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# Installation & Operation Manual



## S1VC and S1GC Self-Service/Self-Contained Display Case



**IMPORTANT – KEEP IN STORE FOR FUTURE USE**






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# Introductions – General Information

This manual has been prepared for our customers and the personnel involved in setting up and maintaining our cases.

Icon Key
 Caution
 Special Note
 Warning

The Kysor//Warren multi-shelf self-service case is specially designed to merchandise packaged sandwiches, cheese, deli, prepared foods, produce and meat. 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° dry-bulb temperature and 55% relative humidity.**

## Case Description

Model	Description
<b>S1VC</b>	Self-service, self-contained, prepared food display case with curved glass and produced in 4 ft. length.
<b>S1GC</b>	Self-service, self-contained, prepared food display case with straight glass and produced in 4 ft, 6 ft, and 8 ft lengths.

These cases are connected to a single condensing unit. Installation and Service instructions are provided by the condensing unit manufacturer and are not part of this manual.

## Receiving/Shipping Damage/Lost Items

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 within three (3) days following delivery. A claim must be filed with the carrier by the consignee for all damages.



Note: All claims for shortages must be within 10 days after receipt of shipment.

# Refrigerant

A variety of refrigerants can be used in the Kysor//Warren cases provided the correct expansion valve is equipped with the case when ordered (i.e., R-22 required for the end user requires specifying the correct expansion valve for R-22 refrigerant when the order is placed). Multiple expansion valves are available, dependant on end user refrigerant requirements. Expansion valves are supplied for the refrigerant specified on the original sales order.

In addition, cases can be modified in the field to allow changing the type of refrigerant used. This requires changing the expansion valve and distributor orifice that is currently equipped in the case. Contact your Kysor//Warren Service Representative for additional information.

## Condensing Unit

The condensing unit is not intended to be removed from the case except in the event a compressor must be replaced. To remove the condensing unit, disconnect the flare suction/liquid connections on the base valves at the right front of the case.



**CAUTION:** Before attempting to remove the condensing unit, be sure that all electrical power to the case has been turned off. Also, caution should be used when releasing pressure on the refrigerant system.

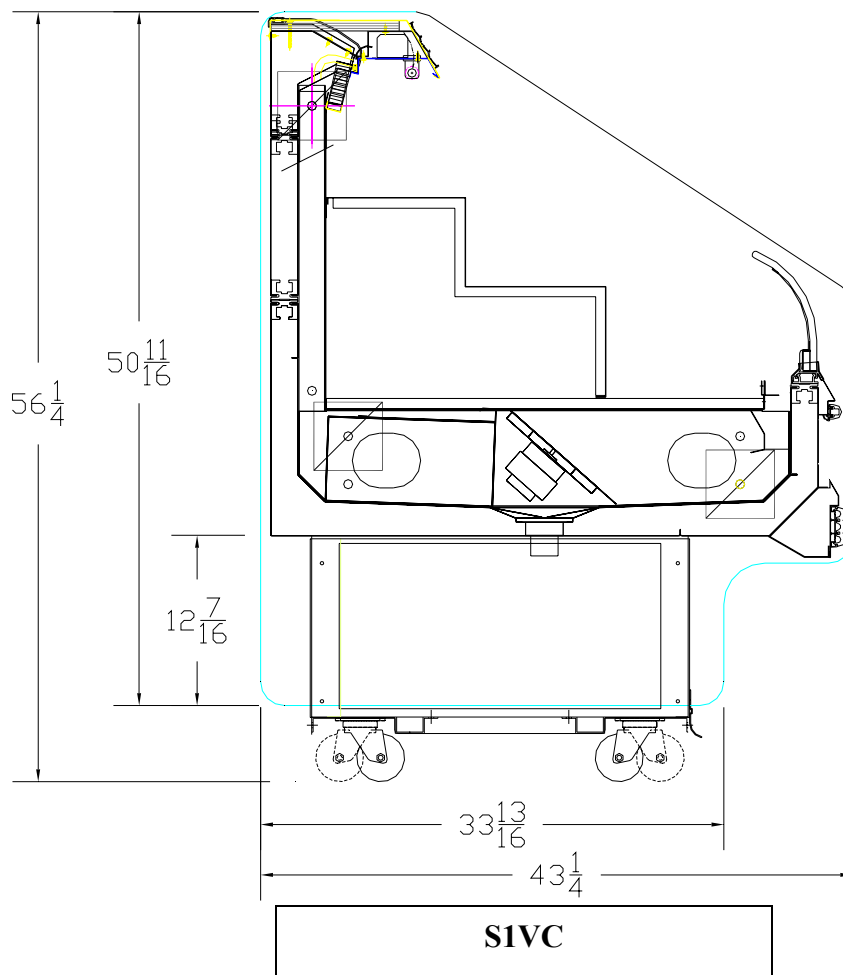


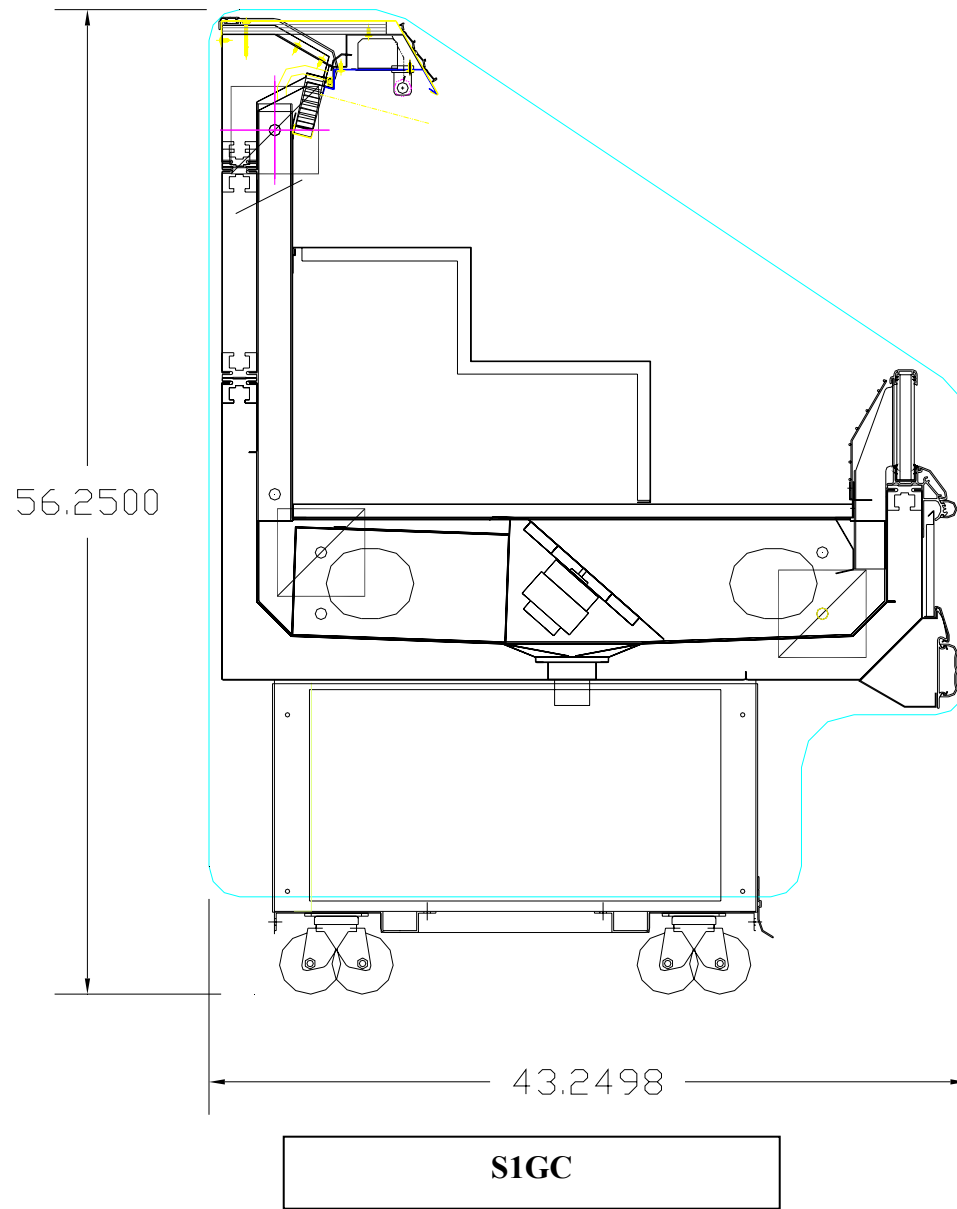
**NOTE:** The refrigerant charge for this case is very critical. If the case should need to be recharged, an accurate charging device must be used. No refrigerant should be released into the atmosphere. It must be reclaimed. There are several different refrigerant configurations to these units. Refer to Case Data for detail.



**CAUTION:** During installation and service of this equipment, precautions should be taken to prevent loss of refrigerant to the atmosphere.

# Plan View and Cross Section





## Case Data

### S1VC

<b>Capacities</b>	<b>4'</b>
Cubic Capacity	9.9
<b>Dimensions</b>	<b>4'</b>
Overall Length (w/o ends)	48.250"
Thickness – Pair Ends	1.5"/End

<b>Defrost (Off Cycle only)</b>	<b>Per Day</b>	<b>Fail Safe</b>	<b>Termination</b>
4'	6	30	40 °F(*)
(*)=Thru factory supplied thermostat mounted on evaporator.			

### Electrical Specification

<b>115V Circuit Data / Amps</b>	<b>4'</b>
Refrigeration Cycle +	18.5
Defrost Cycle +	8.8
Anti-Sweat Amps	0.1
Evaporator Fan Motor Amps	0.7
Light Amps	0 +
BTU Requirements @ + 20 °F	3850
Condensate Pump Amps	N/A
Condensate Pan Heater Amps	8.0
Compressor RLA	9.16
Condenser Fan Motor Amps	0.53
Minimum Circuit Ampacity	21.8
Maximum Overcurrent Protection	30
Power Supply	115/60/1

**+ Add 0.25 Amp per bulbs. Two shelf bulbs and two canopy bulbs maximum.**

### S1VC – Control Settings

Thermostat Discharge Air/Temperature Cut-Out and Cut-In	22-24 °F
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<b>Discharge Air Velocity (1 hour after defrost)</b>	<b>Discharge Air Temperature</b>
300 FPM	26-28 °F



Note: Case data based on 1 lighted 14" shelf or 2 non-lighted 12" and 16" shelves at a 15 degree slope. Consult factory for alternate shelf configurations.



**S1GC**

<b>Capacities</b>	<b>4'</b>	<b>6'</b>	<b>8'</b>
Cubic Capacity	10.8	16.2	21.6
Overall Length (w/o ends)	48.250"	72.250"	96.375"
Thickness – Pair Ends	1.5"/End	1.5"/End	1.5"/End

<b>Defrost (Off cycle only)</b>	<b>Per Day</b>	<b>Fail Safe</b>	<b>Termination</b>
4'	6	30	40 °F(*)
6'	4	40	45 °F(*)
8'	4	40	45 °F(*)
12'	4	40	45 °F(*)
(*)=Thru factory supplied thermostat mounted on evaporator.			

**Electrical Specification**

<b>Circuit Data / Amps</b>	<b>4'</b>	<b>6'</b>	<b>8'</b>
Refrigeration Cycle	19.1 <sup>a</sup>	24.0 <sup>b</sup>	14.2 <sup>c</sup>
Defrost Cycle	9.3 <sup>a</sup>	9.2 <sup>b</sup>	6.9 <sup>c</sup>
Anti-Sweat Amps	0.6	0.7	1.1
Evaporator Fan Motor Amps	0.7	0.5	1.1
Light Amps	0 <sup>a</sup>	0 <sup>b</sup>	0 <sup>c</sup>
BTU Requirements @ +20 °F	3850	5770	7690
Condensate Pump Amps	N/A	N/A	N/A
Condensate Pan Heater Amps	8.0	8.0	4.8
Compressor RLA	9.2	14.0	6.9
Condenser Fan Motor Amps	0.5	0.5	0.4
Minimum Circuit Ampacity	22.3	29.1	18.0
Maximum Overcurrent Protection	30	30	25
Power Input Voltage	115	115	208/115
Cycle	60	60	60
Phase	1	1	1

**a Add 0.25 Amp per bulb. Two shelf bulbs and two canopy bulbs maximum.**  
**b Add 0.20 Amp per bulb. Four shelf bulbs and two canopy bulbs maximum.**  
**c Add 0.25 Amp per bulb. Four shelf bulbs and four canopy bulbs maximum.**  
**d Add 0.25 Amp per bulb. Six shelf bulbs and six canopy bulbs maximum.**



Note: Case data based on lighted 14" and 18" shelves at a 15 degree slope. Consult factory for alternate shelf configurations.

## Control Settings

Thermostat Discharge Air/Temperature Cut-Out and Cut-In	30-35 °F
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Discharge Air Velocity (1 hour after defrost)	Discharge Air Temperature
225	30-35

## Refrigerant and Charge

Case	Refrigerant Type	Charge (lbs)
S1VC1-4	R-404A	3.30
S1GC(1,3)-4	R-404A	3.30
S1GC(1,3)-6	R-22	2.25
S1GC(1,3)-8	R-22	8.25



Note: Temperature is measured in discharge air. Defrost frequency is at design conditions. Higher temperature or humidity may require more defrost and longer fail-safes. These cases are not designed to operate environments where the ambient temperature is greater than 75°F and the relative humidity is greater than 55%.

Refer to [www.kysorwarren.com](http://www.kysorwarren.com) for other electrical data and information.

# Case Installation

## Preparation

Prepare the installation area as follows:

1. Clean area where case is to be installed.
2. Verify installation area is at least 15 feet from any outside entrances or heating and cooling outlets.



**Caution:** To prevent condensation on the end panels of cases, a minimum of 6.0 inches between walls or other cases is required for air flow. If 6.0 inches is not possible, then the space between the cases must be completely filled and sealed or an updraft fan kit must be installed to provide air circulation through the space.

3. Ensure floor loading will support the case and the case contents.
4. Ensure proper AC power is available. Refer to case AC input requirements located in the electrical connections section of this manual.
5. Ensure expansion valve in case is the proper valve for the type of refrigerant used at the installation site.

# Installation

The following instructions are provided for unpacking, moving, loading, and lifting the case prior to installation.



**Note:** READ ALL INSTRUCTIONS CAREFULLY BEFORE BEGINNING INSTALLATION

## Unpacking

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1. Remove all shipping tape from lamps and ensure that all lamp ends are snapped in place.



**Caution:** Use caution when removing the strapping in the following procedure as the shelves are very heavy and could fall causing personal injury or equipment damage.

2. Ensure the evaporator cover is installed correctly with the deck pans installed.
3. Move the case into position, install, adjust superheat, and perform the operational checkout procedures following the instructions within this manual.



**Caution:** Be careful not to damage the factory-installed end while moving the case. Use the case lift points on the case to move it to the proper location.

## Installing Case

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1. Ensure all preparation for installation, as outlined in the above paragraphs, have been fully complied with and are complete.
2. Allow a minimum of 6 inches between the rear of the case and the store walls and/or other cases. This space reduces the possibility of condensation problems. It may be necessary to provide forced air ventilation in some installations.
3. This case must be located on a firmly based floor and leveled within plus or minus 1/16 inch.
4. There are adjustable feet located on the underside of the case. The case needs to be leveled from side-to-side and front-to-back by adjusting the feet.

5. Connect input AC power. Reference electrical installation procedure later in this manual.
6. Connect refrigerant lines. Reference refrigerant connections procedure later in this manual.
7. Install all caps, and trim per the applicable instructions contained in this manual.
8. Remove shipping tape on fluorescent lamps and remove all other shipping material.

CASE MUST BE LEVELED FROM FRONT TO BACK AND END-TO-END AND SUPPORTED CONTINUOUSLY AS NEEDED WITH ADJUSTABLE FEET.

## Installation of Trim, Caps, & Shelves

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We offer several different trim packages. Below are basic instructions for our 3000 trim. For any other trim packages or questions not answered below, please contact the Technical Service Department at Kysor//Warren (800-866-5596).

Case front part selection and case trim selection are provided in the information that follows:

### Case Front Part Selection

For Cases In A Lineup:

- |                           |                        |
|---------------------------|------------------------|
| • Rub Rail Cap Starter    | 1/lineup Std. or w/ptm |
| • Raceway Cap Starter     | 1/lineup               |
| • 1" Mccue Bumper Starter | 1/lineup               |
| • 3" Mccue Bumper Starter | 1/lineup               |
|                           |                        |
| • Rub Rail Cap            | 1/case Std. or w/ptm   |
| • Raceway Cap             | 1/case                 |
| • 1" Mccue Bumper         | 1/case                 |
| • 3" Mccue Bumper         | 1/case                 |

For Single Case:

- |                |                      |
|----------------|----------------------|
| • Rub Rail Cap | 1/case Std. or w/ptm |
|----------------|----------------------|

- Raceway Cap 1/case
- 1" Mccue Bumper 1/case
- 3" Mccue Bumper 1/case
- Canopy End Trim - 2/lineup
- Glass Cap End Trim – 2/lineup
- Glass Cap Joint Trim – 1/joint
- Front Panel End Trim – 2/lineup

### Case Trim Selection

The only trim provided is on the right and left end cases. All exterior panels slide from right to center and left to center.

For Single Case W/ Two Ends:

Trim is factory installed.

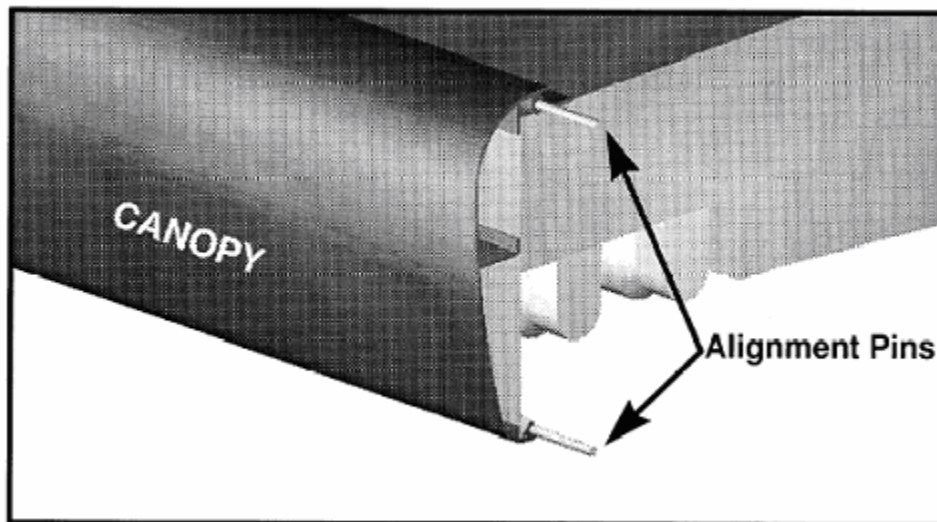
For Mutual End In A Lineup:

Proper additional piece of end trim should be used.

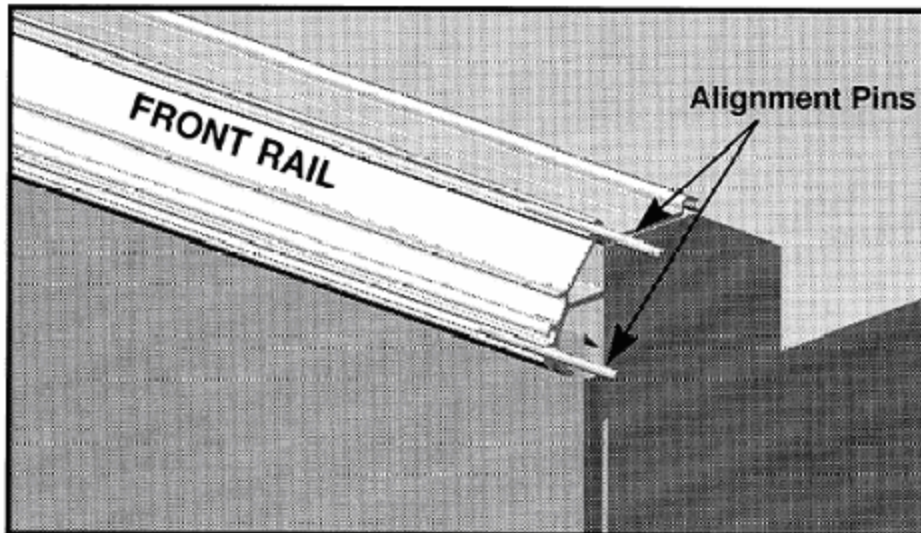
## Canopy and Front Rail Alignment

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After the display cases are properly joined and sealed, align the canopies by sliding the alignment pins across the joint from one canopy into the adjoining canopy. It may be necessary to loosen and/or remove the screws at the top of the canopy to aid in the alignment of the two canopies and to eliminate any gap between the canopies. The screws should be tightened after canopies are aligned.



Align the case front rails with a single alignment pin sliding the pin across the joint into the adjoining front rail. It may be necessary to loosen the screws holding the front rail to aid in the alignment process. The screws should be tightened after the front rails are aligned.



### 3" Bumper

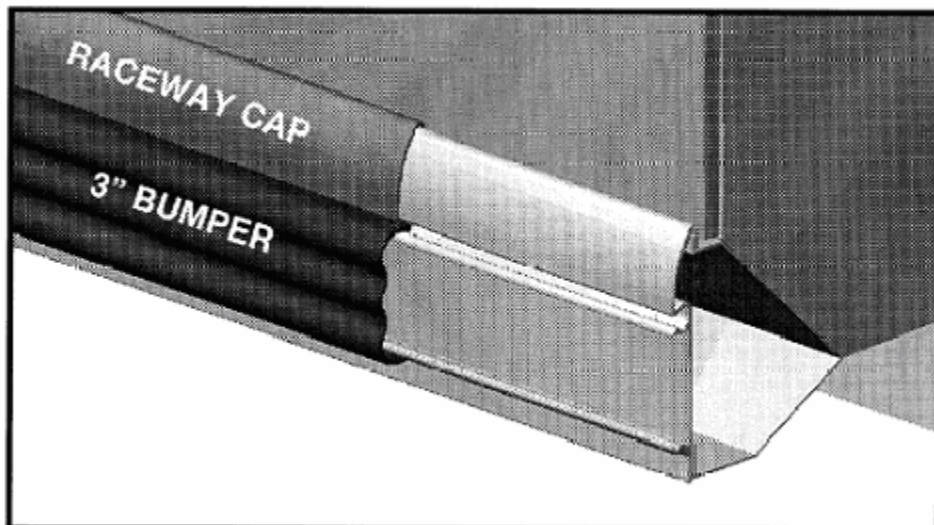
Install the 3" bumper parts to the raceway using the same procedure as described for the 1" bumper parts.

### Raceway Cap

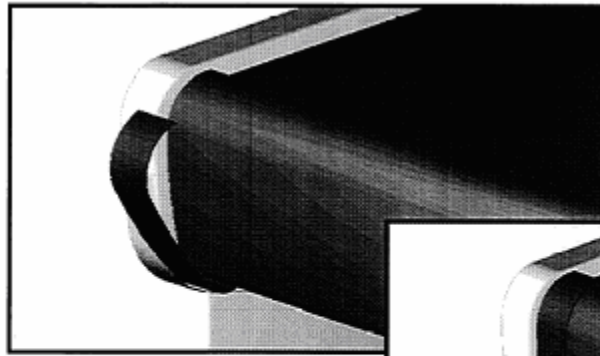
Install the raceway cap parts to the raceway using the same procedure as described for the rub rail cap.



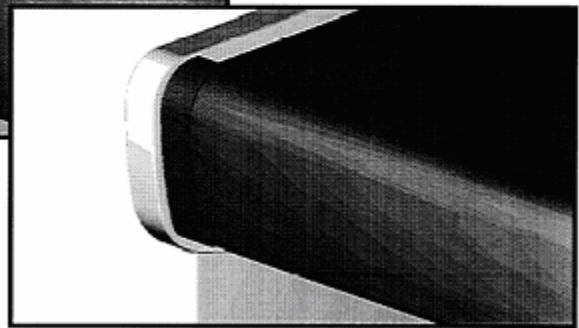
Note: The raceway cover parts do not overlap as the rub rail cap parts do.



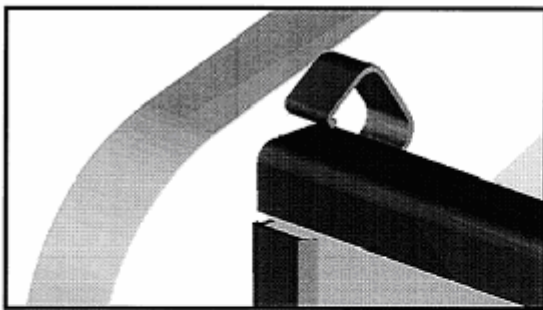
## Canopy End Trim Installation – All Models



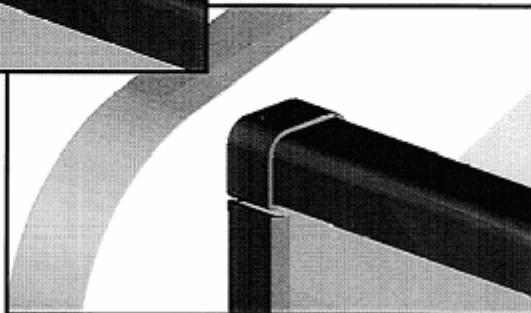
Hook the end trim under the lower edge of the canopy then rotate the part over the top of the canopy and snap into place.



## Glass Cap Rail End Trim Installation – Glass Models



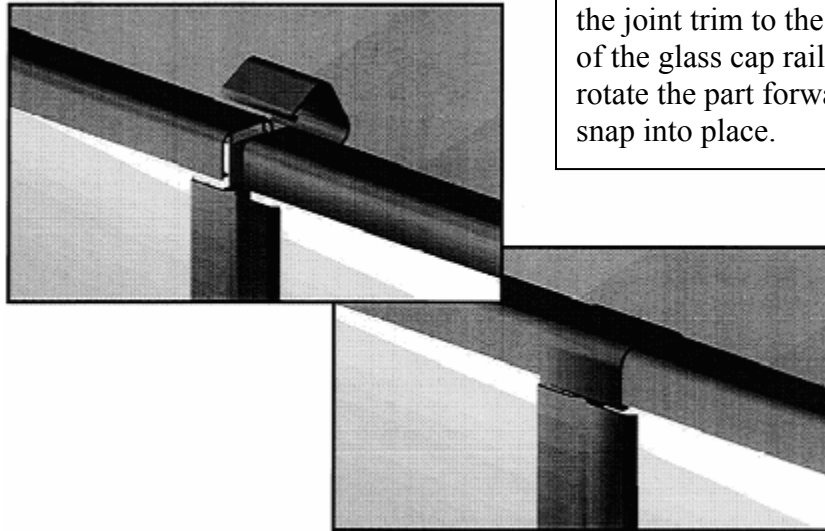
Hook the back inside edge of the end trim to the back side of the glass cap rail then rotate the part forward and snap into place.





## Glass Cap Rail Joint Trim Installation – Glass Models

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Hook the back inside edge of the joint trim to the back side of the glass cap rail then rotate the part forward and snap into place.

## Bumper, Rub Rail Cap, and Raceway Cover Installation

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### 1" Bumper

Install the two-foot length of 1" bumper to the left hand end of the first case in the lineup. To install the bumper, hook the lower edge of the bumper to the aluminum retainer and rotate the bumper up and snap the top edge onto the retainer. Install this part as close to the case flat end panel as possible.

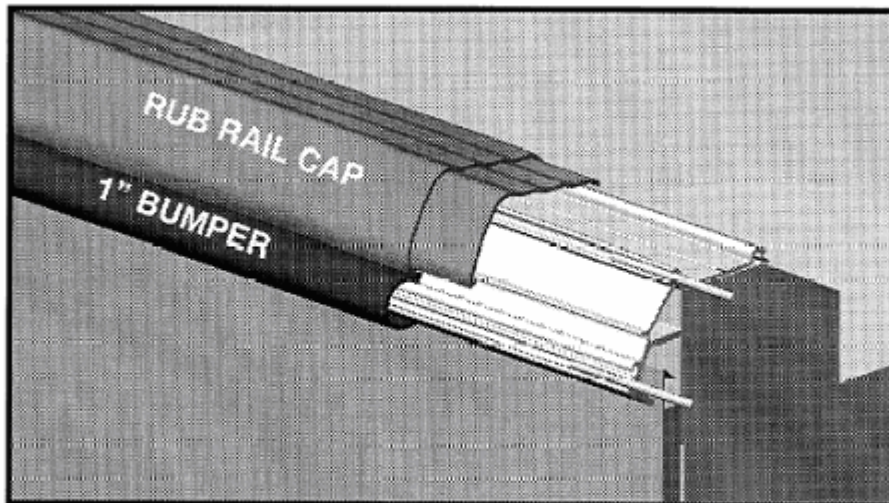
Install the additional case length 1" bumper parts, crossing over the joint of the cases in the lineup and trimming the last piece to fit the last case in the lineup.

### Rub Rail Cap

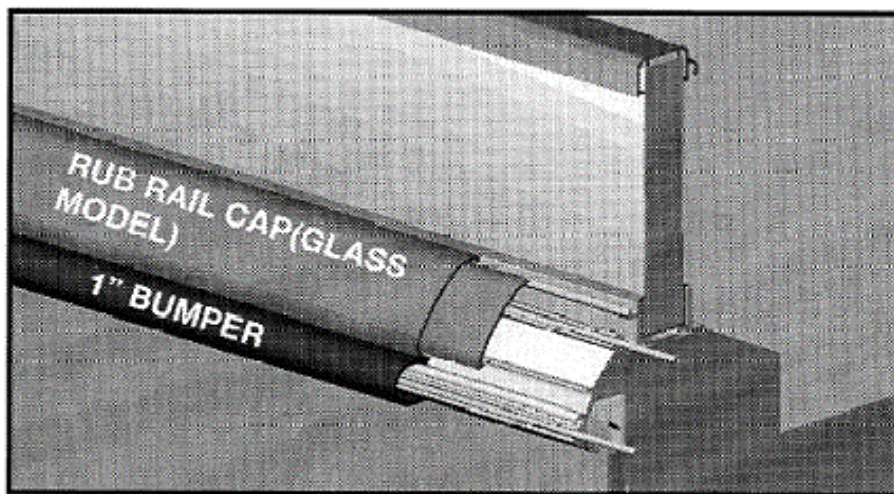
Install the four foot rub rail cap part to the left hand of the first case in the lineup. To install the rub rail cap hook the lower edge of the cap to the aluminum front rail just above the 1" bumper then rotate the cap toward the case and snap it down to the back hook on the aluminum front rail on non-glass models and the top hook on the aluminum rail on glass models. Install this part as close to the case flat end panel as possible.

Install the additional case length rub rail cap parts as close to one another as possible, crossing over the joint of the cases in the lineup and overlapping each part where provided. Trim the last part to fit the last case in the lineup.





**Non-Glass Model**



**Glass Model**



Note: If a mutual end is used in a lineup, the proper additional pieces of trim should be used.

# Electrical Connections – General

Cases are standard with one row of high output lamps. Ballasts are located in the upper front canopy. See wiring diagram for layout.

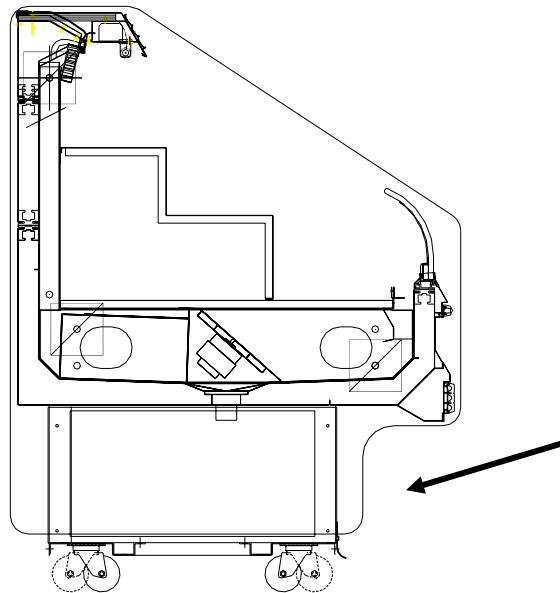
An electrical box is provided with each refrigerator for wiring your fan, anti-sweat heaters, and light circuits. This is an approved method by the Underwriters' Laboratories; however, field wiring must be in accordance with local and national electrical codes.

All field connections are made in the electrical box. Make sure that proper voltage is supplied to your refrigerator. Check refrigerator nameplate for the required voltage for fans, anti-sweat heaters, lights and defrost heaters. **ALL REFRIGERATORS MUST BE GROUNDED.**

The Recommended Control Settings in the Case Data shows the electrical ratings for your case. This is the same information that appears on your refrigeration nameplate.



**NOTE:** Fan motors must operate continuously and panel must be marked sufficiently to prevent the fan motors from being turned off accidentally. When refrigerators are multiplexed, add the total of these amperage values to determine wire size and circuit protection. Anti-condensate controllers can be used to control the anti-condensate heater.





**WARNING!** It is imperative that the pins of the bulbs be completely seated in their respective lamp holder or receptacle. If they are not completely seated, an electrical arc could occur which will cause the lamp holders to melt and become an electrical hazard. Care must be taken during cleaning, product stocking and re-lamping processes to insure that the bulbs and shelf cords are not dislodged.



**Note:** The fluorescent bulb is capable of lighting even if the bulb and shelf power cord are not completely seated.



**WARNING!** Ensure the Kickplate does not come in contact with the case electrical wiring. Live electrical wiring that comes in contact with the case is a shock hazard that may cause severe injury or death by electrocution.

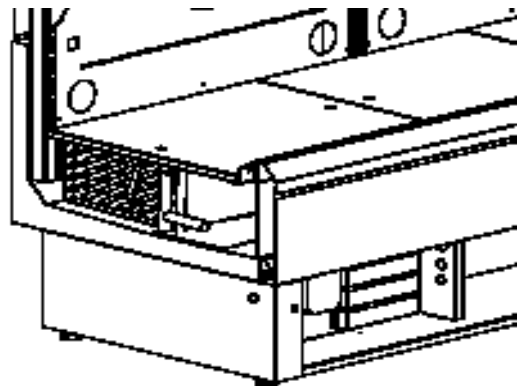


**WARNING!** Always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as fans, heaters, thermostats and light bulbs. Failure to disconnect the electrical power may result in personal injury or death.

## Electrical Termination

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All electrical connections are made in the control box located in the base of the case.



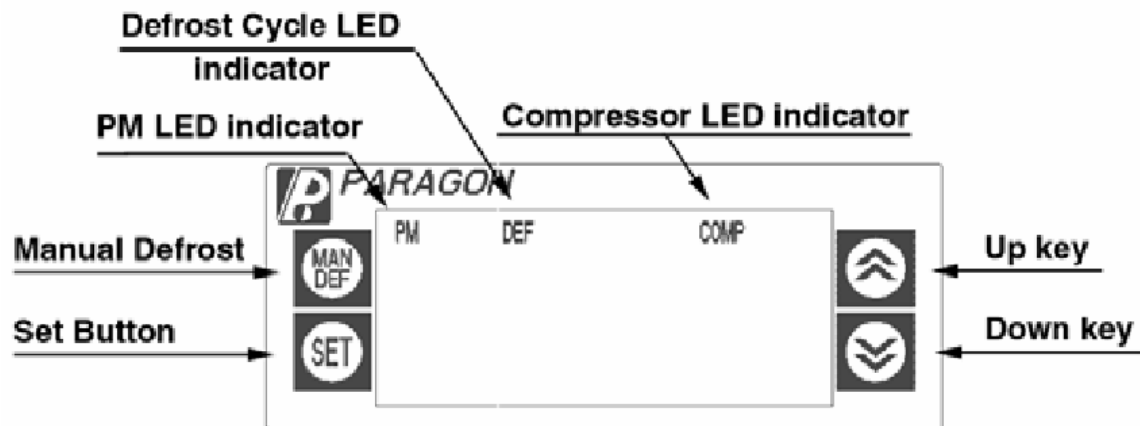
The wires are clearly identified for termination purposes as follows:

Component	Wire Number
Anti-Sweat Heater	1 and 2
Refrigerator Fan Motors and Drain Heater	3 and 4
Lighting Circuit	5 and 6
Defrost Heaters	7 and 8
Temperature Control	9 and 10
Dual Temperature?	15 and 16
Defrost Termination Control	17 and 18

## Paragon ERC-2 Set-Up Instruction (S1VC1-04)










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1. Remove cover from Paragon display so the display LED is visible. The display must be shown on Figure 1:



**FIGURE 1**

To change time-of-day and setpoint temperature (First Level) follow these steps:

Step 1		Press and hold set for 5 seconds. The display will show <b>CLoC</b>
Step 2		Press SET again to change the time-of-day
Step 3		Press UP or DOWN until the correct time-of-day is displayed
Step 4		Press SET to accept the new time
Step 5		Press DOWN to go to the next parameter – Setpoint Temperature - <b>SEt</b> (cut out)
Step 6		Press SET to change the setpoint temperature
Step 7		Press UP or DOWN to go to the desired setpoint. The range is – 40 to 60°F or –40 to 16°C
Step 8		Press SET to accept the change
Step 9		Press DOWN to exit the first level of programming

**Note 1:** During programming, if no button is pushed during 30 seconds, the control will go back to the normal operating mode. This is valid for both programming levels.

**Note 2:** When changing the time, press and hold the MAN DEF button for 3 seconds to change the AM/PM mode.

**FIGURE 2**

2. Set Clock to local time as shown on figure 2.
3. Set Setpoint Temperature, SEt, TO “**23**”
4. Set Clock Format, CLHr, TO “**12HR**”
5. Set Temperature Format, dSP, TO “**F**”
6. Set Defrost Type, dFtP, TO “**Elec**”
7. Set Fan Status During Defrost, EFAN, to “**Yes**”
8. Set Fan Status During Normal Mode, CFAN, to “**On**”
9. Set Defrost Interval, dFin, to “**Tday**”
10. Set Minimum Compressor Off Time, CoFF, to “**0**”
11. Set Minimum Compressor On Time, Con, to “**0**”
12. Set Alarm Delay, Alrd, to “**0**”
13. Set Compressor Run Time, CPn, to “**0**”
14. Set Number Defrost, nodF, to “**6**”
15. Set Start time, dEF1, defrost in **4** hr intervals
16. Set Defrost Duration, dEFd, to “**30 minutes**”
17. Set Fan Delay, Fand, to “**0**”
18. Set Pump Down, Pudn, to “**0**”
19. Set Drip Time, driP, to “**0**”
20. Set Setpoint Differential, diF, to “**2**”
21. Set Temperature Initiated Defrost, tDEF, to “**n/a**”
22. Set Defrost Termination Temp, dEF, to “**40**”
23. Set Fan Cut-In to, FAn, to “**n/a**”
24. Set Low Temperature Alarm, ALLo, to “**20**”

25. Set High Temperature Alarm, ALHi, to “60”

Parameter	Display Symbol	Description	Range / Options
Display Status	<b>dSPL</b>	Information shown on the display during operation conditions	<b>tdAy</b> – time-of-day <b>rSP°</b> – zone temperature (refrigerated space) <b>CyCL</b> – cycle between time and zone temperature <b>Epr°</b> – evaporator coil temperature
Clock Format	<b>CLHr</b>	Format of the time (12 or 24 hours mode)	<b>12Hr</b> – AM/PM format <b>24Hr</b> – 24 hour format
Temperature Format	<b>°dSP</b>	Temperature degrees	<b>°F</b> – degrees Fahrenheit <b>°C</b> – degrees Celsius
Defrost Type	<b>dFtP</b>	Type of defrost used in the application	<b>ELEC</b> – electric heater defrost / off cycle <b>HgAS</b> – hot gas
Fan Status During Defrost	<b>EFAN</b>	Enable or not the fan during defrost	<b>no</b> – fan is turned off during defrost <b>yES</b> – fan remains on during defrost
Fan Status During Normal Mode	<b>CFAN</b>	Enable or not the fan during normal compressor on/off mode	<b>on</b> – fan is always on during normal mode <b>CyCP</b> – fan cycles with compressor
Defrost Interval	<b>dFin</b>	Type of defrost interval	<b>TdAy</b> – time-of-day setpoint <b>CPrn</b> – compressor run time <b>tdEF</b> – temperature initiated defrost
Minimum Compressor Off Time	<b>CoFF</b>	Minimum time that the compressor will remain turned off	Range: from 0 to 15 min
Minimum Compressor On Time	<b>Con</b>	Minimum time that the compressor will remain turned on	Range: from 0 to 15 min
Alarm Delay	<b>ALrd</b>	Time delay before the alarm goes off after the temperature fall off the two alarm setpoints	Range: from 0 to 59 min
Compressor Run Time	<b>CPrn</b>	Time the compressor will run between defrosts	
Number of Defrosts	<b>nodF</b>	Number of defrosts per day	from 0 to 8 (0 means 1 defrost every 48 hours)



Defrost Start Time	<b>dEF1-8</b>	Start time of each defrost	
Defrost Duration	<b>dEFd</b>	Defrost duration time (back-up for defrost termination temperature)	Range: from 0 min to 4 hours
Fan Delay	<b>FAnd</b>	Delay time for the fan after defrost (back-up for fan cut-in temperature)	Range: from 0 to 15 min
Pump Down	<b>Pudn</b>	Pump down duration	Range: from 0 to 59 min
Drip Time	<b>driP</b>	Drip time duration	Range: from 0 to 59 min
Setpoint Differential	<b>diF°</b>	Cut-in temperature differential Note: cut-in is cut-out plus differential	Range: from 1 to 25°
Temperature Initiated Defrost	<b>tdEF</b>	Temperature that will initiate a defrost cycle	Range: from – 40 to 40°F or – 40 to 4°C
Defrost Termination Temperature	<b>dEF°</b>	Temperature in the evaporator that will terminate the defrost cycle	Range: from 0 to 75°F or –18 to 24°C
Fan Cut-In Temperature	<b>FAn°</b>	Temperature in the evaporator that will turn the fan on after defrost	Range: from – 40 to 60°F or – 40 to 16°C
Low Temperature Alarm	<b>ALLo</b>	Low temperature setpoint that will make the alarm go off and the error message appear on the display	Range: from – 40 to 83°F or – 40 to 28°C
High Temperature Alarm	<b>ALHi</b>	High temperature setpoint that will make the alarm go off and the error message appear on the display	Range: from – 40 to 83°F or –40 to 28°C

**Important Note:** To change from degrees **C** to **F** or vice-versa, the user must reprogram all the parameters that are related to the temperature. The unit does not convert the parameters automatically from degrees **F** to **C** or vice-versa.

PLEASE SEE BELOW PARAGON DISPLAY AND ERROR CODE

#### Error Codes

Display	Control Status
<b>Er 1</b>	ERC Fault – software or hardware failure
<b>Er 2</b>	ERC Communication Fault – indicates that there is a problem with the display module cable
<b>Er 3</b>	Zone Sensor Fault – indicates an open or shorted temperature sensor
<b>Er 4</b>	Evaporator Sensor Fault – indicates an open or shorted evaporator sensor
<b>Er 6</b>	Low Temperature Alarm – indicates that the temperature has dropped below the low alarm setpoint
<b>Er 7</b>	High Temperature Alarm – indicates that the temperature has gone above the high alarm setpoint

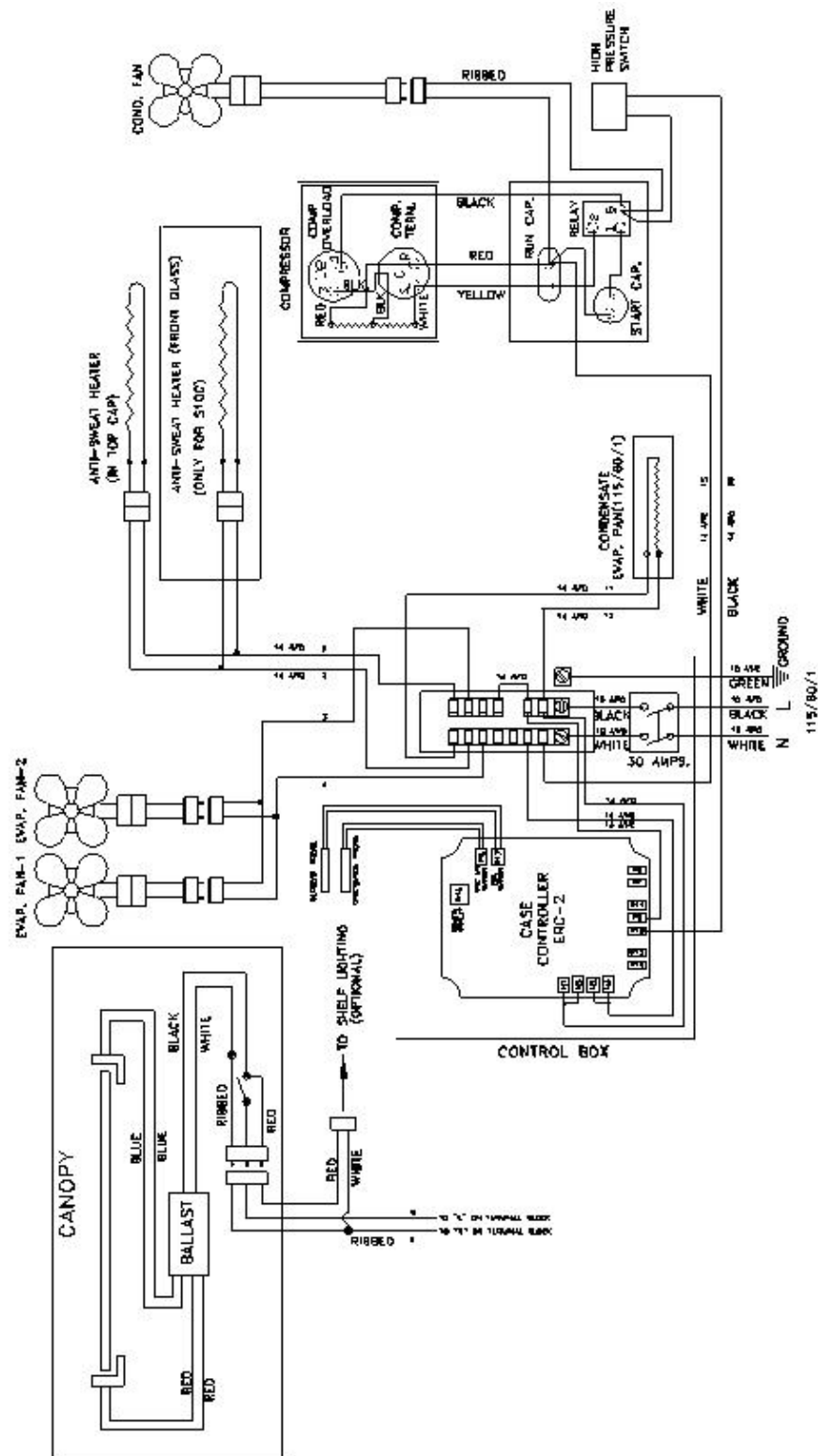
For Error Codes 1 and 2 cut the power to the unit and correct the problem to reset the display.

For Codes 3 and 4, press the UP or DOWN button on the display to reset the error message. If the display still shows the message, the sensor must be replaced.

The Error Codes 6 and 7 will be automatically reset once the temperature is back within the two setpoints.

# Wiring Diagram – S1VC/S1GC

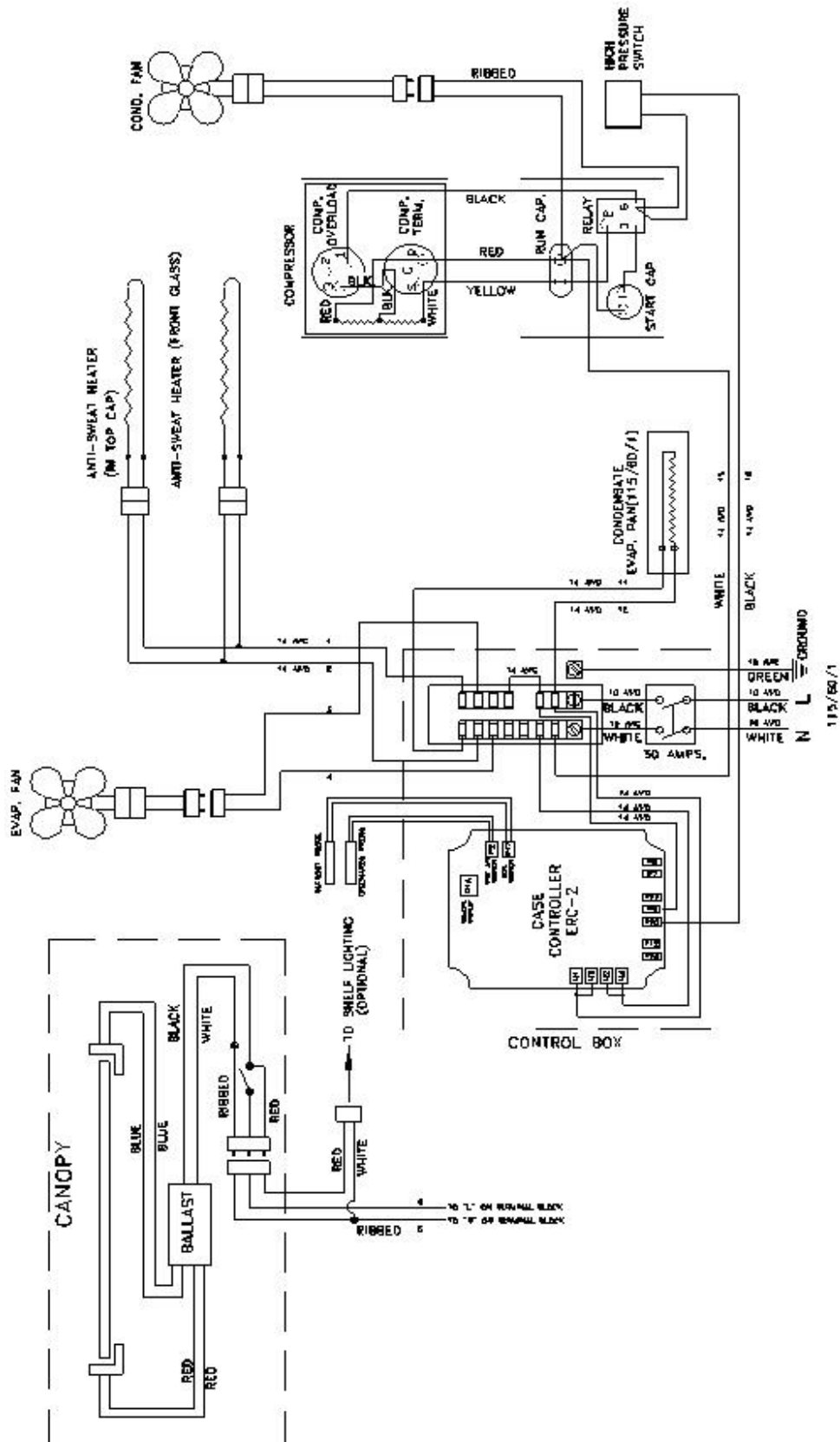
S1VC/S1GC – 4 ft.



S1GC.V00(1,2,3)-4 WIRING DIAGRAM

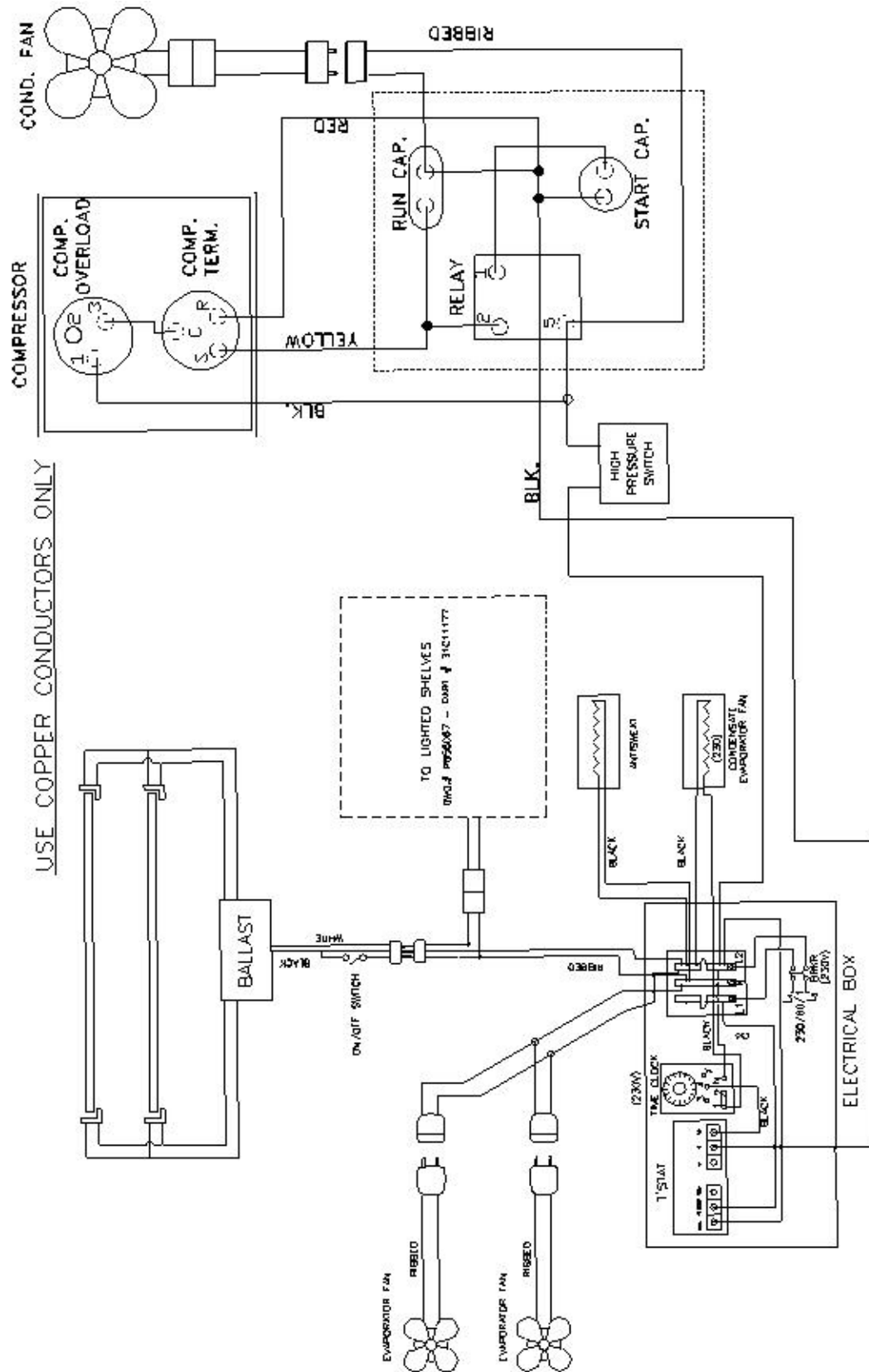


S1GC - 6 ft



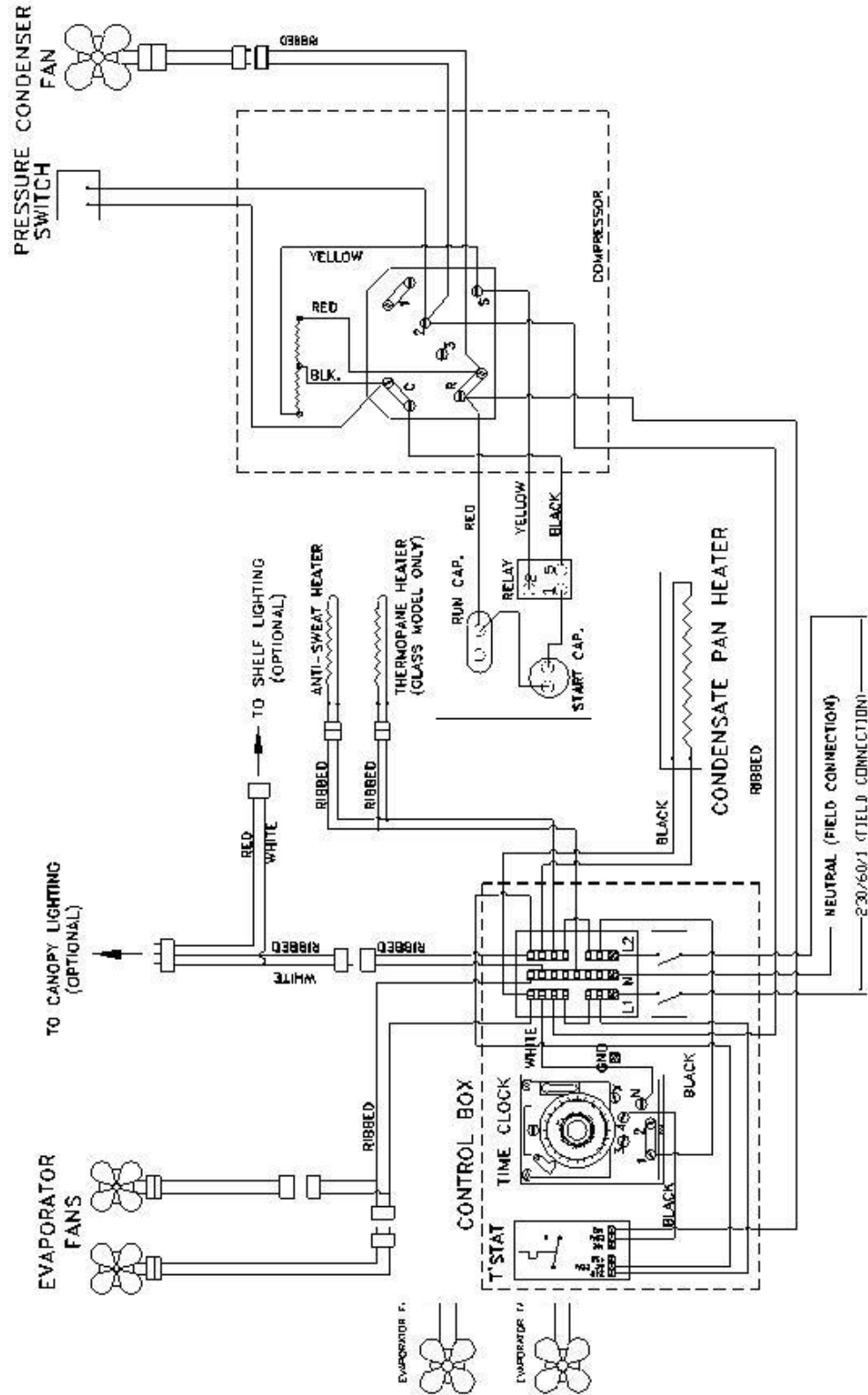
S1GC(1,2,3)-6 WIRING DIAGRAM

S1GC - 8 ft



S1GC(1,3)-8 WIRING DIAGRAM

S1GC-12 ft.



S1GC(1,3,)-12 WIRING DIAGRAM

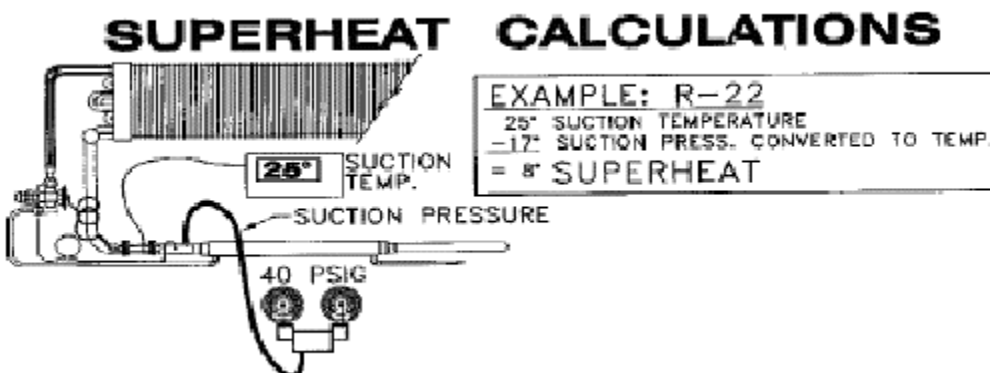
# Expansion Valve and Superheat



**Caution:** During service of this equipment, precautions should be taken to prevent loss of refrigerant to the atmosphere. Always install the expansion valve stem cap after making valve adjustments.

The expansion valve furnished with your case has been sized for maximum coil efficiency. To adjust superheat perform the following:

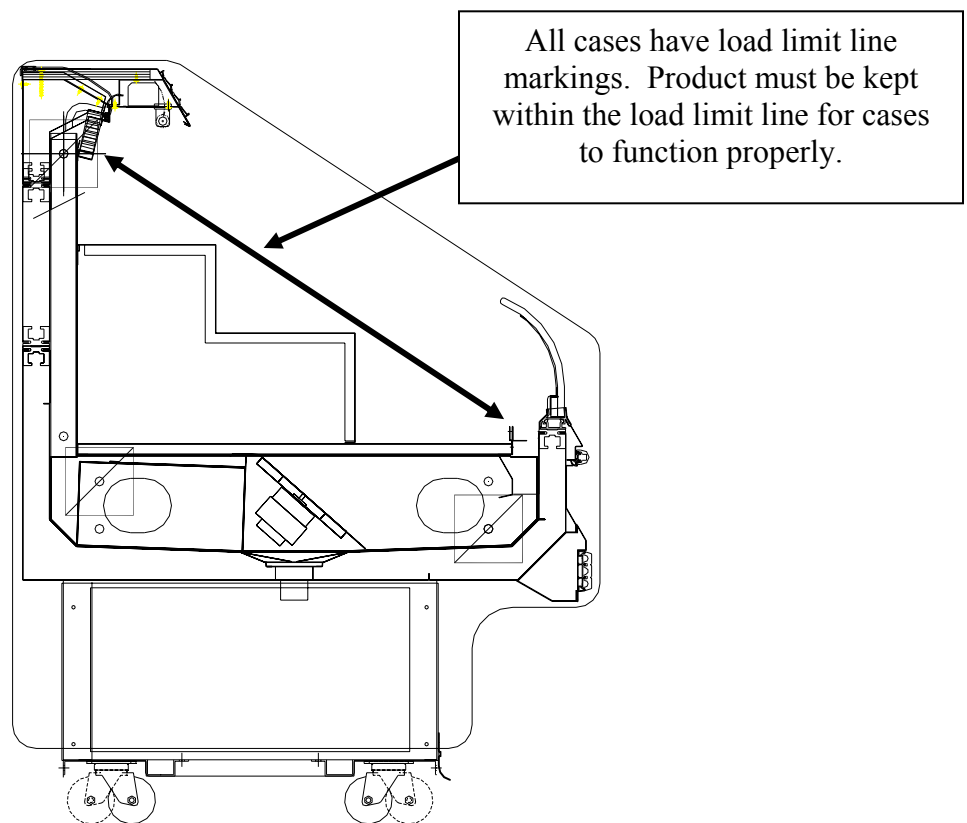
1. Place a thermocouple near the expansion valve bulb. Read the suction line pressure as near coil as possible. (If at the condensing case, estimate suction line loss at 2 PSIG).
2. Convert coil suction pressure to temperature. The difference between coil temperature and the thermocouple temperature is superheat. (Use average superheat when expansion valve is hunting).
3. Do not set superheat until cases have pulled down to operating temperature and never open or close the valve over  $\frac{1}{4}$  turn between adjustments and allow 10 minutes or more between adjustments.
4. Superheat should be set to 6-8°F.
5. After the initial setting, the superheat should be rechecked when product is stocked and at desired temperature.



# Operation

## Loading

Merchandise should not be placed in the fixture until all controls have been adjusted and the case is at the proper temperature. **AT NO TIME SHOULD THE CASE BE STOCKED BEYOND THE LOAD LINE OR OVER THE FRONT EDGE OF ADJUSTABLE SHELVES.**



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Do not place product in cases until it is at proper operating temperature. Air discharge and return flues must remain open and free of debris or obstruction at all times to provide proper refrigeration and air current performance. Do not allow any product, signs, debris, etc. to block these grilles. Do not use any non-approved shelving, display racks or any accessory that could hamper air current performance.



**Warning! Do not walk on top of the cases!** This could result in damage to the case and serious personal injury could occur. These cases are not designed to support excessive external weight. Do not use top of cases for storage.

## Normal Operation

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1. Off-Cycle Defrost is standard on these models and the fans run continuously.
2. Electric Defrost Models are optional. Electric heaters are utilized to melt the frost and ice on the coil. The heaters are located in the air stream in front of the coil. The defrost cycle is time initiated and should be temperature terminated. Case fans operate continuously in defrost and refrigeration. As a safety precaution, a safety cutoff Klixon is wired in series with the defrost heater to turn the heater off at temperatures above 70°F.
3. Hot Gas Defrost Models (optional for parallel compressor operation only) hot gas is routed through the suction line and evaporator coil. It exits the coil through a by-pass around the expansion valve and heat exchanger to return to the liquid line where the condensed liquid is used to feed the other cases on the same parallel case. The case fans continue to operate during defrost to warm up the drain pan and air ducts. The defrost cycle is time initiated and should be temperature terminated. (See case data information on page 4.)
4. Single Condensing Case Systems – A thermostat should be used to control case temperatures. The thermostat bulb should be mounted in the discharge air (see case data if your case is a single condensing case system).

## Cleaning

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As a general rule, always use mild soap and water to wipe the case down. Special precautions must be taken when cleaning some components of the case.

*Exterior surfaces* should be cleaned with warm water and mild soap to protect and maintain the finish. **Do not use cleaners containing abrasive materials or ammonia, which will scratch or dull the finish.** The waste outlet should be flushed with water following each cleaning.

*Interior surfaces* may be cleaned with most mild soap formulas, ammonia based cleaners and sanitizing solutions with no harm to the surface.



**WARNING! Always shut power off during the cleaning process. Cleaning the case with electrical power applied is a shock hazard that may cause serious injury or death.**



**WARNING! DO NOT USE HOT water on COLD glass surfaces. This could cause the glass to shatter and could result in personal injury. Glass fronts and ends should be warm before applying hot water.**



**Caution:** The following could damage the case:

Do not use solvent, oil or acidic-based cleaners on any interior surfaces as the surface may become damaged.

Do not use abrasive cleaners and scouring pads as these will mar the finish.

Never introduce water into the case faster than the waste outlet can release it.

**DO NOT USE STEAM OR HIGH PRESSURE SYSTEMS TO CLEAN THE CASE AS SEALS MAY BE BROKEN WHICH WILL CAUSE THE CASE TO LEAK.**

## Shelves

Do not use a hose or submerge shelves in water. When cleaning lighted shelves, wipe down with a wet sponge or cloth so that water does not enter the light rails.

## Mirrors

Mirrors are sheets of clear glass that have a very thin reflective coating applied to one side. These coatings are susceptible to deterioration if certain cleaning solutions and even water are allowed to come in contact with them. Every precaution should be made to keep liquids away from the coated side of the mirrors. If liquids are allowed to flow along the face side of the mirror to its edge, the liquid can seep between the coating and the glass, causing serious damage.

To help prolong the life of the mirrors:

- Use only mild cleaning solutions (Windex, Solox, or a weak solution of vinegar and water.)
- Do NOT spray liquids on mirrors. Dampen the cleaning cloth, then use the cloth to wipe the mirror.
- Wipe water from the mirrors immediately to prevent difficult to remove water spots and also to prevent the water from reaching the mirrors edge.
- Never use dirty cloths, scrapers or any other abrasive materials for cleaning.

## Condensing Units

Follow the previous general cleaning of the interior and exterior parts with the exception of DO NOT USE WATER HOSE to clean evaporator or tub of the case.



**Caution:** Condensing units should have at least 18" clearance from any wall or other obstruction in order to operate properly.



**WARNING!** Always shut power off at the main breaker during the cleaning process. Cleaning the case or condensing unit with electrical power applied is a shock hazard that may cause serious injury or death.



**Caution: DO NOT FLUSH WITH WATER.** This case is not connected to a drain system and has its own evaporating pan with limited capacity.



**Condensing Units:** Once a month compressed air should be blown through evaporator to clear any debris or dust – opposite to direct normal air flow.



**Caution:** Care should be taken with compressed air. Debris and dust may be blown into eyes.



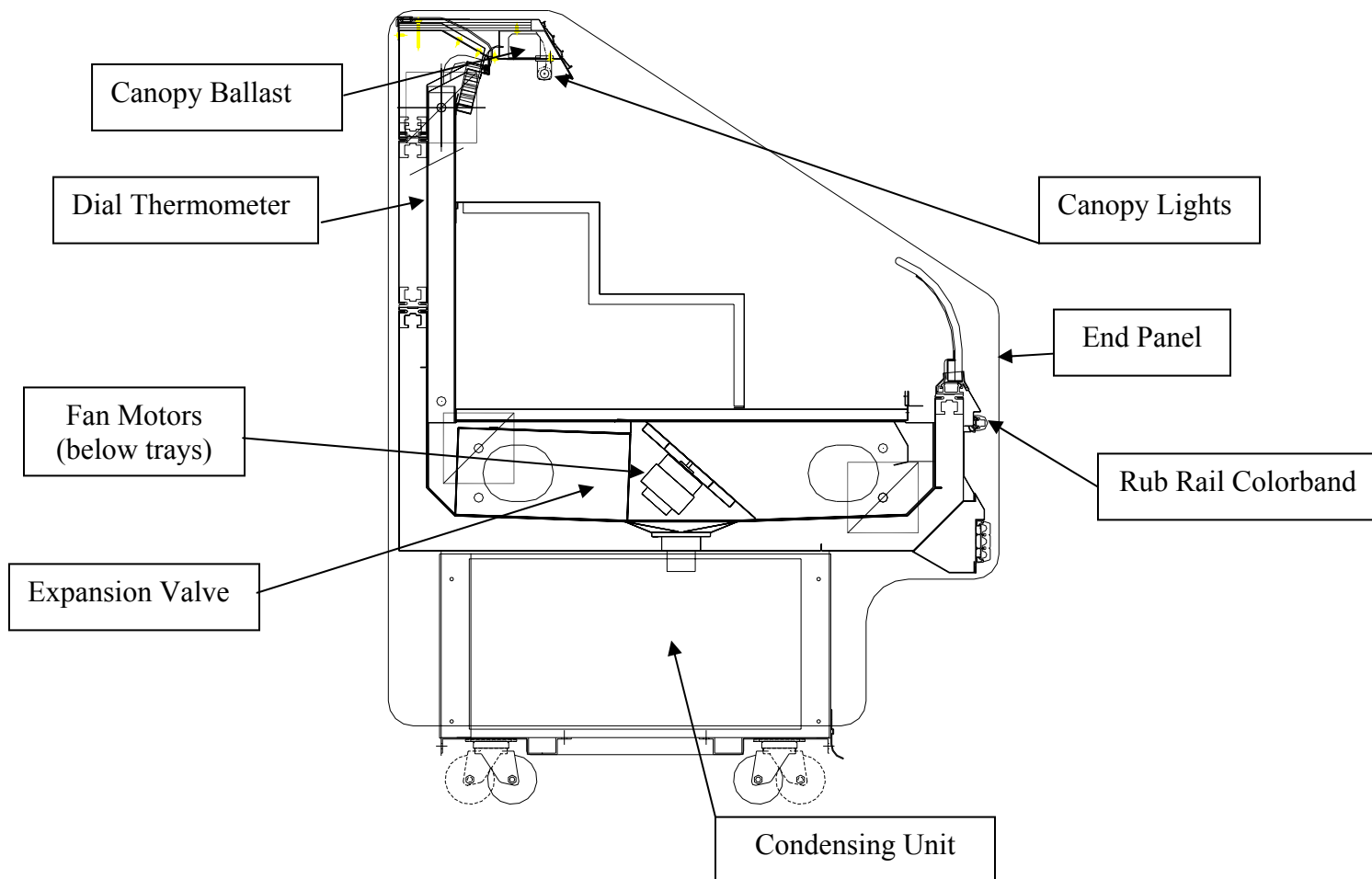
**Note:** Do not stack anything that may block air flow in front of louvers or rear of case. Self-contained cases draw air from back to front and blocking this air flow will cause case to overheat and shut down.

## Honeycomb Assembly

Honeycomb should be cleaned every 6-8 months, depending on store conditions. The honeycomb may be cleaned with a vacuum cleaner or removed to be washed with soap and water. The honeycomb must be completely dry before returning it to the case.



## Parts List and Drawings



Note: Standard parts are provided in the parts lists. Cases may be equipped with specialty parts that were incorporated into the case(s) at the time they were manufactured. It is important to have the case serial number when contacting Kysor//Warren for replacement parts.

## Parts List S1VC/S1GC



Note: S1VC is only in 4'. S1GC is available for 4' – 8'.

Description	S1VC/S1GC	S1GC	S1GC
	4'	6'	8'
Expansion Valve	03A32005	03A26013	03A25042
Evap Fan Mtr STD	09A10040	09A10041	09A10041
Evap Fan Blade	09B10013	09B10061	09B10059
Lamp (canopy) Single Row (CWX)	10A10125	10A10141	10A10125
Lampholder harness (White)	10M10251	10M10197	10M10197
Lampholder harness (Black)	10M10285	10M10282	10M10282
Ballast (canopy) Single Row	10D10065	10D10065	10D10012
Fan Wiring Harness	10M10144	10M10143	10M10144
Shelf Top Cap	71F16208	71F16207	71F16208
Shield-Clear ABS Plastic	13A11062	13A11060	13A11062
Honeycomb White	13A15012	13A15033	96H26994
Honeycomb Black	13A15054	13A15063	96H26995

Standard parts are listed. Individual cases may have options different than listed and the serial number for these cases is required when ordering parts.

## Warranty

Parts Warranty Policy The following procedures are in accordance with Kysor//Warren's standard one-year warranty, which covers any part to be free of defects under normal use and service for one year from the date of installation. **Not to exceed one year and thirty days from the date of original shipment from the factory.**

## New Equipment Parts Shortages and Defects

Any parts shortages or damage must be reported to Kysor//Warren no more than 10 working days from the date of delivery. After this time has expired Kysor//Warren will assume the parts were lost during installation and all parts required will be charged cost plus shipping to replace.

## Parts Ordering Procedure

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All parts must be ordered through the Kysor//Warren parts department with the following information:

- Store Name and Number
- Location
- Case or Case Model and Serial Number
- Firm or Contractor Placing Order
- Shipping Address
- Parts Description
- Reason for Defect

If the order is for a replacement part still in warranty a Purchase Order Number will be required from the contractor placing the order. We will then issue a Return Material Authorization Tag (RMA) that will be sent to the firm or contractor who has ordered the part.

## Return Authorization Procedure

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Warranty parts must be returned postage prepaid to Kysor//Warren within 30 days from replacement part ship date and must be accompanied by a RMA in order to ensure the proper credit. The RMA should also be written on the outside of the box. Any parts not returned within 30 days will be invoiced to the firm or contractor who has placed the order.

IN THE CONSTANT EFFORT TO IMPROVE OUR PRODUCTS, WE RESERVE THE RIGHT TO CHANGE AT ANYTIME SPECIFICATIONS, DESIGN, OR PRICES WITHOUT INCURRING OBLIGATION.

KYSOR//WARREN  
5201 Transport Boulevard  
Columbus, Georgia 31907  
706-568-1514

## One-Year Warranty

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**KYSOR//WARREN** warrants to the original purchaser this new equipment and all parts thereof, to be free from defects in material and workmanship under normal use and service. If any part or parts of the equipment should prove defective during the period of one year from installation date (not to exceed one year and thirty days from the date of original shipment from the factory), KYSOR//WARREN hereby guarantees to replace or repair, without charge (F.O.B. Columbus, Georgia), such part or parts as proven

defective, and which KYSOR//WARREN'S examination disclosed to its satisfaction to be thus defective, with a new or functionally operative part. The liability of KYSOR//WARREN under this warranty shall be limited to claims made by the original purchaser to KYSOR//WARREN or its local distributor within the warranty period.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS, AND ALL OTHER OBLIGATIONS OR LIABILITIES OF KYSOR//WARREN.

#### **I. GLAZING:**

Glass is not guaranteed against breakage. If this refrigerator is equipped with a glazing assembly carrying the manufacturer's brand name (Thermopane, Twindow, etc.), the manufacturer's glazing warranty in effect at the time of this shipment is extended to that assembly. It is void outside the continental United States.

#### **II. BULBS:**

Light bulbs and fluorescent lamp tubes are not covered by any warranty for length of life or for any type of breakage.

#### **III. THIS WARRANTY SHALL NOT APPLY:**

1. To the condensing case used with refrigerated equipment unless same was sold and shipped by KYSOR//WARREN.
2. When this equipment or any part thereof is damaged by fire, flood, act of God, or when the original model and serial number plate has been altered, defaced, or removed.
3. When this equipment or any part thereof is subject to accident, alteration, abuse, misuse, tampering, operation on low or improper voltages, or is put to a use other than recommended by KYSOR//WARREN.
4. When this equipment or any part thereof is damaged, or when operation is impaired, due to failure to follow installation manual (improper installation is the responsibility of the installer).
5. Outside the continental United States, Canada and Mexico.
6. To labor cost for replacement of parts, or for freight or shipping expenses.
7. To freight or shipping charges or to customs duties to any country.
8. If the Warranty holder fails to comply with all the provisions, terms and conditions of this Warranty.

Parts replaced under this Warranty are warranted only through the remainder of the original Warranty. KYSOR//WARREN may, at its option and in its discretion, elect to honor this Warranty and to disregard the original purchaser's non-compliance with any of the provisions, terms and conditions of the Warranty.

**THIS WARRANTY DOES NOT COVER CONSEQUENTIAL DAMAGES.**

KYSOR//WARREN shall not be liable under any circumstances for any consequential damages, including loss of profits, additional labor costs, loss of refrigerant or food products, or injury to person or property caused by defective material or parts or for any delay in the performance of this Warranty due to causes beyond its control. The foregoing shall constitute the sole and exclusive remedy of any purchase and the sole and exclusive liability of KYSOR//WARREN in connection with this product.

Telephone:

1-800-866-5596

Email:

[solutions@kysorwarren.com](mailto:solutions@kysorwarren.com)

Website

<http://www.kysorwarren.com/>

Kysor//Warren, whose policy is one of continuous improvement, reserves the right to change at anytime, these specifications, designs or prices without incurring obligation.

**KYSOR/WARREN**

