Carrier

CARRIER COMMERCIAL REFRIGERATION, INC.

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

SERVICE & INSTALLATION MANUAL

DIPPING CABINETS

R-404A Refrigerant

1 / 2003

51-1298-02

If additional information is necessary, call Carrier Refrigeraiton Operations headquarters.

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 8:00 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. Information in this manual is subject to change without notice.

MODEL DESIGNATION INFORMATION

115V, 60HZ

PART #	MODEL #		DATA PLATE	STYLE
52-1802-31	CKDC27		4HC	CURVED
52-1802-32	CKDC47		8HC	CURVED
52-1953-31	CKDC47 3500K LIGHTS		8HC	CURVED
52-1802-33	CKDC67		12HC	CURVED
52-1953-33	CKDC67 3500K LIGHTS		12HC	CURVED
52-1802-34	CKDC87		16HC	CURVED
52-1953-32	CKDC87 3500K LIGHTS		16HC	CURVED
52-1802-35	KDC27	DL4C	4HR/4HJ	STRAIGHT
52-1802-36	KDC47	DL8C	8HR/8HJ	STRAIGHT
52-1963-31	KDC47F SS NO LIGHTS		8HF	STRAIGHT
52-1802-37	KDC67	DL12C	12HR	STRAIGHT
52-1802-38	KDC87	DL16C	16HR	STRAIGHT

EXPORT 220V, 50HZ

PART #	MODEL #		DATA PLATE	STYLE
52-1901-35	ECKDC27		E4HC	CURVED
52-1901-36	ECKDC47		E8HC	CURVED
52-1901-31	ECKDC67		ECKDC-67	CURVED
52-1901-32	ECKDC87		ECKDC-87	CURVED
52-1901-37	EKDC27	EDL4C	E4HR	STRAIGHT
52-1901-38	EKDC47	EDL8C	E8HR	STRAIGHT
52-1901-33	EKDC67	EDL12C	EKDC-67	STRAIGHT
52-1901-34	EKDC87	EDL16C	EKDC-87	STRAIGHT

EXPORT 220V, 60HZ

PART #	MODEL #	DATA PLATE	STYLE
52-1944-35	KCKDC27	E4HC2	CURVED
52-1944-36	KCKDC47	E8HC2	CURVED
52-1944-31	KCKDC67	E12HC2	CURVED
52-1944-32	KCKDC87	E16HC2	CURVED
52-1944-37	KKDC27	E4HR2	STRAIGHT
52-1944-38	KKDC47	E8HR2	STRAIGHT
52-1944-33	KKDC67	E12HR2	STRAIGHT
52-1944-34	KKDC87	E16HR2	STRAIGHT

Manual effective for models produced January, 2003. Starting serial number 6527372.

Introduction

Dipping Cabinet Introduction

These Dipping Cabinets are designed to merchandise ice cream or yogurt type products. Dipping cabinets are produced in four sizes: 4, 8, 12, and 16 facings of ice cream containers. The cabinet systems contain R-404A refrigerant, metered into the system by a capillary tube. The evaporator is a cold wall which has the refrigerant lines strapped to the inner liner of the cabinet. The condenser is a bare tube mounted on a pullout machinery compartment tray for ease of servicing. All electrical controls are easily accessible for repair. The temperature within the cavity is controlled thermostatically, allowing for maintenance of correct dipping temperatures.

Mechanical equipment may require repair at times. This manual presents information that is helpful in maintaining, diagnosing, and repairing these cabinets.

The high level of quality built into these units will allow for many years of trouble free operation.

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INTRODUCTION

PRINCIPLES OF OPERATION

MAINTENANCE & REPAIR

ILLUSTRATIONS & PARTS

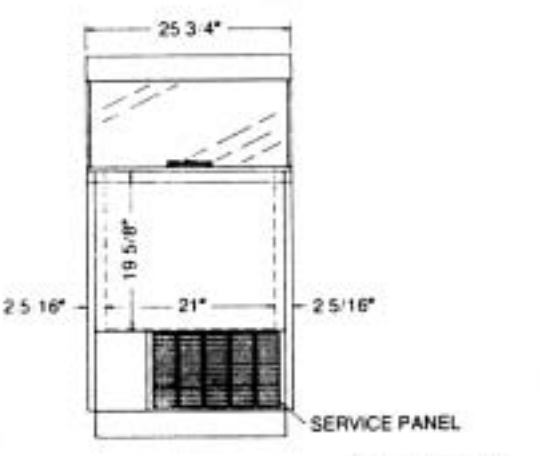
ACCESSORIES

Specifications are subject to change without notice.

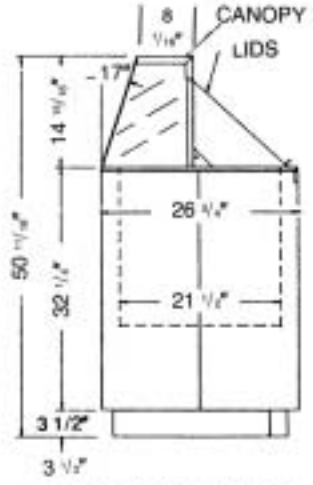
CABINET SPECIFICATIONS

	4HC & 4HR/4HJ	E4HC & E4HR	E4HC2 & E4HR2
Temp. Range	+10°F to -8°F		
Capacity	4.6 Cu. Ft.		
Capacity (3 Gal. Tubs)	4		
Facings (3 Gal. Tubs)	4		
Storage (3 Gal. Tubs)	0		
Compressor Size	1/4 Hp.		
Shipping Weight (App.)	235 lbs.		
Condenser Type	Bare Tube		
Evaporator Type	Cold Wall		
Refrigerant	R-404A		
Refrigerant Control	Capillary Tube		
Defrost System	Manual		
Rated Amps	3.0	1.7	1.7
Electrical Specs.	115V, 60 Hz., 1 Ph.	220V, 50 Hz., 1Ph	220V, 60 Hz., 1 Ph.
Power Cord	No. 16AWG		
NSF Listing	NSF7		
Canopy Construction	S.S. Top with Glass ends Straight or Curved Front Glass		
Lids (Plexiglass)	1 Lid		
Interior Finish	White Baked Enamel on Galvanized Steel		
Exterior Finish	White Baked Enamel		
Lighting	One 20 Watt Bulb		
Accessories	Can Skirt Kit, Lid Locks, Dipperwell, Night Covers, Casters, Legs		

DIMENSIONAL DATA



REAR VIEW



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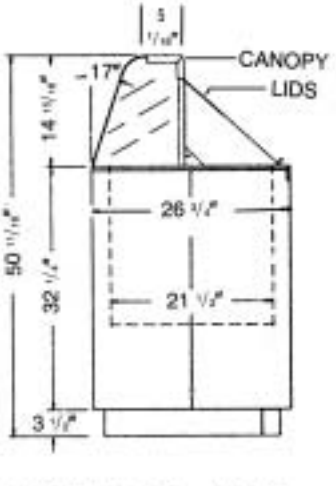
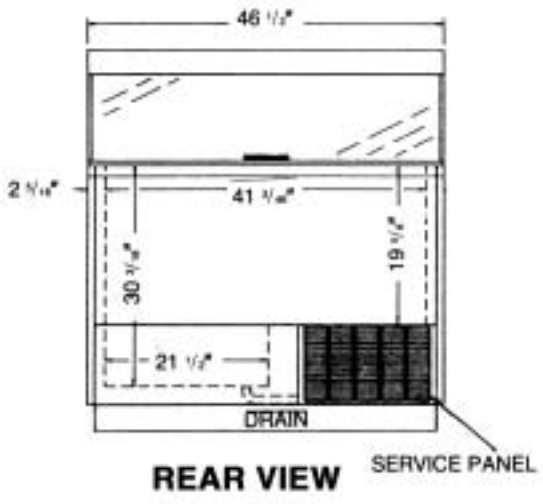


END VIEW - EHC

CABINET SPECIFICATIONS

	8HC & 8HR/8HJ & 8HF	E8HC & E8HR	E8HC2 & E8HR2
Temp. Range	+10°F to -8°F		
Capacity	12.0 Cu. Ft.		
Capacity (3 Gal. Tubs)	12		
Facings (3 Gal. Tubs)	8		
Storage (3 Gal. Tubs)	4		
Compressor Size	1/3 Hp.		
Shipping Weight (App.)	365 lbs.		
Condenser Type	Bare Tube		
Evaporator Type	Cold Wall		
Refrigerant	R-404A		
Refrigerant Control	Capillary Tube		
Defrost System	Manual		
Rated Amps	4.0	2.1	2.1
Electrical Specs.	115V, 60 Hz., 1 Ph.	220V, 50 Hz., 1 Ph.	220V, 60 Hz., 1Ph.
Power Cord	No. 16AWG		
NSF Listing	NSF7		
Canopy Construction	S.S. Top with Glass ends Straight or Curved Front Glass		
Lids (Plexiglass)	1 Lid		
Interior Finish	White Baked Enamel on Galvanized Steel		
Exterior Finish	White Baked Enamel		
Lighting	Two 20 Watt Bulbs Standard (17 Watt Bulbs on Special Cabinets with 3500 K Lighting)		
Accessories	Can Skirt Kit, Lid Locks, Dipperwell, Night Covers, Casters, Legs		

DIMENSIONAL DATA



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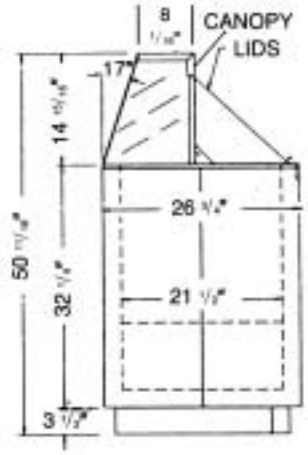

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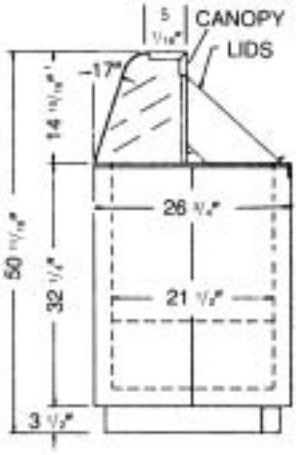
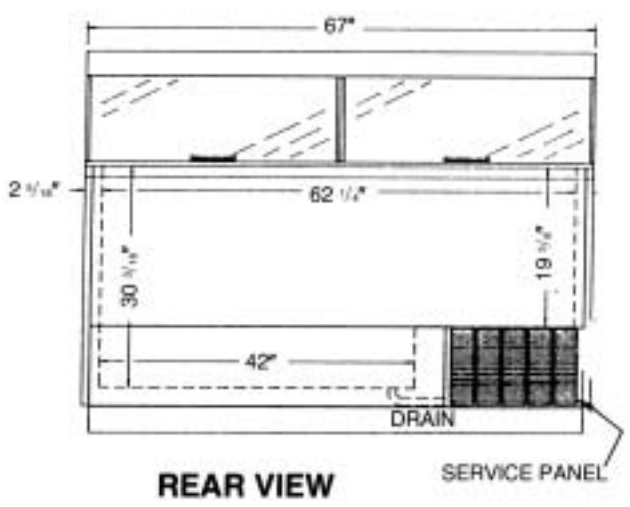


END VIEW - EHC

CABINET SPECIFICATIONS

	12HC & 12HR	ECKDC-67 & EKDC-67	E12HC2 & E12HR2
Temp. Range	+10°F to -8°F		
Capacity	19.1 Cu. Ft.		
Capacity (3 Gal. Tubs)	20		
Facings (3 Gal. Tubs)	12		
Storage (3 Gal. Tubs)	8		
Compressor Size	1/3 Hp.	3/4 Hp.	3/4 Hp.
Shipping Weight (App.)	525 lbs.		
Condenser Type	Bare Tube		
Evaporator Type	Cold Wall		
Refrigerant	R-404A		
Refrigerant Control	Capillary Tube		
Defrost System	Manual		
Rated Amps	8.0	4.1	4.1
Electrical Specs.	115V., 60 Hz, 1 Ph.	220V, 50 Hz, 1 Ph.	220V, 60 Hz, 1 Ph.
Power Cord	Yes		
NSF Listing	NSF7		
Canopy Construction	S.S. Top with Glass ends Straight or Curved Front Glass		
Lids (Plexiglass)	2 Lid		
Interior Finish	White Baked Enamel on Galvanized Steel		
Exterior Finish	White Baked Enamel		
Lighting	Two 30 Watt Bulbs Standard (32 Watt Bulbs on Special Cabinets with 3500 K Lighting)		
Accessories	Can Skirt Kit, Lid Locks, Dipperwell, Night Covers, Casters, Legs		

DIMENSIONAL DATA



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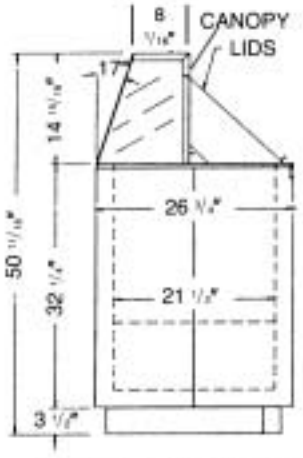

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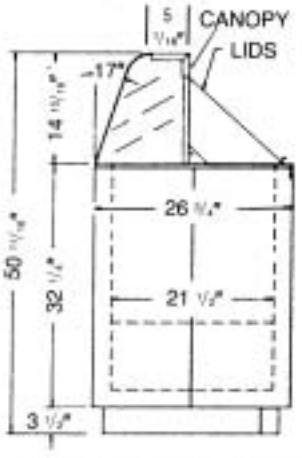
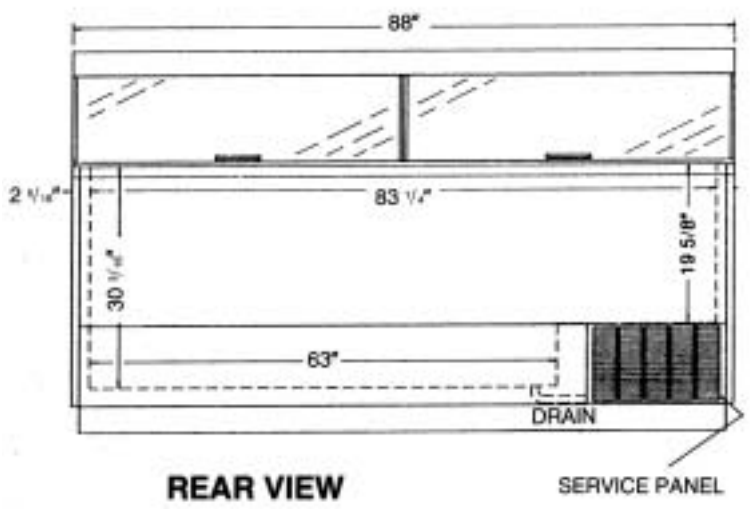


END VIEW - EHC

CABINET SPECIFICATIONS

	16HC & 16HR	ECKDC-87 & EKDC-87	E16HC2 & E16HR2
Temp. Range	+10°F to -8°F		
Capacity	19.1 Cu. Ft.		
Capacity (3 Gal. Tubs)	20		
Facings (3 Gal. Tubs)	12		
Storage (3 Gal. Tubs)	8		
Compressor Size	1/3 Hp.	3/4 Hp.	3/4 Hp.
Shipping Weight (App.)	525 lbs.		
Condenser Type	Bare Tube		
Evaporator Type	Cold Wall		
Refrigerant	R-404A		
Refrigerant Control	Capillary Tube		
Defrost System	Manual		
Rated Amps	8.0	4.1	4.1
Electrical Specs.	115V, 60 Hz., 1 Ph.	220V, 50 Hz, 1 Ph.	220V, 60 Hz, 1 Ph.
Power Cord	Yes		
NSF Listing	NSF7		
Canopy Construction	S.S. Top with Glass ends Straight or Curved Front Glass		
Lids (Plexiglass)	2 Lid		
Interior Finish	White Baked Enamel on Galvanized Steel		
Exterior Finish	White Baked Enamel		
Lighting	Two 40 Watt Bulbs Standard (32 Watt Bulbs on Special Cabinets with 3500 K Lighting)		
Accessories	Can Skirt Kit, Lid Locks, Dipperwell, Night Covers, Casters, Legs		

DIMENSIONAL DATA



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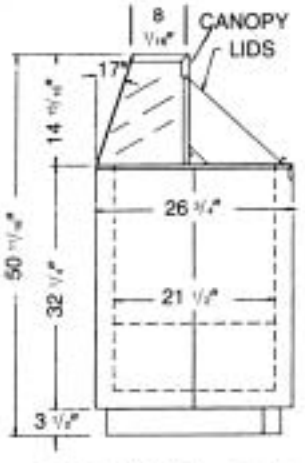

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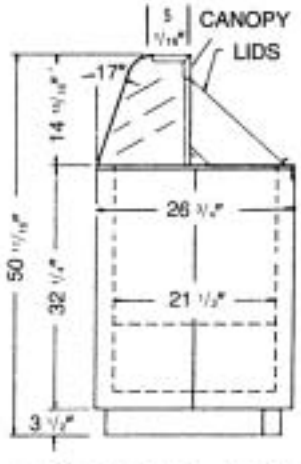


END VIEW - EHC

HANDLING & INSTALLATION-Illuminated Dipping Cabinets

FREIGHT DAMAGES AND SHORTAGES

IMPORTANT

The cabinet was inspected and packaged at the factory, and should have arrived in excellent condition. The transportation company or other parties involved in the shipment are responsible for loss and/or "damage." Always make an inspection before and after uncrating, preferably at the point of unloading by the transportation company.

INSPECTING FOR DAMAGES

Note:

Always use care when removing shipping tape, blocks, pads, hardware or other material. Contact your dealer or distributor if technical assistance is required.

Check the cartons or containers. If these are damaged in any way, open them and inspect the contents in the driver's presence. If damage is detected, do the following:

1. Have the driver note the nature and extent of the damage on the freight bill.
2. Notify the transportation company's office to request an inspection. Carrier claim policies usually require inspections to be made within 15 days of delivery.
3. If damage is noticed, file a claim with the transportation company.

FILING A CLAIM

File a claim for loss at once with the transportation company for:

A. A cash adjustment B. Repairs C. Replacement

When filing your claim, retain all packaging materials and receipts.

HANDLING THE CABINET

Note:

The refrigeration system of the cabinet is designed to operate with the cabinet located on a flat surface. Do not tilt the cabinet more than 30° to any side. If the cabinet must be tilted on an angle for handling or moving purposes, allow it to sit in an upright position 20 to 30 minutes prior to operating.

CHOOSE A LOCATION

This model cabinet should be situated to allow proper air circulation. The cabinet must be installed on sturdy, level floor and positioned so that it can be plugged into a properly grounded three-prong electrical wall outlet. The electrical outlet should not be controlled by a wall switch which might be turned off accidentally.

UNCRATING THE CABINET

The cabinet should be moved as close as possible to the operating location before removing the skid. Be sure to follow the steps in the "INSPECTING FOR DAMAGES" instructions.

INSTALLING THE CABINET

Whenever possible leave the crate skid on the cabinet until it is moved close to the final position. When it is necessary to move the cabinet through a doorway, it may be necessary to remove the crate skid.

Run the cabinet down to storage temperature before adding product.

CAUTION

A. Do not locate cabinet where sunlight or drafts from fans, air conditioners or open doors can affect product temperature.

B. Run cabinet before building in or attaching panels or accessories.

C. Employee side access panel must be kept clear for adjustments and service.

D. Cabinet must be installed on the finished floor to assure rear raceway cover and condensing unit (employee side) can be pulled or removed for service. **DO NOT seal in with cover molding or caulking in the area where condensing unit pulls out.**

E. **Do not use extension cords to power this equipment.**

Run any necessary electrical, water supply and drain lines before setting the cabinet in position. Shim under the cabinet as necessary to level it. N.S.F. approval requires sealing the cabinet to the floor. This can be done by applying a bead of mastic sealer between the cabinet bottom flange and the floor.

Should several cabinets be set up in a row, space is provided in the rear toe space for routing electrical and plumbing lines. Access to this space requires removing screws and the metal cover which runs the length of the cabinet.

Rivnuts are provided on the operator's side for mounting dipperwell and other accessories.

CABINET START-UP

Once the cabinet has been located in its permanent location and the proper power and grounding have been provided, the following items must be checked or completed:

A. Cut and remove the compressor hold-down band (if applicable) so the compressor "floats" freely.

B. Check for traces of oil on the compressor pan which could mean a broken or leaking refrigeration line. **UNDER NO CIRCUMSTANCE SHOULD THE COMPRESSOR BE STARTED WHEN OIL IS PRESENT UNTIL INSPECTED BY A SERVICE TECHNICIAN.**

C. **INSPECT THE FACTORY WIRING FOR TERMINALS THAT MIGHT HAVE VIBRATED LOOSE IN SHIPPING. TIGHTEN ALL SCREW TYPE TERMINALS.**

D. Check the refrigeration lines to see that they are "free" and no damage was done during shipping.

E. Check fan blade for free operation.

F. Turn on the main power switch. Once the compressor starts, the voltage should be checked at the compressor terminals to determine if there is proper voltage to the compressor. The voltage should not exceed the 10% above or below the rated compressor voltage.

EXAMPLE: If the voltage reads 220 volts with no load and it drops below 210 volts when the compressor starts, it may indicate that the supply wiring is too small or that the wire run is too long.

G. Listen for any unusual noise such as lines vibrating, etc. Correct the problem by tightening screws, slightly bending tubing, etc.

H. The temperature control thermostat which is located in the rear post is factory set for average conditions. A customer adjustment requires a coin or screwdriver to turn the slotted shaft. A numbered dial makes it easy to keep track of adjustments. #1 is warmest setting and #7 is coldest setting. An "OFF" position is provided for your convenience in defrosting the cabinet.

I. Allow the cabinet to pull down and cycle prior to loading with product (Approx. 24 hours).

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 circumstance, cut or remove the round grounding plug 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-pronged wall receptacle assures the proper polarization with the appliance plug.

IMPORTANT USAGE INSTRUCTIONS

Dipping Cabinet

The cabinet must be located in an area free from air drafts created by open doors, air conditioning ducts, and fans. The cabinet should not be located in the direct sunlight.

The rear grill must be clear of any obstructions so the intake and exhausting of air for the condensing unit can move freely.

Dipping cabinets are designed for use in an air conditioned store. This cabinet is designed for merchandising, not hardening of the product.

High humidity can cause fogging of the lid and front glass.

High temperatures, installation of warm product and heavy usage can cause the product to soften. This condition will be more noticeable at the top of the cans.

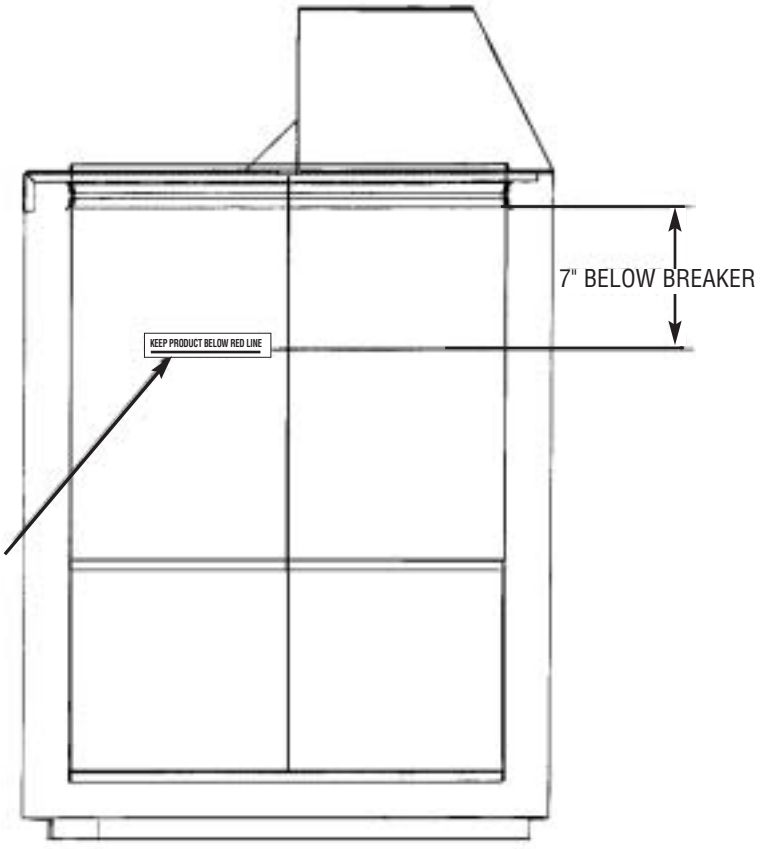
The corners of the cabinets are the coldest areas. These areas should be used for product that is more difficult to keep firm.

Frost and ice act as insulators. The need for defrosting will depend on usage and product firmness.

If the frost is scraped daily with a plastic scraper, intervals between complete defrosting may be extended.

Thermostat adjustments should be made one increment warmer or colder allowing 24 hours between adjustments to allow the product to stabilize.

PRODUCT LOAD LINE LOCATION



NOTE:
KEEP PRODUCT BELOW THIS LINE.

SECTION II
Principles of Operation

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GENERAL OPERATIONS

All the dipping cabinet models are of the same basic design, consisting of a bare tube condenser and a 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 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 away any water that might have accumulated. 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.

NOTE: On initial cabinet pull down the bare tube condenser may become warm to the touch until the normal operating temperatures are achieved.

Refer to model serial data tag for cabinet amperage, refrigerant charge & type.

Compressors being used in these cabinets utilize refrigerant 404A and polyol ester oil. Because of the hygroscopic nature of this oil, extreme care must be taken when any component is changed within the system. In the case of compressor replacement, work should be completed before the caps are removed from the compressor.

Agitation of the oil should be kept to a minimum. Compressors should not be open to the atmosphere for more than 15 minutes max. Should contamination occur the oil can be removed and recharged (following compressor manufacturer's guidelines when performing this procedure). Because of the porous nature of plastic, polyol ester oil should be stored in a metal container. Moisture contained within the oil cannot be removed even under high vacuum conditions and must be replaced.

SYSTEM INFORMATION - 4HR & 4HC
ELECTRICAL

Compressor	Manufacturer: Americold Model: HP-110-3083 V.: 115/100 R.L.A.: 2.0 L.R.A.: 10 Phase 1
Overload Protector	Americold #1456-3453
Start Relay	T.I.: Americold #1456-3372
Start Capacitor	V.A.C.: 165 M.F.: 88-108
Run Capacitor	V.A.C.: 180 M.F.: 15

Evaporator	Cold Wall
Capillary Tube	7' of .031

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/240 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: 5KSM51GG-37845
Condenser Fan Blade	Diameter: 8" # of Blades: 3 Width of Blades: 1 7/8"

Power Cord	A.W.G.: 14 A.: 15 @ 125V
Light Ballast	Manufacturer: G.E. Model: 89G457
Fluorescent Lamp	Manufacturer: G.E. F20T12 CW

REFRIGERATION - Refrig. Charge: R-404A / 11.5 oz. / 326.02 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Suction Pressure - C.O. PSIG/Kpa	13 /	13 /	14 /
Discharge Pressure - C.O. PSIG/Kpa	196 /	224 /	246 /
Compressor Amps	1.8	1.8	1.8
Total Cabinet Amps	2.3	2.0	2.0
Cavity Temperature C.L.	0°F / -17°C	2°F / -16°C	3°F / -16°C

SYSTEM INFORMATION - 8HR & 8 HC
ELECTRICAL

Compressor	Manufacturer: Americold Model: HP-117-1 V.: 115/100 R.L.A.: 3.0 L.R.A.: 21.4 Ph.: 1 HP: ⅓
Overload Protector	Americold #1456-3454
Start Relay	T.I.: 8EA1206K1A
Start Capacitor	V.A.C.: 165 M.F.: 88-108
Run Capacitor	V.A.C.: 200 M.F.: 15

Evaporator	Cold Wall
Capillary Tube	8' of .036

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/240 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: Morrill Model: SPB9S1
Condenser Fan Blade	Diameter: 8" # of Blades: 3 Width of Blades: 2 3/4"

Power Cord	A.W.G.: 14 A.: 15 V.: 125
Light Ballast	Manufacturer: G.E. Model: 89G457(STD) B232I120RH (3500K)
Fluorescent Lamp	Manufacturer: G.E. F20T12 CW (STD) F17T8 / SP35 (3500K)

REFRIGERATION - Refrig. Charge: R-404A / 17 oz. / 481.95 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Suction Pressure - C.O. PSIG/Kpa	9 /	12 /	13 /
Discharge Pressure - C.O. PSIG/Kpa	187 /	228 /	251 /
Compressor Amps	2.9	2.9	2.9
Total Cabinet Amps	3.5	3.5	3.5
Cavity Temperature C.L.	5°F / -15°C	7°F / -13°C	8°F / -13°C

SYSTEM INFORMATION - 12HR & 12HC
ELECTRICAL

Compressor	Manufacturer: Americold Model: HP-127-1 Ph.: 1 Hz.: 60 Volts: 115 Amps: 4.2
Overload Protector	Manufacturer: Americold
Start Relay	Manufacturer: Americold
Start Capacitor	V.: 125 M.F.: 189-227
Run Capacitor	VAC: 370 M.F.: 20

Evaporator	Cold Wall
Capillary Tube	7' of .042

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/250 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: 5KSM51GG3784
Condenser Fan Blade	Diameter: 9.5" # Blades: 3 Width of Blades: 1 29/32"

Power Cord	A.W.G.: 16 A.: 15 V.: 125
Light Ballast	Manufacturer: G.E. Model: 89G457(STD) B232I120RH(3500K)
Fluorescent Lamp	Manufacturer: G.E. F40T12CW (STD) F32T8/SP35 (3500K)

REFRIGERATION - Refrig. Charge: R-404A / 25 oz. / 708.75 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Suction Pressure - C.O. PSIG/Kpa	9 /	10 /	11 /
Discharge Pressure - C.O. PSIG/Kpa	198 /	230 /	268 /
Compressor Amps	4.2	4.2	4.3
Total Cabinet Amps	6.1	6.1	6.2
Cavity Temperature	0°F / -17°C	1°F / -17°C	2°F / -16°C

SYSTEM INFORMATION - 16HR & 16HC
ELECTRICAL

Compressor	Manufacturer: Americold Model: HP-127-1 Volts: 115 R.L.A.: 4.2 L.R.A.: — Ph.: 1 Hz.: 60
Overload Protector	Americold #1456-3321
Start Relay	Americold #1456-3374
Start Capacitor	V.: 125 M.F.: 189-227
Run Capacitor	V.: 370 M.F.: 20

Evaporator	Cold Wall
Capillary Tube	7' of .042

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/240 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: 5KSM51GG3784 V.: 115 Hz.: 60 Ph.: 1
Condenser Fan Blade	Diameter: 9.5" # Blades: 3 Width of Blades: 1 29/32"

Power Cord	A.W.G.: 16 A.: 15 V.: 125
Light Ballast	Manufacturer: G.E. Model: 8G3706 (STD) B232I120RH (3500K)
Fluorescent Lamp	Manufacturer: G.E. F40T12CW (STD) F32T8/SP35 (3500K)

REFRIGERATION - Refrig. Charge: R-404A / 27 oz. / 765.45 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Suction Pressure - C.O. PSIG/Kpa	9 /	10 /	12 /
Discharge Pressure - C.O. PSIG/Kpa	207 /	234 /	262 /
Compressor Amps	3.8	3.8	3.9
Total Cabinet Amps	6.3	6.3	6.3
Cavity Temperature C.L.	-.5°F / -18°C	-.3°F / -17.9°C	-1.2°F / -18.4°C

SYSTEM INFORMATION - E4HR & E4HC (220V / 50 Hz)
ELECTRICAL E4HR2 & E4HC2 (220V / 60 Hz)

Compressor	Manufacturer: Americold Model: HP-110-12-3084 V.: 220 R.L.A.: 2.0 L.R.A.: 12.6 Phase: 1/50Hz.
Overload Protector	T.I.: Americold #1456-3444
Start Relay	T.I.: Americold #1456-3374
Start Capacitor	V.A.C.: 250 M.F.: 108-130
Run Capacitor	V.A.C.: 370 M.F.: 7.5

Evaporator	Cold Wall
Capillary Tube	7' of .031

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/240 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: 5KSM51ECG3905
Condenser Fan Blade	Diameter: 8" # of Blades: 3 Width of Blades: 1 7/8"

Power Cord	A.W.G.: 14 A.: 15 @ 125V
Light Ballast	Robertson #02025 (50Hz) Robertson #02026 (60Hz)
Fluorescent Lamp	Manufacturer: G.E. F20T12/CW

REFRIGERATION - Refrig. Charge: R-404A / 11.5 oz. / 326.02 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Cavity Temperature C.L.	0°F / -17°C	2°F / -16°C	3°F / -16°C
Suction Pressure - C.O. PSIG/Kpa	12 / 82	13 / 89	14 / 96
Discharge Pressure - C.O. PSIG/Kpa	206 / 1420	214 / 1475	239 / 1647
Compressor Amps	2.0	2.0	2.0
Total Cabinet Amps	2.3	2.3	2.3

SYSTEM INFORMATION - E8HR & E8HC (220V / 50 Hz)
ELECTRICAL E8HR2 & E8HC2 (220V / 60 Hz)

Compressor	Manufacturer: Americold Model: HP-118-12 V.: 220 R.L.A.: 3.0 L.R.A.: 12.6 Phase: 1/50Hz.
Overload Protector	Americold #1456-3321
Start Relay	T.I.: 8EA14
Start Capacitor	V.A.C.: 250 M.F.: 108-130
Run Capacitor	V.A.C.: 370 M.F.: 7.5

Evaporator	Cold Wall
Capillary Tube	8' of .036

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 120/240 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: 5KSM51ECG3905
Condenser Fan Blade	Diameter: 8" # of Blades: 3 Width of Blades: 1 7/8"

Power Cord	A.W.G.: 14 A.: 15 @ 125V
Light Ballast	Robertson #02026
Fluorescent Lamp	Manufacturer: G.E. F20T12/CW

REFRIGERATION - Refrig. Charge: R-404A / 17 oz. / 481.95 grams / No. 4 Stat Position

AMBIENT TEMPERATURE CONTROL SETTINGS	70°F / 21.1°C #4 C.S.	80°F / 27°C #4 C.S.	90°F / 32.5°C #4 C.S.
Cavity Temperature Range	5°F / -15°C	7°F / -13°C	8°F / -13°C
Suction Pressure - C.O. PSIG/Kpa	13 / 89	15 / 103	16 / 110
Discharge Pressure - C.O. PSIG/Kpa	213 / 1468	250 / 1723	292 / 2013
Compressor Amps	2.9	3.0	3.1
Total Cabinet Amps	3.5	3.7	3.7

SYSTEM INFORMATION - EKDC-67 & ECKDC-67
ELECTRICAL E12HR2 & E12HC2 (220V / 60 Hz)

Compressor	Mft: Copeland (3/4 HP) Model: KAMB-007E-CAV Phase: 1 Hz.:50
Overload Protector	Model No.: 071-0092-29
Start Relay	G.E. 3ARR3CT3E5 Pick up: 340-360 Drop out: 45-115 Model No.: 040-0001-03
Start Capacitor	V: 220 M.F.: 145-174
Run Capacitor	10UF - 370V

Evaporator	Cold Wall
Capillary Tube	9' of .049

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 125/250 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: KSM51GG3705
Condenser Fan Blade	Diameter: 9-½" # Blades: 3 Width of Blades: 1-29/32"
Pressure Switch	C.O.: 350# C.I.: 250#

Power Cord	A.W.G.: 16 Amp: 15
Light Ballast	VOSSLOH SCHWABE Model: L36.291 (50Hz) Robertson: 1-4026 (60 Hz)
Fluorescent Lamp	Manufacturer: G.E. F40T12CW

REFRIGERATION - Refrig. Charge: R-404A / 25 oz. / 708.75 grams / No. 4 Stat Position

AMBIENT TEMPERATURE	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
CAVITY TEMPERATURE	2°F / -17°C	4°F / -16°C	6°F / -14°C
Suction Pressure - C.O. PSIG/Kpa	8 / 55	10 / 69	12 / 82
Discharge Pressure - C.O. PSIG/Kpa	188 / 1246	225 / 1551	253 / 1744
Compressor Amps	7.2	7.1	7.1
Total Cabinet Amps	9.5	9.3	9.4

SYSTEM INFORMATION - EKDC-87 & ECKDC-87 (220V / 50 Hz)
ELECTRICAL E16HR2 & E16HC2 (220V / 60 Hz)

Compressor	Mft: Copeland (3/4 HP) Model: KAMB-007E-CAV R.L.A.: 5.6 L.R.A.: 36.0 Phase: 208/230V 60 Hz. 200/220V 50 Hz.
Overload Protector	Model No.: 071-0092-29
Start Relay	G.E. 3ARR3CT3E5
Start Capacitor	V: 220 M.F.: 145-174
Run Capacitor	V.: 370 M.F.:10

Evaporator	Cold Wall
Capillary Tube	9' of .049

Thermostat	Manufacturer: Ranco F.L.A.: 25 V.: 125/250 L.R.A.: 100		
Warm Cut-in	11°	Warm Cut-out	—
Mid Cut-in	-12°	Mid Cut-out	-24°
Cold Cut-in	—	Cold Cut-out	-34°

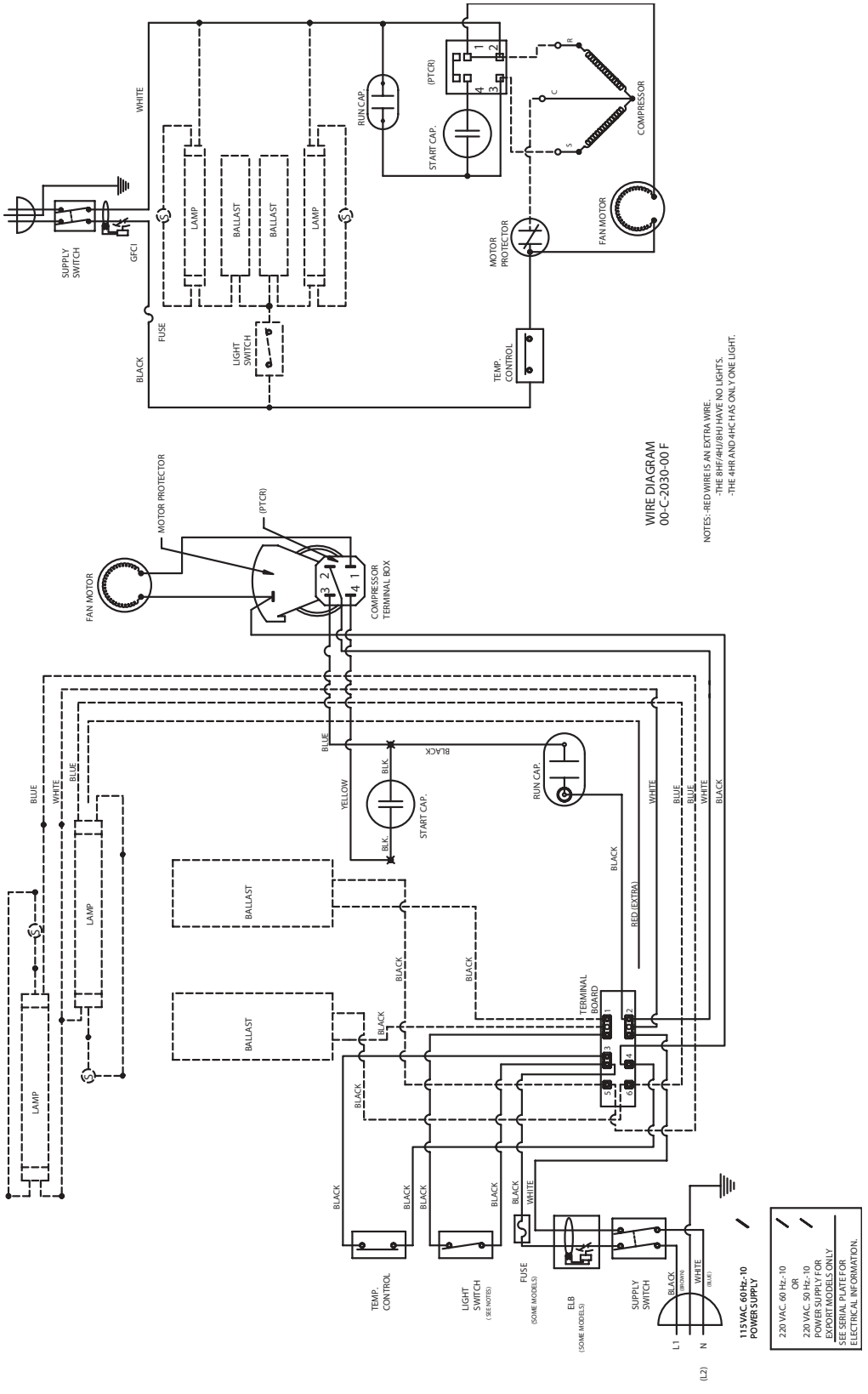
Condenser	Manufacturer: Heatcraft
Condenser Fan Motor	Manufacturer: G.E. Model: KSM51GG3705
Condenser Fan Blade	Diameter: 9-½" # Blades: 3 Width of Blades: 1-29/32"

Power Cord	A.W.G.: 16 Amp: 15
Light Ballast	VOSSLOH SCHWABE Model: L36.291 (50Hz) Robertson: 1-4025 (60 Hz)
Fluorescent Lamp	Manufacturer: G.E. F40T12CW

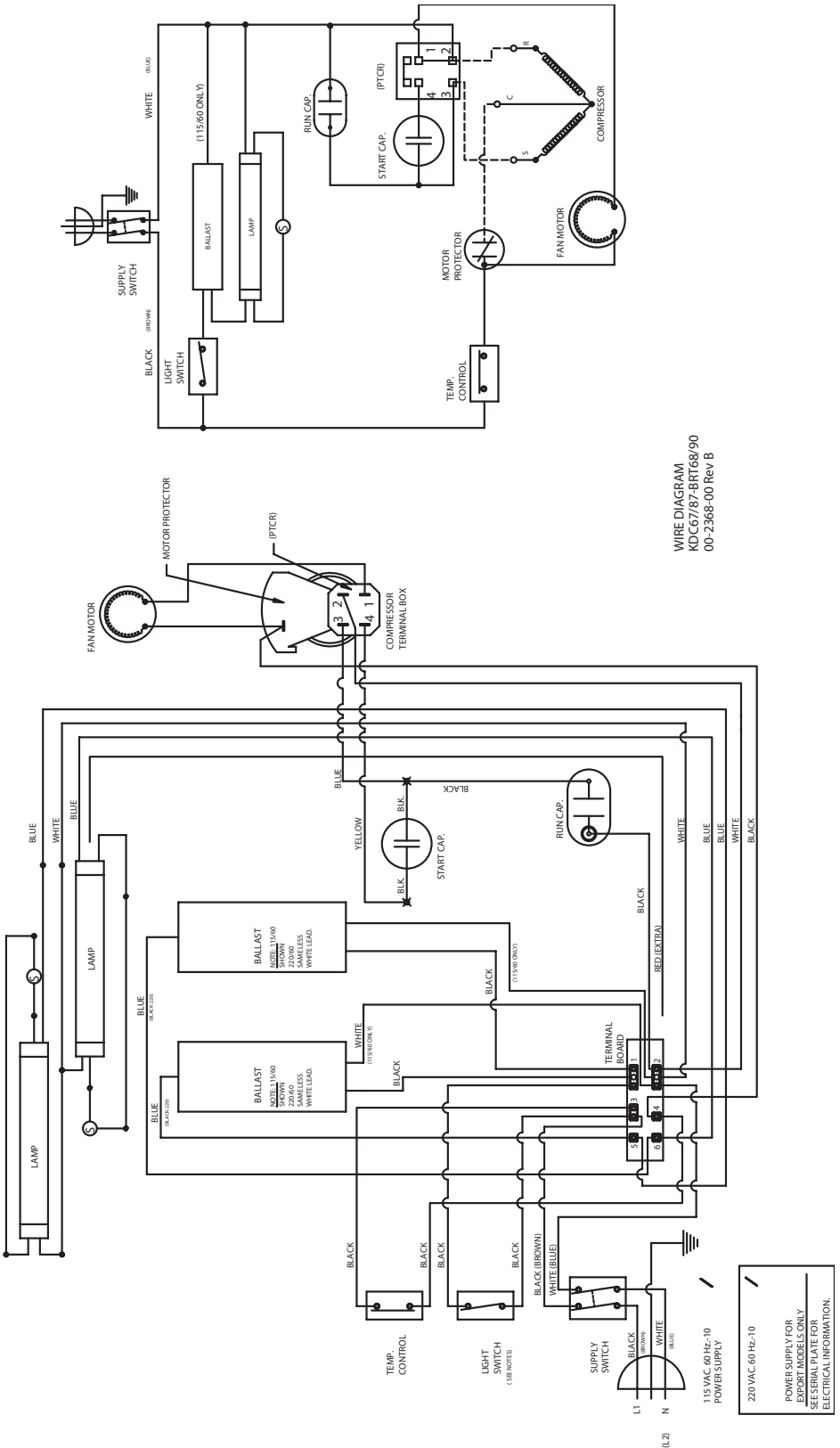
REFRIGERATION - Refrig. Charge: R-404A / 27 oz. / 765.45 grams / No. 4 Stat Position

AMBIENT TEMPERATURE	70°F / 21.1°C	80°F / 27°C	90°F / 32.5°C
CAVITY TEMPERATURE	2°F / -17°C	4°F / -16°C	6°F / -14°C
Suction Pressure - C.O. PSIG/Kpa	8 / 55	10 / 69	12 / 82
Discharge Pressure - C.O. PSIG/Kpa	228 / 1572	257 / 1772	284 / 1958
Compressor Amps	7.4	7.5	8
Total Cabinet Amps	9.5	9.3	10

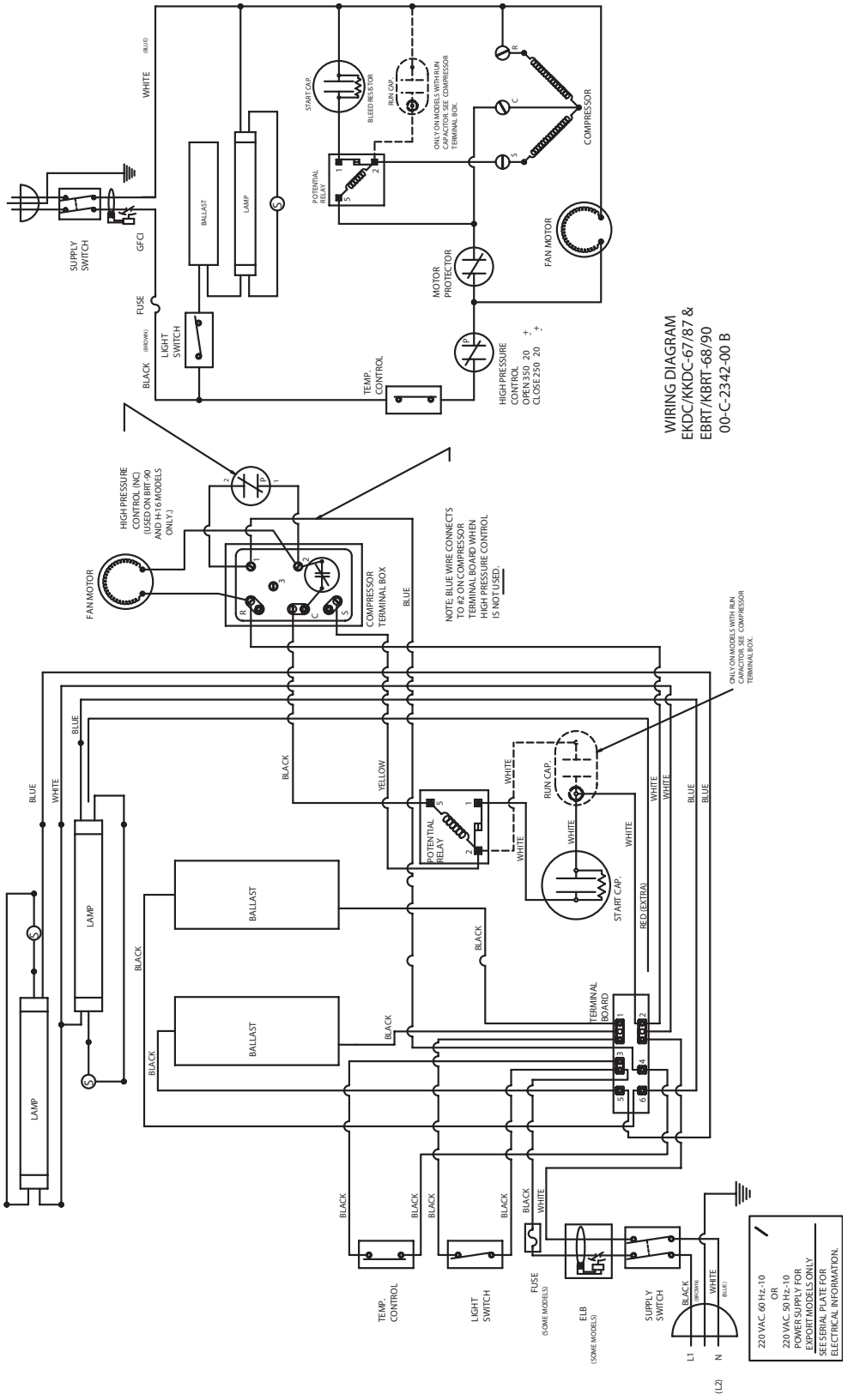
WIRING DIAGRAM - 4HR, 4HC / 8HR, 8HC
E4HR, E4HC / E8HR, E8HC
E4HR2, E4HC2 / E8HR2, E8HC2



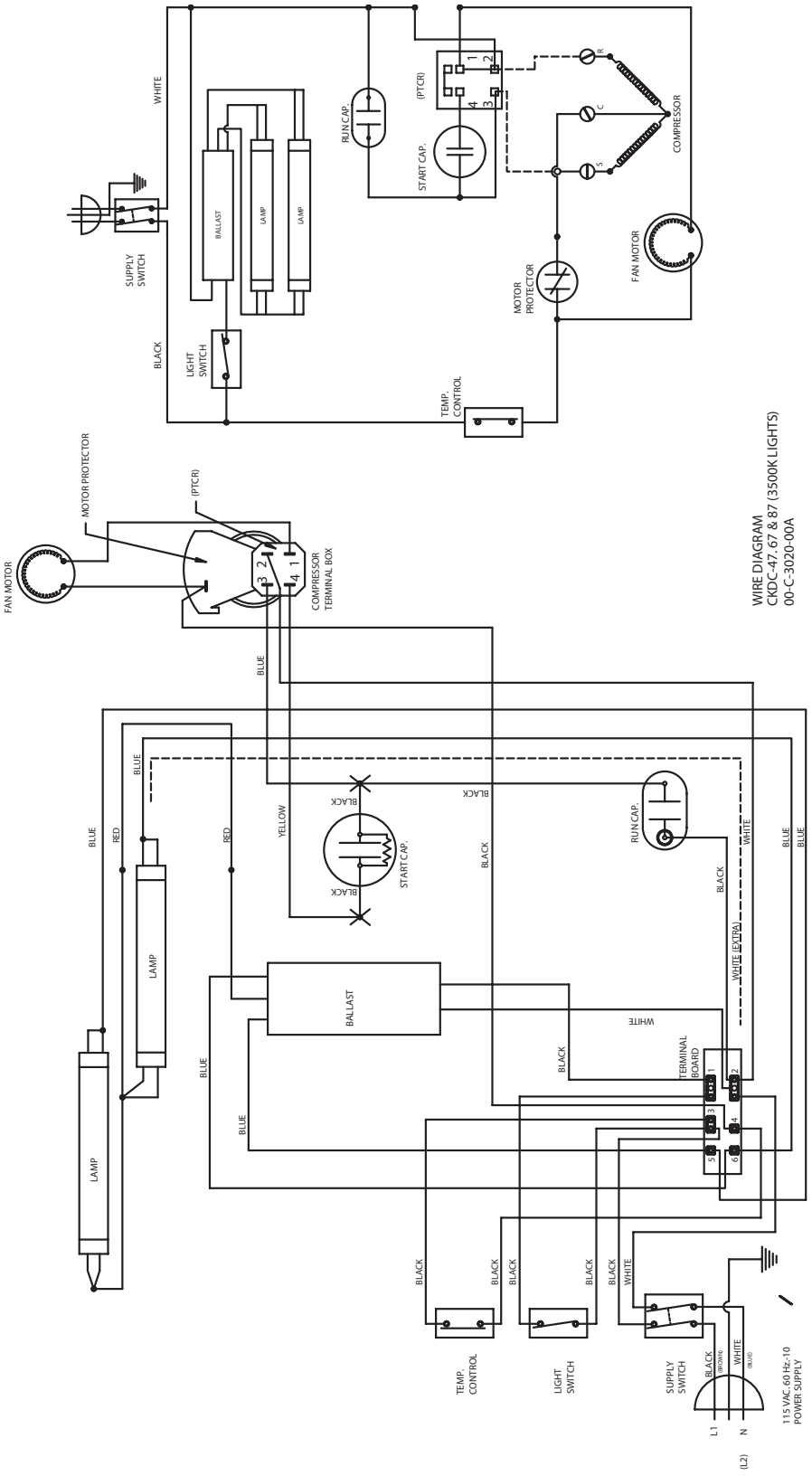
WIRING DIAGRAM - 12HR, 12HC / 16HR, 16HC



WIRING DIAGRAM - ECKDC67, EKDC67 / ECKDC87, EKDC87 E12HC2, E12HR2 / E16HC2, E16HR2



WIRING DIAGRAM - 8HC, 12HC, 16HC WITH 3500K LIGHTS



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SECTION III

Maintenance & Repair

WARNING:

To avoid the possibility of an electrical shock, turn OFF thermostat and unplug the power cord of the cabinet before cleaning or touching electrical connections or parts.

MAINTENANCE & REPAIR — PRE-SERVICE CHECK LIST

You may avoid the cost and inconvenience of an unnecessary service call by first reviewing this check list of the most frequently encountered situations that are not the result of system component failure.

COMPRESSOR RUNS TOO MUCH

1. A refrigerated cabinet automatically compensates for service loading by running longer and more often. Before calling for service, check running time for at least one hour the first thing in the morning (before store traffic starts).
2. Be sure doors seal. A faulty gasket seal will cause increased running time.
3. Check the room temperature. The warmer the room, the more the compressor will run.
4. Check to see that condenser fans are running.
5. Be sure the condenser fan operates.
6. Check to see that condenser fans are running.
7. If product is too hard, (cold) try setting the temperature control (thermostat) warmer. This will result in warmer cabinet temperature and reduced running time.

CABINET DOES NOT OPERATE

1. Be sure the cabinet is plugged in.
2. Check that the breakers or fuses are good and all switches in the supply line are ON.
3. Be sure that cabinet Master Supply Switch is ON.
4. If you are in an area with voltage problems, try shutting off all non-essential electric equipment.

LIGHT IS OFF

1. If the cabinet is operating, be sure the lamp is properly seated in sockets.
2. If the cabinet is not running, check that Master Supply Switch of cabinet is ON, fuses are okay, no switch in the supply is off and the cabinet is plugged in.

CUSTOMER COMPLAINT OR STORED PRODUCT

1. Check cleaning solutions used inside cabinet.
2. Check cleaning solutions, paint or other contaminants used in store maintenance.
3. Sometimes the ingredients used in some products or containers will contaminate other products.
4. Be sure to follow a weekly schedule for cleaning cabinet interior.

SERVICE

In the event of a malfunction, damage to the cabinet, or if the cabinet requires service beyond the items in the "Pre-Service Check List," contact your local refrigeration service company or the dealer or distributor you purchased the unit from.

POWER FAILURE

Do not open the cabinet doors unnecessarily if power is cut off due to electrical failure. The cabinet will start up if the power supply returns, but will require sufficient time to reach maximum cold storage performance.

CABINET FAILURE

1. If the cabinet has stopped operating, check that the cabinet is securely plugged in and turned on. Contact a licensed electrician to locate and correct any power supply problems.
2. Do not open the cabinet lids unnecessarily.
3. Provisions for other storage of the product may be required to prevent spoilage.

If you call us for service, describe the problem and give the information from the following list to the service representative:

Cabinet Model _____

Part Number _____

Serial Number _____

(These are located on a serial number rating plate inside of the machinery compartment of the cabinet.)

SECTION III
MAINTENANCE & REPAIR

TOOLS:

To provide full service diagnostics and repairs on these cabinets the following tools are needed:

A Volt Meter

An Amp Meter

An Ohm Meter or tiplet meter to handle all three functions

An Electronic Leak Detector

An Electronic Micron Gauge

A Vacuum Pump capable of pulling to 50 microns

Four Hand Valves

A Refrigerant Reclaimer

A Compound Gauge Set

A cylinder of nitrogen with a regulator capable of 10 to 400 pounds.

Standard refrigeration hand tools like: wrenches, tubing cutter, swage and flare tools, wire strippers, wire crimpers, wire cutters, standard and phillips head screwdrivers.

PRODUCT HISTORY

The first rule in accurately servicing a refrigeration system is to determine if the problem is an electrical or mechanical failure within the refrigeration system. First, try to obtain the product's history of operation from the customer. This will help identify the source of the problem.

Good facts from the cabinet user can help identify whether the problem is electrical, within the refrigeration system, or a "misapplication by the user." Get the history of operation and failure by asking these questions:

1) Were there any brown-outs or power outages that they are aware of?

2) Is the cabinet on a dedicated circuit?

3) Has any other equipment in this area had operational problems?

4) When was the last time the cabinet's operation was confirmed as working properly?

5) When was a problem noticed?

6) How long has the equipment run without this problem? (Years? Weeks? Days? Hours?)

7) Was anything tried prior to your arrival?

8) Was the warm-up fast, as in three to six hours, or over a prolonged time, as in three to five days?

9) If the cabinet was running for a long time, was the temperature recovery after entering the cabinet always within an hour, or did it appear as though recovery time was longer as usage went on?

The refrigeration system should only be entered if it is absolutely necessary. It is critical that a clean, uncontaminated system be maintained.

If a system is unable to reach the proper operating temperature, a test of the unit's mechanical refrigeration components is required.

COMPRESSOR EFFICIENCY TEST

If the cabinet has a semi-hermetic compressor, begin by testing the compressor's efficiency.

To test a semi-hermetic compressor, place compound gauge on the compressor's suction port.

While the compressor is running, close off the suction line so that only the port and valve are part of the compressor's low side.

When the valve is closed and vacuum has started, time how long it takes to pull the compressor's low side to its lowest possible vacuum.

Compressors used on these cabinets should be capable of pulling at least 20 to 22 inches of vacuum in less than 40 seconds.

Next, shut off the compressor and watch the gauge. A one or two inch rise in pressure is acceptable, since a small amount of freon may remain on the low side of the compressor, after which the reading should stabilize.

If the pressure continues to rise, the discharge reeds in the valve head are bad, allowing high pressure gas to return to the compressor.

If the compressor pulls less than 20 inches, the suction reeds are bad in the valve head.

If it takes longer than 40 seconds to pull the compressor, to its ultimate low vacuum, one or both cylinders are not functioning as they should. Any reading less than these will require replacement of the compressor.

ENTERING THE SYSTEM

Entering the system should only be done as a last resort. Extreme care must be used no matter what the reason is for entering the system. Of course there are times it cannot be avoided, such as component or compressor replacement, or a leak within the system.

The system must also be entered any time you need to obtain the operating pressures. Again, use extreme caution to avoid any possible contamination.

Cabinets that use semi-hermetic compressors allow easy access through the valve ports.

Cabinets using hermetic compressors do not have valve ports, this product has process stubs for both suction and discharge sides of the system.

Line taps should only be used to obtain pressure readings, and not for reprocessing a system. The opening of a line tap is too restrictive for pressure of vacuum procedures.

Install hand valves at the process stub ends. Hand valves will be less restrictive to flow because of a larger opening. They will also be easier to use during repair procedures.

EVACUATION

Once the system has been cleaned and components have been replaced, you are ready to initiate the final servicing procedures necessary to achieve proper cabinet operation.

Pull an evacuation to approximately 50 microns. You can be sure that any contaminants that can affect the system's operation are now removed.

Use this time to check any joints for potential leaks.

CHARGING

You should use a charging cylinder to measure in the the correct amount of refrigerant. The charging methods are:

1) Add the refrigerant to the system until you reach a predetermined balanced pressure. This will give you an approximate static charge.

2) Weigh in the refrigerant using a scale calibrated in ounces.

The cabinet's operation is now ready to be tested. A final check of the refrigeration lines should be made before running the cabinet.

Be sure the refrigeration lines are not kinked or rubbing against each other.

Also check that the door seals properly. An air leak will affect proper operation, and the cabinet's ability to reach its coldest temperature.

Run the cabinet a both 100% run and also at a cycling temperature for at least one day. If the temperature and pressures are correct, the system can be considered repaired.

Hermetic systems should now have their process stubs pinched off, hand valves removed and the ends brazed shut.

COMPRESSOR INSTALLATION & MAINTENANCE / DIAGNOSTICS

HOLD DOWN BOLTS

All models with Copeland compressors have hold down bolts. The compressor has a metal hold down band strapping it tightly to the cabinet body. This band should be removed and discarded upon installation. If compressor does not float freely, keep backing off all of the retaining nuts until it does.

CHECKING COMPRESSOR THAT WON'T START ON CORD CONNECTED CABINETS

1. Check that the supply plug is in wall outlet and that outlet has the proper voltage.
2. Check that the cabinet thermostat is on a numerical setting.

If items 1 & 2 are OK:

3. Pull condensing unit out of the cabinet and remove compressor terminal cover. Check proper voltage at terminals.

TO CHANGE THE COMPRESSOR:

1. Disconnect the power supply to the cabinet.
2. Disconnect power supply leads at the compressor.
3. Disconnect the wires to the relay and capacitors.
4. Remove the relay and starting capacitor and install on the new compressor.
5. Remove the defective compressor from the condensing unit base.
6. Set the new compressor in place.
7. Reconnect the relay and capacitor wires.
8. Reconnect the power supply lead.
9. Leak test, evacuate, and weigh in charge.

CHANGING DRIER

If flare connected, make sure flares and faces of fittings on new drier are clean and in good condition before installing new drier.
Cut tubing only with tube cutters, not hacksaw's, to avoid metal filings from entering the system. Driers must be replaced any time you enter the system, except when you are obtaining operating pressures.

SERVICE VALVES

The compressors on some cabinets have service valves for measuring suction and discharge pressures. Two types are used. The first type is connected directly to the compressor body or shell and back seats to connect gauges to the access port. The second (Schrader type) is on the end of a process tube and requires a gauge or charging line with a depressing pin to open valve when the connection is made.

CAUTION

This type valve should be tightly capped except when making the gauge connection.

TO CHECK FOR OPEN WINDINGS

Use a multimeter. Measure ohms between "C" and "R" and between "C" and "S".
If windings are OK, multimeter will show a resistance reading between terminals.
If there is no reading, the compressor, winding or windings are open and the compressor should be replaced.

TO CHECK FOR GROUNDED COMPRESSOR

Use multimeter. Touch probe from each terminal to an unpainted surface of compressor body. If there is no ground, there will be no change of the meter.

WARNING: Be Careful Not to Touch Uninsulated Parts of the Meter Probes.

A reading indicates a ground and the compressor should be replaced.

If there is voltage at the compressor terminals and the compressor tries, but does not run, check voltage at the compressor terminals while attempting to start the compressor. If the voltage at the compressor terminal is below 90% of the nameplate voltage, it is possible the motor may not have developed sufficient torque to start. Check to determine if:

A. Wire sizes are adequate.

B. Electrical connections are loose.

C. The circuit is overloaded.

D. The power supply is adequate.

A defective relay or capacitor may prevent the compressor starting.

TO CHECK OUT THE RELAY

1. Disconnect the cabinet from the power supply.
2. Remove the wires from the relay.
3. Touch probes to the terminals. Meter should show infinity if closed.
4. Touch probes to the terminals of coil. The meter should show a resistance reading.

If items 3 & 4 are OK, the relay is good. If items 3 & 4 are not as indicated, change the relay.

TO CHECK CAPACITORS

1. Disconnect the cabinet from the power supply.
2. Make sure the capacitors are discharged before checking. (Shunt across the terminal of capacitor with a heavy insulated wire.)
3. Remove the wires from the capacitors.
4. Any capacitor found to be bulging, leading, or damaged should be replaced.
5. Use a multimeter to check the **run and start** capacitors for shorts or open circuits.

With a good capacitor, the indicator should first move to a reading and then gradually increase to infinity.

If there is no reading change, an open circuit is indicated.

If the multimeter remains on a low resistance reading, a short circuit is indicated.

On run capacitor, touch probes to metal case and each terminal. If meter shows any reading, a ground is indicated. All defective capacitors should be replaced.

CLEANING & MAINTENANCE

CLEANING THE CABINET EXTERIOR

Wipe the exterior occasionally with a cloth dampened in mild detergent water; rinse, and wipe dry with a soft, dry cloth. **Do not use abrasive or caustic cleaners or scouring pads.**

CLEANING THE CONDENSER - FIG. 1A

Periodic cleaning of the condenser can be easily accomplished by brushing the coils with a soft brush and/or using a vacuum cleaner with a brush attachment.

Be sure that dirt, dust and collection of other debris do not build up to a point air circulation through the condenser is restricted.

CLEANING THE STORAGE COMPARTMENT

1. Remove product and store it in another suitable cabinet, if possible. Be sure to prevent spoilage of the product which may occur if it is left at room temperature.

2. Turn OFF the thermostat and unplug the cabinet.

3. Remove the can skirts.

4. Defrost completely prior to cleaning.

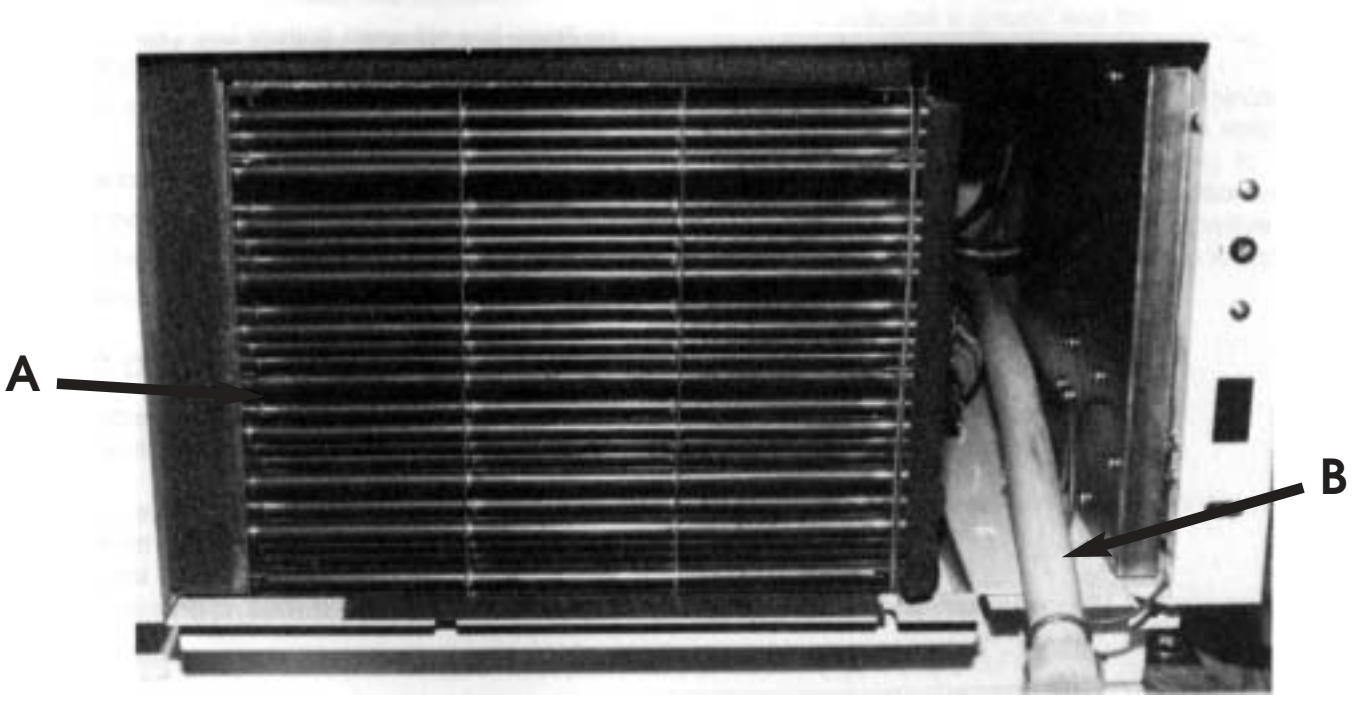
5. Wash the can skirts and the entire interior storage area with warm water and baking soda solution — about a tablespoon of baking soda per quart of water. Rinse thoroughly with clean water and wipe dry.
   This procedure can also be used for cleaning door gaskets.

6. A drain hose (FIG. 1B) is provided in the compressor compartment. Connection is made to fit a standard garden hose for ease of draining water from inside of the tank area.

IMPORTANT: *Do not use any objects or cleaner which may leave residues, odors, or particles. Avoid the use of strong chemicals or abrasive cleaners which may damage the interior surfaces and contaminate product within the storage area.*

6. Wash, rinse, and dry the can skirts while they are outside of the cabinet, using the same procedure as described for the storage area.

7. Be sure to correctly reinstall the can skirts, plug in the cabinet, set the temperature control and allow time for cooling of the storage area before storing product.



CLEANING THE LID

If the lid has been removed from the cabinet, wash with plenty of non-abrasive soap or detergent and water. Use the bare hand to feel and dislodge any caked soil. Rinse thoroughly with clean water. Do not use hard, rough cloths that will scratch the surface of the plastic lid. Dry with a clean, damp chamois.

If the lid is on the cabinet where water cannot be used freely, it should first be lightly dusted (not wiped) with a soft, clean cloth. Then the surface can be wiped carefully with a wet cloth or chamois. The cloth or chamois should be kept free of grit by frequent rinsing in clean water.

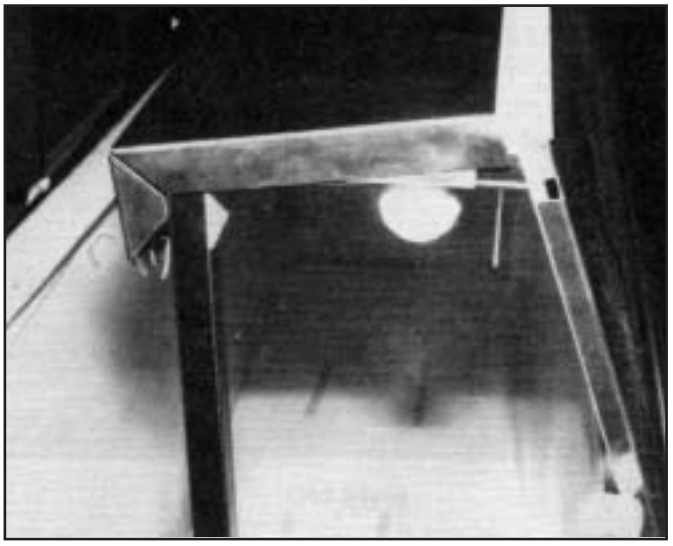
Do not use solvents such as acetone, alcohol, benzene, carbon tetrachloride, fire extinguisher fluid, dry-cleaning fluid, and lacquer thinners, since they attack the plastic part of the lid. **Do not** use window sprays or kitchen scouring compounds.

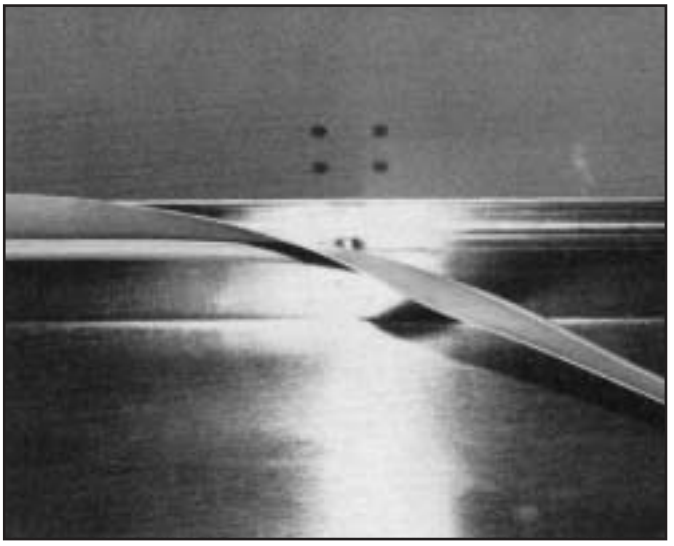
TOUCH-UP PAINTING INSTRUCTIONS -SPRAY PAINT

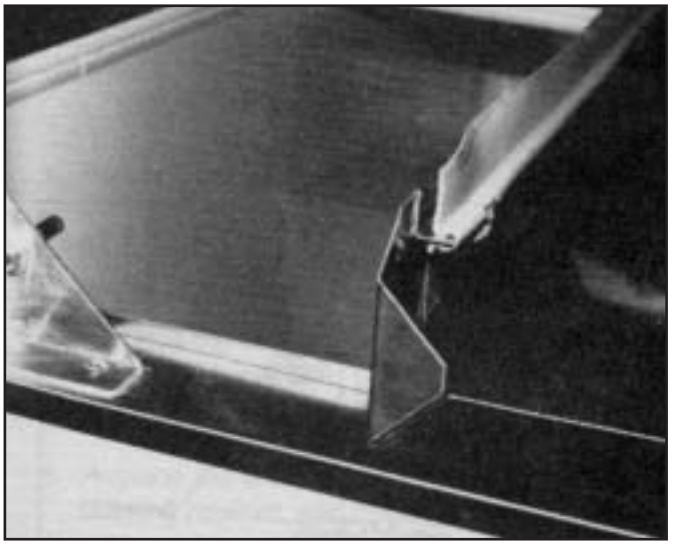
White 9 oz. Touch-up Paint:
Part No. 26-0899-01

1. Sand the entire bare metal or affected area and its edges until the edges are smooth or feathered. This insures that you are spraying on to a painted area that has adhesion.
2. Use an automotive primer (lacquer) over the bare area.
3. Scuff sand the primered area lightly.
4. Test spray can before using on cabinet surface. Apply in short, even strokes holding can 10" to 12" from surface, and moving rapidly during use. Apply top coat of paint in thin layers (4-5 layers minimum) with air drying time in between coats. Scuff sand very lightly between coats. This will remove uneven spots or roughness and will create a high gloss, smooth finish.
5. Use rubbing compound (preferred) or wax over the finished area after a few days of hardening/drying time.

LID SEAL REPLACEMENT



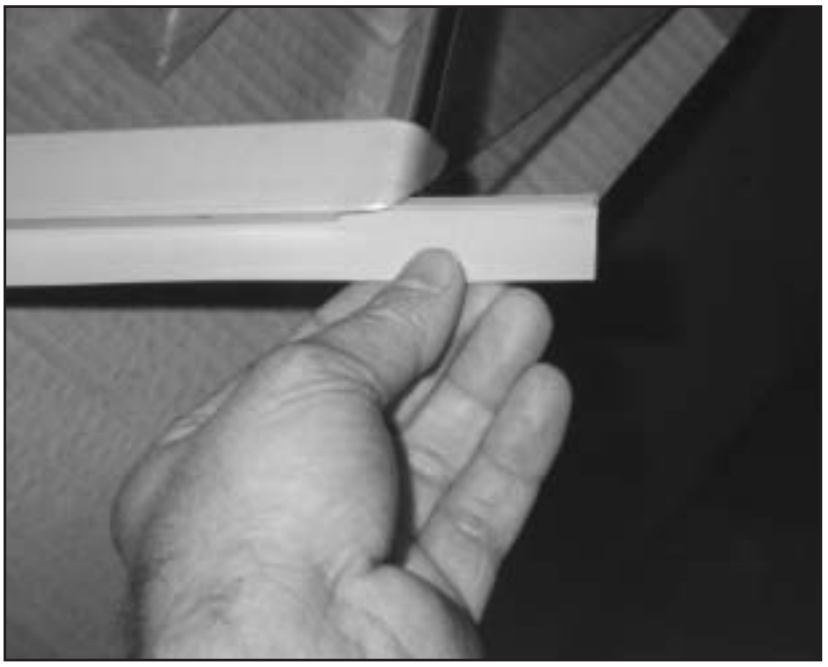




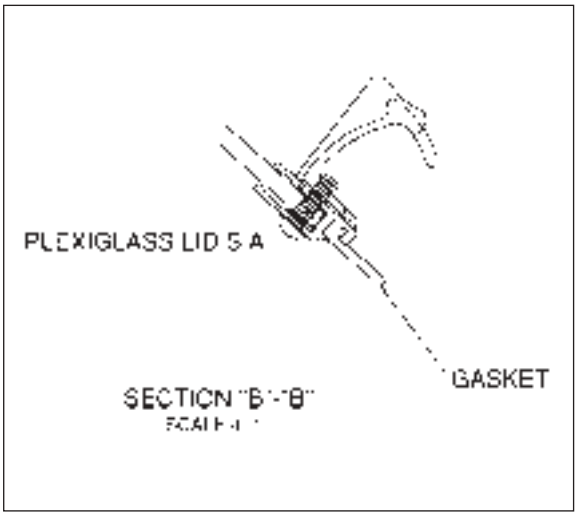
The lid seal is located on the server side of the cabinet, attached to the underside of the stainless steel top.

1. Remove lids from the cabinet.
2. Remove screws on the underside of the stainless top on the server side of the cabinet.
3. Remove the stainless top from the cabinet.
4. Slide the lid seal off of the top channel.
5. Replace the lid seal with new correct art number. Seal needs to be cut to fit the cabinet width.
6. Replace the stainless steel top with the lid seal attached.
7. Replace screws along the stainless steel top server side.
8. Replace lids on the cabinet.

LID GASKET REPLACEMENT

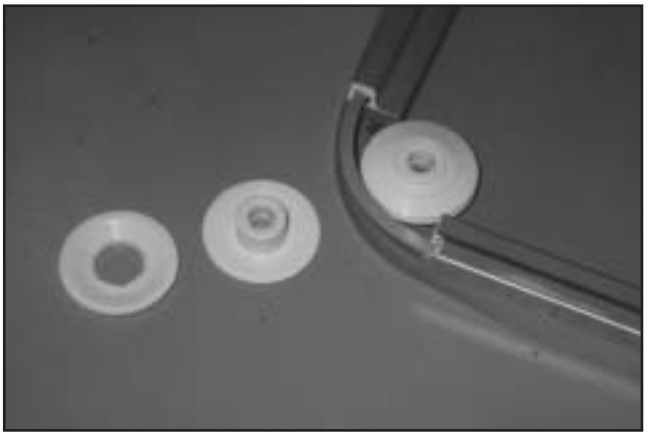


1. Remove the lid from the cabinet.
2. Set the lid on a flat, protected surface.
3. Rotate lid upside down.
4. Slide old gasket from the aluminum lid frame.
5. Install new gasket in the groove provided. See end detail.
6. Reinstall lid in cabinet.



LID PIVOT BUSHING ASSEMBLY REPLACEMENT

Old Style

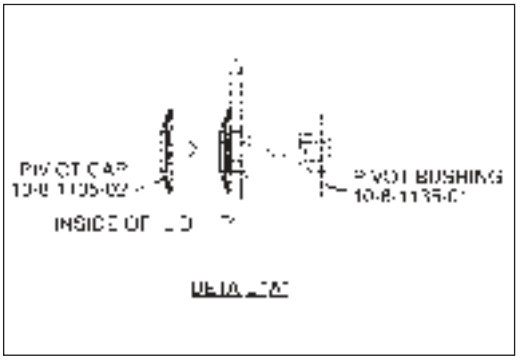


New Style

The pivot pin bushing is located on the outside edge of each lid.

1. Remove the lid from the cabinet. Lay the lid on a smooth, non-scratch surface.
2. Remove the two acorn nuts from the outside edge of the lid assembly.
3. Remove the shake-proof washer, flat washer, pivot bushing retainer, and pivot pin bushing.
4. Replace assembly with the correct new part number.
5. Replace the shake-proof washer, flat washer, pivot bushing retainer, and pivot pin bushing.
6. Replace the two acorn nuts attaching the assembly to the lid. Tighten nuts to 20" lbs. torque.
7. Replace the lid onto the cabinet.

Remove lid from cabinet. Lay the lid on a smooth, non-scratch surface. Simply unsnap lid pivot assembly and replace with a new part.



CENTER/END PIVOT ROD REPLACEMENT

Remove lids from the cabinet.
Remove 2 mounting screws from the mounting bracket.
Replace the pivot bracket with correct new part number.
Reinstall lid assembly.

The 4-hole and 8-hole dipping cabinets have end pivot pins only. The 12- and 16-hole dipping cabinets have end and center pivot brackets.

FLUORESCENT LAMP HOLDER/LIGHT STARTER SOCKET REPLACEMENT

The lamp holder and the light starter socket are located on the lamp channel assembly.

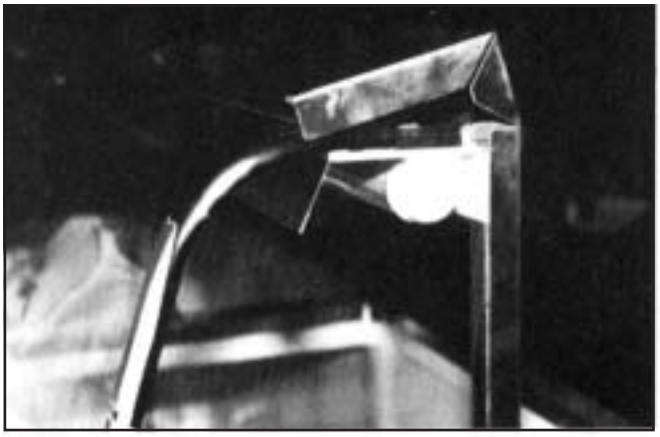


FIG. 1

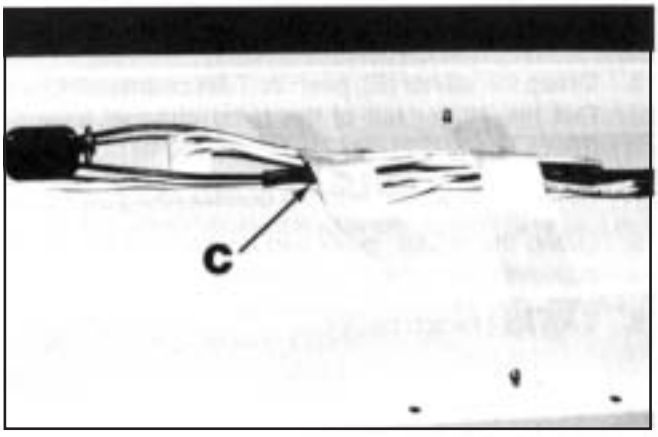


FIG. 2

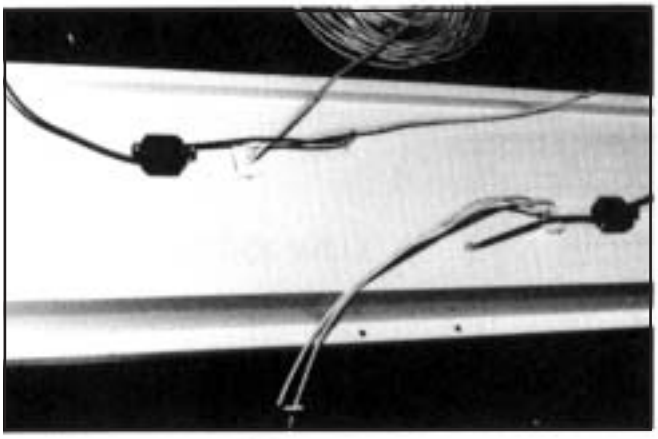


FIG. 3

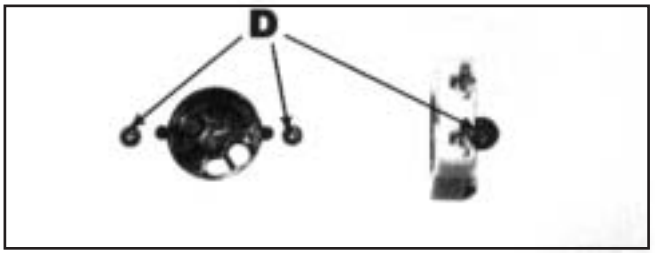
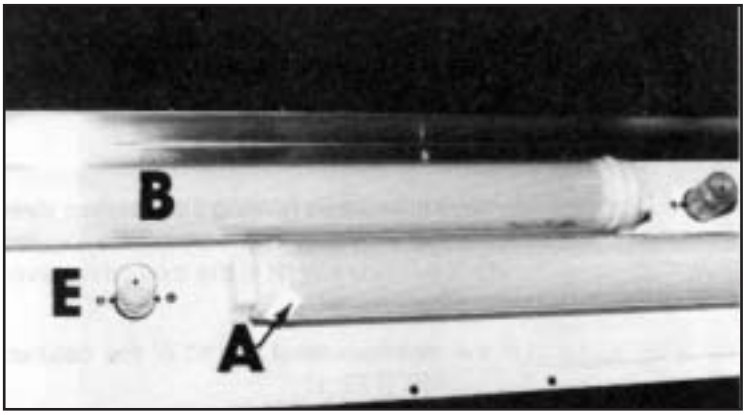


FIG. 4

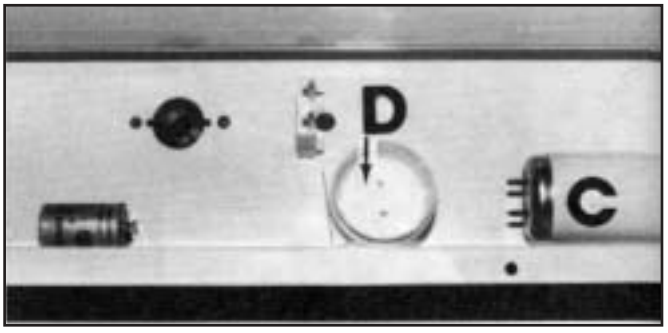
1. Disconnect the power to the cabinet.
2. Remove the lids from the cabinet.
3. Remove the fluorescent bulbs.
4. Remove the screws holding the stainless steel countertop in place. The screws are located under the inside length of the top of the server side of the cabinet.
5. Lift the stainless steel top off of the cabinet. Set it aside. (FIG. 1)
6. For both the lamp holder and the starter socket, remove the screws holding the part in place. (FIG. 4-D) Remove the tape holding the wires to the channel frame. (FIG. 2)
7. Disconnect the lead wires at the butt splice connector. (FIG. 2-C)
8. Replace part with correct new part number.
9. Replace screws removed in Step 4. (FIG. 4-D)
10. Connect white and blue lead wires to main wire with butt connectors. Replace the tape holding the wires to the lamp channel.
11. Replace the stainless steel top (FIG. 1) using screws removed in Step 4.
12. Replace the starter.
13. Replace the bulbs (fluorescent).
14. Reconnect the power to the cabinet.

FLUORESCENT BULB & STARTER REPLACEMENT



BULB REPLACEMENT

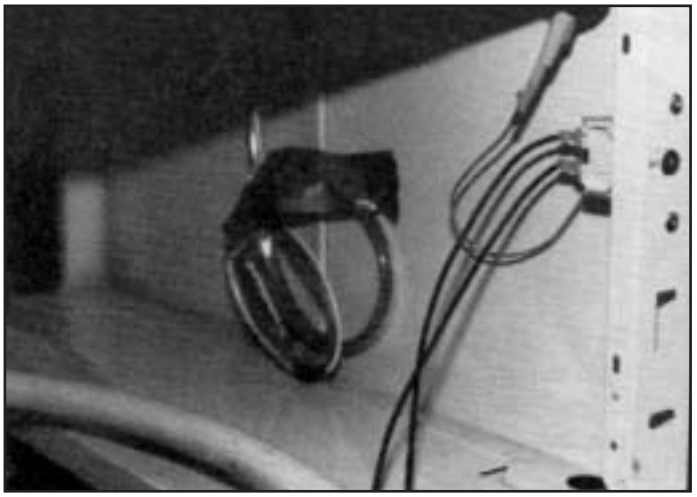
1. Turn light switch off on the cabinet.
2. Pull down on the socket (A).
3. Remove the plastic outer lamp shield (B) and bulb (C).
4. Raise the bulb up. Pull out of the socket.
5. Remove lamp shields and end caps (D).
6. Place the new bulb in the shield. Attach end caps.
7. Insert the bulb into the cabinet, push up an snap into place.
8. Turn light switch back on.



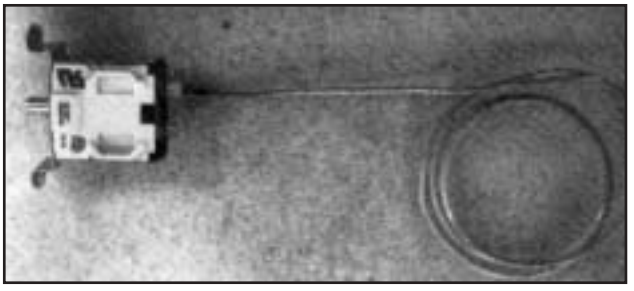
BULB STARTER REPLACEMENT (The fluorescent bulb starter is located on the lamp channel assembly. One starter is necessary per bulb.)

1. Turn light switch off on the cabinet.
2. Remove the lid from the cabinet.
3. Grasp the starter (E), push in. Turn counterclockwise. Pull the starter out of the lamp channel assembly (F).
4. Replace the starter with the correct new part number.
5. Grasp the starter, push into contact holes. Turn the starter clockwise to seat properly.
6. Turn light switch back on.

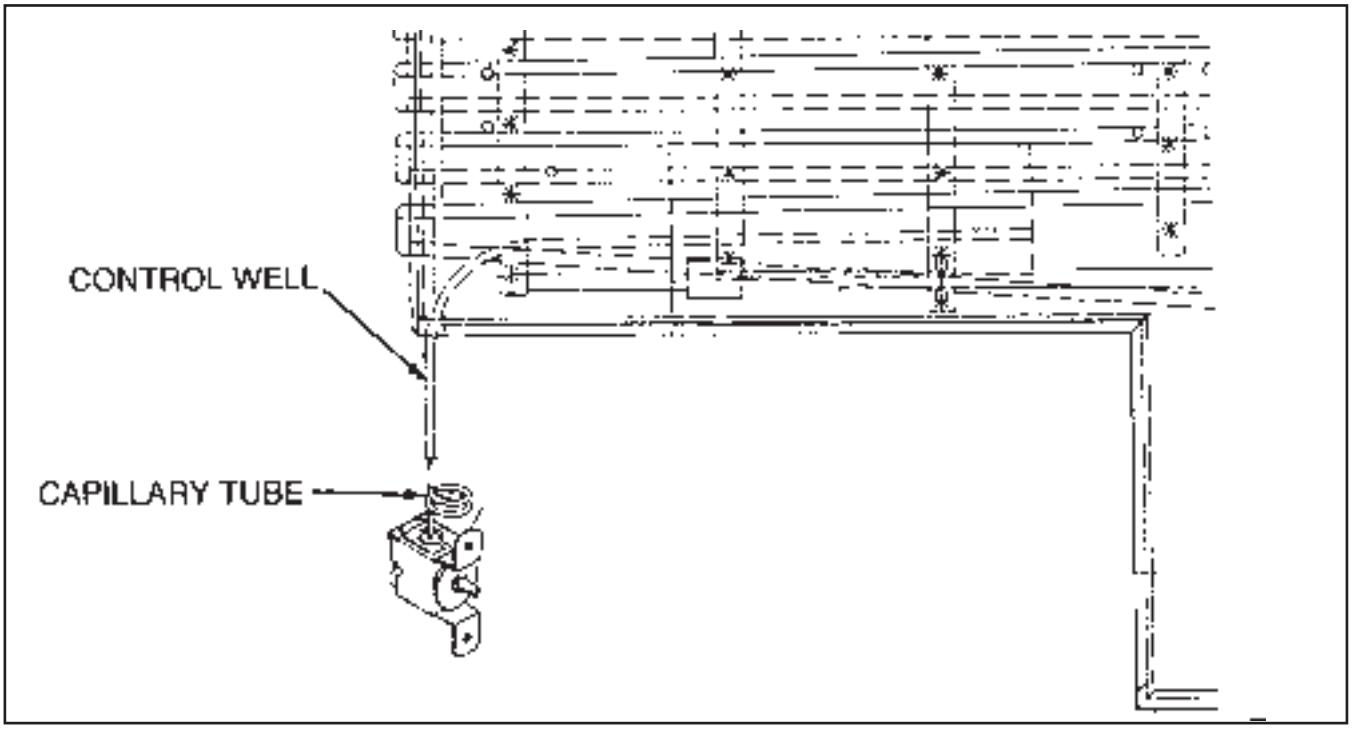
THERMOSTAT REPLACEMENT



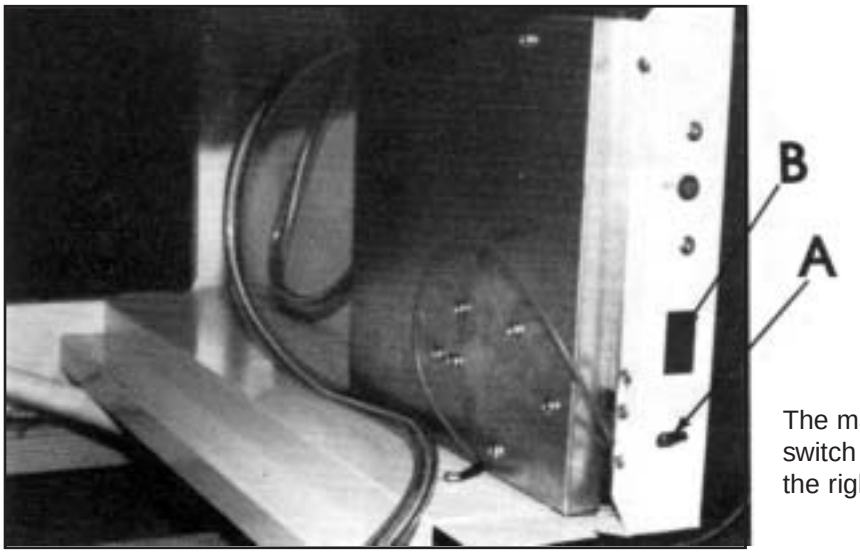
The thermostat is located on the server side of the cabinet, directly behind the service grill. It functions to control the temperature inside the cabinet. The range on the thermostat dial is adjustable from 1 to 7 (7 being the coldest setting). The OFF position is provided for defrosting the cabinet.



1. Disconnect the power to the cabinet.
2. Remove the grill.
3. Remove screws from the thermostat mount.
4. Pull the thermal bulb out of the cabinet.
5. Replace the thermostat with the correct new part number.
6. Slide the capillary tube up the control well which extends into the machinery compartment. (Be very careful. Do not kink the thermal bulb capillary tube.)
7. Reattach the thermostat screws to mounting holes.
8. Replace the grill assembly.
9. Reconnect the power to the cabinet.



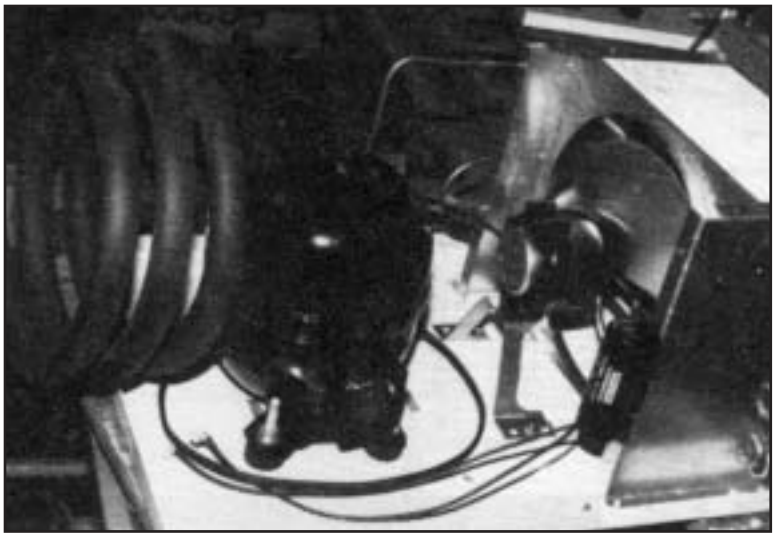
MASTER POWER SUPPLY SWITCH / LIGHT SWITCH REPLACEMENT



The master supply switch (A) and the light switch (B) are located behind the grill panel, on the righthand server side of the unit.

1. Disconnect the power to the cabinet.
2. Remove the grill.
3. Remove screws holding the switch in place.
4. Detach the switch leads.
5. Remove the lock nut on exterior of switch.
6. Replace with new switch.
7. Reattach the electrical leads.
8. Replace the front grill.
9. Reconnect the power to the cabinet.

CONDENSER FAN MOTOR REPLACEMENT



The condenser fan motor is located in the machinery compartment, directly behind the condenser coil.

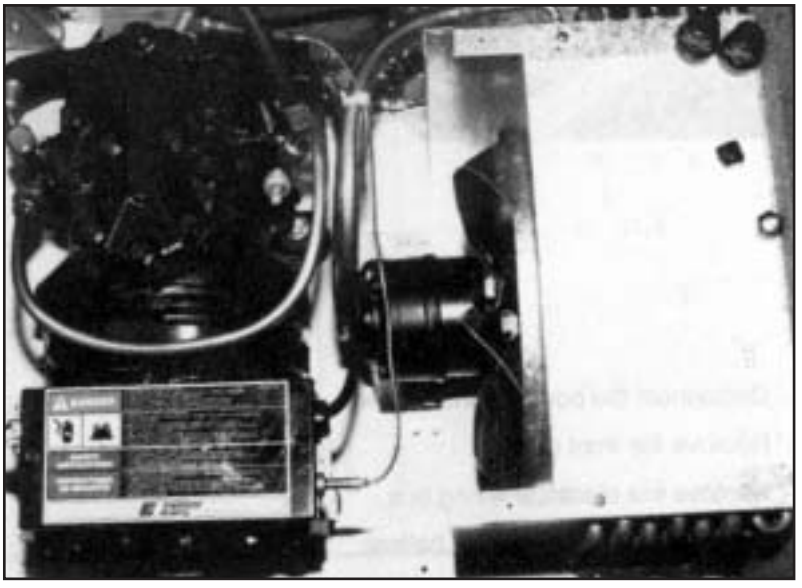
Motor Specifications:

220 Volts

60 Hz.

1 Phase

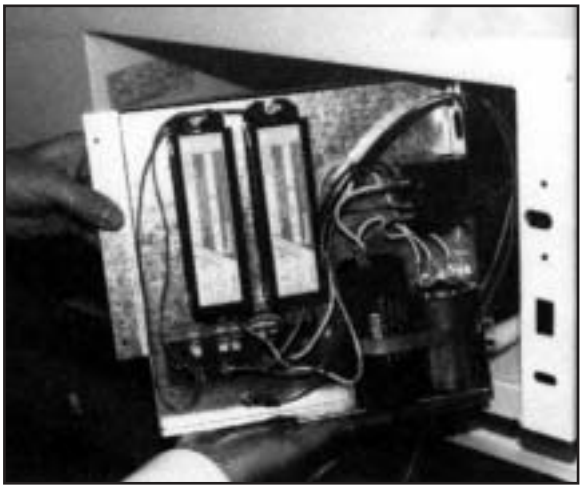
9 Watt



1. Disconnect the power to the cabinet.
2. Remove the grill panel.
3. Remove the condensing tray hold down bolts.
4. Pull the condenser tray out of the cabinet. Disconnect the wire at the compressor.
5. Remove the motor from the fan motor mounting bracket.
6. Replace with correct motor.
7. Reconnect wires at the compressor.
8. Slide the tray back into the cabinet. Replace hold down bolts.
9. Replace the front grill.
10. Reconnect the power to the cabinet.

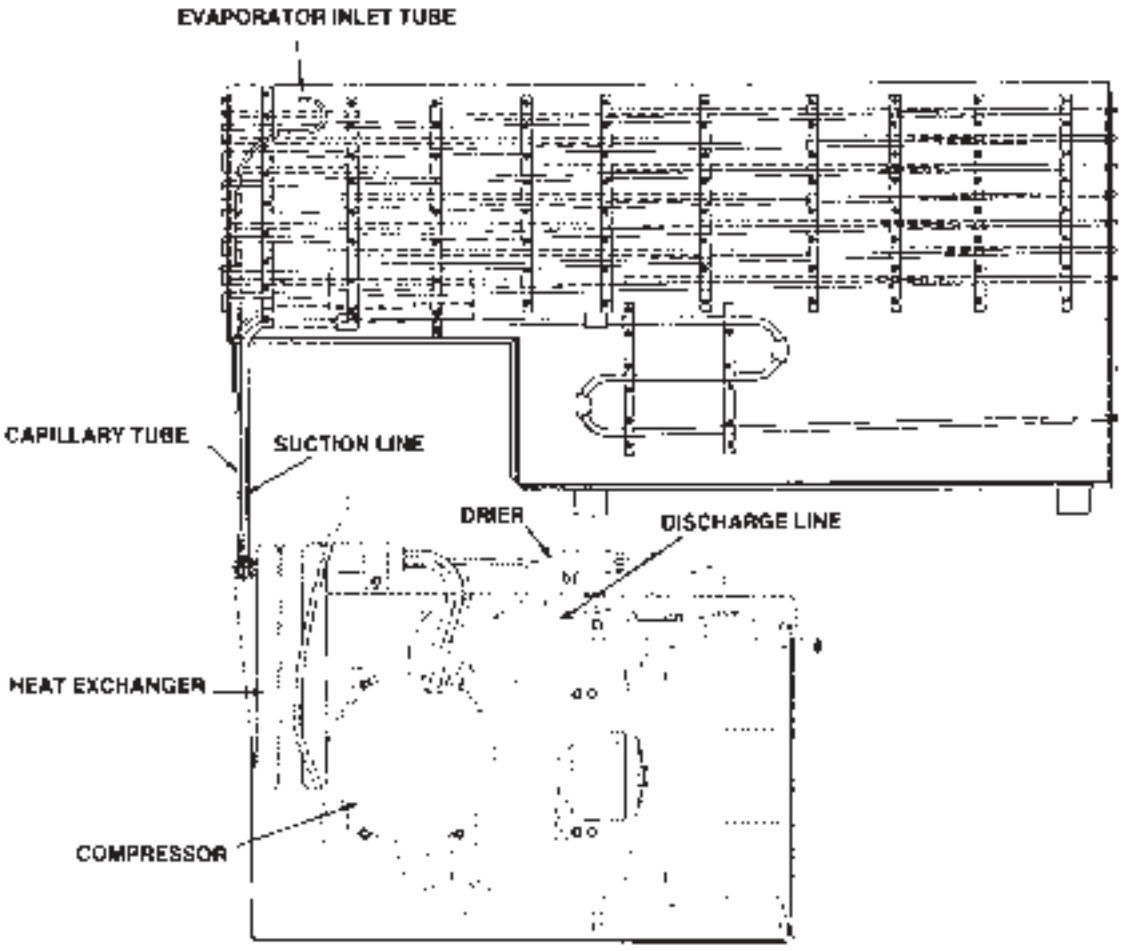
BALLAST REPLACEMENT

The ballast is located in the machinery compartment inside the electrical box.



1. Disconnect the power to the cabinet.
2. Remove the front grill.
3. Remove the electrical wiring box.
4. Disconnect the leads to the ballast.
5. Replace the ballast with correct part.
6. Reconnect the leads to the ballast.
7. Replace the electrical box assembly.
8. Replace the front grill.
9. Reconnect the power to the cabinet.

METERING DEVICE/HEAT EXCHANGER REPLACEMENT



1. Disconnect power to the cabinet.
2. Pull out the condensing unit.
3. Disconnect the liquid line.
4. Disconnect the suction line at the compressor.
5. Cut off the evaporator inlet tube about five inches down below the point where it comes out of the cabinet.
6. Remove the capillary tube from the inside of the evaporator inlet tube.
7. Connect the end of the capillary on the new heat exchanger to the evaporator inlet tube.
8. Connect the suction line to the compressor valve and the capillary line to the bottom of the drier. Replace the drier.
9. Evacuate and recharge.
10. Secure short lengths of insulating tubing provided around exposed tubing in place with tape and seal to bottom of the cabinet with permagum which is provided.
11. Reconnect power to the cabinet.

CABINET TROUBLESHOOTING GUIDE

TROUBLE	COMMON CAUSE	REMEDY
UNIT WILL NOT RUN.	Blown Fuse.	Replace fuse. Check outlet with voltmeter, should check 115V plus or minus 10%. If circuit overloaded, either reduce load or have electrician install separate circuit. If unable to remedy any other way, install autotransformer.
	Broken temperature control.	Jumper across terminals of control. If unit runs and connections are all tight, replace control.
	Broken relay.	Check relay, replace if necessary.
	Broken overload.	Check overload. Replace if necessary.
	Broken compressor.	Check compressor. Replace if necessary.
	Defective service cord.	Check with test light at unit. If no circuit and current is indicated at outlet, replace or repair.
	Broken lead to compressors or cold control.	Repair or replace broken leads.
	Broken timer	Check with test light and replace if necessary.
CABINET TOO WARM.	Fan motor not running.	Check and replace fan motor if necessary.
	Cold control set too warm or broken.	Check and replace if necessary.
	Shortage of refrigerant.	Check for leaks. Repair, evacuate and recharge system.
	Not enough air circulation around cabinet.	Relocate cabinet or provide clearance to allow sufficient circulation.
	Dirty condenser or obstructed condenser ducts.	Clean the condenser.
	Poor lid seal.	Level cabinet, replace lid seal.
CABINET TOO COLD.	Cold control knob improperly set.	Turn knob to warmer position

CABINET TROUBLESHOOTING GUIDE

TROUBLE	COMMON CAUSE	REMEDY
UNIT RUNS ALL THE TIME.	Not enough air circulation around cabinet or air circulation is restricted.	Relocate cabinet or provide proper clearances around cabinet.
	Poor lid seal.	Check and make necessary adjustments.
	Refrigerant charge.	Undercharge or overcharge--check, evacuate and recharge with proper charge.
	Room temperature too warm.	Ventilate room as much as possible.
	Cold Control.	Check control; if it allows unit to operate all the time, replace control.
NOISY OPERATION.	Loose flooring or floor not firm.	Tighten flooring or brace floor.
	Tubing contacting cabinet or other tubing.	Move tubing.
	Cabinet not level.	Level cabinet.
	Fan hitting shroud.	Move fan blade.
	Compressor mechanically grounded.	Replace compressor mounts.
UNIT CYCLES ON OVERLOAD.	Broken relay.	Replace relay.
	Weak overload protector.	Replace overload protector.
	Low voltage.	Check outlet with voltmeter. Underload voltage should be 115V plus or minus 10%. Check for several appliances on same circuit or extremely long or undersized extension cord being used.
STUCK MOTOR COMPRESSOR	Broken valve.	Replace motor compressor.
CABINET RUNS ALL THE ITEM. TEMP TOO COLD.	Faulty thermostat.	Check thermostat—test and replace if necessary.
RAPID ICE BUILDUP ON EVAP.	Leaky door gasket; lid left open.	Replace gasket; close lids when not serving.
FREEZER WORKS, THEN WARMS UP.	Moisture in system.	Evacuate and recharge.

COMPRESSOR TROUBLESHOOTING GUIDE

PROBLEMS & CAUSE	REMEDY
Compressor won't start—no hum.	
1. Open line circuit.	1. Check wiring, fuses, receptacle.
2. Protector open.	2. Wait for reset - check current.
3. Control contacts open.	3. Check control; check pressures.
Compressor won't start—hums intermittently (cycling on protector).	
1. Improperly wired.	1. Check wiring against diagram.
2. Low line voltage.	2. Check main line voltage, determine location of voltage drop.
3. Open starting capacitor.	3. Replace starting capacitor.
4. Relay contacts not closing.	4. Check by operating manually. Replace relay if defective.
5. Open circuit in starting winding.	5. Check stator leads. If leads are all right, replace compressor.
6. High discharge pressure.	6. Eliminate cause of excessive pressure.
7. Tight compressor.	7. Check oil level-correct binding condition, if possible. If not, replace compressor.
8. Weak starting capacitor or one weak capacitor of a set.	8. Check oil level. Check binding. Replace compressor if necessary.
Compressor starts; motor will not get off starting winding.	
1. Low line voltage.	1. Bring up voltage.
2. Improperly wired.	2. Check wiring against diagram.
3. Defective relay.	3. Check operation - replace relay if defective.
4. Discharge pressure too high.	4. Check ventilation, restrictions and overcharge.
5. Starting and running windings shorted.	5. Check resistances. Replace compressor if defective.
6. Starting capacitor weak or one of a set open.	6. Check capacitance - replace if defective.
7. High discharge pressure.	7. Condenser dirty.
8. Tight compressor.	8. Check oil level. Check binding. Replace compressor if necessary.
Compressor starts and runs, but cycles on protector.	
1. Short cycling.	1. Reduce number of starts to 20 or less per hour.
2. Additional current passing through protector.	2. Check for added fan motors and pumps connected to wrong side of protector.
3. Suction pressure too high.	3. Check compressor for proper application.
4. Discharge pressure too high.	4. Check ventilation, restrictions and overcharge.
5. Starting and running windings shorted.	5. Check resistances. Replace compressor if defective.
6. Starting capacitor weak or one of a set open.	6. Check capacitance - replace if defective.
7. Inadequate motor cooling.	7. Correct cooling system.
8. Compressor tight.	8. Check oil level. Check for binding condition.
9. Unbalanced line (three-phase)	9. Check voltage of each phase. If not equal, correct condition of unbalance.
10. Discharge valve leaking or broken.	10. Replace valve plate.
Starting capacitors burn out.	
1. Short cycling.	1. Reduce number of starts to 20 or less per hour.
2. Prolonged operation on starting winding.	2. Reduce starting load.
3. Relay contact sticking.	3. Clean contacts or replace relay.
4. Improper relay or incorrect relay setting.	4. Replace relay.
5. Improper capacitor.	5. Check parts list for proper capacitor rating—mfd. and voltage.
6. Capacitor voltage rating too low.	6. Check capacitors with recommended voltage rating.
7. Capacitor terminals shorted by water.	7. Install capacitors so terminals will not be wet.
Running capacitors burn out.	
1. Excessive line voltage.	1. Reduce line voltage to not over 10% above rating of motor.
2. High line voltage and light load.	2. Reduce voltage if over 10% excessive.
3. Capacitor voltage rating too low.	3. Install capacitors with recommended voltage rating.
Relays burn out.	
1. Low line voltage.	1. Increase voltage to not less than 10% under compressor motor rating.
2. Excessive line voltage.	2. Reduce voltage to maximum of 10% above motor rating.
3. Incorrect running capacitor.	3. Replace running capacitor with correct mfd. capacitance.
4. Short cycling.	4. Reduce number of starts per hour.
5. Relay vibrating.	5. Mount relay rigidly.
6. Incorrect relay.	6. Use relay recommended for specific motor compressor.

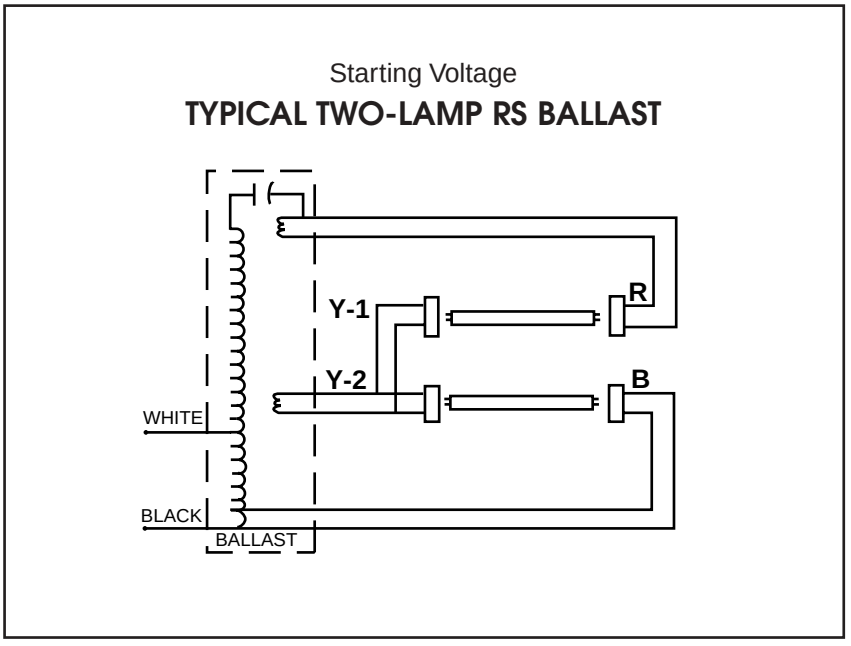
FLUORESCENT LAMPS - TROUBLESHOOTING GUIDE

Carrier Refrigeration uses standard fluorescent lamps in all of its applications. Standard one- and two- lamp ballast circuits are used. Replacement lamps should be purchased over the counter from a local electrical wholesaler. The table below indicates general problems that may be encountered with fluorescent lighting applications, possible causes, and corrective maintenance suggestions.

TROUBLE	COMMON CAUSE	REMEDY
NORMAL END OF LIFE. Lamp won't operate. Flashes momentarily and goes out or blinks on and off. Ends probably blackened.	Normal failure. Active material on cathodes exhausted.	Replace lamp properly.
SHORT LIFE.	Wrong lamp type used.	Replace with lamp type marked in owner's manual.
	Wrong type of starter.	Replace with correct starter.
	Ballast not supplying the specified electrical values.	Replace with correct ballast for rating for lamp size.
	Wrong type of ballast used.	Replace ballast with proper type.
	Too low or too high voltage.	Check primary voltage with range specified on ballast name plate.
	Poor circuit contact. (likely at lampholders)	Lamholder should be rigidly mounted and lamp securely seated.
	Ballast improperly or incompletely connected.	Study ballast label wiring diagrm and check connections.
	Too many lamp starts.	Average life for most lamps is dependant on number of starts and hours of operation.
END BLACKENING. Dense blackening at one end or both, extending 2" to 3" from base.	Normal end of life.	Replace lamp promptly.
	Mercury deposit - generally within 1" of lamp end.	Should evaporate as lamp is operated.
	Poor circuit contact likely at the lampholder.	Lampholders should be rigidly mounted and lamp securely seated.
	Ballast improperly or incompletely connected.	Study ballast wiring instructions and check connections.
	Wrong type lamp used.	Replace with correct lamp type.
	Wrong type of starter or defective starter causing on /off blinking or prolonged flashing at each start.	Replace with proper starter.
	Ballast intalled not supplying the specified electrical values.	Replace with ballast of correct rating for lamp size.
	Line voltage too low or too high.	Check line voltage with range specified on ballast plate.
	Ballast improperly or incompletely connected.	Study ballast label wiring instuctions and check connections.

TROUBLE	COMMON CAUSE	REMEDY
NO STARTING EFFORT OR SLOW STARTING.	Open lamp cathode circuit due to broken cathode, air leak, or open weld.	If open, circuit is shown by continuity test or by viewing end of bulb against a pinhole of light. Replace lamp.
	Wrong lamp type used.	Replace with lamp type indicated in owner's manual.
	Starter at end of life.	Replace starter.
	Starter sluggish.	Replace starter.
	Ballast installed not supplying the specified electrical values.	Replace with certified ballast of correct rating for lamp size.
	Temperature cold air contact to bulb.	Correct installation of lamp protection tubes, or shields to prevent cold air effects.
	Circuit voltage.	Check voltage and correct if possible.
DECREASED LIGHT OUTPUT. Full illumination of bulbs requires correct assembly of all components of lighting system.	Temperature operation, cold air affects lamp performance.	Properly install jacketed lamps where applicable.
	Circuit voltage.	Check voltage and correct if possible.
	Ballast improperly or incompletely connected.	Study ballast label wiring instructions and check connections.
	Dust or dirt on lamp or fixture.	Clean.
	Normal failure. Active material on cathodes exhausted.	Replace lamp promptly.
BLINKING ON/OFF. Accompanied by shimmering effect during "lighted" period.	Possible lamp fault.	Replace lamp. Investigate further if successive lamps blink or flicker in same lampholders.
	Wrong type of starter or defective starter.	Replace with proper starter.
	Ballast installed not supplying the specified electrical circuit.	Replace with correct ballast with correct rating for lamp size.
	Circuit voltage.	Check voltage and correct if possible.
	Loose circuit contact.	Lampholders should be rigidly mounted and lamp securely seated.
OVERHEATED BALLAST.	Wrong lamp type used.	Replace with correct lamp number located in owner's manual.
	Wrong ballast used. Wrong voltage rating.	Replace ballast.
	Circuit voltage.	Check voltage and correct to design specification.
	Ballast improperly or incompletely connected.	Study ballast label. Correct if installed wrong.

MEASUREMENTS - Starting Lamp Voltage
TYPICAL TWO-LAMP RS BALLAST



The largest percentage of light ballast used today are of the two-lamp rapid start type. In order to read starting or open circuit voltage, as it is often called, remove both lamps from their sockets. The high voltage (OVC) which starts and operated the lamp is always between the “R” and “B” sockets. The two lamps are in series between these sockets. The Y-1 and Y-2 connections provide cathode heat, and serve to connect the lamp ends together. Because the leads between Y-1 and Y-2 are connected together by jumper leads, they are always wired to sockets at one end of the fixture. Therefore, the “R” and “B” sockets are always at the other end of the fixture. This means that in order to measure the voltage which starts the lamps (OVC), the meter probes must be placed in the sockets at one end of the fixture. The Y-1 and Y-2 end of the fixture will read zero while the “R” and “B” end of the indoor ballast should read as follows:

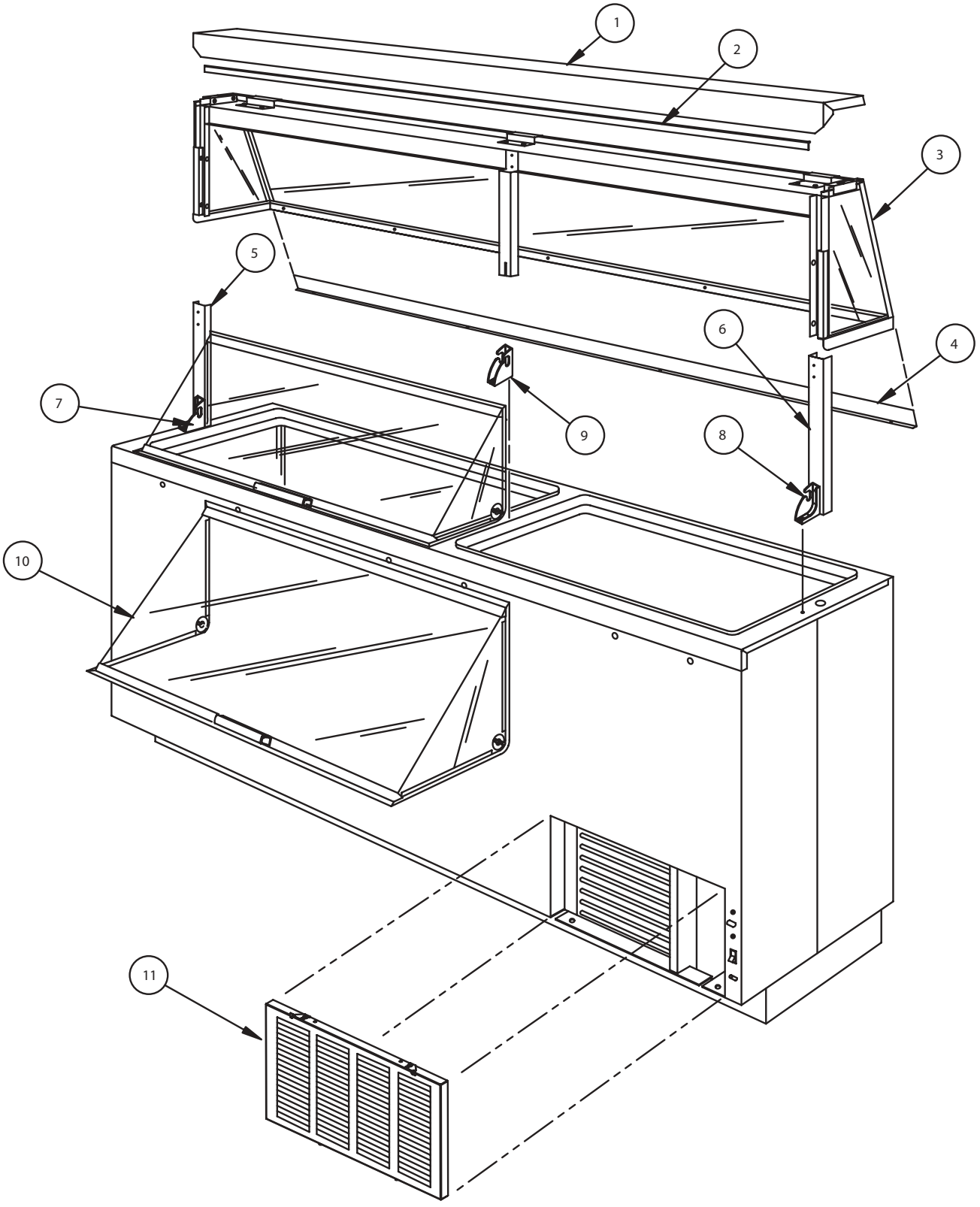
Lamp Type	Min. RMS Voltage	HO	Min. RMS Voltage	1500 MA.	Min. RMS Voltage
F40	256	48"	256	48"	250
F30	215	72"	395	72"	350
		96"	465	96"	470

PARTS LISTING

With Illustration

Identification

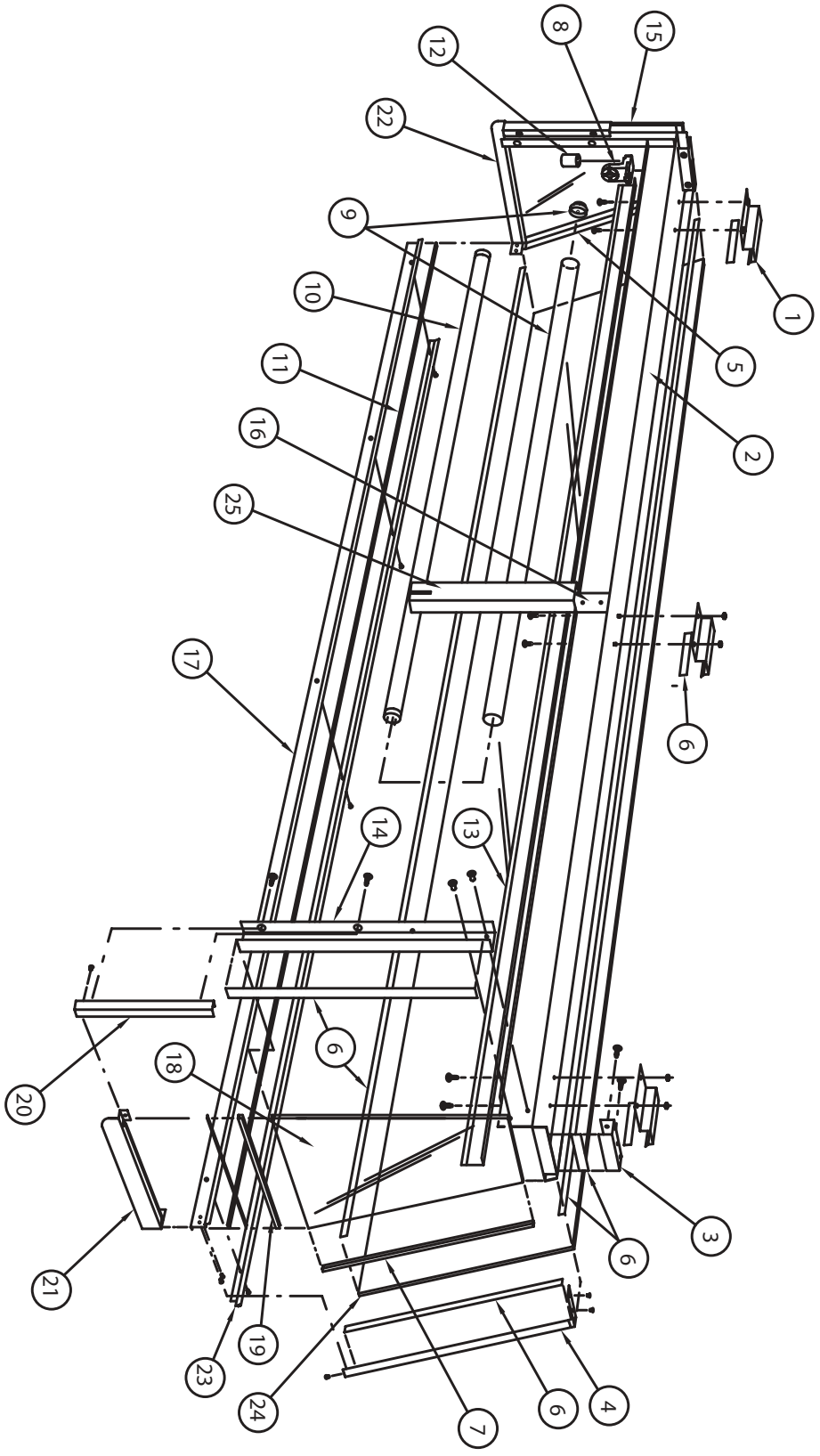
CABINET PARTS - EXPLODED VIEW



CABINET PARTS LIST

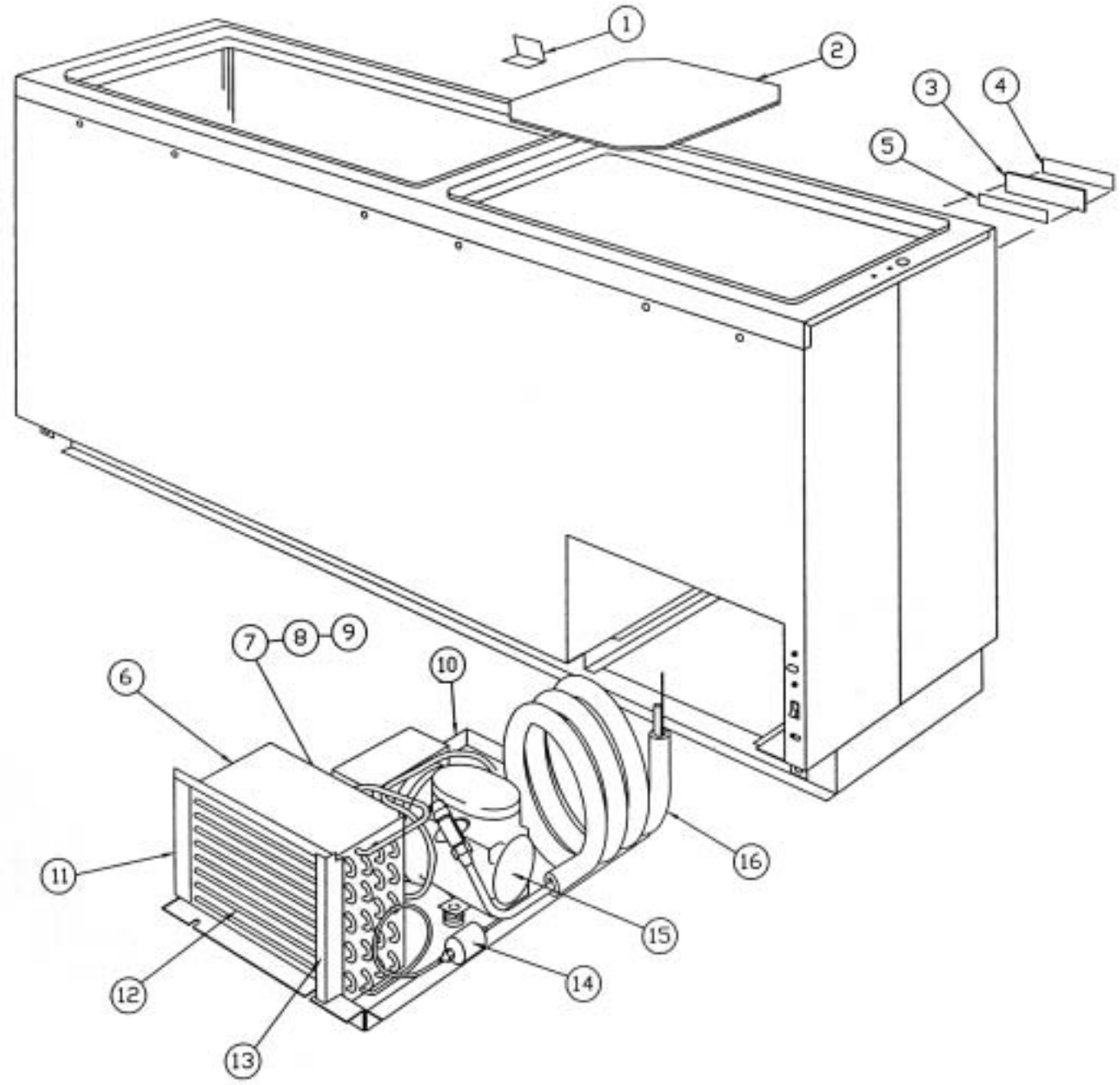
CABINET PARTS **Dipping Cabinets** **Curved & Flat & Export**				MODEL NO. **4HC**		MODEL NO. **8HC**		MODEL NO. **8HC (3500K)**		MODEL NO. **12HC**		MODEL NO. **12HC (3500K)**		MODEL NO. **16HC**		MODEL NO. **16HC (3500K)**		MODEL NO. **4HR**		MODEL NO. **8HR**		MODEL NO. **12HR**		MODEL NO. **16HR**	
	PART NUMBER	**DESCRIPTION**	**U/M**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**
1	05-1199-*	Canopy Top	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04								
	05-1187-*	Canopy Top	EA															1	-01	1	-02	1	-03	1	-04
2	44-0862	Upper Lid Seal	IN	24.3	-	44	-	44	-	64.5	-	64.5	-	86.8	-	86.8	-	24.3	-	44	-	64.5	-	86.8	-
3	51-1506-*	Canopy Assembly	EA	1	-01	1	-02	1	-04	1	-03	1	-05	1	-04	1	-06								
	51-1505-*	Canopy Assembly	EA															1	-01	1	-02	1	-03	1	-04
4	05-1029-*	Lower Front Trim	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04	1	-01	1	-02	1	-03	1	-04
5	05-1198-01	Outside Post, RH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
6	05-1198-02	Outside Post, LH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
7	10-1158-01	Pivot Bracket, RH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
8	10-1158-02	Pivot Bracket, LH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
9	10-1157-00	Pivot Bracket, Center	EA							1	-	1	-	1	-	1	-					1	-	1	-
10	51-1507-*	Lid Assembly	EA	1	-01	1	-02	1	-02	2	-03	2	-03	2	-04	2	-04	1	-01	1	-02	2	-03	2	-04
11	50-4192-01	Grill Panel Assembly	EA	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-

CANOPY PARTS - EXPLODED VIEW



CANOPY PARTS Dipping Cabinets Curved & Flat & Export				MODEL NO. 4HC		MODEL NO. 8HC		MODEL NO. 8HC (3500K)		MODEL NO. 12HC		MODEL NO. 12HC (3500K)		MODEL NO. 16HC		MODEL NO. 16HC (3500K)		MODEL NO. 4HR		MODEL NO. 8HR		MODEL NO. 12HR		MODEL NO. 16HR	
	PART NUMBER	DESCRIPTION	U/M	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#
1	01-0902-01	Glass Bracket, Top	EA	2	-	2	-	2	-	3	-	3	-	3	-	3	-								
	02-0942-00	Glass Bracket, Top	EA															2	-	2	-	3	-	3	-
2	51-1502-*	Lamp Channel Assembly	EA	1	-01	1	-02			1	-03			1	-04			1	-05	1	-06	1	-07	1	-08
	51-1503-*	Lamp Channel Assembly	EA					1	-01			1	-03			1	.02								
	01-1129-*	Lamp Channel	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04								
	01-1128-*	Lamp Channel	EA															1	-01	1	-02	1	-03	1	-04
3	02-0936-00	Clamp Top End	EA	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-
4	05-1034-02	Corner Trim, RH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-								
	05-1035-02	Corner Trim, RH	EA															1	-	1	-	1	-	1	-
5	05-1034-01	Corner Trim, LH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-								
	05-1035-01	Corner Trim, LH	EA															1	-	1	-	1	-	1	-
6	26-6504-00	Tape, Double Sided	FT	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-	1.8	-
7	10-1061-02	Glass Channel, Vert.	EA															2	-	2	-	2	-	2	-
	10-1042-00	Gasket, Glass (Curved)	EA	3	-	3	-	3	-	3	-	3	-	3	-	3	-								
8	19-1975-00	Lampholder	EA	1	-	2	-	4	-	2	-	4	-	2	-	4	-	1	-	2	-	2	-	2	-
	19-0088-00	Lampholder, W/Starter Soc.	EA	1	-	2	-			2	-			2	-			1	-	2	-	2	-	2	-
9	10-0445-00	Lamp Shield &Cap, 40 Watt	EA							2	-	2	-	2	-	2	-					2	-	2	-
	10-0551-00	Lamp Shield &Cap, 20 Watt	EA	1	-	2	-	2	-									1	-	2	-				
10	19-0151-00	Lamp, 40 Watt	EA							2	-			2	-							2	-	2	-
	19-0149-00	Lamp, 20 Watt	EA	1	-	2	-											1	-	2	-				
	19-1277-00	Lamp, 34 Watt (3500K)	EA									2	-			2	-								
	19-1312-00	Lamp, 17 Watt (3500K)	EA					2	-																
11	26-1006-00	Tape, Cush.	FT	2.25	-	4	-	4	-	5.5	-	5.5	-	7.25	-	7.25	-	2.25	-	4	-	5.5	-	7.25	-
12	19-0145-00	Starter, FS4	EA							2	-			2	-							2	-	2	-
	19-0144-00	Starter, FS2	EA	1	-	2	-											1	-	2	-				
13	05-1036-*	Light Shield	EA															1	-01	1	-02	1	-03	1	-04
	05-0935-*	Light Shield	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04								
14	05-1197-02	Inside Post RH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
15	05-1197-01	Inside Post LH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
16	05-1192-01	Inside Post, Center	EA							1	-	1	-	1	-	1	-					1	-	1	-
17	05-1031-*	Frame, Lower Front	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04	1	-01	1	-02	1	-03	1	-04
18	20-0073-00	Glass, End	EA	2	-	2	-	2	-	2	-	2	-	2	-	2	-								
	20-0076-00	Glass, End	EA															2	-	2	-	2	-	2	-
19	10-1061-01	Glass Channel, Horz.	EA	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-
20	02-0937-00	Clamp Bottom End	EA	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-	2	-
21	05-1015-02	Frame, Canopy End RH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
22	05-1015-01	Frame, Canopy End LH	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
23	05-1030-*	Glass Retainer, Lower Front	EA	1	-01	1	-02	1	-02	1	-03	1	-03	1	-04	1	-04	1	-01	1	-02	1	-03	1	-04
24	20-0072-*	Glass, Front	EA			1	-02	1	-02	1	-03	1	-03	1	-04	1	-04								
	20-0075-*	Glass, Front	EA															1	-01	1	-02	1	-03	1	-04
25	05-1193-01	Outside Post, Center	EA							1	-	1	-	1	-	1	-					1	-	1	-

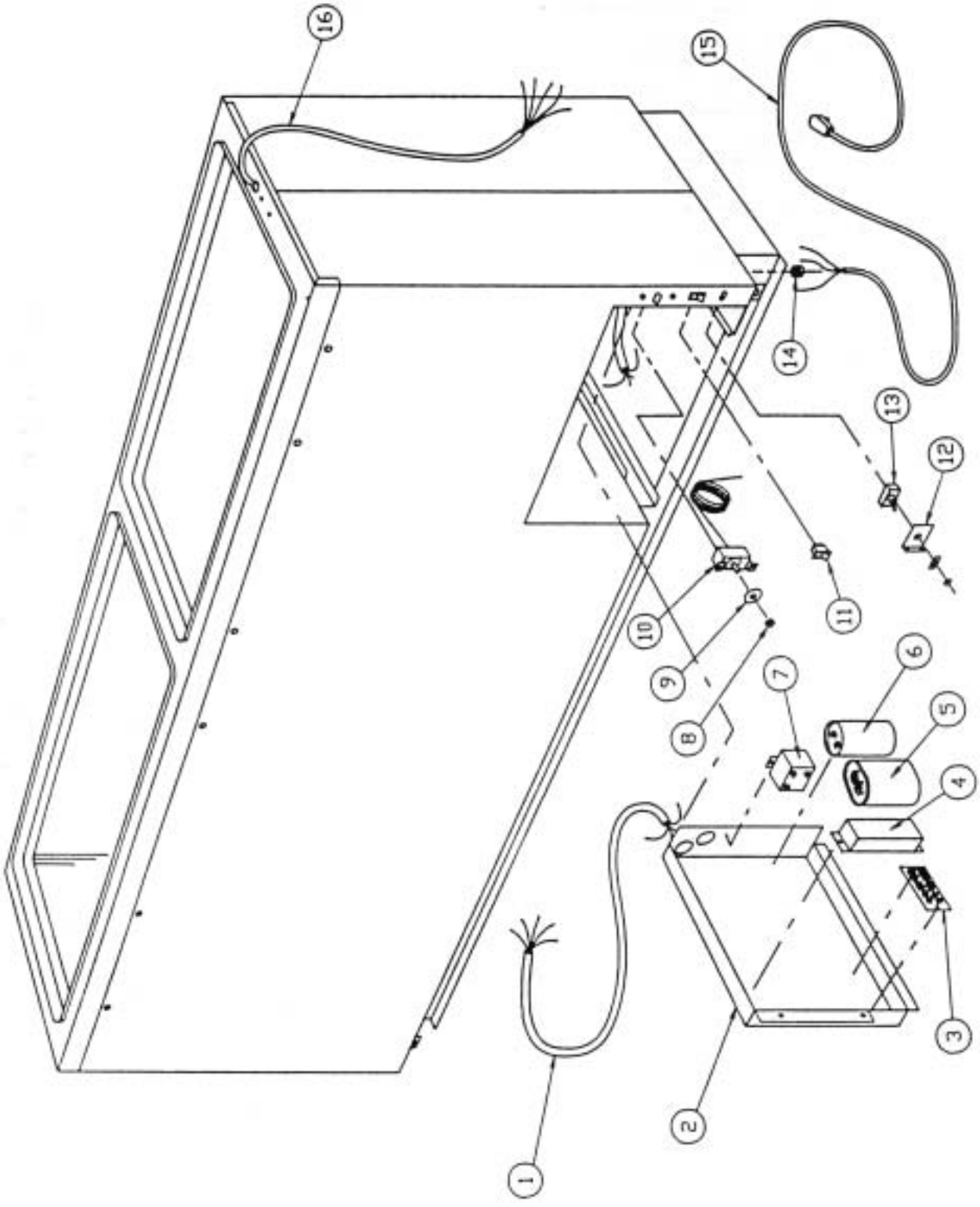
CONDENSING UNIT EXPLODED VIEW



CONDENSING UNIT PARTS **Dipping Cabinets** **Curved & Flat & Export**				MODEL NO. **4HC** **4HR**		**8HC** **8HR**		**12HC** **12HR**		**16HC** **16HR**		**E4HC** **E4HC2** **E4HR** **E4HR2**		**E8HC** **E8HC2** **E8HR** **E8HR2**		**ECKDC-67** **E12HC2** **EKDC-67** **E12HR2**		MODEL NO. **ECKDC-87** **E16HC2** **EKDC-87** **E16HR2**	
	PART NUMBER	**DESCRIPTION**	**U/M**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**
1	310A0010	Flavor Strip holder	EA	2	-	4	-	6	-	8	-	2	-	4	-	6	-	8	-
2	90-0125	Insert Bottom Pad	EA	1	-	2	-	3	-	4	-	1	-	2	-	3	-	4	-
3	315256	Nameplate Frame	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
4	31-5257	Nameplate Insert (Kelv)	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
	26-959-00	Nameplate Insert (U/N)	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
5	92-0242	Tape, Double Sided	IN	7.5	-	7.5	-	7.5	-	7.5	-	7.5	-	7.5	-	7.5	-	7.5	-
	51-1509-*	Condensing Unit As'y	EA	1	-01	1	-02	1	-05	1	-06	1	-03	1	-04				
	51-1510-00	Condensing Unit As'y	EA													1	-	1	-
6	02-0255-00	Condenser Shroud	EA	1	-	1	-	1	-	1	-	1	-	1	-				
	02-1007-00	Condenser Shroud	EA													1	-	1	-
7	24-0396	Condenser Fan Motor	EA	1	-	1	-												
	19-0933-00	Condenser Fan Motor	EA					1	-	1	-								
	24-0397	Condenser Fan Motor	EA									1	-	1	-				
	19-0934-00	Condenser Fan Motor	EA													1	-	1	-
8	19-0410-00	Condenser Fan Blade	EA	1	-	1	-					1	-	1	-				
	19-0101-00	Condenser Fan Blade	EA					1	-	1	-					1	-	1	-
9	19-0925-00	Condenser Fan Bracket	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
10	50-0165-02	Unit Base Plate Weld As'y	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
11	51-0709-*	Condenser Coil	EA	1	-01	1	-02	1	-02	1	-03	1	-01	1	-02				
	18-0543-00	Condenser Coil	EA													1	-	1	-
12	02-0274-00	Baffle, RH	EA	1	-	1	-	1	-	1	-	1	-	1	-				
	02-0275-00	Baffle, RH	EA													1	-	1	-
13	02-0851-00	Baffle, LH	EA													1	-	1	-
14	12-3024	Filter Drier	EA	1	-	1	-	1	-	1	-	1	-	1	-				
	18-1122-00	Filter Drier	EA													1	-	1	-
15	16-0308-00	Compressor	EA	1	-														
	16-0309-00	Compressor	EA			1	-												
	16-0313-00	Compressor	EA					1	-	1	-								
	16-0311-00	Compressor	EA									1	-						
	16-0312-00	Compressor	EA											1	-				
	16-0301-00	Compressor	EA													1	-	1	-
	17-0314-00	Motor Protector	EA	1	-														
	17-0315-00	Motor Protector	EA			1	-												
	17-0316-00	Motor Protector	EA					1	-	1	-								
	17-0317-00	Motor Protector	EA									1	-						
	17-0290-00	Motor Protector	EA											1	-				
	17-0286-00	Start Relay	EA	1	-	1	-												
	17-0300-00	Start Relay	EA					1	-	1	-	1	-	1	-				
	15-0325	Cover, Comp Terminals	EA	1	-	1	-	1	-	1	-	1	-	1	-				
	15-0326	Strap, Cover	EA	1	-	1	-	1	-	1	-	1	-	1	-				
16	50-3488-*	Heat Exchange, Coil	EA	1	-01	1	-02					1	-01	1	-02				
	50-4035-00	Heat Exchange, Coil	EA					1	-	1	-								
	50-3475-02	Heat Exchange, Coil	EA													1	-	1	-

CONDENSING UNIT PARTS

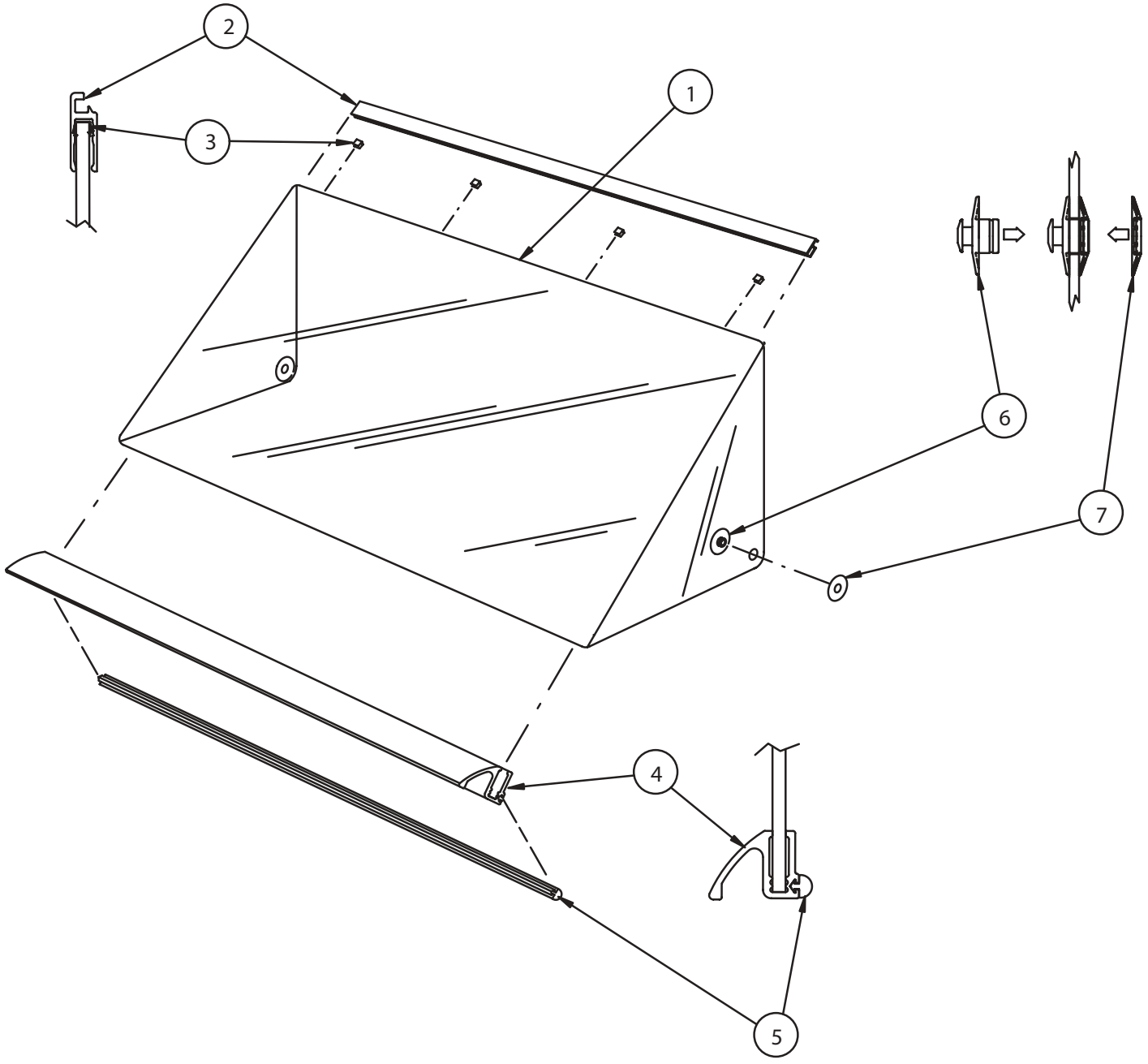
ELECTRICAL PARTS - EXPLODED VIEW



ELECTRICAL PARTS LIST

ELECTRICAL PARTS **Dipping Cabinets** **Curved & Flat & Export**				MODEL NO. **4HC** **4HR**		MODEL NO. **8HC** **8HR**		**8HC** **(3500K)**		MODEL NO. **12HC** **12HR**		MODEL NO. **12HC** **(3500K)**		MODEL NO. **16HC** **16HR**		MODEL NO. **16HC** **(3500K)**		MODEL NO. **E4HC** **E4HR**		MODEL NO. **E8HC** **E8HR**		MODEL NO. **ECKDC-67** **EKDC-67**		MODEL NO. **ECHKD-87** **ECKDC-87**		MODEL NO. **E4HC2** **E4HR2**		**E8HC2** **E8HR2**		MODEL NO. **E12HC2** **E12HR2**		**E16HC2** **E16HR2**	
	PART NUMBER	**DESCRIPTION**	**U/M**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**	**QTY**	**GR.#**
1	19-1148-00	Wire Harness, Compr	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-					1	-	1	-				
	19-1149-00	Wire Harness, Compr	EA																					1	-	1	-					1	-	1	-
2	02-0835-01	Electrical Box	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
3	19-1414-00	Terminal Board	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
4	19-0146-00	Ballast, 20w	EA	1	-	2	-																												
	19-0912-00	Ballast,	EA															1	-																
	19-0916-00	Ballast,	EA																	2	-							1	-	2	-				
	19-0458-00	Ballast,	EA							2	-			2	-																				
	19-1329-00	Ballast,	EA																			2	-	2	-										
	19-0539-00	Ballast,	EA																													2	-	2	-
	19-1276-00	Ballast, 3500k	EA					1	-			1	-			1	-																		
5	17-0288-00	Capacitor, Run	EA	1	-	1	-	1	-																										
	17-0302-00	Capacitor, Run	EA															1	-	1	-					1	-	1	-						
	17-0320-00	Capacitor, Run	EA							1	-	1	-	1	-	1	-																		
	17-0283-00	Capacitor, Run	EA																			1	-	1	-					1	-	1	-		
6	17-0291-00	Capacitor, Start	EA	1	-	1	-	1	-																										
	17-0301-00	Capacitor, Start	EA															1	-	1	-					1	-	1	-						
	17-0319-00	Capacitor, Start	EA							1	-	1	-	1	-	1	-																		
	19-1327-00	Capacitor, Start	EA																			1	-	1	-										
	17-0168-00	Capacitor, Start	EA																													1	-	1	-
7	17-0306-00	Start Relay	EA																			1	-	1	-					1	-	1	-		
8	43-0182	Grommet, Temp Control	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
9	82-0141	Dial Plate, Temp Control	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
10	19-1222-00	Temperature Control	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
11	19-0659-00	Switch, Light	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
12	01-1136-00	Bracket, Power Switch	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
13	19-0103-00	Switch, Power Supply	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-
14	19-0813-00	Strain Relief	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-														
15	19-0620	Power Supply Cord	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-														
	19-1349-00	Power Supply Cord	EA																			1	-	1	-	1	-	1	-	1	-	1	-	1	-
16	19-0915-00	Wire Harness, Cabinet	EA	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-	1	-

LID - EXPLODED VIEW



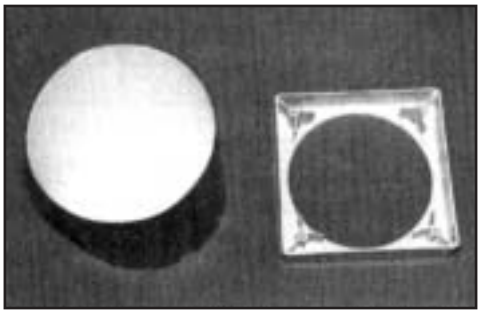
LID PARTS LIST

LID PARTS Dipping Cabinets Curved & Flat & Export				MODEL NO. 4HC 4HR		MODEL NO. 8HC 8HR		MODEL NO. 12HC 12HR		MODEL NO. 16HC 16HR	
	PART NUMBER	DESCRIPTION	U/M	QTY	GR.#	QTY	GR.#	QTY	GR.#	QTY	GR.#
1	10-1141-*	Lid, Plexiglas	EA	1	-01	1	-02	1	-03	1	-04
2	08-0517-*	Lid Frame, Top	EA	1	-01	1	-02	1	-03	1	-04
3	23-0164-00	U-Clip	EA	6	-	10	-	10	-	10	-
4	08-0520-*	Lid Frame, Handle	EA	1	-01	1	-02	1	-03	2	-04
5	09-0219-00	Bumper, Lid Front	FT	1.73	-	3.46	-	2.49	-	3.66	-
6	10-1156-00	Pivot Bushing, Male	EA	2	-	2	-	2	-	2	-
7	10-1135-02	Pivot Fushing,Female	EA	2	-	2	-	2	-	2	-

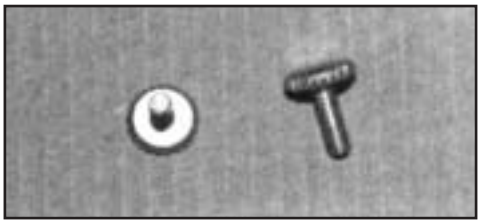
BLANK

ACCESSORIES

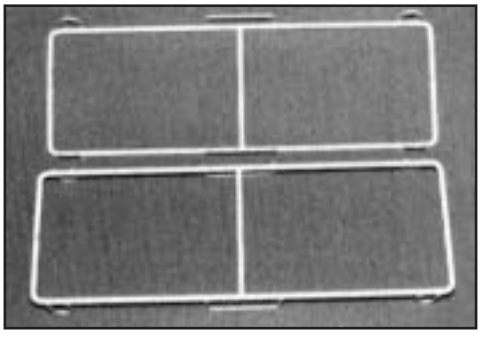
CAN SKIRT ACCESSORY PARTS LIST



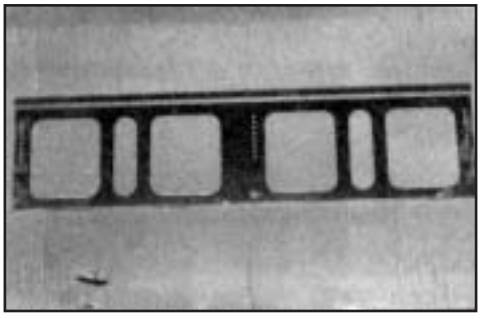
A Can Skirt Assembly w/ Gripper 50-3326-02
Gripper 09-0202-00
Can Skirt Only 10-0952-02



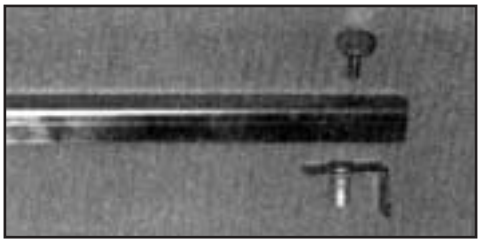
B Thumbscrew 22-1729-00



C Can Rack 15-0296-00



D Support Bracket (Short) 01-0930-00
Support Bracket (Long) 01-0931-00



E Thumbscrew 22-1729-00

F Product Spacer 05-1011-00

G Product Spacer Angle 05-1010-00

CAN SKIRT INSTALLATION INFORMATION

ACCESSORY PART NUMBER		CABINET MODEL NUMBER	
52-1804-01	4-Hole	CKDC27, CKDC27C, DL4C	4HC & 4HR
52-1804-02	8-Hole	CKDC47, CKDC47C, DL8C	8HC & 8HR
(1) 52-1804-01 plus (1) 52-1804-2	12-Hole	CKDC67, CKDC67C, DL12C	12HC & 12 HR
(2) 52-1804-01 plus (1) 52-1804-2	16-Hole	CKDC87, CKDC87C, DL16C	16HC & 16HR

Each accessory assembly contains a complete set of can skirts & brackets for the size cabinet as indicated in the chart above.

1. Set cabinet into its serving location.
2. Remove all packaging material, clean interior.
3. Locate can skirt assembly cartons.
4. Open can skirt assembly cartons.
5. Sort parts by style.

   [A] Can Skirt Ass'y w/Gripper 50-3326-02

   [B] Thumbscrew 22-1729-00

   [C] Can Rack 15-0296-00

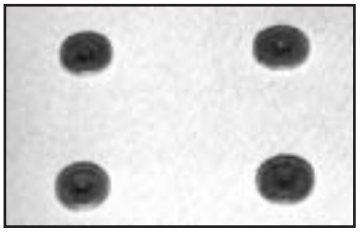
   [D] Support Bracket (Short) 01-0930-00

   Support Bracket (Long) 01-0931-00

   [E] Product Spacer.....05-1011-00

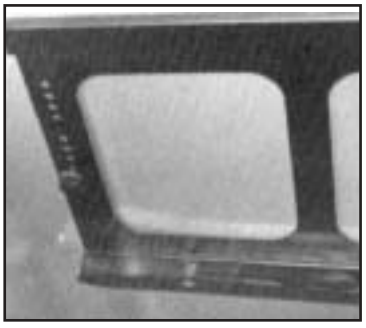
   [F] Product Spacer Angle.....05-1010-00

6. Clean all parts.

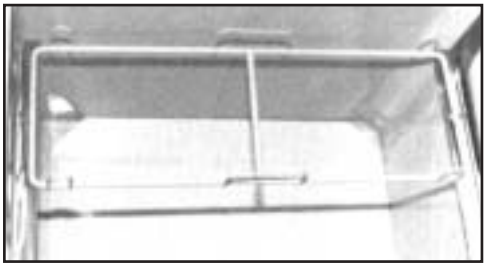


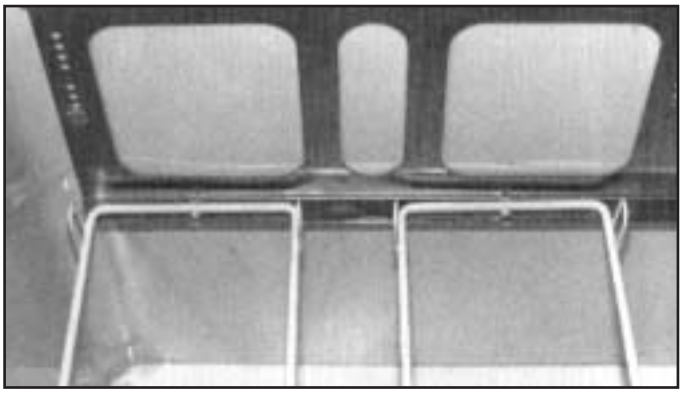
7. Remove plastic hole covers in rivnut holes inside cabinet tank. Discard plastic hole covers.

8. Attach can rack support bracket [D] to the inside wall of the tank using thumbscrews [B] provided. One thumbscrew is necessary per mount hole series. Adjust height of can rack support bracket to desired dipping height. Can rack support brackets attach to front and rear wall of inner tank.

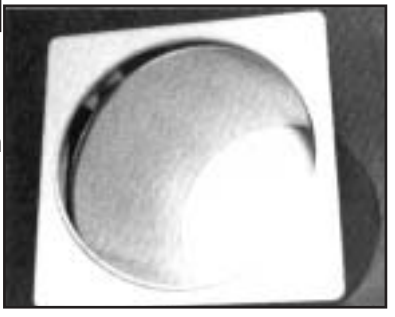


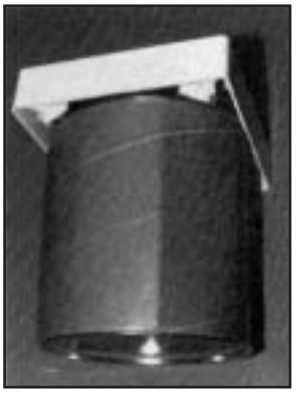
9. Place can racks [C] into support bracket. Place ball of can rack into slot on the support bracket.





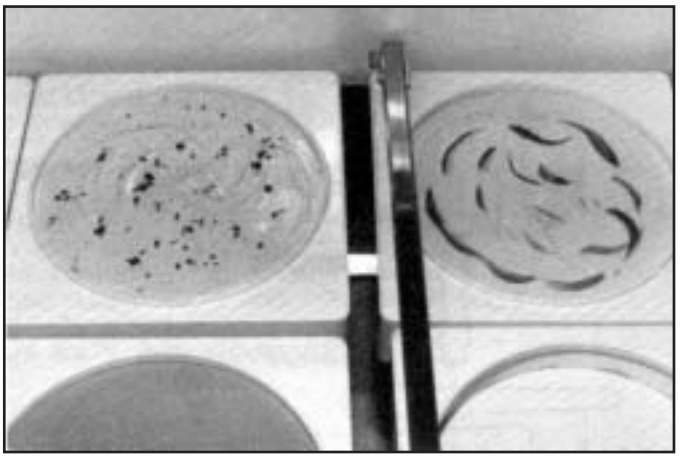
10. Place can skirt [A] over the product container. Slide the product container with can skirt attached into the can rack. Fill the complete cabinet with product containers.

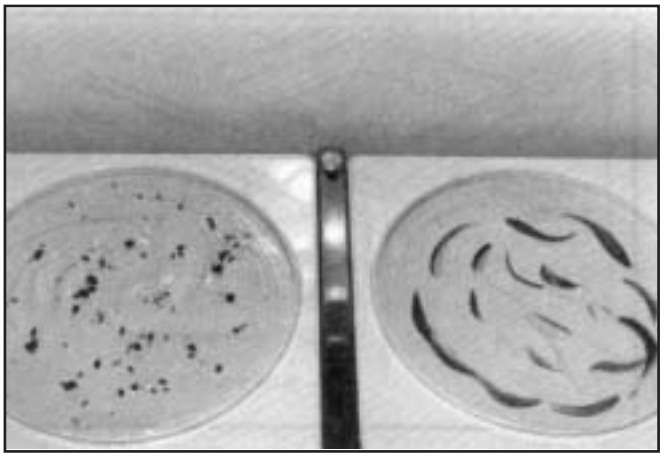




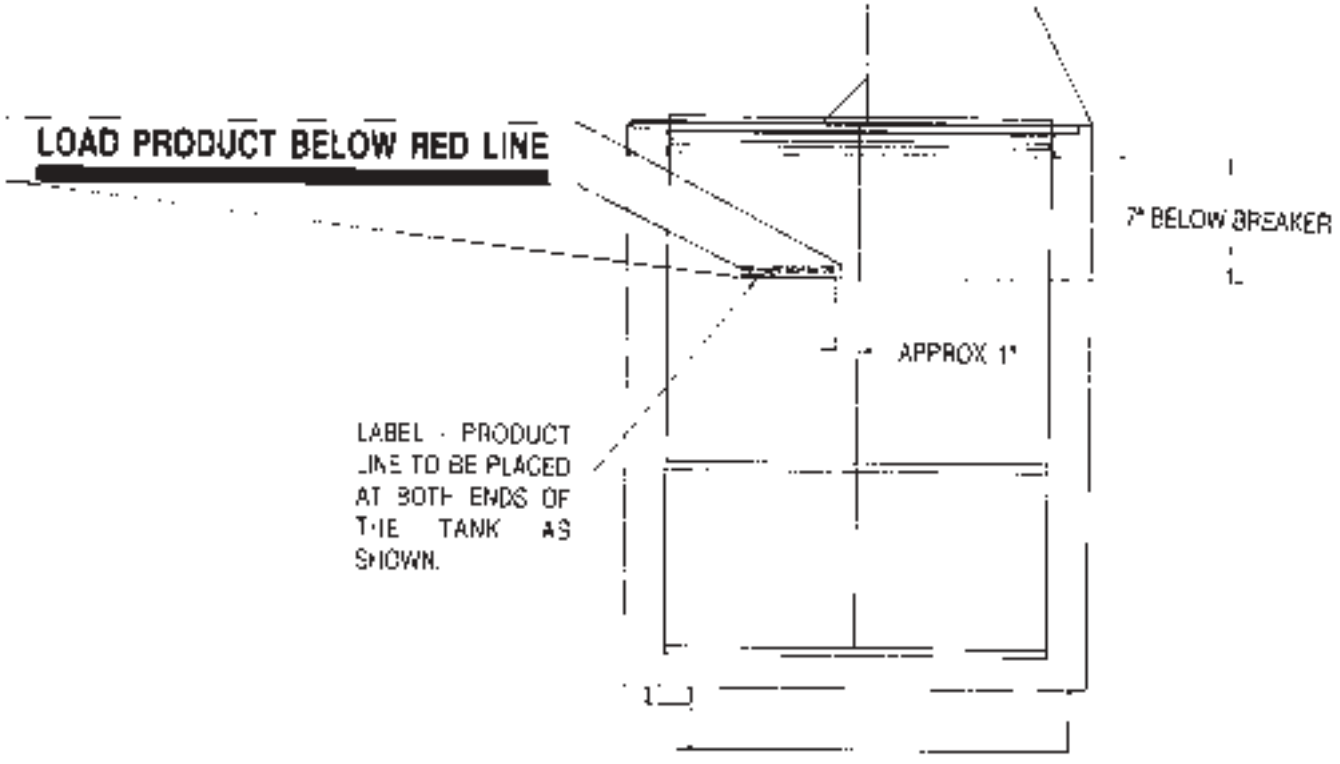
CAN SKIRT INSTALLATION INFORMATION

11. Place product spacer [E] into the cabinet at center of tank. Eight-hole and 12-hole assemblies have one spacer bar; 16-hole has 2 spacer bars.

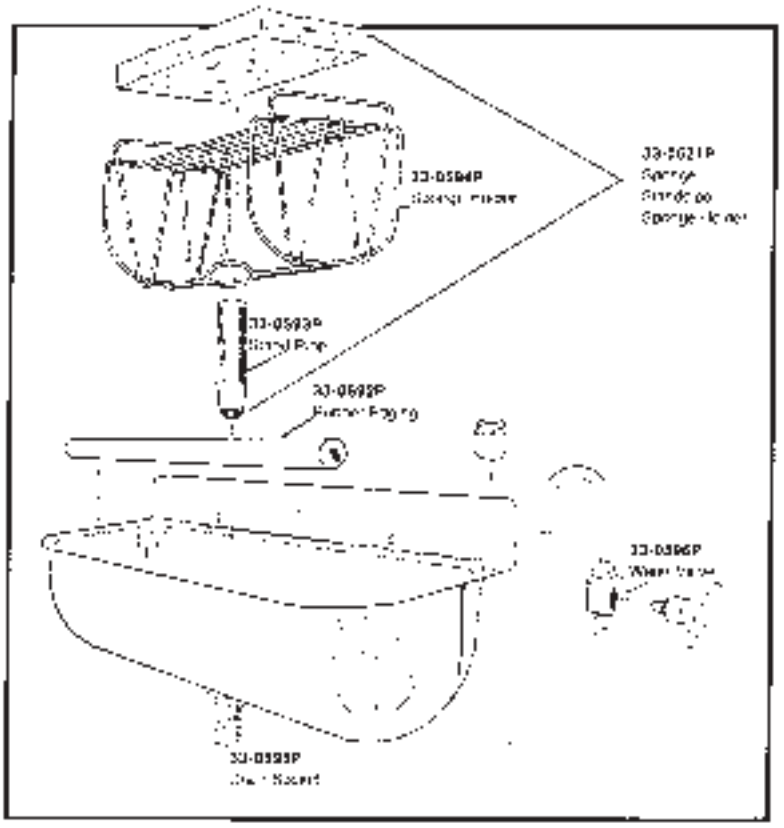




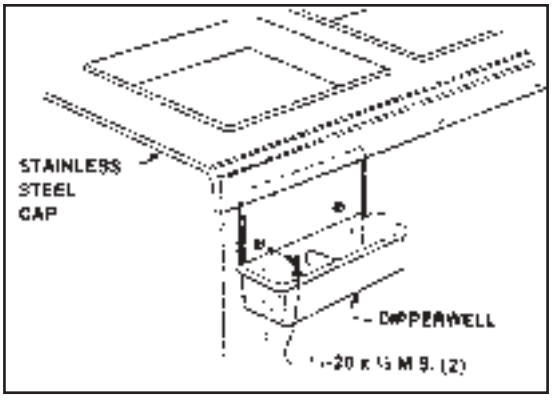
12. Can skirt is now installed.



DIPPERWELL INSTALLATION INFORMATION - 7300000

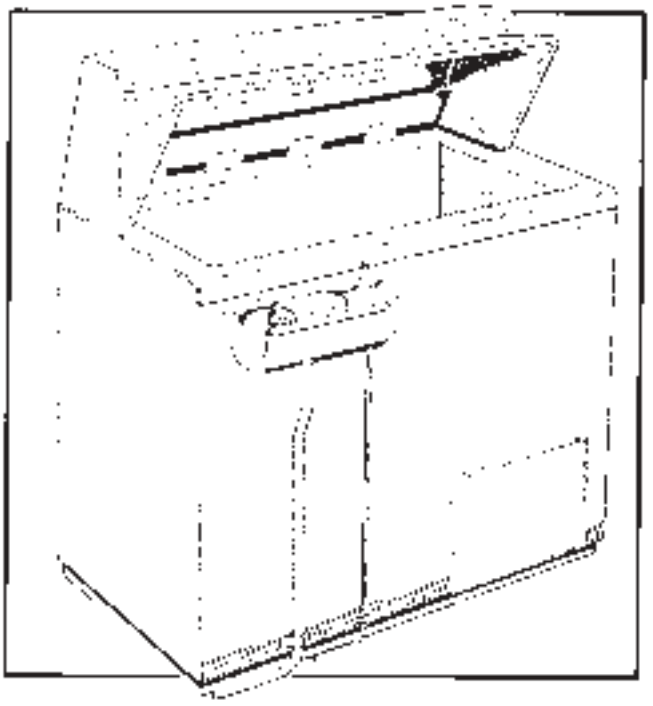


NOTE: There are provisions for either righthand or lefthand dipperwell positioning.



To install dipperwell:

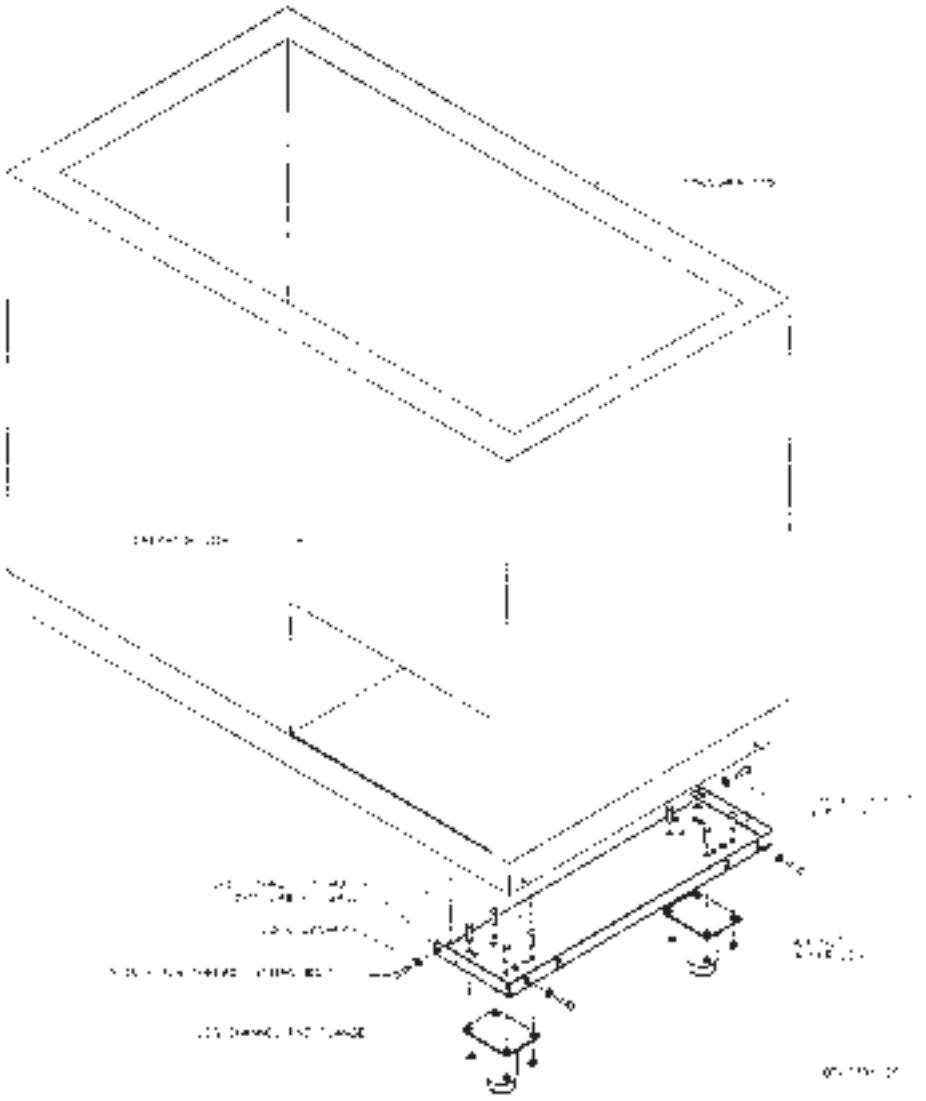
1. Remove plastic hole tabs.
2. Mount dipperwell to cabinet using (2) 1/4-20 x 1/2 M.S.
3. Mounting plate must be under flange of stainless steel cap.
4. Slide flange of dipperwell under stainless steel cap and line up hole in dipperwell to hole provided in cabinet.
5. Secure dipperwell to cabinet with (2) 1/4-20 x 1/2 M.S.



ADJUSTABLE LEG KIT - 52-1831-01

LEG INSTALLATION INSTRUCTIONS - KDC MODELS

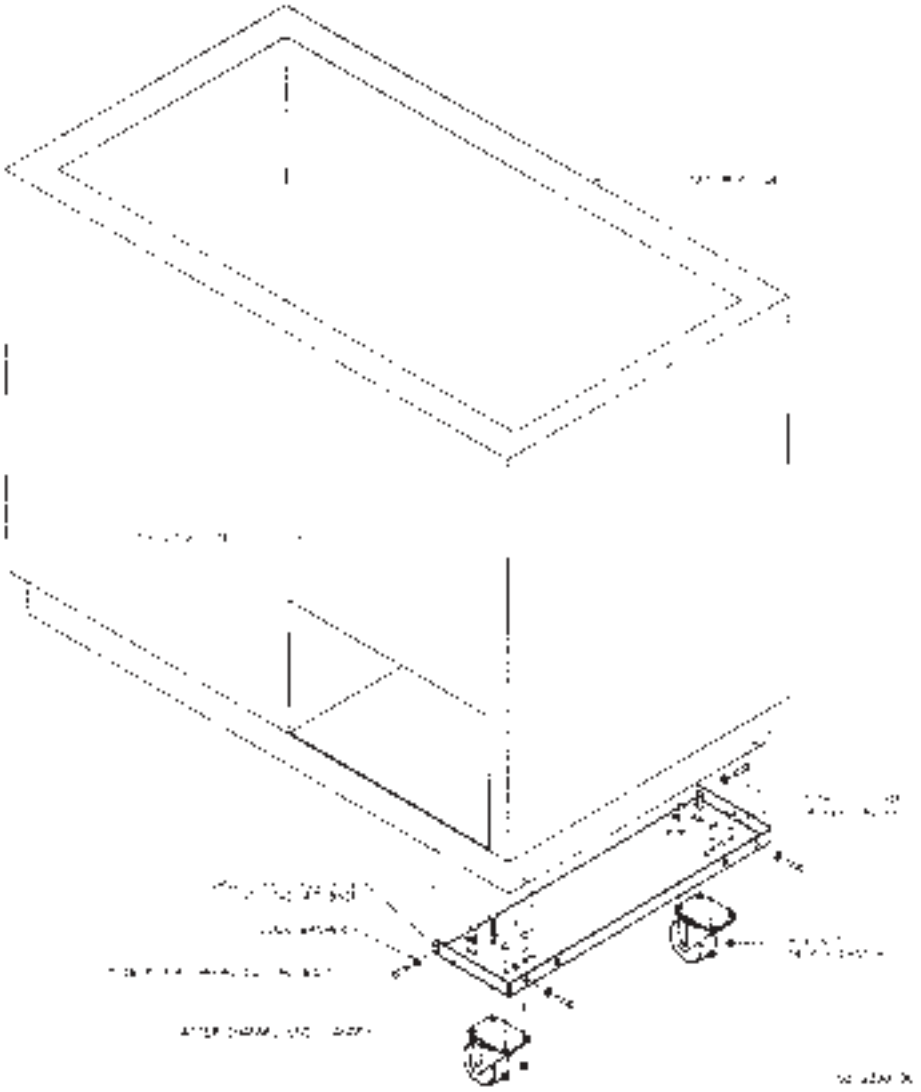
1. ATTACH THE LEGS TO THE CHANNELS WITH 5/16 X 1/2" BOLTS AND HEX NUTS.
2. LIFT ONE END OF THE CABINET AND PLACE THE LEG AND CHANNEL ASSEMBLY UNDER THE CABINET BASE WITH THE CHANNEL FLANGES AGAINST THE CABINET BASE.
3. INSERT 5/16 X 3/4 THREAD CUTTING BOLTS THRU THE SIDE FLANGES INTO THE EXISTING CRATE MOUNTING HOLES USING THE LOCK WASHERS AS SHOWN.
4. REPEAT STEP 2 AND 3 ON THE OTHER END OF THE CABINET.
5. DRILL THRU ALL 4 END FLANGE HOLES INTO THE CABINET BASE WITH A 1/4 DIAMETER DRILL BIT.
NOTE: ON OLDER CABINETS WITH A FRONT RACEWAY ONLY THE FLANGE ON THE CONSERVER SIDE CAN BE USED.
6. INSERT 5/16 X 3/4 THREAD CUTTING BOLTS THRU THE END FLANGE HOLES INTO THE DRILLED HOLES USING THE LOCK WASHERS AS SHOWN.
7. PUSH FIT VINYL COVERS OVER EXPOSED THREADS OF 3/4 BOLTS. (NSF REQUIREMENT)



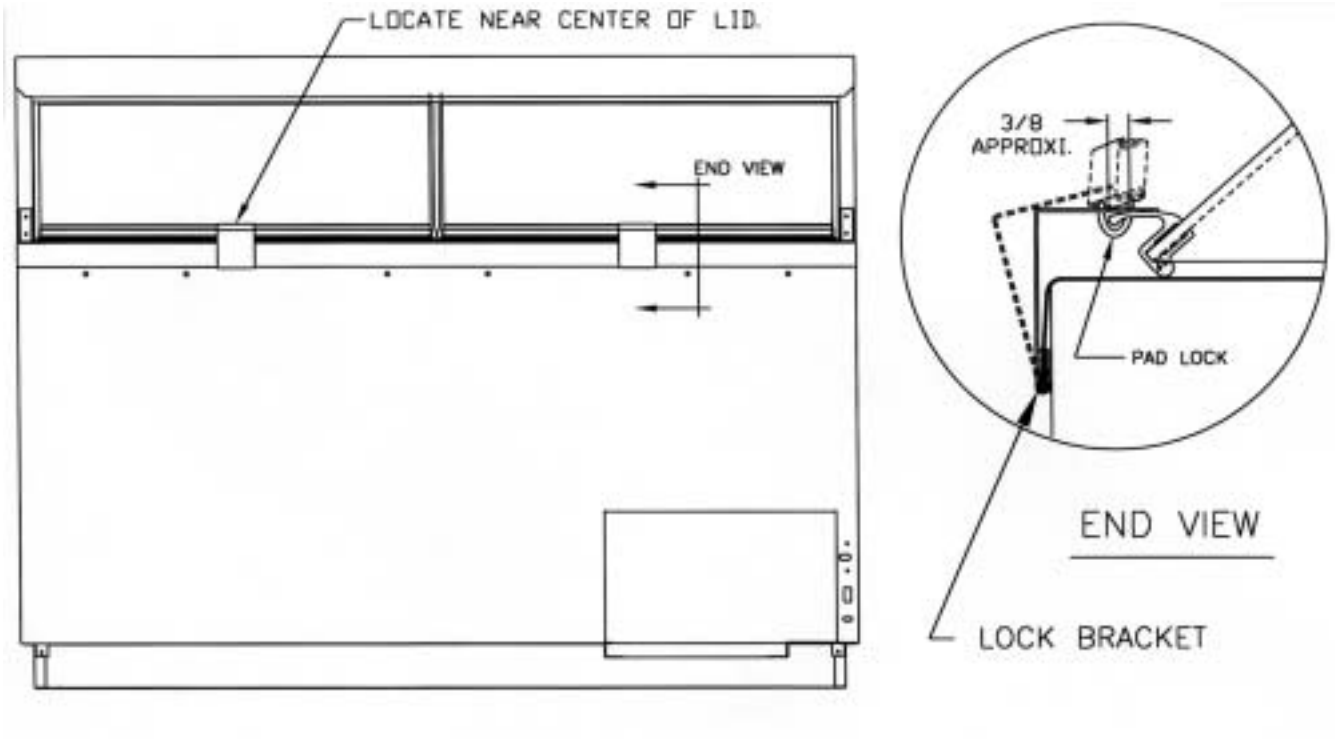
CASTER KIT- 52-1830-01

CASTER INSTALLATION INSTRUCTIONS – KOC 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. INSERT 5/16 X 3/4 THREAD CUTTING BOLTS THRU THE SIDE FLANGES INTO THE EXISTING CRATE MOUNTING HOLES USING THE LOCK WASHERS AS SHOWN
4. REPEAT STEP 2 AND 3 ON THE OTHER END OF THE CABINET
5. DRILL THRU ALL 4 END FLANGE HOLES INTO THE CABINET BASE WITH A 1/4 DIAMETER DRILL BIT
NOTE: ON OLDER CABINETS WITH A FRONT RACEWAY ONLY THE FLANGE ON THE CONSUMER SIDE CAN BE USED.
6. INSERT 5/16 X 3/4 THREAD CUTTING BOLTS THRU THE END FLANGE HOLES INTO THE DRILLED HOLES USING THE LOCK WASHERS AS SHOWN
7. PUSH THE VINYL COVERS OVER EXPOSED THREADS OF 3/4 BOLTS. (NSF REQUIREMENT)



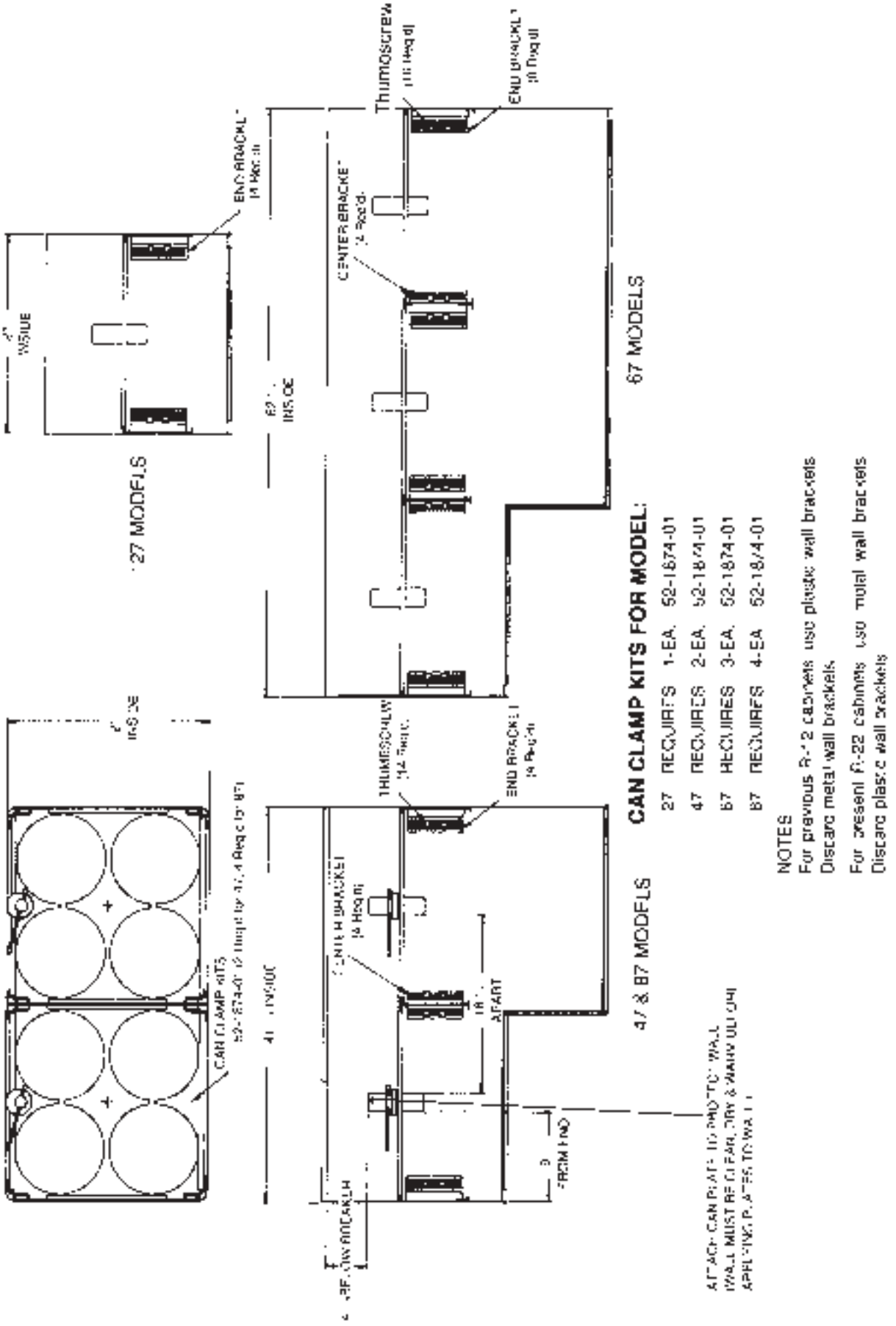
INSTALLATION INSTRUCTIONS FOR LID LOCK KIT-52-2081-00 (DIPPING CABINETS)



1. Locate and drill a 5/16" (.313) dia. hole 3/8" (.375) from the edge of the handle.

2. Slip the hooked end of the lock bracket under the stainless steel top (see end view above), pull out to allow lid handle to pass and place the padlock through the handle and the bracket.

CAN CLAMP INSTALLATION



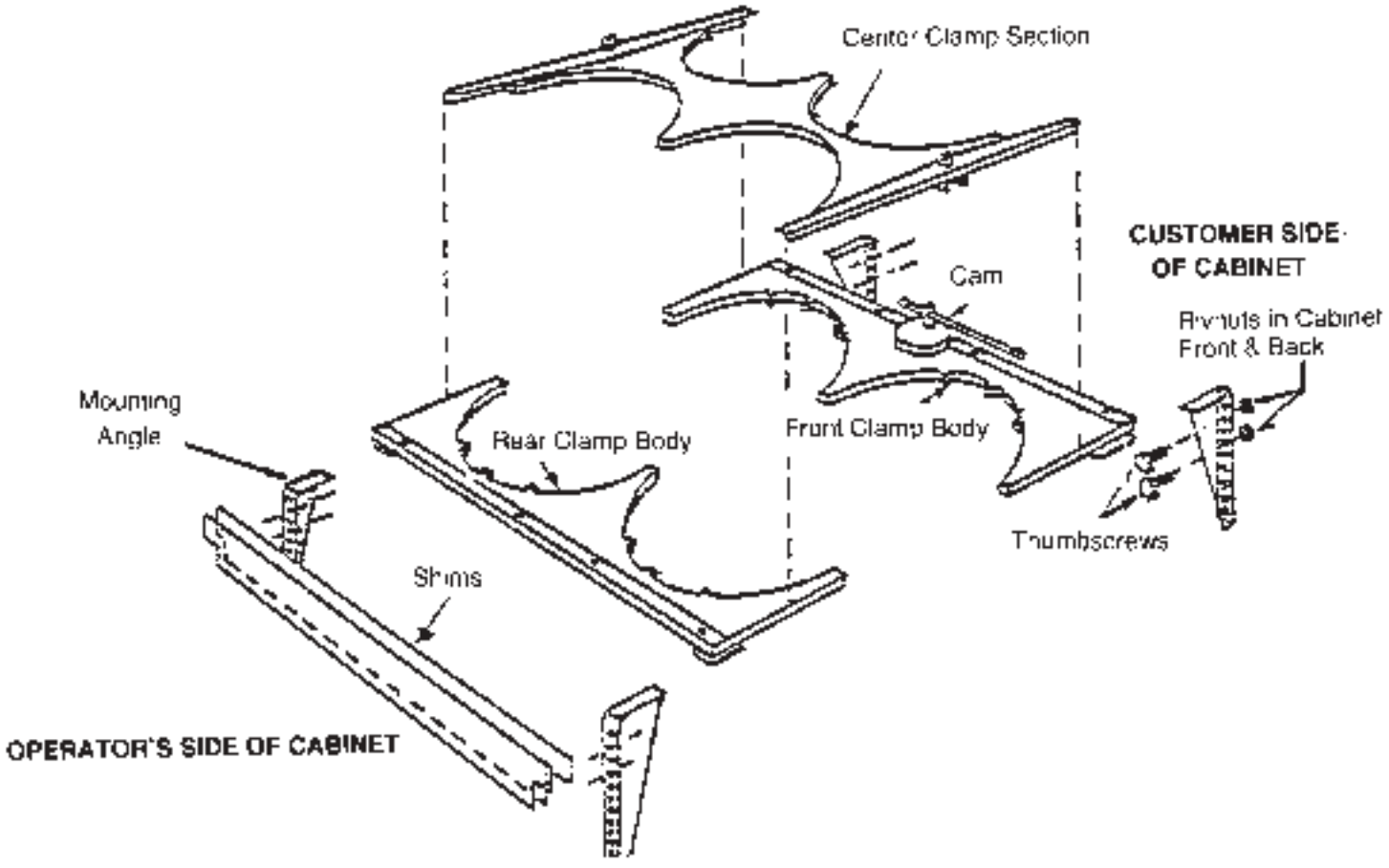
INSTALLATION INSTRUCTIONS - ACCESSORY PART NO. 52-1874-01
ROUND CAN CLAMP - 9 ¼" to 9 ⅝" Dia. - PLASTIC CANS

Each accessory contains parts to clamp one 4-can cluster of ice cream containers.

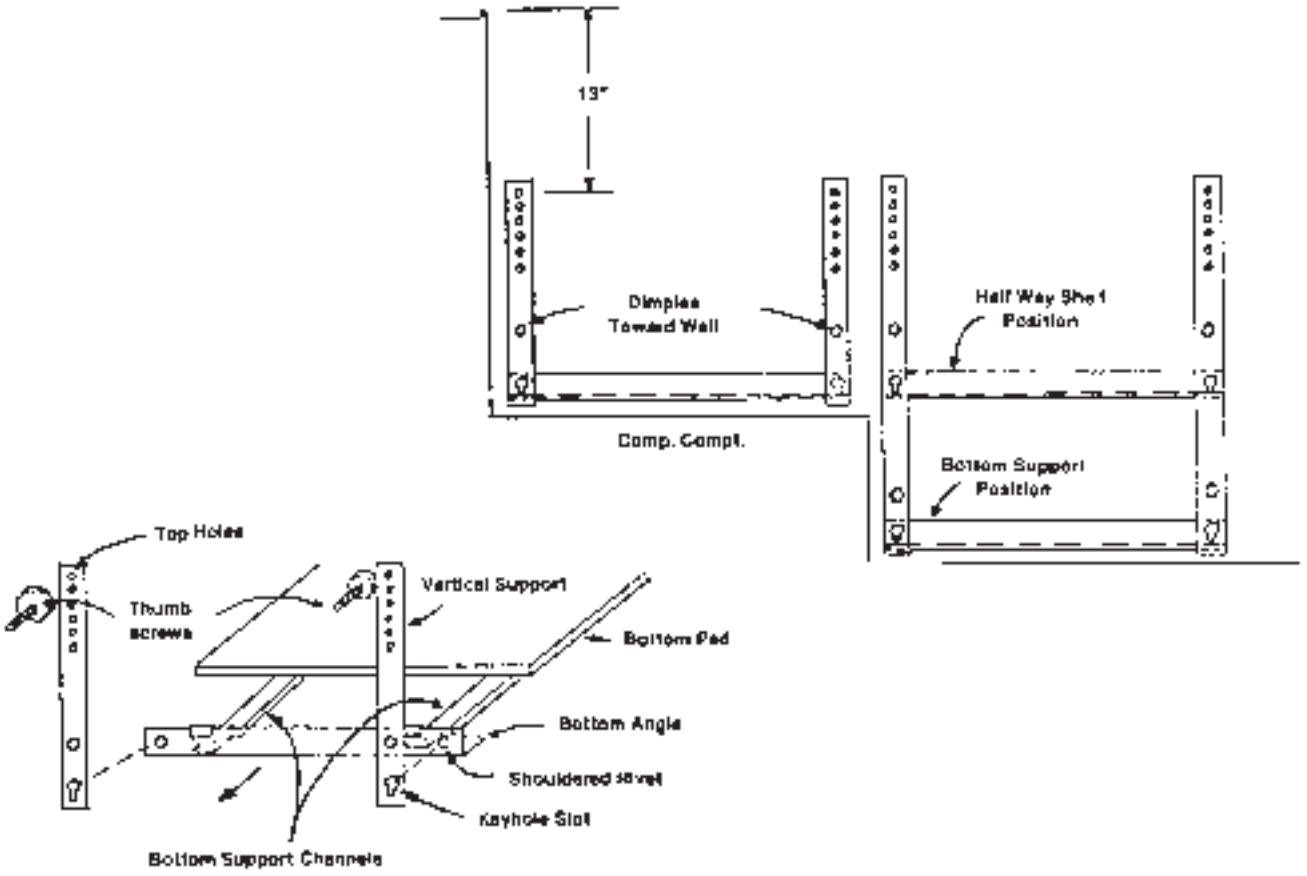
1. Install 4 mounting angles, using 2 thumbscrews each. Select a hole location which will meet your height requirements. Other cans or other means to obtain proper height of the four cans in relation to the can clamps may be used.
   NOTE: Cans cannot extend above clamps more than 1-1/2" in order for the cam handle to clear the top of the cans. Can clamp mounting angles offer approximately 4" of adjustment.
2. Slide rear clamp body (without cam) on mounting angles on operator's side.
3. Slide front clamp body (with cam) on mounting angles on customer's side. Position 4 cans against front and rear clamp bodies.
4. Drop in the center clamp section and turn cam about 90 degrees to lock in cans.
5. If it is necessary to increase clamping pressure, install plastic shim or shims. Rest the notched-out corners on the mounting angles (operator's side) between the rear of the rear clamp body and the liner wall. Shims drop in place without removing parts.

PARTS LIST

Center Clamp Section	764183P
Front Clamp Body	764181 P
Rear Clamp Body	764182P
R-12 Mounting Angle, LH	764185P
R-12 Mounting Angle, RH	764184P
R-22 Metal Mounting Bracket, Flat	01-0917-00
R-22 Metal Mounting Bracket, Curved	01-0918-00
Thumbscrews	530536P
Thumbnuts	548905P
Handle	371057P
Cam	371059
Cap	430243P



HALF-WAY SELF BOTTOM SUPPORT KIT



1. Assemble vertical supports to cabinet with thumbscrews through top hole of support onto rivnuts in liner. The dimple formed in each support should be towards the wall. The four (4) short supports go over the unit compartment.
2. Engage the shouldered rivets in each bottom angle in the keyhole slots of two vertical supports as illustrated, note that in the deep section you have a choice of two locations. For cans one row deep, use top keyhole slot. For cans two deep, use lower keyhole slot.
3. Hook bottom support channels over bottom angle between verticle supports.
4. Set bottom pads on angles and load product.
5. To raise product - move supports up to position on 2nd through 6th hole.

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