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REVISED:

KYSOR//WARREN

The Leading Edge of Technology

INSTALLATION & OPERATION MANUAL

MODEL:

HZV1-ZV1-HZU1-ZU1

PRODUCE

THIS REFRIGERATOR CONFORMS TO THE COMMERCIAL REFRIGERATOR MANUFACTURERS ASSOCIATION HEALTH AND SANITATION STANDARD.

KYSOR//WARREN

DIVISION OF KYSOR INDUSTRIAL CORPORATION

1600 INDUSTRIAL BLVD., CONYERS, GEORGIA 30207 / 404•483•5600
5201 TRANSPORT BLVD., COLUMBUS, GEORGIA 31907

INSTALLATION AND OPERATING INSTRUCTIONS

FOR

HZV1, ZV1, HZU1, ZU1

SELF-SERVICE PRODUCE MERCHANDISERS

APPLICATION:

The Kysor//Warren single and multi-deck produce cases are designed to merchandise bulk or packaged vegetables. These cases should be installed and operated according to the instructions contained in this manual to insure proper performance. They are designed for display of products in an air-conditioned store where temperature and humidity are maintained at a maximum of 75-degree F dry bulb, 55% relative humidity.

MODELS	DESCRIPTION
HZV1	Air Curtain Produce Case 74" High With Mirrors
HZU1	Non-Refrigerated Produce Case Companion to HZV1
ZV1	Single Deck Produce Case 48" High Without Canopy
ZU1	Non-Refrigerated Single Deck Produce Case Companion to ZV1

GENERAL

These display refrigerators may be installed individually or in a continuous line-up consisting of several 8' and 12' sections by using a joint trim. A plexiglass divider kit must be used between cases operating on different refrigeration systems. Divider will be factory installed if specified on order.

SHIPPING DAMAGE

All equipment should be examined for shipping damage before and during unloading. If there is any damage, the carrier should be notified immediately and an inspection requested. The delivery receipt must be noted that the equipment was received damaged. If damage is of a concealed nature you must contact the carrier immediately or no later than three days following delivery. A claim must be filed with the carrier by the consignee for all damages.

LOCATION

This refrigerator must be located on a firmly based floor and leveled within plus or minus 1/16". Use shims provided to level your refrigerator.

JOINING

Two or more fixtures of like models can be joined together to form a continuous line-up. Instructions for joining fixtures are included in the joint kit. Before lining up refrigerator, inspect refrigeration lines, electrical connections and controls to insure refrigerators are in proper line-up and are in the proper sequence.

NOTE: THESE REFRIGERATORS ARE LINED UP AT THE FACTORY AND ARE NUMBERED. INSURE THEY ARE LINED UP IN THE FIELD IN THE SAME SEQUENCE NUMBER.

WASTE OUTLET

These cases are equipped with a 1-1/2" FPI waste outlet connection which terminates in the center of the refrigerator below the insulated bottom. A 1-1/2" galv. water seal trap is provided for field installation.

INSTALLING DRIP PIPE

Improperly installed drip pipes can seriously effect the operation of this equipment and result in increased maintenance cost. Listed below are some general rules for drip pan installation:

1. Never use a double water seal.
2. Never use a pipe smaller than the size pipe or water seal supplied with the equipment.
3. Always provide as much fall as possible in drip pipe. (1" fall for each 4' of drip pipe.)
4. Avoid long runs in drip pipe which make it impossible to provide maximum fall in pipe.
5. Provide a drip space between drip pipe and floor drain or sewer connection.

6. Do not allow drip pipe to come in contact with uninsulated suction lines, which will cause the condensation from your refrigerator to freeze.

CLEANING

To insure minimum maintenance cost, cabinet should be thoroughly emptied and washed out every three months. The exterior should be washed weekly. A mild soap and water solution is recommended for painted surfaces of the cabinet. Do not use cleaners containing abrasive materials which will scratch or dull finish. The waste outlet should be flushed with a bucket of water following each cleaning.

NOTE: NEVER INTRODUCE WATER INTO THE FIXTURE FASTER THAN THE WASTE OUTLET CAN CARRY IT AWAY.

When cleaning lighted shelves, wipe down with a wet sponge or cloth so that water does not enter the light rails. Do not use a hose or submerge shelves in water. Be sure refrigeration is turned off and all electrical is off before washing your refrigerator.

LOADING

Merchandise should not be placed in the fixture until all controls have been adjusted and the refrigerator is at proper temperature. At no time should the fixture be stocked beyond the load line or over the front edge of adjustable shelves. In doing so, you will seriously affect the performance which will result in higher product temperatures and increase operating costs.

ELECTRICAL

All field installed wiring must comply with the NATIONAL ELECTRICAL CODES and LOCAL CODES.

ELECTRICAL RACEWAY

An electrical raceway is provided with each refrigerator for running your fan, anti-sweat heaters, and light circuits from case to case without using conduit. This applies, of course, when the front bumper is properly secured into position. This is an approved method by the Underwriters' Laboratories; however, wiring must be run in accordance with local and national electrical codes.

ELECTRICAL CONNECTIONS

All field connections are made in the electrical raceway.

Fan motors must operate continuously and panel must be marked sufficiently to prevent the fan motors and anti-sweat heaters from being turned off accidentally. When refrigerators are multiplexed, add the total of these amperage values to determine wire size and circuit protection.

Chart #1 shows the electrical ratings for your refrigerator. This is the same information that appears on your refrigeration nameplate.

CASE LIGHTING (HZV(U)1)

Cases are standard with one row of rapid start lamps (40T12CWK). Ballasts are located behind the canopy. If lighted shelves are supplied, ballasts for each shelf will be located behind the lower bumper assembly in the electrical raceway. See wiring diagram for layout.

REFRIGERATION FAN MOTORS

The fan motors employed are permanently oiled for the life of the motor and require no periodic maintenance. They are wired according to the enclosed wiring diagram and MUST RUN CONTINUOUSLY.

EXPANSION VALVE

The expansion valve furnished with your refrigerator has been sized for maximum coil efficiency. To adjust superheat, place a thermocouple under the expansion valve bulb. Read the suction line pressure as near coil as possible. (If at the condensing unit, estimate suction line loss at 2 PSIG.)Convert coil suction pressure to temperature. The difference between coil temperature and the thermocouple temperature is superheat. (Use average superheat when expansion valve is hunting.) Do not set superheat until cases have pulled down to operating temperature and never open or close valve over 1/4 turn between adjustments and allow 10 minutes or more between adjustments. Superheat should be set to 6-8-degree F.

REFRIGERATION LINES

The refrigeration lines are located under the deck pans on the 8' and 12' cases. A refrigeration outlet is provided in the front right hand end of the HZV and ZV cases. Make sure all refrigeration lines lie as close to the refrigerator bottom so as not to obstruct the air pattern or block the deck pans. See the section on "Recommended Piping Practices" for additional details on piping practices.

These 8' and 12' refrigerators have polyurethane foamed-in-place insulation. In opening a ferrule hole, simply heat a piece of copper tubing of the same size as the tubing to be employed and force it through the ferrule hole.

NOTE: SEAL AROUND LINES AFTER CONNECTIONS ARE MADE. KEEP DIRECT FLAME FROM BOTTOM OF REFRIGERATOR, AS HEAT WILL DISINTEGRATE THE BOTTOM AND INSULATION. USE A HEAT SHIELD WHEN WELDING NEAR THE BOTTOM OF THE CASES.

REFRIGERANT

R-502 expansion valves are standard. If other refrigerant is used, the order must specify the expansion valve to be supplied.

HEAT EXCHANGER

Heat exchangers are optional in these refrigerators. They aid to increase operating efficiency and reduce frosting and flood-back to compressor.

OPERATION

On single condensing unit systems a thermostat should be used to control temperatures. The thermostat bulb should be mounted in the discharge air. On parallel units, temperature control can be provided by EPR valve, thermostat and liquid line solenoid or solid state low pressure controls on compressor unit. Chart #2 shows approximate settings for merchandisers. Since many variables are present in each installation, such as store temperature, length of tubing runs, temperature desired in refrigerator, etc., Chart #2 is only a guide for the installer.

DEHYDRATION OF REFRIGERATION SYSTEMS

PLEASE READ CAREFULLY BEFORE PLACING SYSTEM INTO OPERATION. After laying refrigerant lines, they should be blown out before making final connection at fixture or condensing unit. Use dry nitrogen to prevent any foreign matter being left in the lines. Keep pressure below 250 pounds. To prevent scaling due to brazing, dry nitrogen should be allowed to flow through lines while brazing operations are taking place.

After the refrigeration system has been pressure-tested and proven leak-free, it is recommended that the system be dehydrated with a vacuum pump to 1000 microns for the first two evacuations and 500 microns on the third. The triple evacuation method requires evacuating the system three successive times and breaking each vacuum with dry refrigerant. Allow the pressure to rise above atmospheric pressure.

CAUTION: DURING INSTALLATION AND SERVICE OF THIS EQUIPMENT, PRECAUTIONS SHOULD BE TAKEN TO PREVENT LOSS OF REFRIGERANT TO THE ATMOSPHERE.

OFF-TIME DEFROST

Off-time defrost is standard on these models. The fans run continuously and defrost termination is by pressure or time (fail safe). See Chart #2 for defrost settings.

THERMOSTAT LOCATION (HZV1)

For convenience, the thermostat (if utilized) is located at the left end of the case in the canopy light rail. Adjustment access is between the light tubes. Should the thermostat have to be replaced, remove the canopy lights for access.

CHART #1

ELECTRICAL RATINGS

MODEL	EVAPORATORS FANS (AMPS)	ANTI-COND HEATER (AMPS)	LIGHT (AMPS)
HZV1- 8	.56	0.0	.8
HZV1-12	1.12	0.0	1.27
HZU1- 8	0.0	0.0	.8
HZU1-12	0.0	0.0	1.27
ZV1- 8	.56	0.0	0.0
ZV1-12	1.12	0.0	0.0
ZU1- 8	0.0	0.0	0.0
ZU1-12	0.0	0.0	0.0

*Light amps indicated is for canopy only. If lighted shelves are used, add .64 amps for each shelf.

CHART #2

RECOMMENDED CONTROL SETTINGS

MODEL	REFRIGERANT & APPLICATION	LP CONTROL CUT-OUT	LP CONTROL CUT-IN	SETTING	THERMOSTAT CUT-OUT	THERMOSTAT CUT-IN
HZV1	R- 22 Produce	38 PSIG	50 PSIG	41#	34-degF	40-degF
	R-502 Produce	52 PSIG	68 PSIG	50#	34-degF	40-degF
ZV1	R- 22 Produce	38 PSIG	50 PSIG	41#	34-degF	40-degF
	R-502 Produce	52 PSIG	68 PSIG	50#	34-degF	40-degF

MODEL	*DEFROST PERIODS PER 24 HOURS	PRESSURE TERMINATION R-22	PRESSURE TERMINATION R-502	FAIL SAFE SETTING PRES. TER.	FAIL SAFE SETTING TIME OFF
HZV1,ZV1	4	80#	90#	32 min.	32 min.

*Defrost frequency is specified at design conditions. Higher temperature or humidity may require frequent defrost settings.

PARTS LIST

HZV(U)1/ZV(U)1

DESCRIPTION	PART NO. 8'	PART NO. 12'
Expansion Valve (BFRE-A-C)	3A11-051	3A11-051
Fan Blade (8",-40 DG P)	(1)9B10-055	(2)9B10-055
Fan Motor (9W, 115V)	(1)9A10-041	(1)9A10-041
Light Switch	10J10-030	10J10-030
Fan Wiring Harness	10M10-143	10M10-144
Mirror	14E10-040	14E10-040
Receptacle Harness (Main)	(2)10M10-197	10M10-197
Lower Front Panel	51A12-213	51A14-164
Upper Front Panel	51A12-224	51A14-175
Colorband(Bright S.S.)	55F12-150	55F14-128
Canopy Front Panel(Painted)	51C12-072	51C14-068
Bulb (F40T12 CWX B1 PIN)	(2)10A10-056	(2)10A10-056
Bumper Raceway Assy.(Less BMP)	55A12-036	55A14-031
Deck Pan	(4) 54N18-237	54N18-237
Front Baffle	54G28-099	54G30-071
Mirror Edging	13A12-079	13A12-079
Kickplate (Painted)	51A12-207	51A14-159
Canopy Ballast (1 lamp)		(1)10D10-037
(2 lamp)	(1) 10D10-038	(1)10D10-038

SHELF & FENCE

Optional shelf is shipped installed when ordered. However, the shelf may be removed and re-installed if so desired. To remove, lift entire shelf up until tabs clear, and lift out and away from the shelf standard. To install, insert the top tab on both shelf brackets into the slots in the shelf standards. Insert the remaining tabs and push downward to lock in position. Care must be taken to insure that the mirror edging is positioned to cover all slots not occupied by the shelf brackets. The flow of refrigerated air might be affected if the slots are left uncovered. This would also detract from the appearance of the case.

To install fence, tilt fence back as shown in View "A", Position 1 and bring forward until in Position 2.

RECOMMENDED PIPING PRACTICES FOR WARREN/SHERER CASES

~1. Proper size refrigeration lines are essential to good refrigeration performance. Suction lines are more critical than liquid or discharge lines. Oversized suction lines may prevent good oil return to the compressor. Undersized lines can rob refrigeration capacity and increase operating cost. Consult the technical manual or legend sheet for proper line sizes.

~2. Refrigeration lines in cases in line-ups can be reduced. However, the lines should be no smaller than the main trunk lines in at least 1/3 of the cases and no smaller than one size above the case lines to the last case. Reductions should not exceed one line size per case. It is preferred to bring the main trunk lines in at the center of line-up. Liquid lines on systems on hot gas defrost must be increased one line size above the main trunk line for the entire line-up. Individual feed lines should be at the bottom of the liquid header.

~3. Do not run refrigeration lines from one system through cases on another system.

~4. Use dry nitrogen in lines during the brazing to prevent scaling and oxidation.

~5. Insulate suction lines from the cases to the compressor with 3/4" wall thickness Armaflex or equal on low temperature cases to provide maximum of 65-degree sub-cooled gas back to the

compressor and prevent condensation in exposed areas. Insulate suction lines on medium temperature cases with 1/2" thick insulation in exposed areas to prevent condensate droppage.

~6. Suction and liquid lines should never be taped or soldered together. Adequate heat exchanger is provided in the case.

~7. Refrigeration lines should never be placed in the ground unless they are protected against moisture and electrolysis attack.

~8. Always slope suction lines down toward the compressor, 1/2" each 10'. Do not leave dips in the line that would trap oil.

~9. Provide "P" traps at the bottom of suction line risers, 4' or longer. Use a double "P" trap for each 20' of risers. "P" traps should be the same size as the horizontal line. Consult the technical manual or legend sheet for proper size risers.

10. Use long radius ells and avoid 45-degree ells.

11. Provide expansion loops in suction lines on systems on hot gas defrost. An expansion loop is required for each 100' of straight run.

12. Strap and support tubing to prevent excessive line vibration and noise.

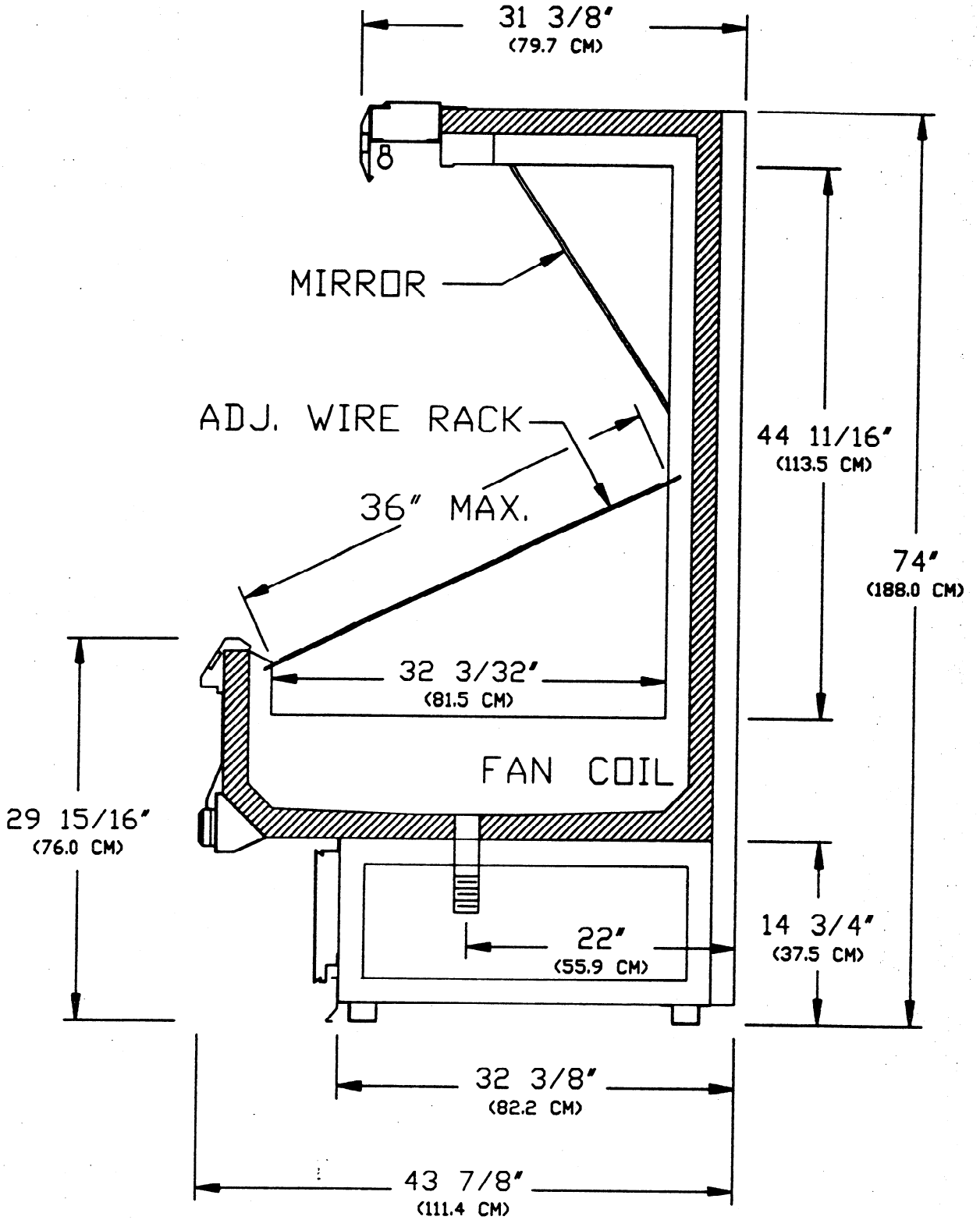
13. Brazing of copper to copper should be with a minimum of 10%

silver. Copper to brass or copper to steel should be with 45% silver.

14. Avoid the use of "bull head" tees in suction lines. An example is where suction gas enters both ends of the tee and exits the center. This can cause a substantial increase in pressure drop in the suction lines.

15. When connecting more than one suction line to a main trunk line, connect each branch line with an inverted trap.

06/13/89

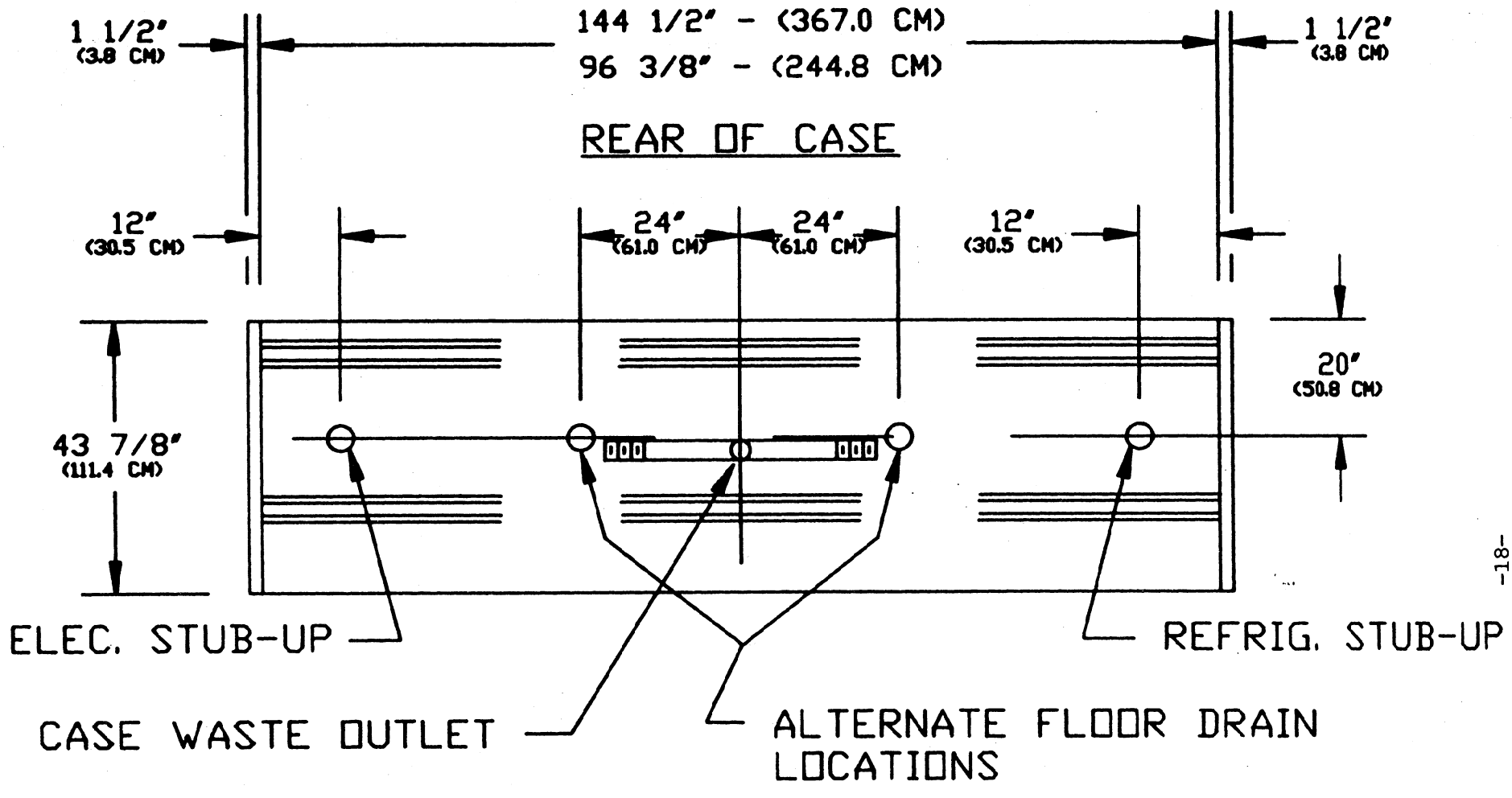


LETTER	REVISION	DATE	BY

DATE 5 APR 89
SCALE 1/8"=1"
DRAWN BY JESSE

LAYOUT FOR

HZV1
CROSS SECTION



LETTER	REVISION	DATE	BY

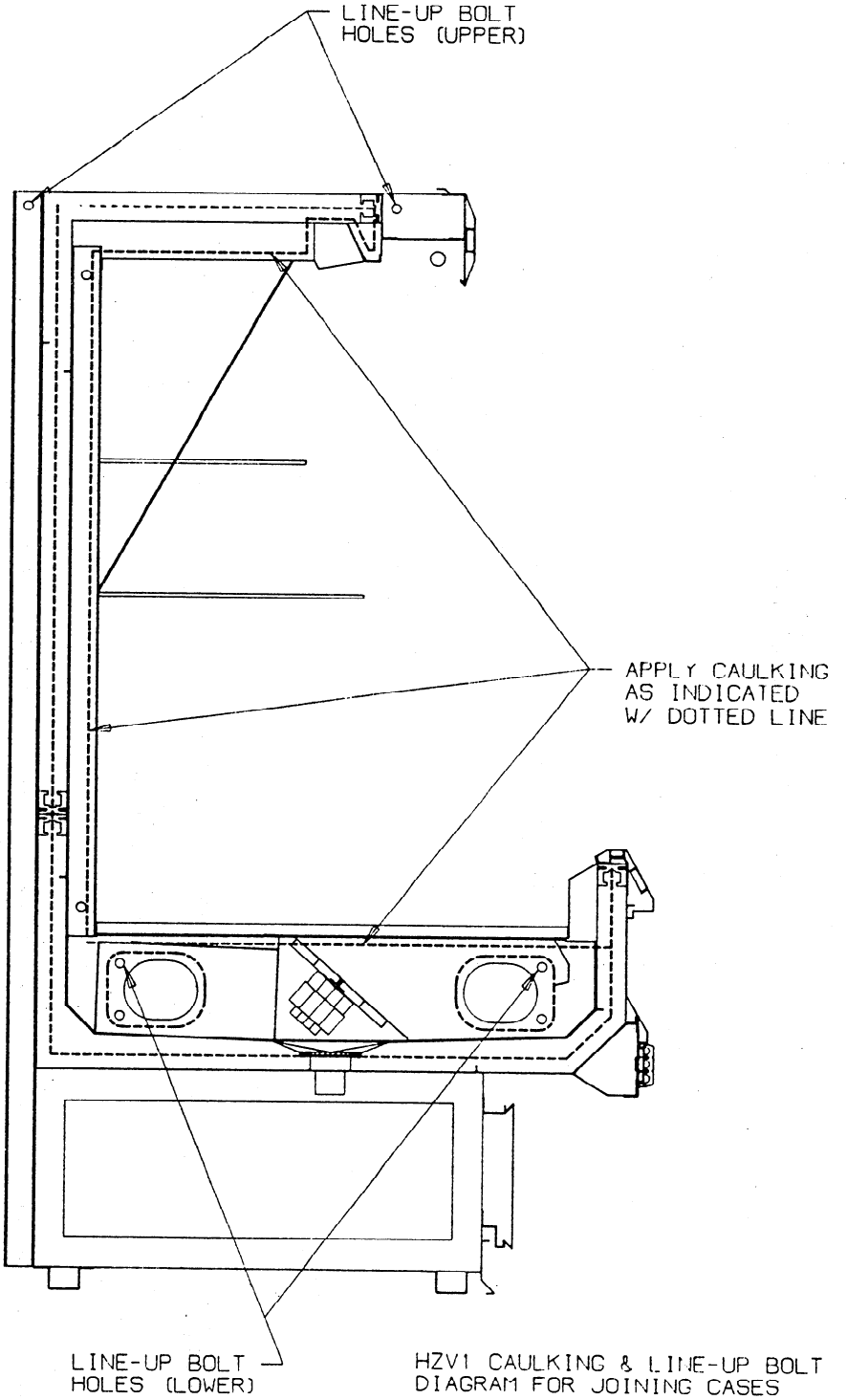
DATE 5 APR 89
SCALE 1/2"=12'
DRAWN BY JESSE
SHEET

LAYOUT FOR

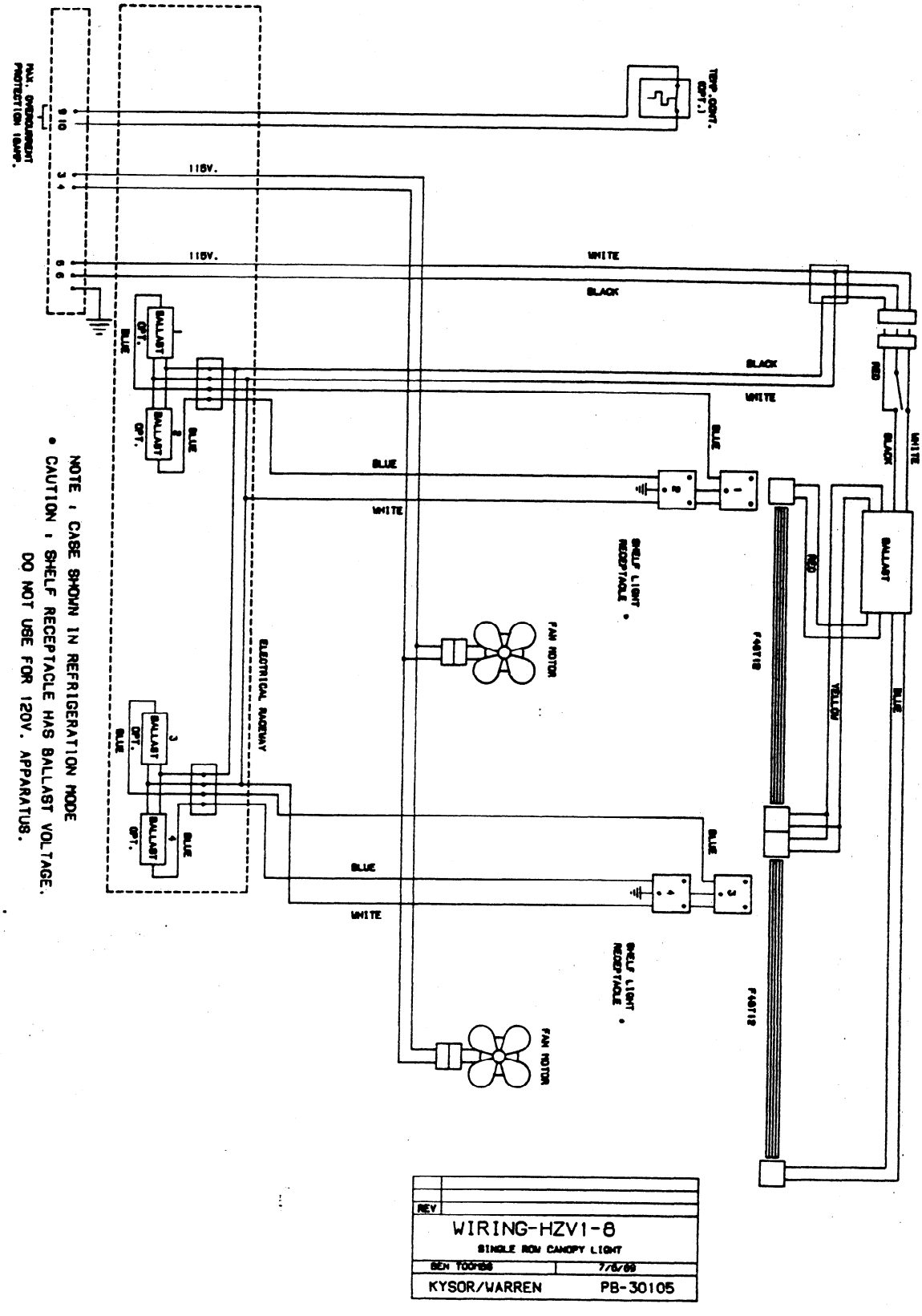
HZV1
PLAN VIEW

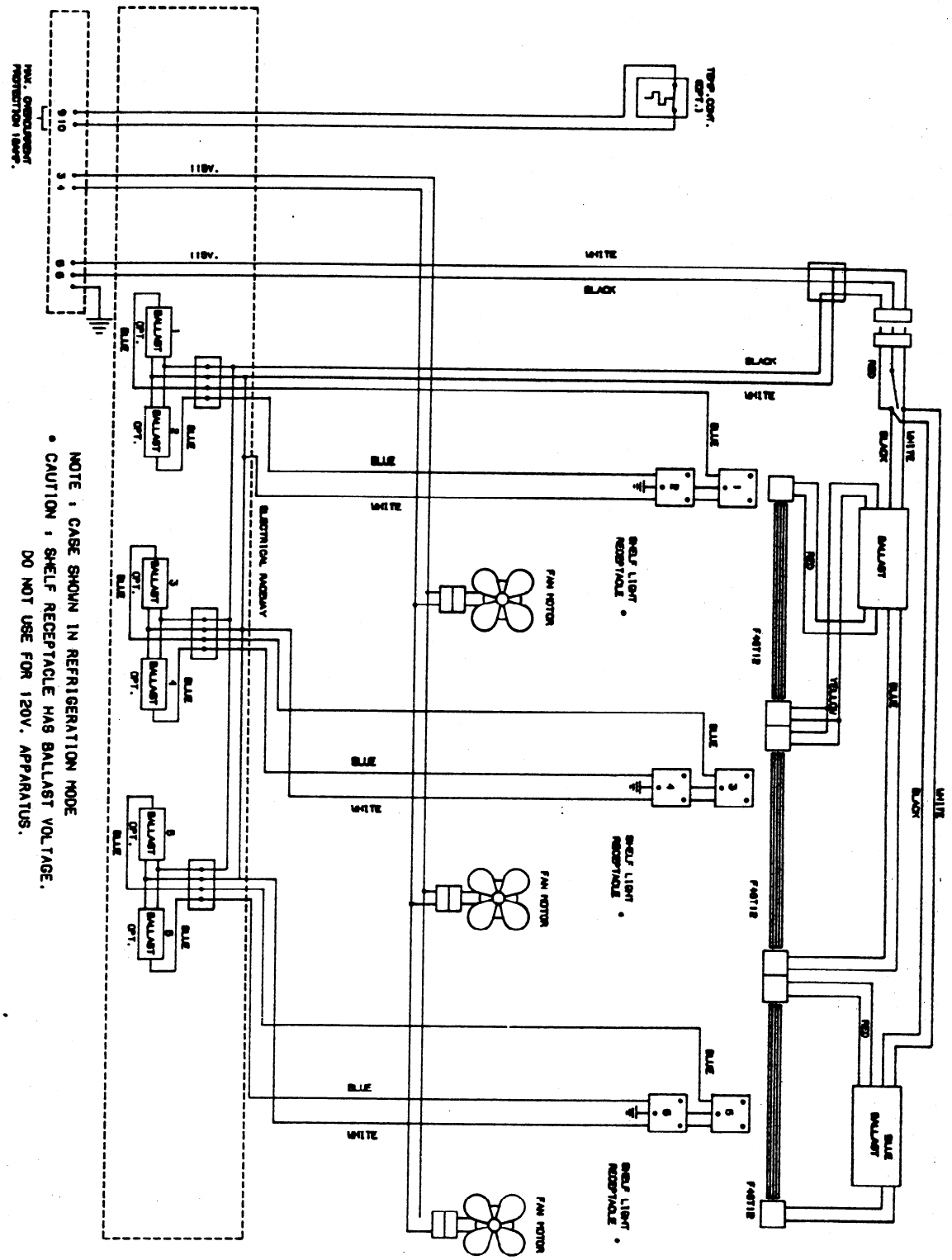
KYSOR // WARREN

DRAWING NUMBER
PLAN VIEW



HZV1 CAULKING & LINE-UP BOLT
DIAGRAM FOR JOINING CASES


TEMP. CONT. (OPT.)
MAN. OVERCURRENT PROTECTION 10AMP.
115V.
115V.
WHITE
BLACK
BLACK
WHITE
BLUE
BLUE
WHITE
BALLAST OPT.
BALLAST OPT.
BALLAST OPT.
BALLAST OPT.
BLUE
BLUE
BLUE
BLUE
BLUE
WHITE
ELECTRICAL RACEWAY
SHELF LIGHT RECEPTACLE *
SHELF LIGHT RECEPTACLE *
FAN MOTOR
FAN MOTOR
F48TI2
F48TI2
BALLAST
RED
YELLOW
BLUE
WHITE
BLACK
NOTE : CASE SHOWN IN REFRIGERATION MODE
* CAUTION : SHELF RECEPTACLE HAS BALLAST VOLTAGE. DO NOT USE FOR 120V. APPARATUS.
REV
WIRING-HZV1-8
SINGLE ROW CANOPY LIGHT
KYSOR/WARREN
PB-30105



REV	
WIRING-HZV1-12	
SINGLE RSU CANOPY LIGHT	
SCN 100-68	7/6/88
KYSOR/WARREN	P8-30104