Part Number: 31E04008 New

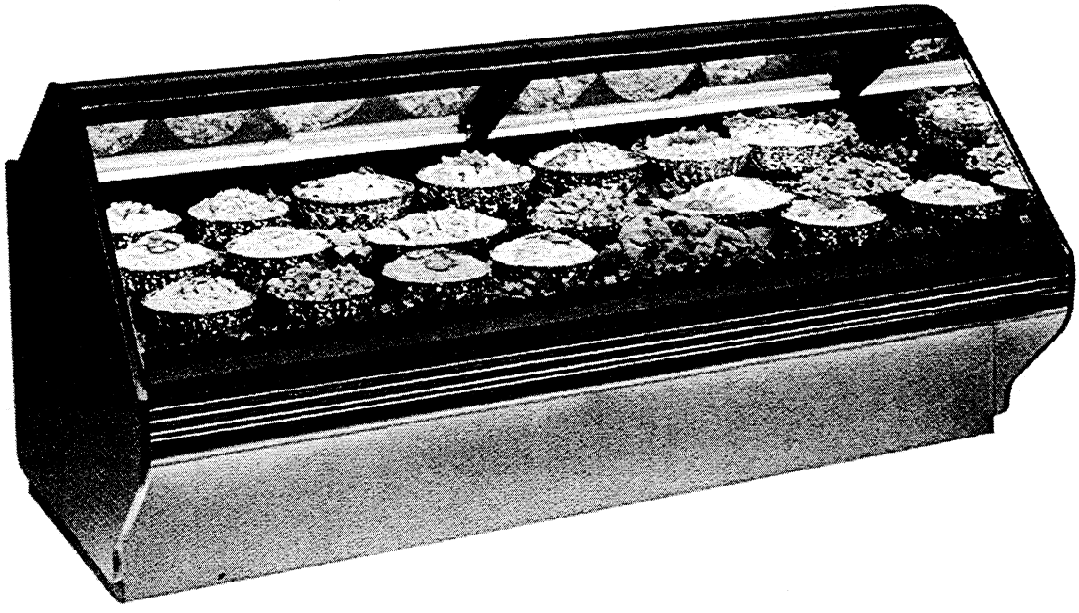
KYSOR/WARREN®

Division Of Kysor Industrial Corporation

Installation & Operation Manual

Service Deli Cases
Model Series 2600
S26VJ_L1

July 24, 1995



The Leading Edge of Technology

This refrigerator conforms to the Commercial Refrigerator Manufacturers Association Health and Sanitation Standard.

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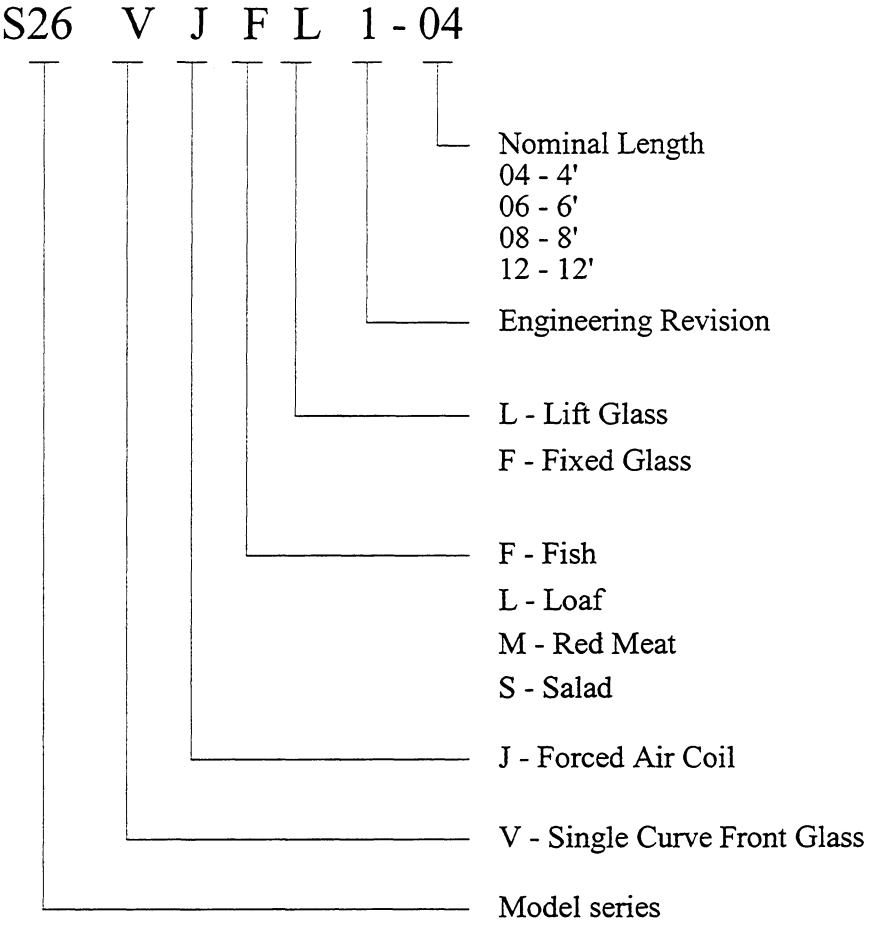
Model Nomenclature



Model Description

Models	Description	Type	Glass	Refrigeration	Lengths
S26VJFL1	Service Fish	Forced Air Coil	Lift Single Curved Front	Remote	4, 6, 8, 12
S26VJLL1	Service Loaf	Forced Air Coil	Lift Single Curved Front	Remote	8, 12
S26VJML1	Service Meat	Forced Air Coil	Lift Single Curved Front	Remote	4, 6, 8, 12
S26VJSL1	Service Salad	Forced Air Coil	Lift Single Curved Front	Remote	4, 6, 8, 12

Receipt and Inspection of Unit

When Moving the Case

Notice to Installer

When moving this case lift it as evenly as possible to prevent twisting which can cause the glass to break.

Notice to Owner or Operator

Failure to properly support the base of this case while moving can cause future glass breakage when the case is loaded and placed in operation.

Inspection Notes

- Inspect the Series 2600 Service Case and any accessories shipped with it for damage or shortages 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 (3) days following delivery.
- It is the responsibility of the consignee to file all claims for damage with the transportation company.
- The case is shipped with a holding charge of dry nitrogen. Check to see that pressure is still in the unit upon receipt. Report lack of pressure immediately to the service department.
- Be sure that you receive all items. All claims for shortages must be made within 10 days after receipt of shipment.

Installation

The Series 2600 display cases may be installed individually or in a continuous line-up consisting of several 4, 6, 8 and 12 foot sections by using a joint trim kit. A plexiglas divider or mutual end must be used between cases operating on different refrigeration systems. These will be factory installed if specified on the order.

Application

The Kysor//Warren Series 2600 Service Case is designed to merchandise fresh fish, meat or delicatessen products. These cases should be installed and operated according to the instructions contained in this manual to insure proper performance. They are designed for the display of products in an air-conditioned store where temperature and humidity are maintained at a maximum of 75°F dry bulb, 55% relative. To reduce product drying a humidification system is available for fish cases. This humidification system is standard in the red meat case.

Leveling the Case

Notice to Installer

Before installing this case, check the entire floor surface on which the case will be placed. The case has leg levelers at the front and rear on each leg position. The case must be leveled within ± 1/16" to prevent settling and twisting of the case. Failure to properly level the case will result in improper glass alignment and improper drainage of condensate.

Notice to Owner or Operator

Before loading and operating this case, check to see that the installer has properly adjusted each leg both front and rear. If there are air spaces between the floor and any base leg, the case can twist when loaded causing subsequent glass breakage. If the case is not level a potential health hazard may be created due to improper drainage of condensate.

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 the case, inspect refrigeration lines, electrical connections and controls to insure the cases are in proper line-up and are in the proper sequence.

Position Number

These refrigerators are lined up at the factory and are numbered with a "line up" and a "position" number. Insure they are installed in the field in the same sequence.

Waste Outlet

These cases are equipped with a 1-1/2" fpt waste outlet connection which terminates in the center of the refrigerator below the insulation bottom.

Installing Drip Pipe

Improperly installed drip pipes can seriously affect the operation of this equipment and result in increased maintenance cost. Listed below are some general rules for drip pipe 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 (minimum of 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 non-insulated suction lines, such contact will cause the condensate from your refrigerator to freeze.

Electrical

All field installed wiring must comply with the national electrical codes and local codes.

Electrical Junction

On these cases, an electrical junction box is provided for field connections. The junction box is located along the rear of the case for leg mounted models and the front for pedestal models.

Electrical Connections

All field connections are made in the electrical junction box.

Make sure that proper voltage is supplied to your refrigerator. Check refrigerator nameplate for correct circuits, volts, and amps. ***All refrigerators must be grounded.***

When cases are multiplexed, add the total of these amperage values to determine wire size and circuit protection.

Make sure that proper wire size and branch circuit protection are employed for safe operation.

Refrigeration Fan Motors

Permanent split capacitor fan motors are provided as standard for energy efficiency. These motors are permanently oiled for the life of the motor and require no periodic maintenance. They are wired according to the enclosed wiring diagram.

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 the first two vacuums with dry nitrogen. The third vacuum would be broken with the refrigerant specified for the system.

Caution

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

Refrigeration

Refrigerant Type

Available refrigerants are R22, R134a, R404A, R507. Expansion valves are supplied for the refrigerant specified on the original sales order.

Expansion Valve

The expansion valve furnished with your case 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 measurement is at the condensing unit and pressure after evaporator coil is unknown, 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 between 6 and 8°F.

Refrigeration Lines

Refrigerant connections (suction and liquid) are stubbed inside the case with an access through the bottom of the case. Cases multiplexed together must be field connected by running refrigerant lines in the space under the case. The field installed suction lines must be insulated to prevent condensation accumulation on the floor. See the section on "recommended piping practices" for additional details on piping practices.

Note:
Seal around lines after connections are made. Keep direct flame from bottom of the case, as heat will disintegrate the bottom and insulation. Use a heat shield when brazing near the bottom of the cases.

Heat Exchanger

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

Recommended Piping Practices

1. Use only clean sealed copper tubing.

2. 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 proper oil return to the compressor. Undersized lines can rob refrigeration capacity and increase operating costs. Consult the technical manual or legend sheet for proper line sizes.

3. When the case is in a line-up the refrigeration lines may 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 for systems with 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.

4. Do not run refrigeration lines from one system or circuit through cases connected to another system or circuit.

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

6. When using a high pressure nitrogen container, proper regulating equipment in good operating condition must be used.

7. Insulate suction lines with 1/2" thick insulation in exposed areas to prevent condensate dripping.

8. A heat exchanger is available as an option. Therefore the suction and liquid lines should not be taped or soldered together.

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

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

11. 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.

12. Use long radius elbows and avoid 45° elbows.

13. Provide expansion loops in suction lines on systems on hot gas defrost. See Engineering Bulletin #85-204-3 for detail.

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

15. Brazing of copper to copper should be with a minimum of 10% silver solder. Copper to brass or copper to steel should be with a minimum of 45% silver solder.

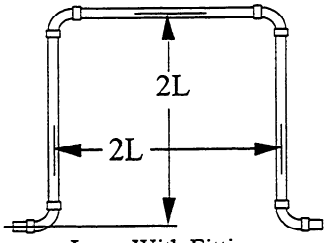
16. Avoid the use of "bullhead" tees in suction lines. An example is where suction gas enters both ends of the tee and exits the center. This can cause a substantial increase in pressure drop in the suction lines.

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

Expansion Loops - Engineering Bulletin #85-204-3

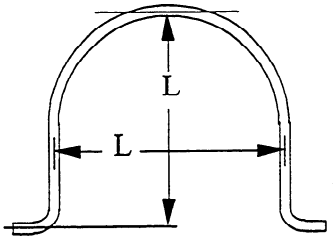
Reprinted from Kysor//Warren Technical Bulletin #85-204-3 dated 9/11/90.

On a refrigeration system with gas defrost, the refrigerant lines expand and contract with temperature changes. The suction line will normally have the greatest movement since it has the largest temperature change during defrost.



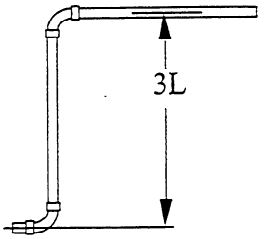
Loop With Fittings

If this expansion and contraction is not planned for during the installation of refrigeration lines, kinking and breaking of the lines could occur.



Formed Loop

In order to compensate for the expansion of the tubing, it is necessary to estimate the amount of expansion and then provide offsets or loops in the refrigerant piping. As a general rule, medium temperature lines will expand approximately 1-1/2" for each 100' and low temperature lines approximately 2" for each 100' of tubing. Normally, in a supermarket, the area to be most concerned with is the straight line distance from the fixture to the main access pit in or near the motor room.



Offset

In compensating for expansion and contraction, two items are very important.

1. Liquid and suction lines can not be joined together and should not touch at any point.
2. Pipe hangers must be located and installed in such a manner as not to restrict the expansion and contraction of the tubing. All tubing clamps should have an insulation material (i.e. Hydra Sorb bushing) to prevent metal to metal contact.

Example

Expansion Loop Calculation
Medium Temperature
Line Length 225'
Line Size 1-5/8"

Amount of expansion = 200/100 x 1.5/100 = 3"

Based on 3" expansion and 1-5/8" tubing, the legs of the loop would be 2 times the value of L or 2 x 35 = 70" each.

Low temperature lines would be calculated in a similar manner.

By utilizing proper methods to allow for expansion and contraction of refrigerant lines, the reliability of systems with gas defrost is enhanced greatly.

Expansion chart

Ref. Line	Length - L (inches) Amount of Expansion			
OD	1/2	1	1-1/2	2
7/8	10	15	19	22
1-1/8	11	16	20	24
1-3/8	11	17	21	26
1-5/8	12	18	23	28
2-1/8	14	20	25	31
2-5/8	16	22	27	32

Ref. Line	Length - L (inches) Amount of Expansion				
OD	2-1/2	3	4	5	6
7/8	25	27	30	34	38
1-1/8	27	29	33	38	42
1-3/8	29	32	36	42	47
1-5/8	31	35	39	46	51
2-1/8	34	38	44	51	57
2-5/8	37	42	47	56	62

Paul F. Renaud 3/13/85 rev. 9/11/90

Operation

On single condensing unit systems, a thermostat should be used to control temperatures. The thermostat bulb is mounted in the discharge air. On parallel units, temperature control can be provided by epr valve and thermostat or temperature probe. See the Temperature and Pressure table for approximate settings. Since many variables are present in each installation, such as store temperature, length of tubing runs, temperature desired in refrigerator, etc., the table is only a guide for the installer.

Cleaning

1. Be sure that the refrigeration and all electrical power is turned off before washing your Series 2600 Service Case.

2. To insure proper sanitation and minimum maintenance cost, the case should be emptied and thoroughly washed out at least once a week. The interior should be cleaned with a mild soap/water solution and a sanitizer. Never introduce water into the fixture faster than the outlet can carry it away.

3. The waste outlet should be flushed with clean water following each cleaning.

4. Do not use steam, extremely hot water or high pressure washing systems to clean the refrigerator as interior seals may be broken and/or cause the glass surfaces to break.

5. The exterior of the refrigerator should be cleaned with a mild soap and water solution as necessary to maintain a good appearance. Do not use cleaners containing abrasive materials that will scratch or dull the painted finish.

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

Loading

Merchandise should not be placed in the fixture until all controls have been adjusted and the case is at proper temperature.

The fixture must not be stocked beyond the load line or over the front edge of adjustable shelves. Doing so will seriously affect the performance, which will result in higher product temperatures and increase operating costs.

Defrost Cycle

Off-time defrost is standard on these models. Hot Gas defrost is optionally available on all models. Electric defrost is optionally available of "Fish" models. See the Defrost Setting tables.

Electronic Lighting Advisory

When Electronic Lighting is used in the canopy or on the shelves of display cases, SPECIAL ATTENTION must be given to the proper installation of bulbs and shelf plug-ins. It is IMPERATIVE that the pins of the bulbs and the shelf power cords be completely seated in their respective lamp holder or receptacle. If they are not completely seated, and electrical arc could occur that will cause the lamp holders or the shelf light receptacles to melt and become an electrical hazard. Care must be taken during cleaning and stocking processes to insure that bulbs and shelf cords are not dislodged.

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

General notes

All units have the discharge air at the rear of the display case. The return air is at the front of the case. It is very important to keep these areas clear. Disruption of proper air flow will result in higher product temperatures which may present a health hazard.

S26VJML1

The air flow of "Red Meat" cases is lower than that of the other S26VJ cases.

A humidifier system is provided as standard on "Red Meat" cases. Please see the manufacturer's manual included.

S26VJLL1

A maximum of two rows of shelves are available on these units. The shelves may lighted. Lighted shelves have T8 electronic lights.

Electrical Ratings

Fans & Lights

(115V/60/1 phase)

All Models	Fan Amps	Light Amps *	Receptacle Rating
4'	0.26	0.57	15
6'	0.26	0.57	15
8'	0.52	1.14	15
12'	0.78	1.71	15

* Cases are standard with one row of lights in the top canopy and one row of front ledge lights. The "S26VJLL1" model cases can accommodate two rows of lighted shelves. For each lighted shelf, add 0.21 amps.

Anti-Sweat Loaf

(115V/60/1 phase)

Length	Watts	Amps
8'	120	1.05
12'	180	1.57

Anti-Sweat Fish & Salad

(115V/60/1 phase)

Length	Watts	Amps
4'	40	0.35
6'	70	0.61
8'	80	0.70
12'	140	1.22

Electric Defrost Fish

(230V/60/1 phase)

Length	Watts	Amps
6'	1500	6.52
8'	1500	6.52

Control Settings

Note

All Series 2600 Service Case temperatures should be controlled with a thermostat and epr valve. On conventional condensing units, the thermostat should cycle the connected compressor. On parallel refrigeration systems, the thermostat must cycle an epr/suction stop or a liquid line solenoid valve. If a liquid line solenoid is used, it must be located at the case.

Defrost Setting

Off-Cycle

Model	Number Per Day	Termination	Fail Safe (Min.)
S26VJFL1	1	Time	46
S26VJLL1	1	Time	46
S26VJML1	1	Time	46
S26VJSL1	1	Time	46

Hot Gas

Model	Number Per Day	Termination	Fail Safe (Min.)
S26VJFL1	1	Temp	10
S26VJLL1	1	Temp	10
S26VJML1	1	Temp	10
S26VJSL1	1	Temp	10

If time termination is used only about 2 to 3 minutes are required.

Electric

Model	Number Per Day	Termination	Fail Safe (Min.)
S26VJFL1	1	Temp	10

If time termination is used only about 2 to 3 minutes are required.

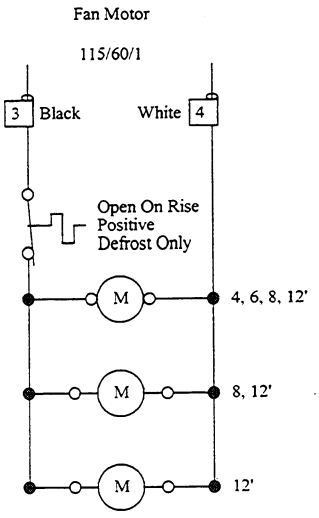
Temperature and Pressure

Model	Refrigerant	Epr Setting	Thermostat °F Disch Air Cut-Out	Thermostat °F Disch Air Cut-In
S26VJFL1	HCFC-22	45	28	32
	HFC-134a	18		
	R-404A	56		
	R-507	57		
S26VJLL1	HCFC-22	45		
	HFC-134a	18		
	R-404A	56		
	R-507	57		
S26VJML1	HCFC-22	45		
	HFC-134a	18		
	R-404A	56		
	R-507	57		
S26VJSL1	HCFC-22	45		
	HFC-134a	18		
	R-404A	56		
	R-507	57		

Wiring Diagrams

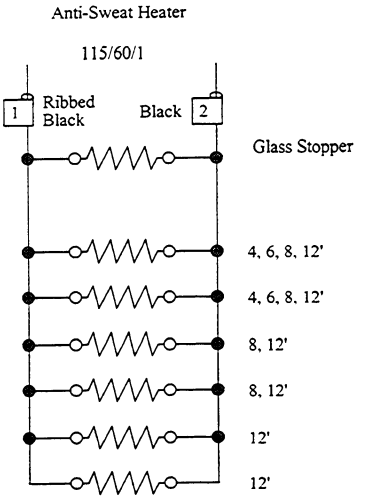
Fan Motors

All fan motors are high efficiency PSC with an amp rating of .26 @ 115/60/1. A fan thermostat is employed on all units with a positive defrost. This will shut off the fans after defrost has begun, and start them after the coil has pulled down to temperature following defrost.



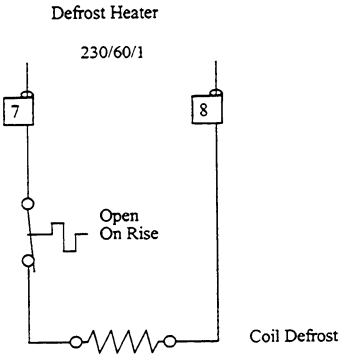
Anti-Sweat Heaters

Glass Stopper anti-sweat heaters are used on all models except "Loaf". Super structure anti-sweat heaters are used on S26VJLL1 "Loaf" models only. All anti-sweat heaters are 115/60/1.



Defrost Heaters

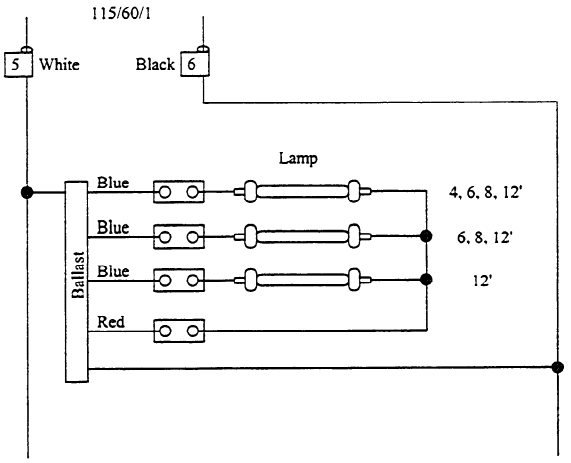
Defrost heaters are used on S26VJFL1 "Fish" models only. All defrost heaters are rated 230/60/1.



Lights

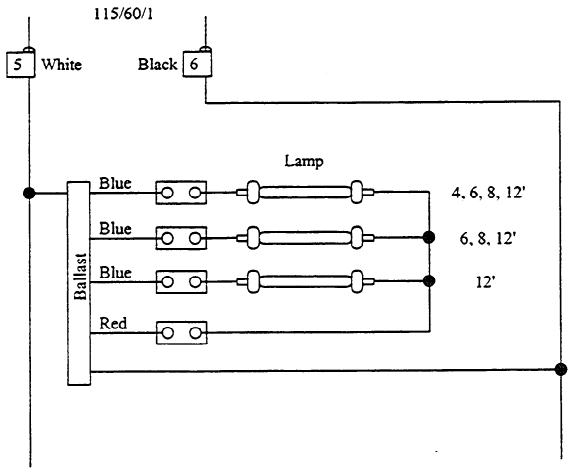
Upper Canopy

All units employ canopy lights with an electronic ballast. The ballast is located in the raceway. The ballast can power up to three T8 lamps. If fewer than three lamps are used then all unused "Blue" wires are insulated. All ballasts are rated 115/60/1.



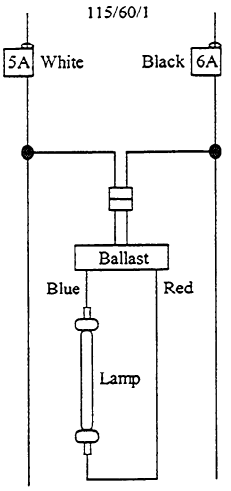
Lower Ledge

All units employ lower ledge lights with an electronic ballast. The ballast is located in the raceway. The ballast can power up to three T8 lamps. If fewer than three lamps are used then all unused "Blue" wires are insulated. All ballasts are rated 115/60/1.



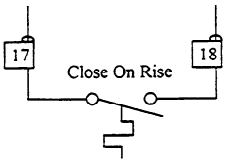
Shelf

S26VJLL1 "Loaf" units are available with optional lighted shelves. These lighted shelves employ an electronic ballast. All units with lighted shelves feature split wiring of the shelf lights (the shelf lights are powered separately from the canopy and ledge lights). The ballast is located on the shelf and powers only one shelf. All ballasts are rated 115/60/1.

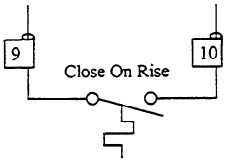


Defrost Termination

A bi-metal disc thermostat is used for defrost termination on units provided with optional "Hot Gas Defrost".



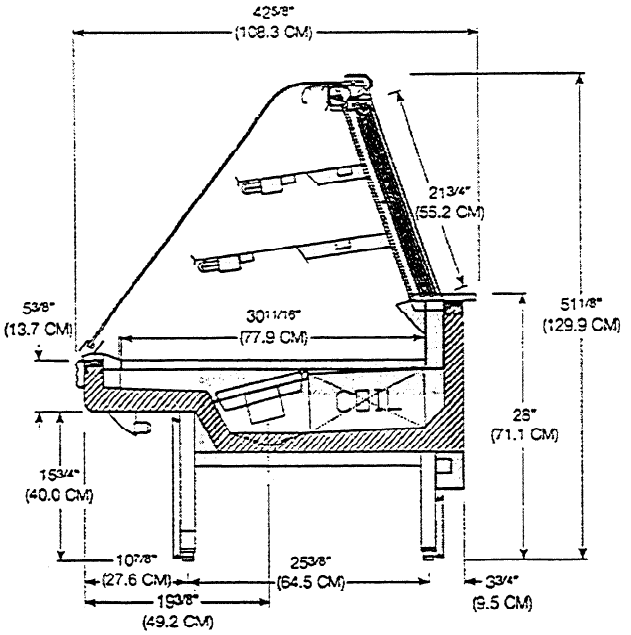
Optional Temperature Control



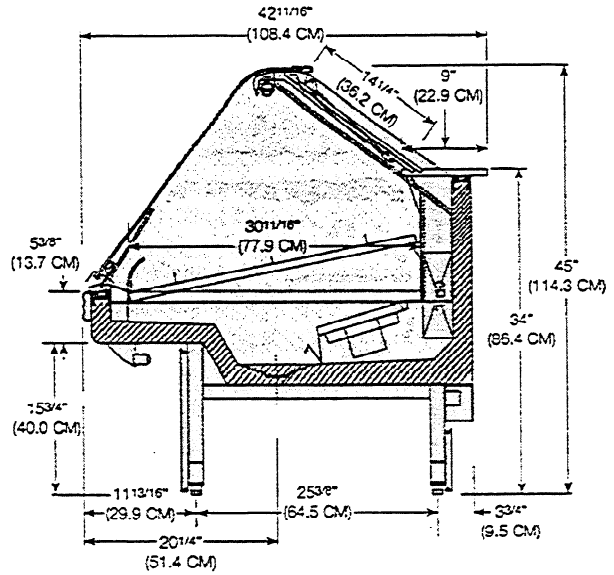
Cross Sections

Dimensions

"S26VJLL1"



"S26VJFL1", "S26VJML1" and "S26VJSL1"



Replacement Parts List

All Models

Description	Part No	4'	6'	8'	12'
High Efficiency Fan Motor	09A10055	1	1	2	3
Ballast Canopy	10D10065	1	1	1	1
Ballast Ledge	10D10065	1	1	1	1
Lamp Canopy F32T8	F32T8	1	1	2	3
Lamp Ledge F32T8	F32T8	1	1	2	3
Hot Gas/Electric Defrost Termination	08A11049	1	1	1	1
Fan Control	08A11081	1	1	1	1

Fish, Red Meat, and Salad Case

Description	Part No	4'	6'	8'	12'
Fan Blade	09B10032	1	1	2	3
Cutting Board	13A10115	1	-	-	-
Cutting Board	13A10116	-	1	-	-
Cutting Board	13A10106	-	-	1	-
Cutting Board Left Hand	13A10110	-	-	-	1
Cutting Board Right Hand	13A10111	-	-	-	1
Front Lift Glass	14B11035	1	-	2	3
Front Lift Glass	14B11036	-	1	-	-
Defrost Heater (1500W @ 230V Fish Only)	10K10129	-	1	1	-
Anti-Sweat Glass Stopper (80W @ 115V)	10K12062	-	-	1	-
Anti-Sweat Glass Stopper (140W @ 115V)	10K12063	-	-	-	1

Loaf Case

Description	Part No	4'	6'	8'	12'
Fan Blade	09B10059	-	-	2	3
Cutting Board	13A10112	-	-	1	-
Cutting Board Left Hand	13A10113	-	-	-	1
Cutting Board Right Hand	13A10114	-	-	-	1
Front Lift Glass	14B11037	-	-	2	3
Anti-Sweat SuperStructure (30W @ 115V)	10K12028	-	-	4	6
Ballast Shelf	10D10068	-	-	4 Max.	6 Max.
Lamp Shelf F25T8	F25T8	1 Per Shelf			

In the constant effort to improve our products, we reserve the right to change at any time specifications, design, or prices without incurring obligation.

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404-483-5600

One-Year Warranty

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. Conyers, Georgia), such part or parts as prove defective, and which Kysor//Warren's examination discloses 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.

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.

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.

This warranty shall not apply:

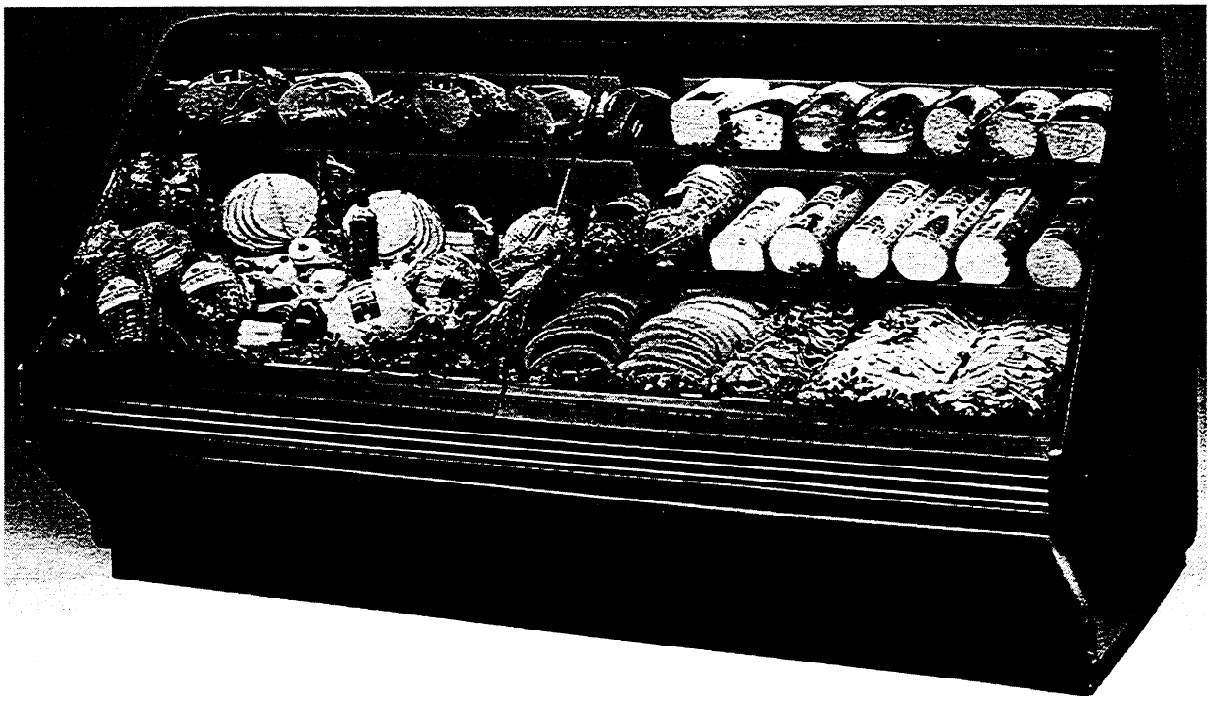
To the condensing unit used with refrigerated equipment unless same was sold and shipped by Kysor//Warren.
When this equipment or any part thereof is damaged by fire, flood, act of god, or when the original model and serial number plate has been altered, defaced, or removed.
When this equipment or any 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.
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.
Outside the continental United States.
To labor cost for replacement of parts, or for freight or shipping expenses.
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 noncompliance with any of the provisions, terms and conditions of this 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 purchaser and the sole and exclusive liability of Kysor//Warren in connection with this product.

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



Series 2600 Service Cases are designed and manufactured in Columbus, GA. USA.

Telephone Numbers

Sales Service Parts	800-866-3390	770-483-5600	Conyers, GA
Application Engineering	800-866-4490	706-568-1514	Columbus, GA

Addresses

Kysor//Warren
1600 Rockdale Industrial Blvd.
Conyers, GA. USA
30207

Kysor//Warren
5201 Transport Blvd.
Columbus, GA. USA
31907

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