in, run it to be sure the operation is satisfactory.



BE SAFE. SEE ILLUSTRATION ABOVE.

When a cabinet is installed in a moving vehicle, use the original crate mounting angles or equivalent to securely bolt the cabinet to the vehicle floor so it won't move going around corners or during sudden starts and stops.

Grounding Instructions

This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazards. The appliance should be plugged directly into a properly grounded three-prong receptacle.

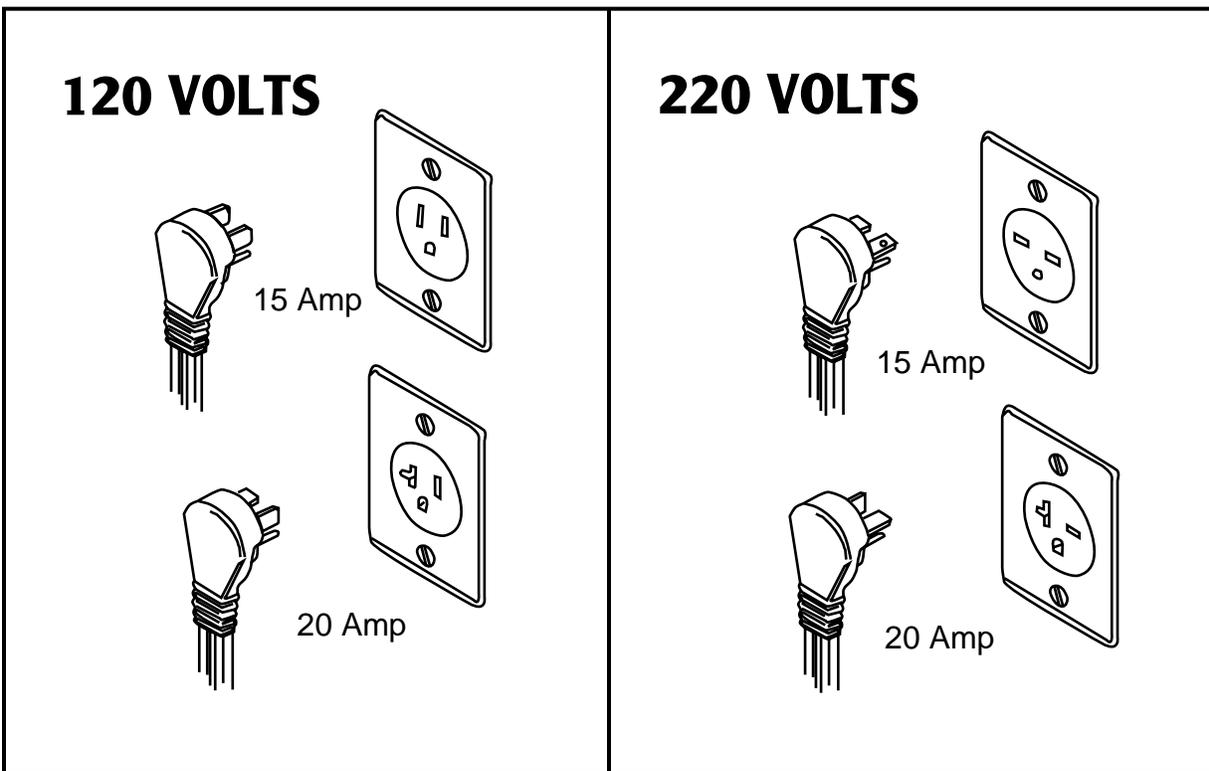
Where a two-prong wall receptacle is encountered, it must be replaced with a properly grounded three-prong receptacle in accordance with the National Electrical Code and local codes and ordinances. The work must be done by a licensed electrician.

IMPORTANT

Do not, under any circumstances cut or remove the round grounding prong from the appliance plug.

WARNING

Consult a licensed electrician if you have any doubt about the grounding of your wall receptacle. Only a licensed electrician can determine the polarization of your wall receptacle. Only a properly installed three-prong wall receptacle assures the proper polarization with the appliance plug.



Cleaning Instructions

DIRECTIONS FOR PROPER CARE & CLEANING

1. Wipe up spilled foods promptly.
2. Use lukewarm detergent solution for cleaning the cabinet interior, exterior, and lids. Follow with a clean, damp cloth and then wipe dry.
3. Protect the exterior enamel finish and plastic lid frame with automotive type cleaner and wax.
4. Protect all stainless steel surfaces with a commercial silicone emulsion type cleaner. This cleaner is excellent for all stainless steel surfaces. It leaves a protecting film that prevents fingermarking and the adherence of food particles.
5. CAUTION:
 - a. Never use naphtha or solvent type cleaner on plastic parts or lid frames.
 - b. Never use harsh abrasive polishes on plastic parts or plastic lid frames.
 - c. Do not blow steam or dash excessively hot water against plastic materials when cleaning the tank or defrosting, as damage to plastic parts may occur.
6. When the cabinet is taken out of service for more than a short period:
 - a. Remove lids. (DO NOT replace them on the cabinet until the cabinet is again refrigerated.)
 - b. Defrost cabinet and remove any spilled ice cream from the chamber guards.
 - c. Wash and dry chamber guards and cabinet interior. (See Item 2 above.)

INSTRUCTIONS FOR SEALING CABINET TO FLOOR

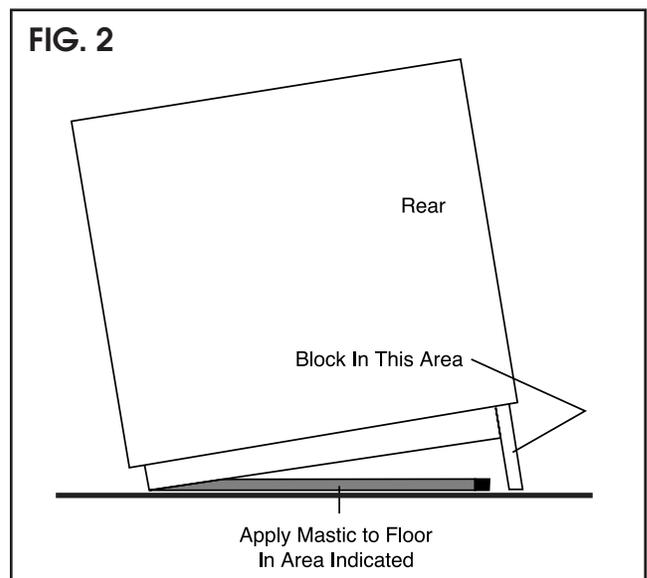
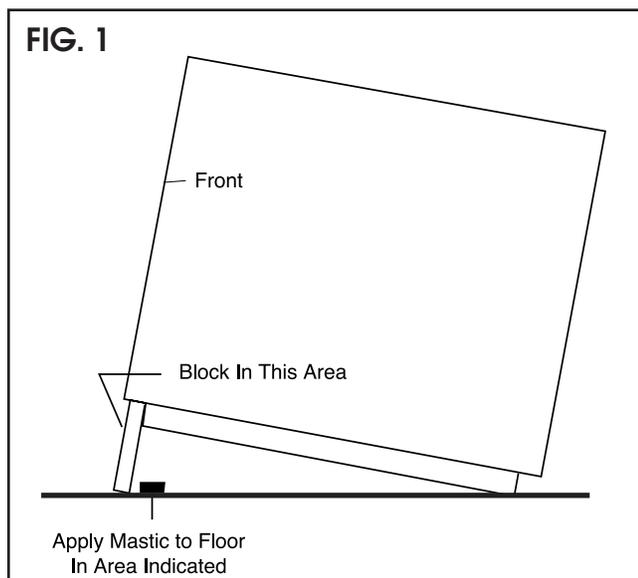
The National Sanitation Foundation recommends these cabinets be sealed to the floor to prevent water, dirt and vermin, etc. from getting under the cabinet. The instructions below meet their requirements.

1. Position and level the cabinet.
2. Draw outline of the base on the floor.
3. Raise and block the front side of the cabinet as illustrated in FIG. 1.
4. Apply a bead of mastic (See approved list below) to the floor one half inch inside the outline drawn. (See FIG. 2.) Bead must be heavy enough to compress at all points when the cabinet is set down.
5. Raise and block the rear of the cabinet as illustrated in FIG. 1.
6. Apply mastic on the floor as outlined in step 4 on the other three sides.
7. Examine to see that cabinet is sealed to floor around entire perimeter.

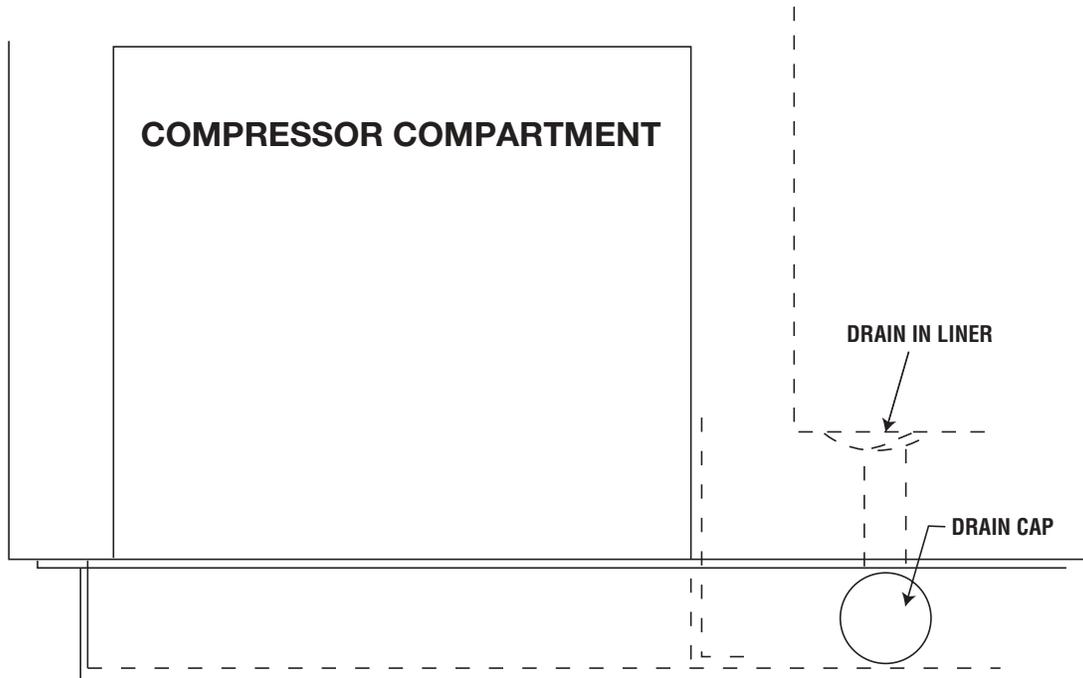
NOTE. Asphalt floors are very susceptible to chemical attack. A layer of tape on the floor prior to applying the mastic will protect the floor.

APPROVED MASTICS

3M #EC800	Caulk
3M #EC2185	Caulk
3M #EC1055	Bead
3M #EC1202	Bead
Armstrong Cork	Rubber Caulk
Products Research Co. #5000	Rubber Caulk
G.E. Silicone Sealer	



Defrosting Instructions

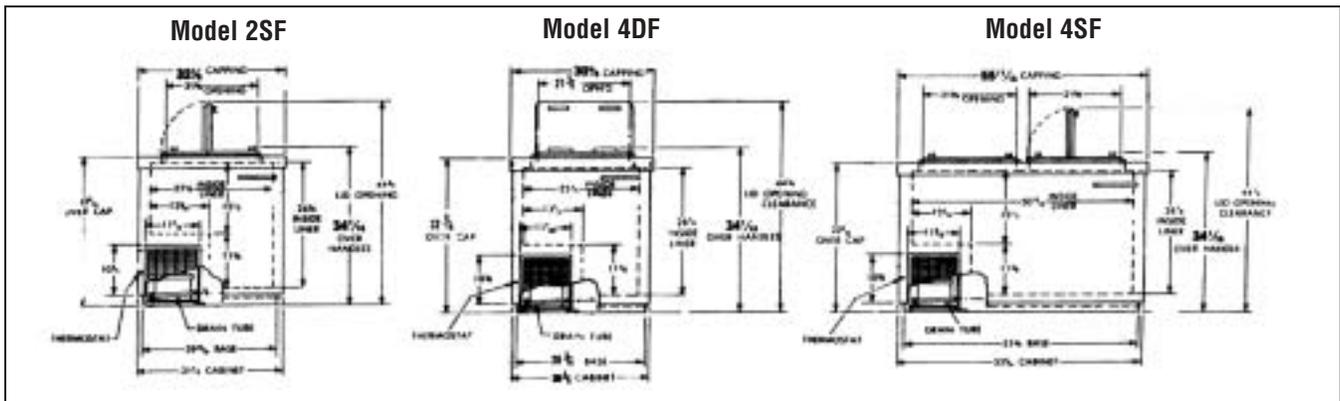
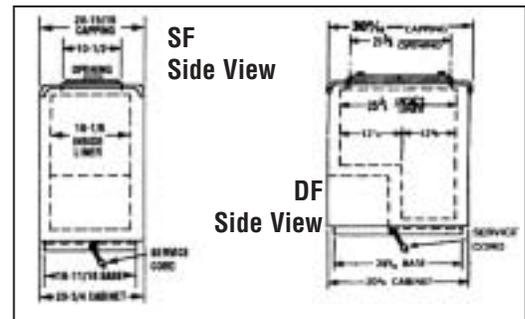
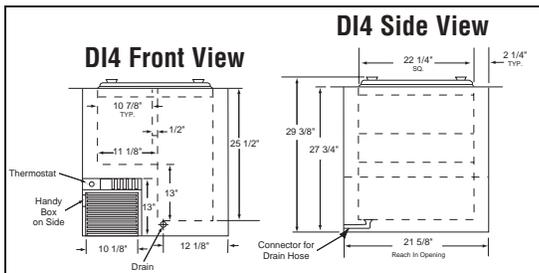


A drain fitting is located in the bottom of the storage tank. To drain the defrost water:

1. Remove and store products in another freezer.
2. Loosen and remove any items such as ice cream, nuts, berries, paper labels, etc., which could plug the bottom drain.
3. Remove the cap from the drain hose fitting.
4. Connect a hose to the fitting and run it to a floor drain, a shallow (2" high maximum) pan, or to a "Filordrain" at the sink.
5. Disconnect the cabinet by pulling the plug or turning the thermostat off to melt down the frost. You can hasten the defrost by using the "Filordrain" or a hose to spray warm water on the cabinet walls. (Detailed instructions for using the "Filordrain" for spraying the frost and removing the accumulated water are available from your dealer.)
6. Recap hose fitting after defrosting is complete.

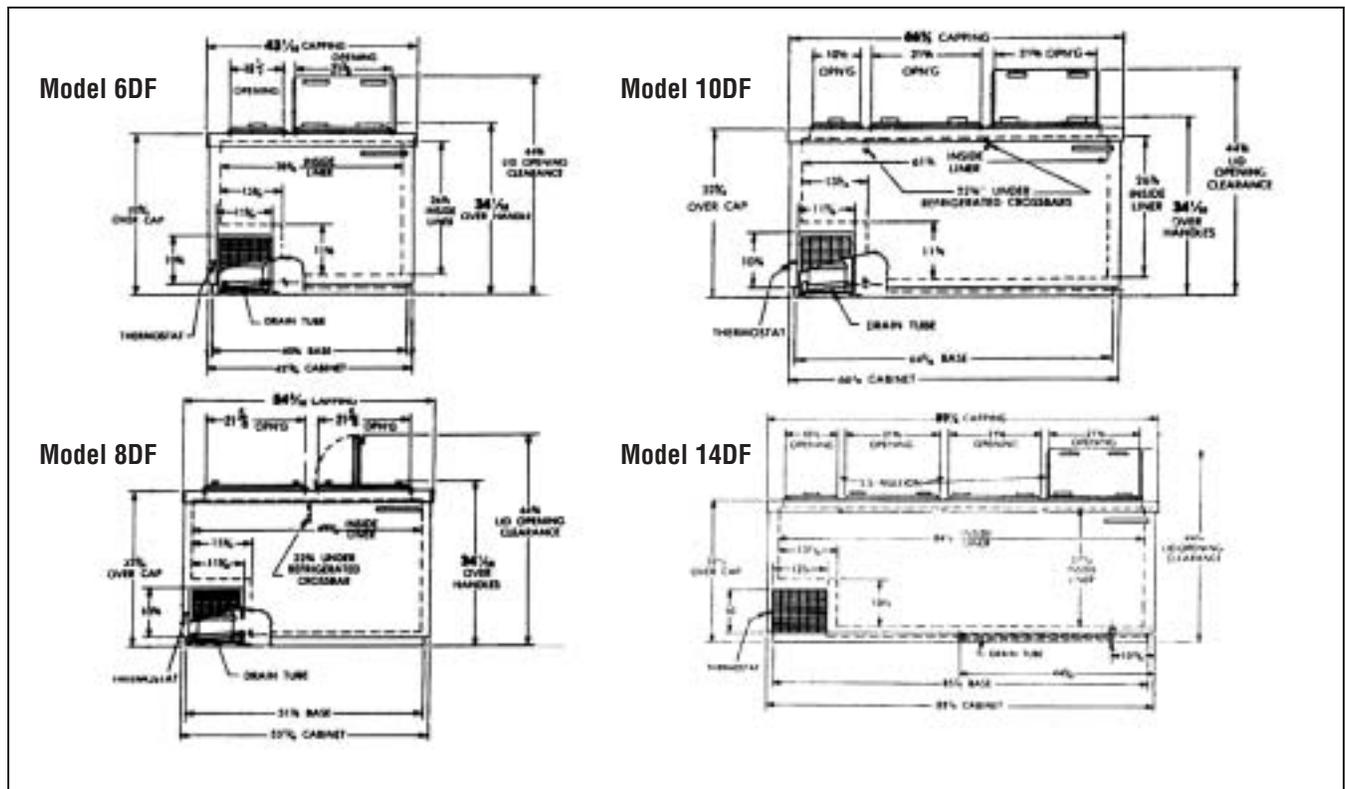
Specifications - Specifications Subject to Change without Notice.

	DI4	2SF	4DF	4SF
Compressor Mount	Front	Front	Front	Front
Temperature Range	0° to -20°F (-18° to -29°C)	0° to -25°	0° to -25°	0° to -20°
Number of Lids	2	2	2	4
Lid Construction	Stainless Steel, High Density, Foamed-In-Place Insulation w/ Vinyl Gaskets	High Density, Foamed-in-Place Insulation w/ Vinyl Gaskets	High Density, Foamed-in-Place Insulation w/ Vinyl Gaskets	High Density, Foamed-in-Place Insulation w/ Vinyl Gaskets
Hinge Type	Continuous Composition	Continuous Composition	Continuous Composition	Continuous Composition
Insulation	Polyurethane Foam	Polyurethane Foam	Polyurethane Foam	Polyurethane Foam
Wall Thickness	2-1/4"	2-5/16"	2-5/16"	2-5/16"
Capacity	4.9 cu. ft.	5.4 cu. ft.	9.1 cu. ft.	11.3 cu. ft.
Capacity				
3 gal. (9-1/2" I.D.) cans	6	4	9	10
2-1/2 gal. (9" I.D.) cans	6	5	10	13
2-1/2 gal. (9-1/4" I.D.) cans	6	5	12	15
1/2 gal. packages	—	63	116	136
Shipping Weight	210 lbs.	212 lbs.	247 lbs.	294 lbs.
Compressor Size	1/5 HP	1/5 HP	1/5 HP	1/5 HP
Condenser Type	Forced Convection	No-clog, Wrap-around Radiant Shell	No-clog, Wrap-around Radiant Shell	No-clog, Wrap-around Radiant Shell
Evaporator Type	Cold Wall	Cold Wall	Cold Wall	Cold Wall
Refrigerant Type	R404A	R-404A	R-404A	R-404A
Refrigerant Control	Capillary	Capillary	Capillary	Capillary
Defrost System	Manual	Manual	Manual	Manual
Amp Draw	2.0	2.0	2.0	2.0
Electrical Specs. (V/Hz/Ph)	115/60/1	115/60/1	115/60/1	115/60/1
NSF-7 (Ice Cream Storage)	Yes	Yes	Yes	Yes
UL & CUL Listed	Yes	Yes	Yes	Yes
Interior Finish	Baked Enamel on Galvanized Steel	Baked Enamel	Baked Enamel	Baked Enamel
Exterior Finish	Unpainted Galvannealed Steel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap
Electrical Information	Conduit Connected, Max. Fuse Size: 15 Amp, Circuit Ampacity: 15A	15 Amp Service Cord NEMA 5-15P Plug	15 Amp Service Cord NEMA 5-15P Plug	15 Amp Service Cord NEMA 5-15P Plug



Specifications - Specifications Subject to Change without Notice.

	6DF	8DF	10DF	14DF
Compressor Mount	Front	Front	Front	Front
Temperature Range	0° to -20°F	0° to -20°	0° to -20°	0° to -25°
Number of Lids	4	4	6	8
Lid Construction	High Density, Foamed-In-Place Insulation w/ Vinyl Gaskets			
Hinge Type	Continuous Composition	Continuous Composition	Continuous Composition	Continuous Composition
Insulation	Polyurethane Foam	Polyurethane Foam	Polyurethane Foam	Polyurethane Foam
Wall Thickness	2-5/16"	2-5/16"	2-5/16"	2-5/16"
Capacity	14.1 cu. ft.	18.6 cu. ft.	23.6 cu. ft.	31.5 cu. ft.
Capacity				
3 gal. (9-1/2" I.D.) cans	16	21	29	40
2-1/2 gal. (9" I.D.) cans	19	25	33	47
2-1/2 gal.(9-1/4" I.D.) cans	21	30	40	56
1/2 gal. packages	173	234	298	103
Shipping Weight	304 lbs.	353 lbs.	396 lbs.	598 lbs.
Compressor Size	1/3 HP	1/3 HP	1/3 HP	(2) 1/3 HP
Condenser Type	No-clog, Wrap-around Radiant Shell			
Evaporator Type	Cold Wall	Cold Wall	Cold Wall	Cold Wall
Refrigerant Type	R-404A	R-404A	R-404A	R-404A
Refrigerant Control	Capillary	Capillary	Capillary	Capillary
Defrost System	Manual	Manual	Manual	Manual
Amp Draw	3.0	3.0	5.5	6.0
Electrical Specs. (V/Hz/Ph)	115/60/1	115/60/1	115/60/1	115/60/1
NSF-7 (Ice Cream Storage)	Yes	Yes	Yes	Yes
UL & CUL Listed	Yes	Yes	Yes	Yes
Interior Finish	Baked Enamel on Galvanized Steel	Baked Enamel	Baked Enamel	Baked Enamel
Exterior Finish	Unpainted Galvannealed Steel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap	Baked Enamel w/ Stainless Steel Cap
Electrical Information	15 Amp Service Cord NEMA 5-15P Plug			



Specifications - Specifications Subject to Change without Notice.

8FR

Compressor Mount	Front
Temperature Range	0° to -20°F
Number of Lids	2
Lid Construction	High Density, Foamed-In-Place Insulation w/ Vinyl Gaskets
Hinge Type	Continuous Composition
Insulation	Polyurethane Foam
Wall Thickness	2-5/16"
Capacity	14.1 cu. ft.
Capacity	
3 gal. (9-½" I.D.) cans	21 - 12 top / 9 bottom
2-½ gal. (9" I.D.) cans	25
2-½ gal.(9-¾" I.D.) cans	30
½ gal. packages	234
Shipping Weight (Approx.)	353 lbs.
Compressor Size	1/3 HP
Condenser Type	No-clog, Wrap-around Radiant Shell
Evaporator Type	Cold Wall Shell
Refrigerant Type	R404A
Refrigerant Control	Capillary
Defrost System	Manual
Amp Draw	3.0
Electrical Specs. (V/Hz/Ph)	115/60/1
NSF-7 (Ice Cream Storage)	Yes
UL & CUL Listed	Yes
Interior Finish	Baked Enamel on Galvanized Steel
Exterior Finish	Baked Enamel w/ Stainless Steel Cap
Electrical Information	15Amp Service Cord NEMA 5-15P Plug

8FR

Operation - General

All the chest freezer models are of the same basic design consisting of a hot wall condenser cap tube fed tank wrap evaporator. Ice formation on the walls over a period of time is normal. This frost should be scraped off periodically in order to maintain peak performance. These cabinets are thermostatically controlled for various temperature requirements. The thermostat is located post adjacent to the unit compartment and can be accessed for adjustment by the user with a screwdriver or a dime. Thermostat position #1 being the warmest and position #7 being the coldest.

These cabinets are manual defrost and a drain is provided for periodic cleaning. A garden hose can be attached to the drain plug for draining any water that may accumulate. This drain attachment is located in the front base rail of the cabinet.

NOTE: The power supply cord must be disconnected when cleaning or servicing these cabinets.

On initial cabinet pulldown, the hot wall condenser may become warm to the touch until the normal operating temperatures are achieved.

Refer top model serial data tag for cabinet amperage, refrigerant charges and type.

CABINET CONSTRUCTION

The low side tank is lowered into the outer shell and anchored to the sub top by a plastic extrusion and foam. The space between the outer wrapper and the inner tank is then filled with urethane foam insulation (2-1/4"

thick) forming a three-ply wall of single unit construction. The low side tank then is not removable and no repair of the low side can be made.

The stainless steel top capping is of drawn one piece construction. It is put in place after the inner tank is assembled to the wrapper and is secured to the sides of the cabinet with 1/8" pop rivets.

COOLING TANK ASSEMBLY

The low side assemblies are designed so that the sides and the ends of the tank are refrigerated.

The evaporator coil assembly on the tank is different to that on previous models. It is now a serpentine coil arrangement. The new evaporator starts at the top of the inner tank and spirals downward to the condensing unit.

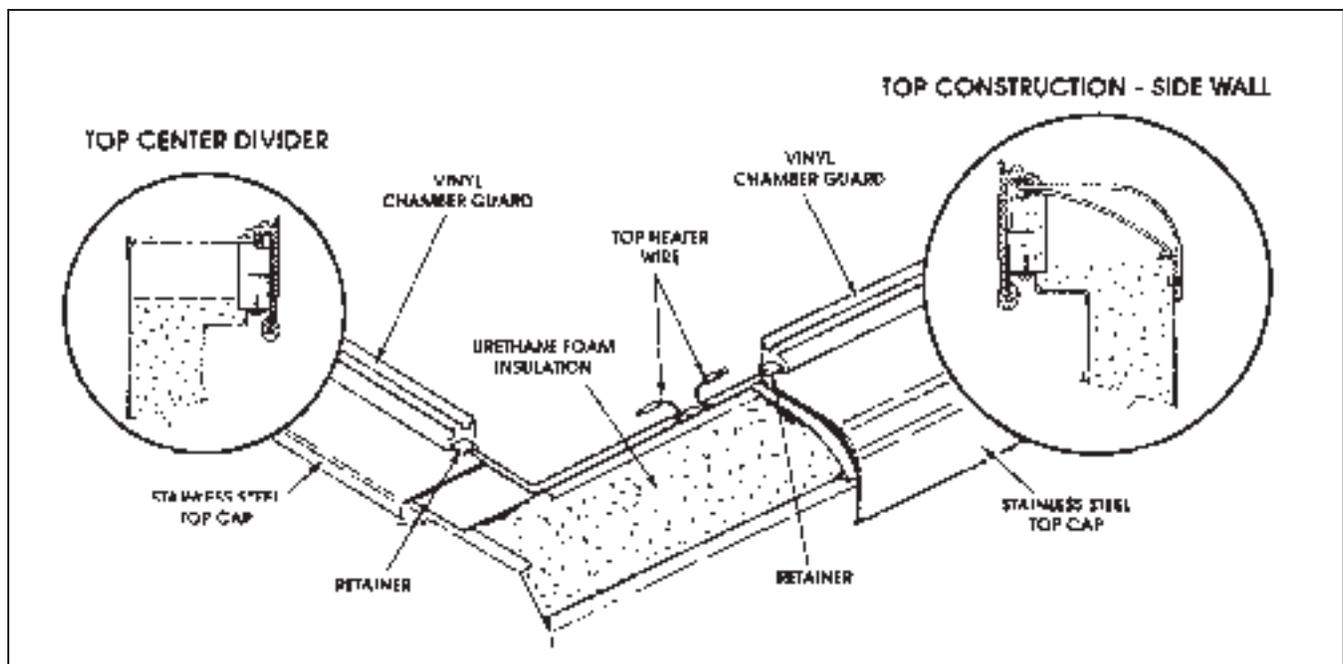
The thermostat bulb well is located near the front of the machine compartment in all models.

CHAMBER GUARDS

The one-piece vinyl chamber guard extends from the top of the lid opening down into the inner tank.

Galvanized steel chamber guard retainers mounted in the top of the tank frame hold the vinyl chamber guard against the top stainless steel capping. A special sealing compound laid on the inside angle of the retainers seals the vinyl to the stainless steel capping. One-piece retainer brackets along the lower edge of the tank frame retain the lower edge of the vinyl chamber guard.

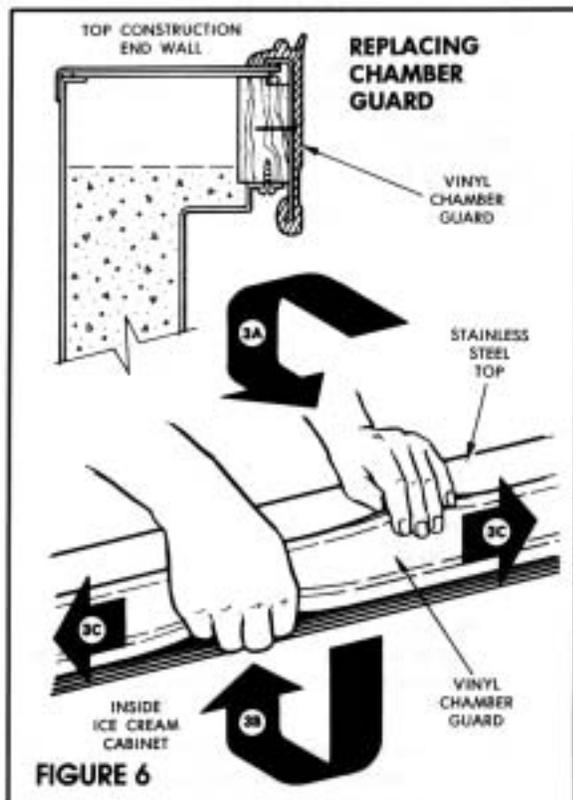
To remove the vinyl chamber guard, merely unhook from lower edge of the brackets and the top edge of the chamber guard retainers. (See below)



REPLACING THE CHAMBER GUARD

To install the New Vinyl Guards, Proceed as Follows:

1. Clear off the old mastic from around the top chamber guard retainer.
2. Mastic is to be used between the stainless steel top and the top chamber guard retainer. Hold the tapered edge of the spout at an angle, then press on tube and force mastic out. Pull along the retainer at an even pace.
3. Hook the four corners of the chamber guard in place and work the top edge along the top retainers hooking the top edge in place. (B). Then stretch the chamber guard downward, and hook in place over the bottom retainer (C). If there is any excess mastic from around top, Hexane, light naphtha, will remove the mastic.



LIDS

The cabinet lids of the Flip-Flop design are made in two widths: single width and double width. The double width lids are for the double row cabinets and cover the square area so the lids may be placed to lift from side to side of from end to end as desired. Stainless steel lid assemblies are made in two widths.

To replace the hinges, proceed as follows:

1. Remove the lid from the cabinet.
2. Remove the screws securing the hinge plate to the lid.
3. Remove the defective hinge.
4. Align the new gasket and hinge plate in insert screws.

REPLACING STAINLESS STEEL TOP CAP

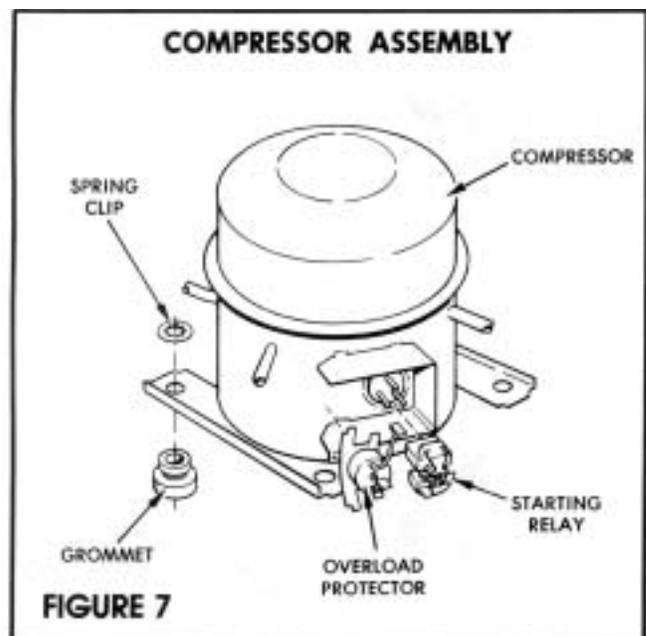
Should it become necessary to remove or replace the top capping, the rivets can easily be removed by drilling out with a small electric drill using a No. 30 drill to insure not increasing the size of the hole in either the cap or the wrapper. In reassembling, install 1/8" aluminum pop rivets, Number 576860, in the holes throughout the stainless steel cap and the cabinet wrapper.

REFRIGERATING SYSTEMS

All compressors have fusite mounted terminals and a plug-on starting relay. The overload protector plugs on the common fusite terminal.

The compressor and motor are built as one unit and spring mounted inside a steel shell. Welded construction makes the unit hermetically sealed. The compressor embodies a reciprocating type pump, directly connected to the motor.

An oil pump supplies oil to every moving part and literally floods every bearing surface with oil to minimize friction and insure quiet operation. The compressor dome is four-point base mounted.



CONDENSER

The condenser tubing is held to the inside of the cabinet wrapper or shell along the front, the back, by saddle clamps which are spot welded to the outer shell.

Efficient heat transfer is obtained from the tube to the entire shell which is the condenser surface. By the natural convection of the room air due to the absorption of the heat from the wrapper, an efficient cooling action is obtained and sufficient heat is removed from the hot compressor refrigerant vapor to result in the liquidation of the refrigerant. During the initial pull down of a hot

cabinet in a warm room the wrapper will be warm to the touch. This is a normal condition with this type of condenser.

The wrapper type condenser is free of many of the faults common to the conventional type system. Because of the design there are no fans to fail; no fins to clog with grease, lint or dust causing high condensing temperatures. The condensing temperatures compare very favorably with other types and the system has the added advantage that condenser efficiency is constant throughout the life of the cabinet.

FILTER DRIER

A filter drier's purpose is to filter and trap minute particles of foreign materials and absorb any moisture which may be in the system.

The drier is located in the liquid line ahead of the capillary tube. A fine mesh screen filters out foreign particles and the desiccant absorbs the moisture.

REPLACING THE FILTER DRIER

1. Disconnect the cabinet from its power source.
2. Install a tap line service valve to both the high and low side process tubes.
3. Attach a compound gauge manifold to system.
4. Hook up refrigerant reclaiming to system and remove all refrigerant from cabinet.
5. Remove drier from system.
6. Replace with same part number. **Changing drier size will effect the system charge.**
7. Evacuate system to 500 microns.
8. Refer to cabinet data plate for proper charge and type of refrigerant used.

CAPILLARY TUBE

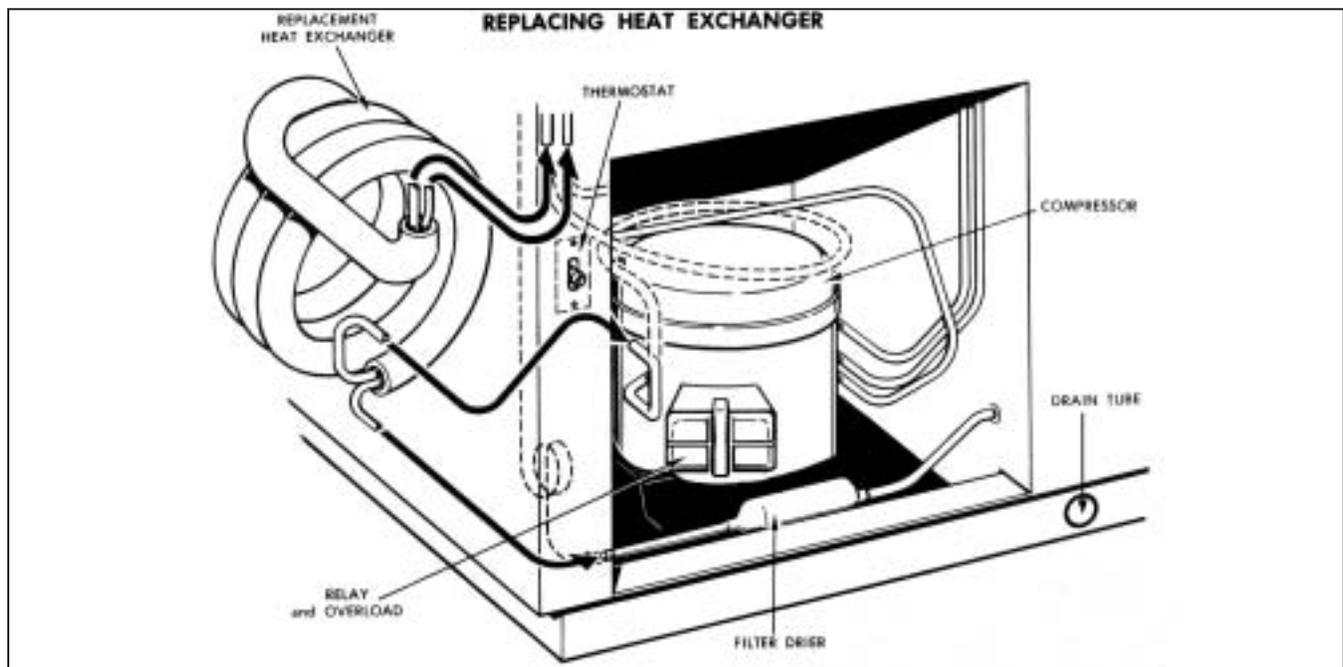
A capillary tube is used to regulate the flow of liquid refrigerant into the low side of the system. Its resistance or pressure drop due to the length of tube and smaller diameter, meters the flow of the refrigerant.

HEAT EXCHANGER

The liquid and suction lines are soldered together to form an efficient heat exchanger. The warm liquid refrigerant is sub-cooled by the cold suction vapor prior to entering the low side. The heat exchanger is located in the area above the compressor.

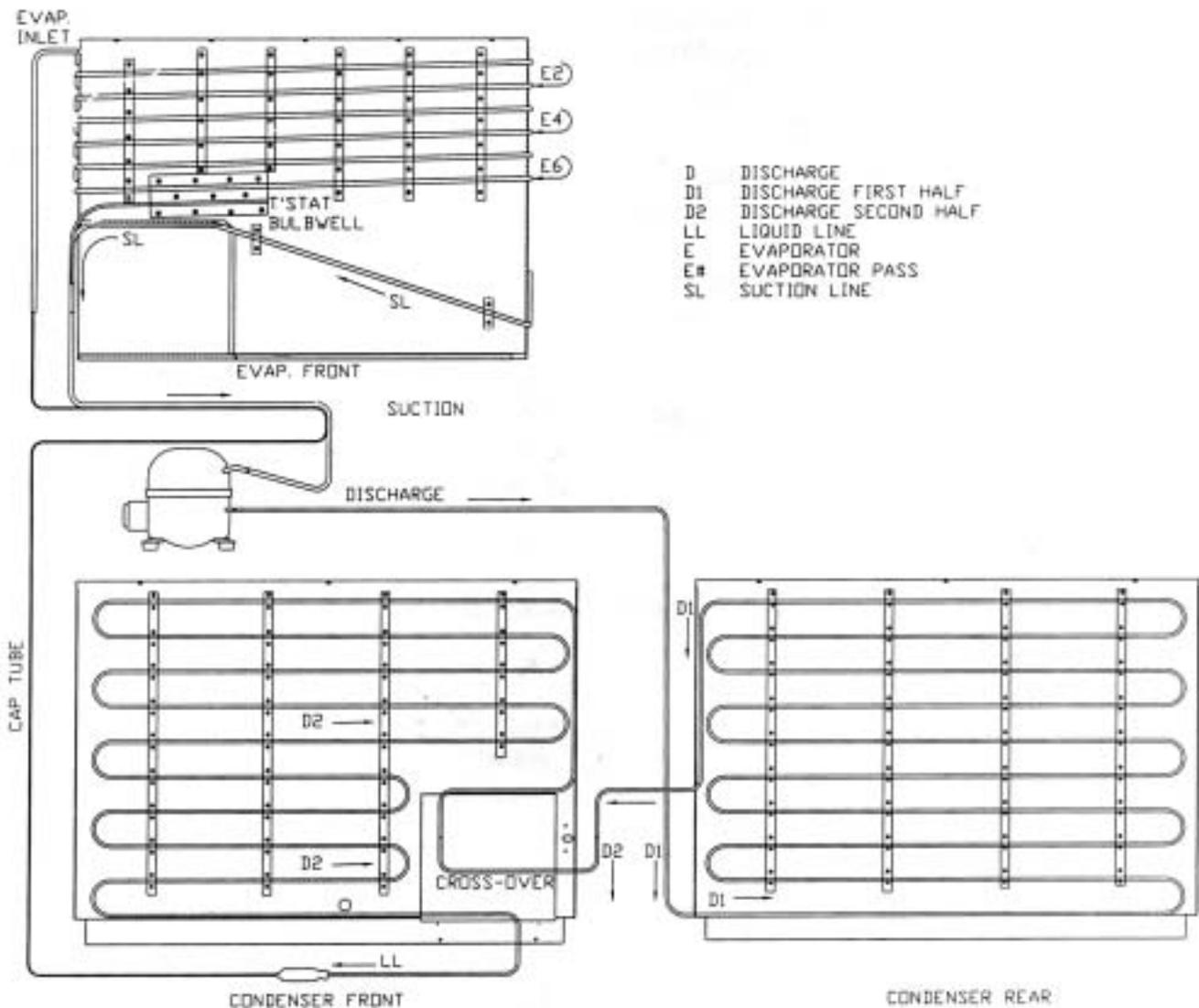
REPLACING THE HEAT EXCHANGER

1. Disconnect the cabinet from the power source.
2. Install service taps to process tube on high and low sides of system.
3. Attach a manifold gauge set.
4. Reclaim all refrigerant in cabinet.
5. Remove cork impregnated tape from refrigerant lines at bottom of cabinet.
6. Disconnect heat exchanger suction line from low side outlet line.
7. Disconnect the capillary line from the low side inlet line.
8. Place replacement heat exchanger in position and connect the lines.
9. Replace the filter drier.
10. Evacuate system below 500 microns.
11. Refer to cabinet data plate for charge and type of refrigerant. After charging, pinch off service taps and braze tube closed.

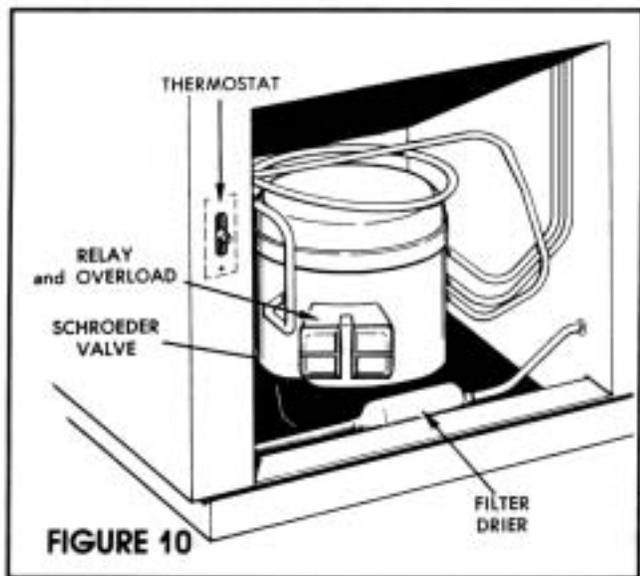


REFRIGERANT CYCLE - Condenser & Evaporator

Liquid refrigerant is evaporated in the low side coil by heat absorbed from the tank walls. The refrigerant passes as a vapor from the accumulator through the suction line to the compressor. It enters the interior of the shell which is at suction pressure. From the top of the shell, vapor passes down through a tube into the compressor cylinder. The pressure (and temperature) of the vapor is raised in the cylinder by the compression and the vapor is then forced through the discharge valve and into the discharge line leading to the condenser where the vapor is cooled and some condensation to a liquid takes place.



ELECTRICAL SERVICE



THERMOSTAT

The thermostat is mounted in the machine compartment at top or left side of front opening and the thermal element is extended into the thermostat well. See Figure 10. The well is a cylindrical tube fastened to the exterior of the inside tank, It is located near left front corner of the machine compartment (left rear on single row).

NOTE: Caution must be exercised when replacing a thermostat from thermal element tube so it does not touch any of the refrigeration lines in the machinery compartment. Because it senses the coldest temperature before attempting to change the range or the cut-out point, make sure the thermostat thermal element is properly inserted into the well to the red mark. The correct distance from the end of the element to the red mark on the element should be 22". Always remember a poor contact will naturally affect the operating range and cabinet temperature. See table below.

The range and the cut-out point of differential can be adjusted to settings other than those given in the table. If a higher or lower range than is obtainable by the slotted shaft is desired, change the adjustment screw located between the two space connector behind the control. Turn the adjustment screw clockwise to raise the temperature, and counterclockwise to lower the range.

THERMOSTAT SPECIFICATIONS Differential at Mid-Position 9-1/2 to 14-1/2°F

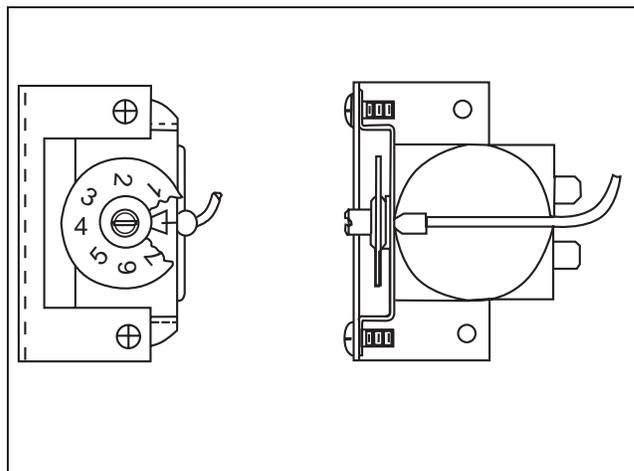
		TEMPERATURE SETTINGS AT CONTROL BULB - °F.			
		WARM POSITION		MID-POSITION	COLD POSITION
THERMOSTAT	#1 CUT-IN	OUT	CUT-IN	OUT	#7 CUT-OUT
762938 or 23-5117	+20°	0	-1°	-16°	-30°

THERMOSTAT - Adjusting Screw

The differential adjusting screw is covered with a liquid sealer which must be removed before any adjustment can be made. Turn the differential screw clockwise to lower the cut-in temperature and narrow the differential. Turn the screw counterclockwise to raise the cut-in temperature and widen the differential. Adjust the screw only if has been proven that the thermostat differential is too narrow — less than 9.5°F, or too wide, 14.5°F.

THERMOSTAT- Temp Adjustment

Thermostat dial is labeled #1 thru #7. #1 being warmest and #7 being coldest. To lower cabinet temperature, insert a dime or screwdriver in the slot provided and turn clockwise.



Condensate Heater

A low wattage heater is located under the metal chamber guard retainer. Electrical connections are made in the machine compartment.

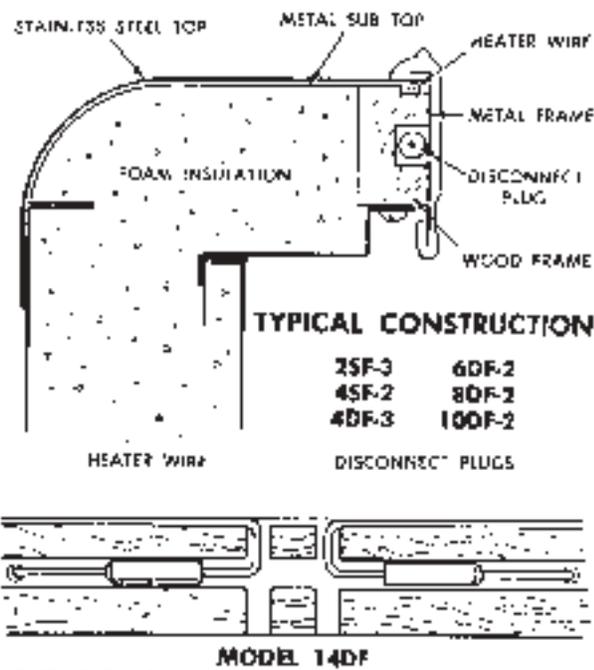
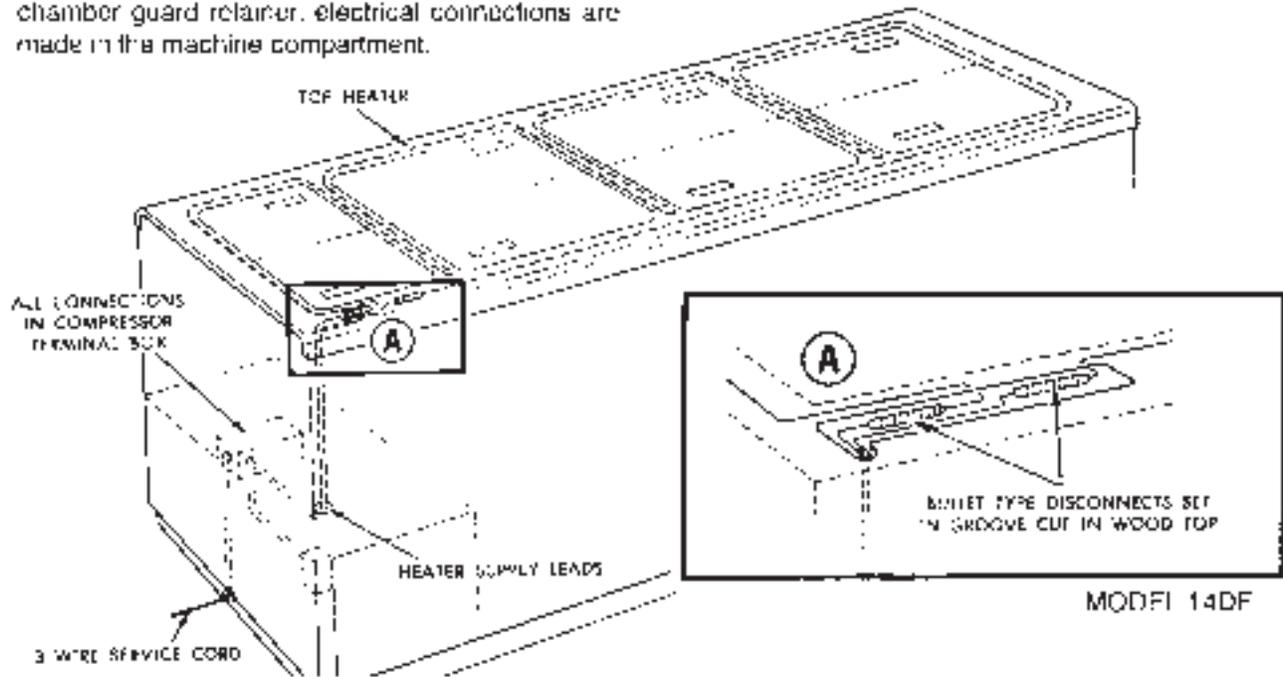


FIGURE 13

TO REPLACE HEATER WIRE

1. Unhook the bottom edge of the chamber guard and remove.
2. Pull out screw nails and lift out chamber guard retainer.
3. Unplug and pull out original heater, carefully checking for any damaged areas. Carefully check recess for heater where damaged heater wire was installed.

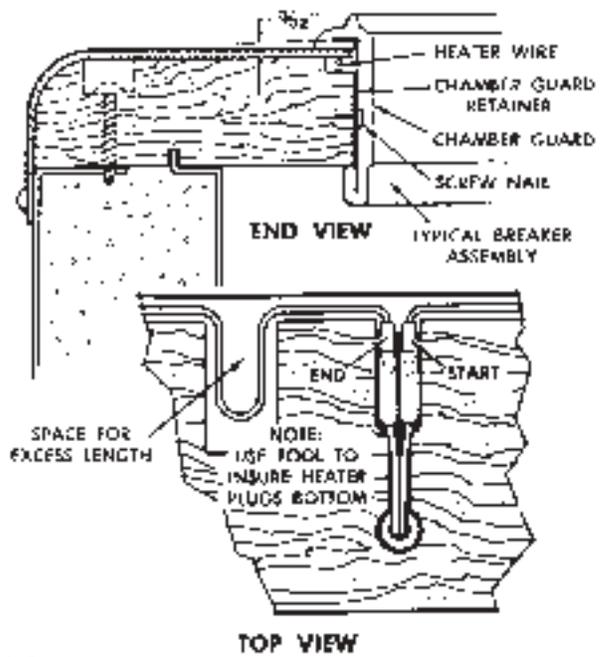


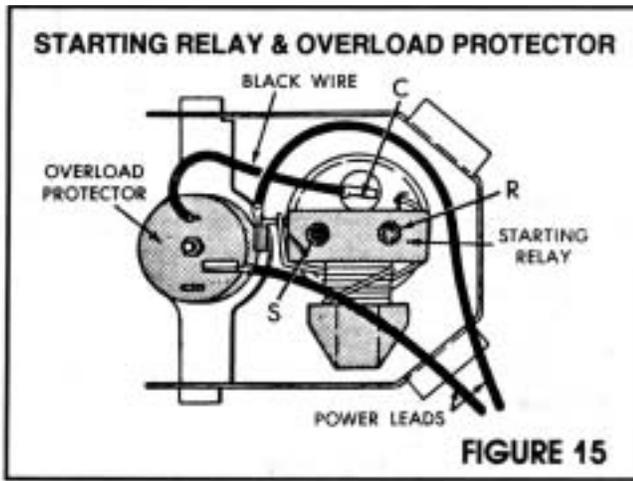
FIGURE 14

4. Plug in one end of the replacement heater (see FIGURE 14), and carefully insert heater in recess around top opening. Tuck any excess length in space provided after plugging in the opposite end of the heater wire. Reconnect the heater wiring. Replace in slots provided and reseal cavity with clear silicone.
5. Check that heater operates before replacing retainer and chamber guard.

MOTOR & RELAY

Split phase motors are used in all compressors. Models 6-DF, 8-DF, and 10-DF have 2-pole, 3450 RPM motors. The use of low starting torque motors is made possible by unloading the compressor prior to the start, thus reducing the required starting torque.

The starting relays on the "A" line compressors is the push on type that mounts on the Start (S) and Run (R) terminals of the compressor, as shown in Figure 15 below. The starting relay is a magnetic switch with starting contacts. Its magnetic coil is in series with the run winding of the motor. The relay coil carries the main winding current. The relay armature holds the starting winding contacts in open position except during the starting period. At the moment of starting, when the thermostat closes the electrical circuit, a surge of electrical current passes through the main motor winding and through the relay coil.



This energizes the relay coil and pulls up the relay armature, allowing the starting winding contacts to close. The current through the start windings introduces a second out of phase, magnetic field in the starter and starts the value motor. As the motor speed increases, the main winding current is reduced. At a predetermined condition, the main winding current, which is also the current through the relay coil, drops to a value below that necessary to hold in the relay armature. The armature drops and opens the starting winding contacts and takes the starting winding out of the circuit.

Refrigerant 404A compressors utilize a Positive Temperature Coefficient resistor (P.T.C.) The PTC resistor is connected in parallel with the run capacitor and in series with the start winding. The PTC has a low resistance when it is cold. When the motor starts the low resistance causes a large current to flow through the resistor. Current drawn by the resistor is out of phase with the current drawn by the motor windings. As the resistor draws current it begins to heat and resistance builds to a point where it cannot flow to the start windings, thus switching current to the run windings.

In series with the motor windings is a separate bi-metal overload protector held in place on the compressor by a spring clip. The short wire lead on the overload protector connects to the common (C) terminal on the compressor.

Should the current in the motor windings increase to a dangerous point, the heat developed by passage of the current through the bi-metal disc will cause it to deflect and open the contacts. This act breaks the circuit to the motor windings and stops the motor before any damage can occur.

The overload protector provides added protection for the compressor motor because in addition to protecting against excessive current it also protects against excessive temperature rises.

After an overload or a temperature rise has caused the overload protector to break the circuit, the bimetal disc cools and returns the contact to the closed position. The time required for the overload switch to reset varies with room temperature and compressor dome temperatures.

The overload protector is specifically designed with the proper electrical characteristics for the compressor motor and this ice cream cabinet application. Any replacement must be made with the exact replacement

“NEVER SUBSTITUTE AN OVERLOAD PROTECTOR WITH ANOTHER OF AN UNAUTHORIZED PART NUMBER.”

The wrong protector can result in a burnt out motor. If either the overload protector or the relay is found inoperative, both the relay and protector should be replaced. When the thermostat cuts off after normal cycle or when the service cord is pulled from the wall during a running cycle, about eight (8) minutes time is required for unloading (longer if it occurs during pull down), which is the reduction of the pressure differential between the high side and the low side of the system. During this unloading period, the overload will trip if the service cord is plugged into the electrical outlet.

If the compressor does not start, look for other trouble (low line voltage—less than 100 volts at the compressor terminals during the starting interval, inoperative relay, inoperative compressor).

Since the relay is current operated and is designed for a specific compressor and motor current value, the current size relay represented by the part number is an absolute must.

“NEVER SUBSTITUTE AN OVERLOAD PROTECTOR WITH ANOTHER OF AN UNAUTHORIZED PART NUMBER.”

These relays cannot be adjusted or properly repaired in the field. If the compressor repeatedly starts and runs for a few seconds, and then cycles on the overload protector, the starting relay contacts may be stuck closed and the excessive current is tripping the overload.

CHECKING FOR ELECTRICAL TROUBLE

When checking for electrical trouble, always be sure there is a “live” electrical circuit to the cabinet and that the thermostat dial is not in the “OFF” position. When the sealed unit will not start and the cabinet temperature is warm, the trouble may be in the relay, in the thermostat, in the wiring, or it may be in the compressor motor itself.

If the compressor will not run, make a test across the power lead terminals (one at the relay, the other at the overload protector). See Figure 15, page 18. The test should show a live circuit if the thermostat knob is in the normal operating position and not in the “OFF” position. If this check does not show positive, the thermostat and wiring should be checked for an open circuit.

If the compressor motor does not start, check the line voltage, to see that there is not more than 10% variation from the normal 115 volts. If the voltage is correct, relay and overload check out, and the compressor will not start and run, change the compressor. Even though the cause of the electrical trouble is determined, check the complete electrical circuit. Look for broken wire, wires with frayed ends, and loose terminals.

REFRIGERATION SERVICE OPERATING CHARACTERISTIC

On the initial startup of a warm cabinet, the suction pressure drops rapidly to about 0 to 5 pounds. This will vary some with the temperature of the cabinet and the ambient temperatures. After 15 to 20 minutes of operation, the suction pressure begins to rise again and will rise to about 20 to 30 pounds.

The head pressure also rises and they both “peak” or stop rising about 30 to 60 minutes of operation. Abnormally warm cabinets and high ambient temperatures will affect both the pressure and the time interval involved by raising the pressures and lengthening the intervals.

After this “peak” has been reached, the discharge and suction pressures begin to drop slowly.

After some 30 minutes of operation, the system starts to lower the air temperature inside the cabinet. The discharge pressure will gradually lower as the cabinet temperature drops until a point is reached consistent with the ambient temperature. The suction pressure will drop as the cabinet temperature drops until the compressor is shut off by the thermostat. Table 3 on page 15 gives average suction and discharge pressures for the different sized cabinets for a thermostat setting of 5 1/2 on the temperature selector dial. Discharge pressures are given for both 70°, 80° and 90° ambient temperatures. To check operating pressure, install service taps and service gauges. The capillary tube allows the high pressure refrigerant to pass into the low side when the unit is on the “OFF” cycle. The discharge pressure is therefore

lowered and the motor starting load is greatly reduced. The time required for unloading is about 8 minutes when the cabinet is down to operating temperatures as the majority of the refrigerant is in the low side. However, when a warm cabinet is just started and during the initial pull down, the unloading is considerably longer.

CHANGING THE COMPRESSORS

Carefully study the section “**Refrigeration Service**” before changing the sealed compressor and definitely determine that this is necessary before proceeding.

TO INSTALL A REPLACEMENT COMPRESSOR:

1. Disconnect power to the cabinet.
2. Disconnect wire leads from the compressor.
3. Attach a manifold gauge set to both high and low service taps of system.
4. Reclaim all refrigerant in system.
5. Unbrazed secondary tube connections from the cabinet to a compressor assembly.
6. Install primary tubes on new compressor; oil cooler; discharge, etc.
7. Install the new compressor in the cabinet and rebraze secondary tube connections.
8. Install a new filter drier.
9. Evacuate below 500 microns and valve off to check for leaks.
10. Check serial rating plate for refrigerant type and charge. Weigh in refrigerant and check for leaks before turning cabinet on.
11. Refer **ELECTRICAL & REFRIGERATION INFORMATION** pages for the proper refrigerant charge. Weigh in the proper charge or use a charging cylinder to measure in the proper charge.
12. Check high side of system for leaks with compressor running. Stop compressor and allow pressure to build up on the low side, then check the low side for leaks.
13. Start compressor. Replace machinery compartment grill.

REFRIGERANT SERVICE LEAK TESTING

The serviceman making a leak test on any cabinet that has urethane foam insulation must first understand the characteristics of the insulation and what some of its chemicals are. Number one is that the urethane foam is charged with Freon R-22 as a blowing agent.

The refrigerant is sealed in the cells of the urethane foam and when a cell opens, it will release a small

amount of refrigerant which will show up as a leak. Do not be quick to condemn the cabinet as a leaker. Let the cabinet air out for a few minutes, then make another leak test being careful not to pull on the tubing entering the insulated area as other cells may be opened. Proceed in a normal manner for leak testing a system.

To check a cabinet with a suspected internal leak:

1. Install service taps on both high and low side of system.
2. Reclaim all refrigerant in system.
3. Refer to page 14 to isolate evaporator from condenser, compressor, etc.
4. Pressurize each section with 250 pounds of dry nitrogen and install gauges.
5. Let the cabinet sit overnight to see which section loses pressure. In most cases, any leaks found will be in unit compartment area.

UNDERCHARGE OF REFRIGERANT

An undercharge of refrigerant caused by a refrigerant leak or by improper installation of a replacement compressor will result in a lower than normal suction pressure, excessive or continuous operation of the compressor or higher than normal cabinet temperature. When a system has a normal refrigerant charge the operating suction pressure will be shown on pages 29-35. Also the suction line entering the compressor will be slightly cooler than room temperature.

ADDING REFRIGERANT

CAUTION

Always introduce refrigerant in a vapor state into the system.

When a system shows by its operating characteristics to be short of refrigerant, it must be assumed that there is a leak somewhere in the system. Proceed to check the system with a leak detector. When the leak is located, it should be repaired if it is a repairable leak. Any repairable leak will occur as a broken tube, or possibly a loose flare fitting in the machinery compartment.

Unless the system has lost most of its refrigerant charge, the leak test can be made without the addition of extra refrigerant. If the system is completely void of gas, then a sufficient refrigerant charge must be added to make a leak test, and the system must be completely evacuated and recharged.

COMPLETE RECHARGE OF REFRIGERANT

Give the system a complete recharge of refrigerant in case of a major refrigerant leak; one that is repairable, such as a broken tube or a cracked flare connection occurring in the machine compartment.

If such a leak should occur, the unit will run, but with partial or no refrigerant and the operating pressures are usually low enough and below atmospheric pressure so that with a leak on the low side, air and moisture are drawn into the system.

If there is any reason to believe the system contains moisture, the low side and high side should be evacuated and a new filter drier installed. Charge should be weighed in.

OVERCHARGE OF REFRIGERANT

When the cabinet is pulled down to temperature, an indication of an overcharge is that the suction line will be cooler than normal and may frost up. The normal temperature of the suction will be a few degrees cooler than room temperature. If its temperature is much lower than room temperature, the unit will run longer because the liquid is pulled beyond the accumulator into the heat exchanger. When the overcharge is excessive, the suction line will sweat or frost. Purge any excess refrigerant into a reclaiming. Purge carefully so that system does not become undercharged.

COMPRESSOR MOTOR BURNED OUT

There are four major causes of motor burn out:

1. LOW LINE VOLTAGE
2. LOSS OF REFRIGERANT
3. HIGH HEAD PRESSURE
4. MOISTURE

1. LOW LINE VOLTAGE

When the motor winding in a compressor gets too hot the insulation melts and the winding short circuits. A blackened, burned out run or start winding is the result. Low line voltage causes the winding to get very hot because it is forced to carry the current at the same compressor load. When this current gets too high or is carried for too many hours, the motor run windings fail. A burn out caused by low voltage is generally a slow burn out, and contaminates the system.

2. LOSS OF REFRIGERANT

A second cause of motor burn out is loss of refrigerant. In a hermetically sealed compressor the refrigerant vapor passes down around the motor winding. The cool refrigerant vapor keeps the motor operating at the proper temperature. If there is a refrigerant leak and there is little or no cooling of the motor, the windings become too hot and a burn out will result. The overload protector may not always protect against this type of burn out, since it requires the transfer of high heat from the motor through the refrigerant vapor to the compressor dome.

3. HIGH HEAD PRESSURE

High head pressure is a third cause of motor burn out. With high head pressure the motor load is increased and the increased current causes the windings to overheat and eventually fail. Poor circulation of air over the high side condenser can cause motor failure for this reason. Another cause of excessive head pressure may be caused by air in the system.

4. MOISTURE

The fourth major cause of motor burn out is moisture. It takes very little moisture to cause trouble. In the compressor dome refrigerant is mixed with lubricating oil and heat from the motor windings and compressor operation. If there is any air present, the oxygen can combine chemically with hydrogen in the refrigerant oil to form water. Just one drop of water no matter how it gets into the system can cause trouble.

When the water comes in contact with the refrigerant oil, in the presence of heat, hydrochloric or hydrofluoric acid is formed. These acids destroy the insulation on the motor windings. When the winding short circuits, a momentary temperature of over 3000° F. is created. Acids combine chemically with the insulation and oil in the compressor dome to create sludge, which quickly contaminates the refrigeration system.

Sludge collects in various places throughout the system and is very hard to dislodge. A purge of the refrigerant vapor through the system will not clean the system.

If any of these cases have occurred, an acid test kit should be used to determine the true condition of the oil.

REFRIGERANT FLOW STOPPED

This condition may result in continuous running of the compressor or it may cycle on overload depending on the refrigerant charge and load conditions. High tank temperatures result. This condition may be caused by a restricted capillary tube due to moisture freezing at the outlet end of the tube or foreign matter plugging the line. The major part of the refrigerant charge will be pumped into the high side resulting in very low suction pressure.

Moisture on a properly serviced system is a remote possibility. However, if moisture does enter the system with air drawn in on the suction side of the system or during service operation, it will eventually freeze and restrict or completely stop the flow of refrigerant into the

low side.

If this condition should occur, pull the service cord and allow the cabinet to warm up to a temperature above 32°F. or room temperature. This warm up can be accelerated by the use of heat lamps inside the cabinet. 100 watt lamps can also be used to accelerate the warm up period.

After the cabinet has warmed up sufficiently to melt the ice and relieve the restriction in the capillary line, reclaim refrigerant charge down to zero pounds gauge pressure. Blow out the low side and high side with nitrogen. Follow the instructions given under “**COMPLETE RECHARGE OR REFRIGERANT**” including replacement of the filter drier.

If the capillary line is plugged with foreign matter or dirt, exert a pressure backwards through the line to free it. Proceed as follows:

1. Install a compound gauge on the suction line to determine whether or not the low side is under a vacuum or a pressure. If the low side is under a vacuum, hook manifold gauge to a cylinder of dry nitrogen and pressurize system to 0 pounds.
2. Disconnect the capillary line from the low side inlet and remove the filter drier. Exert a vapor pressure in the reverse direction through the capillary by “cracking” the drum valve. Allow the pressure to build up to about 75 pounds if necessary to clear out any foreign matter.

CLEANING SYSTEM AFTER BURN OUT

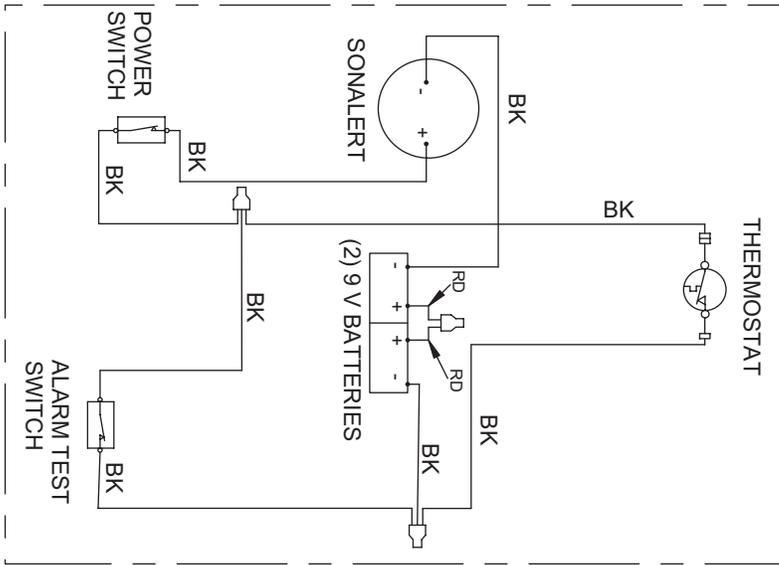
1. Install the service taps and reclaim all refrigerant in cabinet.
2. Remove the inoperative compressor and filter drier.
3. Obtain a sample of oil and check the condition with an acid test kit.
4. Connect the oil cooler lines together.
5. Most reclaimers have the ability to push liquid refrigerant through the system and back to the reclaimer for cleaning.

Once this has been accomplished:

6. Install new compressor and filter drier.
7. Evacuate system below 500 microns.
8. Check serial rating plate for charge and weigh in correct amount.

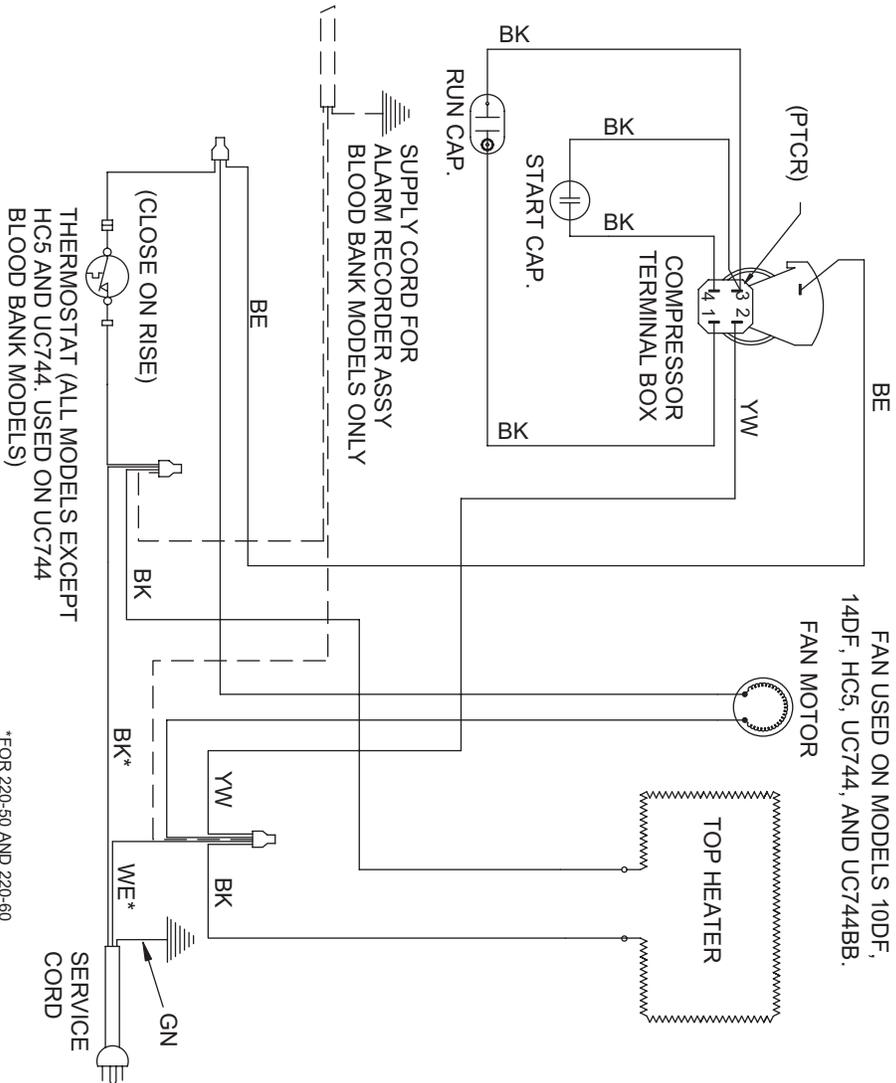
Wiring Diagram - Chest Models

26-0959-00



ALARM ASSEMBLY
HCS AND STD. UC744 ONLY

SEE ELECTRICAL RATING
PLATE FOR SUPPLY VOLTAGE
AND FREQUENCY.



FAN USED ON MODELS 10DF,
14DF, HC5, UC744, AND UC744BB.

FAN MOTOR

THERMOSTAT (ALL MODELS EXCEPT
HCS AND UC744. USED ON UC744
BLOOD BANK MODELS)

SUPPLY CORD FOR
ALARM RECORDER ASSY
BLOOD BANK MODELS ONLY

NOTE:
CABINET MUST BE GROUNDED.
USE COPPER CONDUCTORS ONLY.

*FOR 220-50 AND 220-60
EXPORT-CONNECT THE BLUE
IN PLACE OF WHITE AND BROWN IN
PLACE OF BLACK.

26-0959-00 REV. E

2SF-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 110-1-3083
Recommended Operating Temp. Range	+10°F to -20°F
Cabinet Volts	115
Expansion Device	7' x .031
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	1	1	1
Suction Pressure (PSIG)	13	14	17
Discharge Pressure (PSIG)	259	290	331
Compressor Amps	1.5	1.6	1.6
100% Run	-30	-23	-16

NOTE: REFER TO SERIAL DATA PLATE FOR REFRIGERANT TYPE & CHARGE.

4SF-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 117-1-3085
Recommended Operating Temp. Range	+10°F to -20°F
Cabinet Volts	115
Expansion Device	7' x .031
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	-1	0	1
Suction Pressure (PSIG)	10.6	13	15
Discharge Pressure (PSIG)	244	277	316
Compressor Amps	2.3	2.5	2.5
Total Refrigeration Amps	2.5	2.7	2.7
100% Run	—	-18°F / -28°C	—

4DF-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 110-1-3083
Recommended Operating Temp. Range	+10°F to -10°F
Cabinet Volts	115
Expansion Device	7' x .031
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	0	-1	-2
Suction Pressure (PSIG)	15	16	18
Discharge Pressure (PSIG)	256	289	323
Compressor Amps	1.5	1.5	1.6
Total Refrigeration Amps	1.6	1.7	1.7
100% Run	-25	-19	-11

NOTE: REFER TO SERIAL DATA PLATE FOR REFRIGERANT TYPE & CHARGE.

6DF-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 117-1-3085
Recommended Operating Temp. Range	+10°F to -10°F
Cabinet Volts	115
Expansion Device	8' x .036
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	-2	-2	-4
Suction Pressure (PSIG)	10	11	13
Discharge Pressure (PSIG)	246	279	314
Compressor Amps	2.3	2.3	2.4
Total Refrigeration Amps	2.6	2.6	2.7
100% Run	-29	-20	-14

8DF-13 & 8FR-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 121-1-3087
Recommended Operating Temp. Range	+10°F to -15°F
Cabinet Volts	115
Expansion Device	8' x .036
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	-4	-2	-1
Suction Pressure (PSIG)	7	8	11
Discharge Pressure (PSIG)	242	277	314
Compressor Amps	3.1	3.1	3.3
Total Refrigeration Amps	3.2	3.3	3.5
100% Run	-27	-21	-14

NOTE: REFER TO SERIAL DATA PLATE FOR REFRIGERANT TYPE & CHARGE.

10DF-13 ELECTRICAL/REFRIGERATION SPECS SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 127-1-3615
Recommended Operating Temp. Range	+10°F to -13°F
Cabinet Volts	115
Expansion Device	7' x .042
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	-3	0	0
Suction Pressure (PSIG)	10	12	14
Discharge Pressure (PSIG)	238	274	318
Compressor Amps	4.0	4.2	4.4
Total Refrigeration Amps	4.4	4.5	4.6
100% Run	-27	-21	-14

14DF-13 ELECTRICAL/REFRIGERATION SPECS

SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP 127-1-3515
Recommended Operating Temp. Range	+10°F to -15°F
Cabinet Volts	115
Expansion Device	7' x .042
Charge Refrig. Type / Oz.	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
Cavity Temp. (F/C)	+2	+3	+2
Suction Pressure (PSIG)	12	14	15
Discharge Pressure (PSIG)	236	269	304
Compressor Amps	4	4	4.5
Total Refrigeration Amps	4.8	5.0	5.1
100% Run	—	14°F / -10°C	—

NOTE: REFER TO SERIAL DATA PLATE FOR REFRIGERANT TYPE & CHARGE.

DI4-1 ELECTRICAL/REFRIGERATION SPECS

SYSTEM COMPONENTS - R-404A

Compressor	Americold
Compressor Horsepower	HP-110-1-3083
Recommended Operating Temp. Range	+10°F to -15°F
Cabinet Volts	115
Expansion Device	7' x .031
Charge Refrig. Type / Oz. / Grams	Refer to serial data plate located in unit compartment.

SYSTEM PERFORMANCE - (THERMOSTAT SET AT #4 POSITION)

AMBIENT	70°F / 21.1°C	80°F / 27°C	Stat Position #1 90°F / 32.5°C
Cavity Temp. (F/C)	-7	-7	19
Suction Pressure (PSIG)	9	8	22
Discharge Pressure (PSIG)	221	240	332
Compressor Amps	1.3	1.3	1.7
Total Refrigeration Amps	1.9	1.9	2.2
Kwh / 24 hours	2.8	3.3	3.1
100% Run	—	-19°F / -28.5°C	—

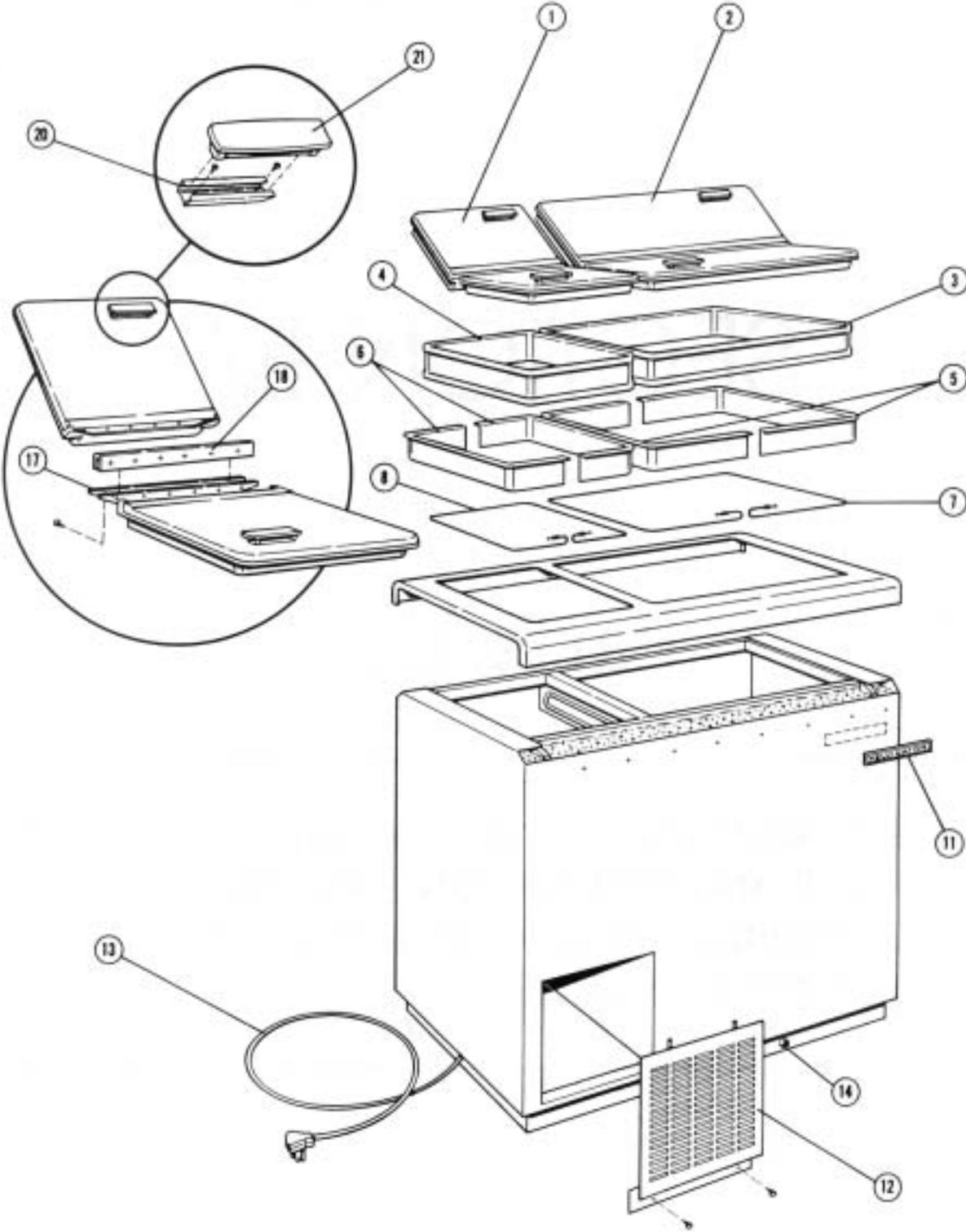
NOTE: REFER TO SERIAL DATA PLATE FOR REFRIGERANT TYPE & CHARGE.

Parts List

When ordering parts, order by part number and description, including, if at all possible, the complete cabinet model and serial number.

Cabinet Parts Illustration

Models: 2SF, 4SF, 4DF, 6DF, 8DF, 8FR, 10DF, 14DF, DI4-2



Cabinet Parts List - Domestic

Models: 2SF, 4SF, 4DF, 6DF, 8DF, 8FR, 10DF, 14DF, DI4-2

PARTS LIST - Cabinet Parts, Domestic										
Item	Description	2SF	4SF	4DF	6DF	8DF	8FR	10DF	14DF	DI4-2
1	Lid Ass'y, Small	28903	28903	28903	28903	28903	28903	28903	28903	
2	Lid Ass'y, Large		29103	29103	29103	29103	29103	29103	29103	29103
3	Chamberguard, Large		10-1077-02	10-1077-02	10-1077-02	10-1077-02	10-1077-02	10-1077-02	10-1077-02	10-1077-02
4	Chamberguard, Small	10-1077-01	10-1077-01	10-1077-01	10-1077-01	10-1077-01	10-1077-01	10-1077-01	10-1077-01	10-1077-01
5	Chamberguard Ret, Large	318A0007	318A0007	320A0006						
6	Chamberguard Ret, Small	318A0007	318A0007	320A0005						
7	Heater, Top Large		21-0356	21-0356	21-0356	21-0356	21-0356	21-0356	21-0356	
8	Heater, Top Small	21-0357	21-0357	21-0357	21-0357	21-0357	21-0357	21-0357	21-0357	
11	Name plate	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01	
12	Grill, Unit Compartment	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00	
13	Service Cord	20-3117-03	20-3117-03	20-3117-03	20-3117-03	20-3117-03	20-3117-03	20-3117-03	20-3117-03	
14	Drain Cap	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00
17	Hinge Plate, Small	320037	320037	320037	320037	320037	320037	320037	320037	
	Hinge Plate, Large			320036	320037	320038	320039	320040	320041	320041
18	Hinge, Small	43-0238	43-0238	43-0238	43-0238	43-0238	43-0238	43-0238	43-0238	
	Hinge, Large			43-0239	43-0239	43-0239	43-0239	43-0239	43-0239	43-0239
20	Handle Retainer	318D0001								
21	Handle, rubber	43-0171	43-0171	43-0171	43-0171	43-0171	43-0171	43-0171	43-0171	43-0171

Cabinet Parts List – Export

Models: E2SF, E4SF, E4DF, E6DF, E8DF, 8FR

PARTS LIST - Cabinet Parts, Export							
Item	Description	E2SF	E4SF	E4DF	E6DF	E8DF	8FR
1	Lid Ass'y, Small	28903	28903		28903		
2	Lid Ass'y, Large			29103	29103	29103	29103
3	Chamberguard, Large			10-1077-02	10-1077-02	10-1077-02	10-1077-02
4	Chamberguard, Small	10-1077-01	10-1077-01		10-1077-01		
5	Chamberguard Ret, Large			320A0006	320A0006	320A0006	320A0006
6	Chamberguard Ret, Small	318A0007	318A0007		320A0005		
7	Heater, Top Large			21-0561	21-0561	21-0561	21-0561
8	Heater, Top Small	21-0560	21-0560		21-0560		
11	Name plate	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01	50-3221-01
12	Grill, Unit Compartment	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00	50-3527-00
13	Service Cord	19-1349-00	19-1349-00	19-1349-00	19-1349-00	19-1349-00	19-1349-00
14	Drain Cap	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00	10-0306-00
17	Hinge Plate, Small	320037	320037		320037		
	Hinge Plate, Large			320036	320037	320038	320039
18	Hinge, Small	43-0238	43-0238		43-0238		
	Hinge, Large			43-0239	43-0239	43-0239	43-0239
20	Handle Retainer	318D0001	318D0001	318D0001	318D0001	318D0001	318D0001
21	Handle, rubber	43-0171	43-0171	43-0171	43-0171	43-0171	43-0171

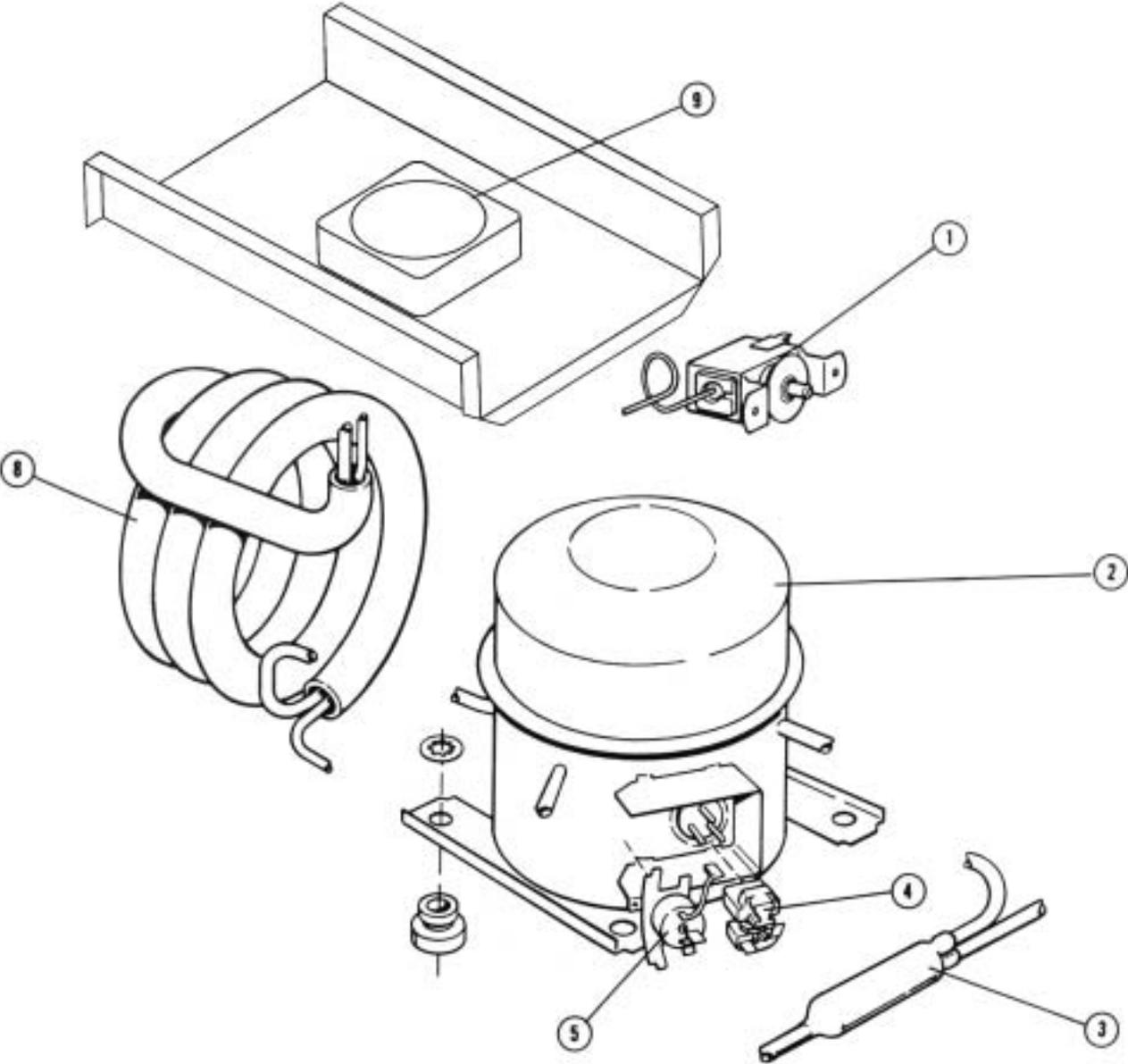
Condensing Unit Compartment Parts List – Export

Models: E2SF, E4SF, E4DF, E6DF, E8DF, E8FR

PARTS LIST - Condensing Unit Parts, Export							
Item	Description	E2SF	E4SF	E4DF	E6DF	E8DF	E8FR
1	Thermostat	23-5117	23-5117	23-5117	23-5117	23-5117	23-5117
2	Compressor	16-0311-00	16-0311-00	16-0311-00	16-0312-00	16-0312-00	16-0312-00
3	Drier / Filter	12-3024	12-3024	12-3024	12-3024	12-3024	12-3024
4	Start Relay	17-0300-00	17-0300-00	17-0300-00	17-0300-00	17-0300-00	17-0300-00
	Start Capacitor	17-0301-00	17-0301-00	17-0301-00	17-0301-00	17-0301-00	17-0301-00
	Run Capacitor	17-0302-00	17-0302-00	17-0302-00	17-0302-00	17-0302-00	17-0302-00
5	Motor Protector	17-0317-00	17-0317-00	17-0317-00	17-0290-00	17-0290-00	17-0290-00
8	Heat Exchanger	50-1099-01	50-1099-01	50-1099-01	50-1099-02	50-1099-02	50-1099-02

Condensing Unit Compartment Illustration

Models: 2SF, 4SF, 4DF, 6DF, 8DF, 8FR, 10DF, 14DF



Condensing Unit Compartment Parts List – Domestic

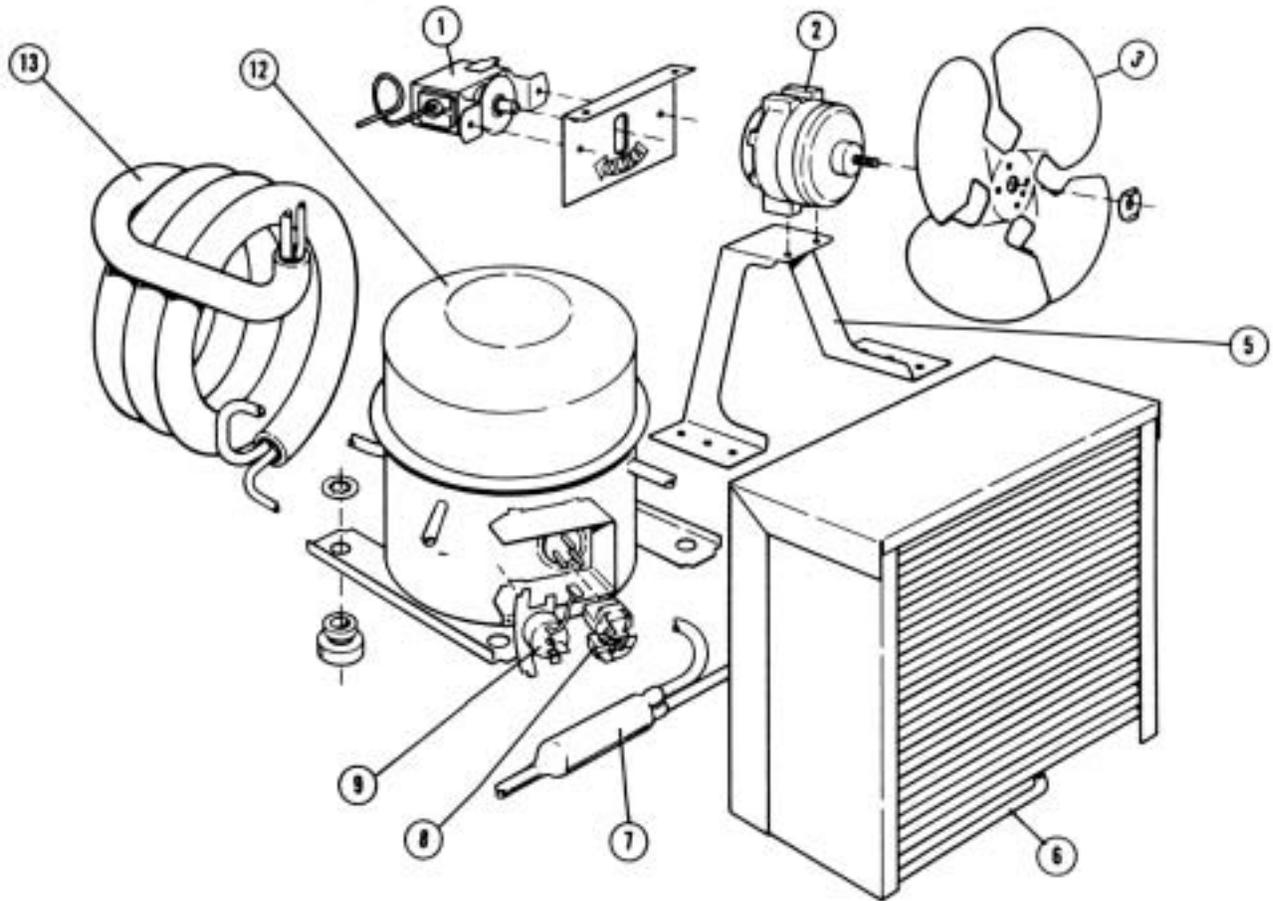
Models: 2SF, 4SF, 4DF, 6DF, 8DF, 8FR, 10DF, 14DF

PARTS LIST - Condensing Unit Parts, Domestic									
Item	Description	2SF	4SF	4DF	6DF	8DF	8FR	10DF	14DF
1	Thermostat	23-5117	23-5117	23-5117	23-5117	23-5117	23-5117	23-5117	23-5117
2	Compressor	16-0308-00	16-0309-00	16-0308-00	16-0309-00	16-0309-00	16-0309-00	16-0313-00	16-0313-00
3	Drier / Filter	12-3024	12-3024	12-3024	12-3024	12-3024	12-3024	12-3024	12-3024
4	Start Relay	17-0286-00	17-0286-00	17-0286-00	17-0286-00	17-0286-00	17-0286-00	17-0300-00	17-0300-00
	Start Capacitor	17-0291-00	17-0291-00	17-0291-00	17-0291-00	17-0291-00	17-0291-00	17-0319-00	17-0319-00
	Run Capacitor	17-0288-00	17-0288-00	17-0288-00	17-0288-00	17-0288-00	17-0288-00	17-0320-00	17-0320-00
5	Motor Protector	17-0314-00	17-0315-00	17-0314-00	17-0315-00	17-0315-00	17-0315-00	17-0316-00	17-0316-00
8	Heat Exchanger	50-1099-01	50-1099-01	50-1099-01	50-1099-02	50-1099-02	50-1099-02	50-1099-03	50-1099-03
9	Condenser Fan							19-1699-00	19-1699-00

Condensing Unit Compartment Illustration & Parts List

Model: DI4-1

Item	Description	Part Number
1	Thermostat	23-5117
2	Fan Motor	24-0396
3	Fan Blade	24-0260
5	Fan Bracket	24-0020
6	Condenser Assembly	50-4124-00
7	Drier / Filter	12-3024
8	Start Relay	17-0286-00
9	Motor Protector	17-0314-00
10	Compressor	16-0308-00
	Start Capacitor	17-0291-00
	Run Capacitor	17-0288-00
13	Heat Exchanger	50-4125-00



8FR Accessories

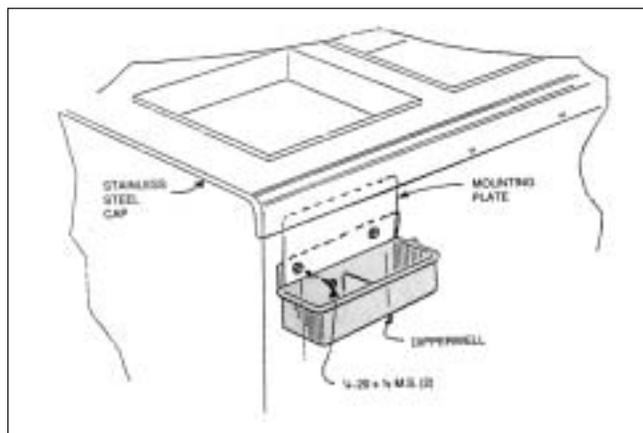
DESCRIPTION	PART NO.
Dipperwell Accessory	7300000
Stainless Steel Syrup Rail Kit	76-3745
S.S. Housing Cap Ass'y	76-3733P
Short Jar	33-0448
Pump Syrup	33-0449
Chocolate Pump	33-0450
Lid with Ladle	33-0544-01
Hinged Lid	33-0544
Cover with Ladle Attached	33-0545
Divider & Jar	33-0452

ACCESSORY MOUNTING

NOTE: There are provisions for either righthand or left hand dipperwell position.

TO INSTALL DIPPER WELL:

1. Remove (2) 1/4 - 20 x 1/2 machine screws securing the mounting plate to the cabinet. (Save the screws.)
If the dipper well is mounted on the opposite end, remove the two plug buttons covering the mounting holes. (Save the plug buttons.)
2. Mounting plate (supplied with the cabinet) must be under the flange of the stainless steel cap.
3. Slide the flange of the dipper well under the mounting plate and line up the holes in the dipper well and mounting plate to the holes provided in the cabinet.
4. Secure the dipper well and mounting plate to the cabinet with (2) 1/4 - 20 x 1/2 machine screws which were removed in instruction #1.
5. Replace plug buttons (removed in instruction #1) in the holes not being used.



CLEANING PROCEDURES FOR CHOCOLATE & SYRUP PUMPS

In order to keep pumps in good working condition, all pumps should be cleaned daily.

When the pumps are cleaned, it will be necessary to remove the pump cups from the pumps. This can be done by pushing up on the cup and turning. Before the cup is removed, set the pump in a large container of warm water and mild detergent, the pump several times until flushed clean. After the pumping operation, remove the cup and let it soak in the cleaning solution until all syrups or chocolate have been removed. Once clean, replace the pump cup on the pump. Final flushing should be done with hot water only. The assembly is now ready for the next day's operation.

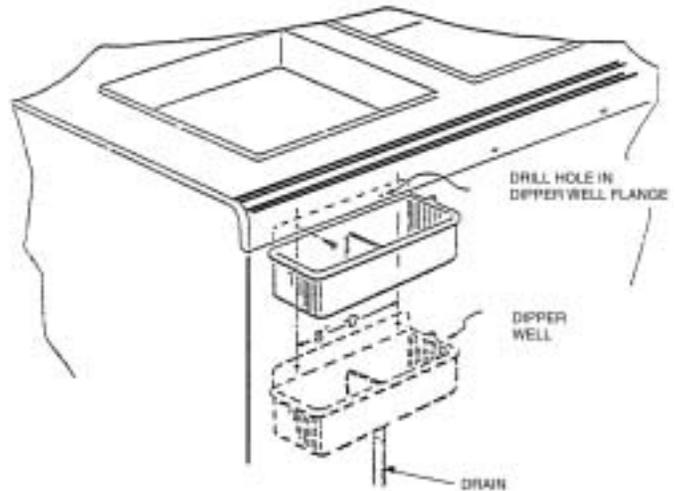
It is recommended that you do not put pump parts in the dishwasher.

Accessory Mounting Limitations

To install a dipper well, remove two aluminum pop rivets in the area the dipper well is to be mounted. Remove the rivets using a NO. 30 high speed drill. Use care to avoid enlarging the holes in either the cap or the cabinet. The drill should not penetrate more than 1/4 inch.

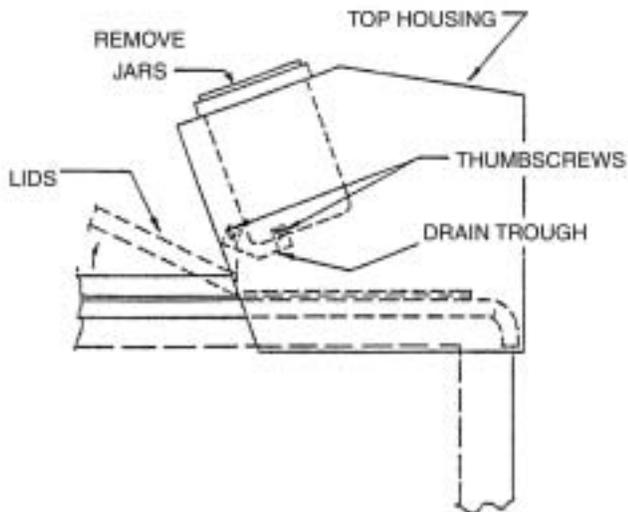
Slip the dipper well flange under the cap as illustrated and slip a pin, drill or rivet through the mounting hole. Level the well and mark the location of the second hole on the flange of the dipperwell. Remove the well and drill a hole the same size as the other two holes at the marked location. Press in a small dab of sealer in each hole before installing the dipper well using (2) No. 6 screws.

NOTE: If a smaller dipper well is used, one fastening may be adequate.



DRAIN TROUGH

Remove jars and reach through opening to remove (4) thumbscrews securing the drain trough to support gussets to permit dropping drain trough down into product zone.



Caster Installation Instructions- SF/DF Models

Caster Kit

52-2777-01 SF Models

52-2777-02 DF Models

1. Attach the casters to the channels with 5/16 x 1/2" bolts and hex nuts. The two casters with locks may be placed at any position desired.
2. Lift one end of the cabinet and place the caster and channel assembly under the cabinet base with the channel flanges against the cabinet base.
3. Attach the caster mounting channels to the base of the cabinet by screwing through the flanges of the caster channel into the side of the cabinet base with seven (7) of the #10 self-drilling sheetmetal screws supplied with the kit.
4. Repeat steps 2 and 3 on the other end of the cabinet.

