

# STRATUS Multi-Deck Display Case

# Installation and Operation Manual



## KYSOR WARREN

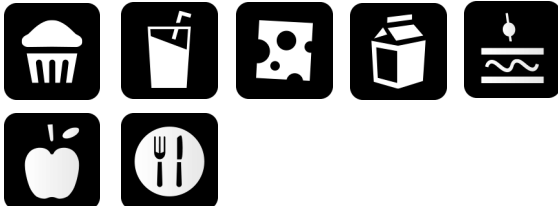


**April 2023**

**Part No. 31E01037**

**Models:  
DX6LN-MCU**

**Applications:**



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# Installation and Operation Manual

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## Introduction—General Information

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

Our STRATUS case line has been designed with a focus on things most important to your bottom line. Enhanced merchandise visibility, high energy efficiency, and merchandising flexibility have all merged in an attractive design. Custom styles fit seamlessly into your floor plan and an eco-friendly design protects the environment while saving energy costs. The DX6LN multi-deck, dairy door case is available for medium temperature applications.

These cases should be installed and operated according to the instructions contained in this manual to ensure proper performance. They are designed for display of products in an air conditioned store where temperature and humidity are maintained at conditions that are below 75°F dry-bulb temperature with 55% relative humidity.

*CAUTION: Failure to maintain store air conditions below 75°F dry-bulb temperature with 55% relative humidity may result in operational issues such as the following: increased thermal (Btuh) load, high product temperatures, coil icing, product frosting, and external sweating.*

This case will accommodate up to 5 levels of product display shelving in addition to the deck pan level for greater merchandising visibility that grabs shoppers' attention. These cases offer exceptional display facing area and product pack-out in a case that is 97" in height.

## Case Description

Model	Description
DN6LN-MCU	Multi-deck, narrow depth, 6 deck, low, door, with modular condensing unit

## 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. The consignee for all damages must file a claim with the carrier.

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

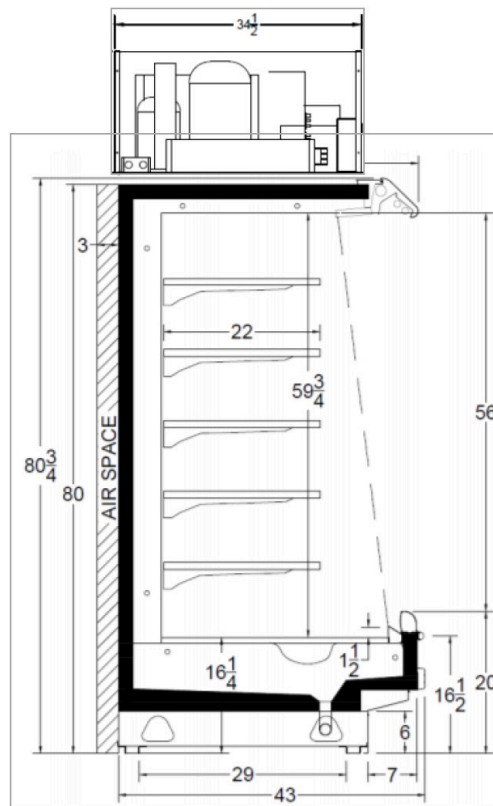
## Refrigerant

The DX6LN medium temperature cases use R-448A refrigerant.

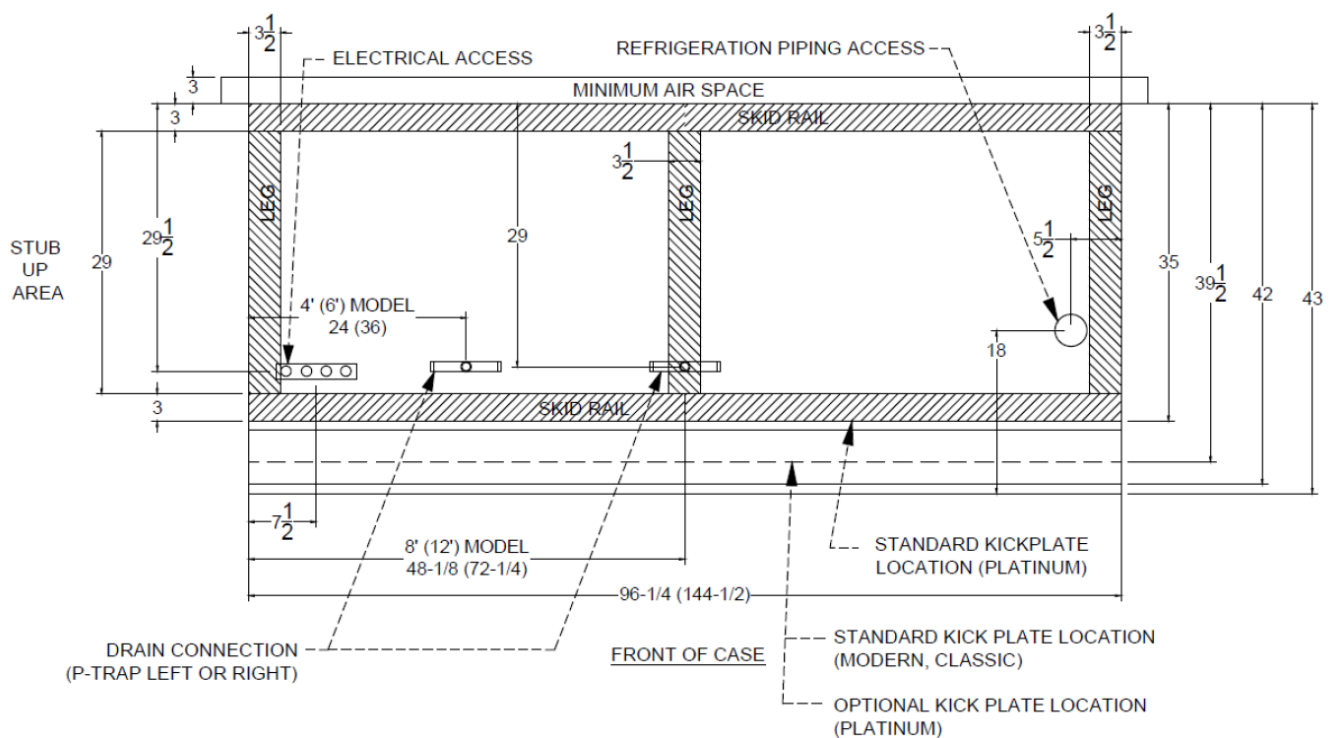
*NOTE: Refer to Case Data Control Settings for refrigeration requirements.*

# STRATUS Multi-Deck Display Case

## Cross Section View



## Plan View



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## Modular Condensing Unit

The selected condensing unit will have the following features:

- Electrical Rating — 208 – 230V / 60Hz / 1 Phase
- Refrigerant — R-448A
- Receiver and suction service valves
- All refrigerant piping employs sweat connections
- Each condensing unit is designed to operate one case
- Condensing units are UL Listed

## Condensate Pump

The condensate pump is a compact top mount suction head type pump. It has the following features:

- Electrical rating - 115 VAC / 60 Hz / 1 Phase, 1.9 Amps
- Capacity: 1.6 GPM at zero head
- Pump is UL Listed

## Paragon ERC-2 Controller Set-Up Instructions

A Paragon ERC-2 Controller is provided to control the compressor, fans and case defrost.

- Temperature Control—When the case reaches the desired discharge air temperature, the controller shuts off the compressor. When the discharge air temperature rises above the cut-in set point, the compressor turns on.
- Compressor Control—Compressor operating parameters such as minimum off time, minimum run time and start-up time delay are field adjustable. Recommended settings are listed in the table on Page 6.

### ERC 2—Electronic Refrigeration Control

Remote Display



# STRATUS Multi-Deck Display Case

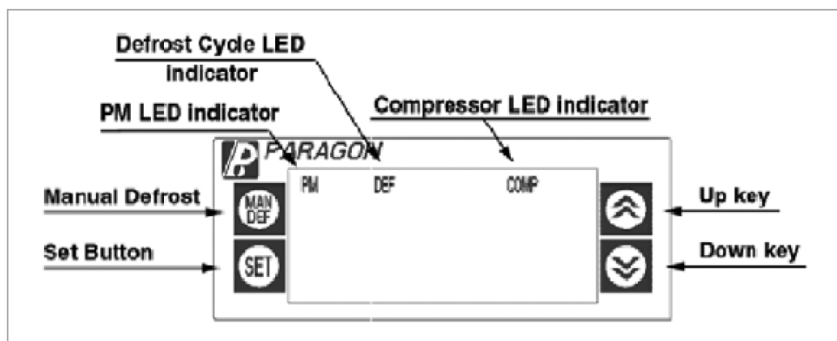
The ERC-2 (Electronic Refrigeration Control) is a microprocessor-based electronic controller designed to control both the temperature and the defrost functions of a commercial refrigeration unit. It can be powered by 120, 208, or 240 VAC (50 or 60 Hz). The control comes with four relay outputs, which are for the following: compressor control, defrost control, evaporator fan, and alarm.

The ERC-2 includes a digital display module that provides a readout of the temperature, time, and built-in diagnostics. The display module can be mounted locally or remotely from the unit and contains a touch keypad for simply programming. For defrost control it uses a real time clock.

This control is NSF certified and can be applied to many different commercial refrigeration applications like reach-ins, walk-ins, refrigerated cases, or other different products where accurate control of refrigerated space and defrost cycles is required.

## Programming Paragon Case Controller

Remove cover from Paragon display so display LED is visible as shown.



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

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

*NOTE: During programming, if no button is pressed for thirty (30) seconds, the control will go back to the normal operation mode. This is valid for both programming levels.*

*NOTE: When changing the time, press and hold the MAN DEF button for three (3) seconds to change the AM / PM mode.*

To change the other parameters (Second Level), follow these steps:

1. Press and hold SET and DOWN for ten (10) seconds. The display will show "dSPL." Press SET to change the parameter.
2. Press UP or DOWN to change options, time, or temperature for the currently selected parameter. Press SET to accept new value.
3. Press DOWN to go the next parameter. Then, go back to Step 2. After the last parameter is displayed (ALHi), the display will return to the normal operating condition.

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## DX6LN PARAGON ERC-2 Controller Settings

Set the Paragon ERC-2 controller parameters as described in table below:

CloC = Set to local time	SEt = 32	dSPL = rSP°	CLHr = 12HR
°dSP = F°	dFtP = ELEC	EFAN = yES	CFAN = on
dFin = TdAy	CoFF = 0:00	Con = 0:00	Alrd = 0:00
CPrn = NA	nodF = 6	dEF1 = 00:00 dEF2 = 04:00 dEF3 = 08:00 dEF4 = 12:00 dEF5 = 16:00 dEF6 = 20:00	dEFd = 25
Fand = 0:00	Pudn = 0:00	DriP = 0:00	diF° = 1
tDEF = NA	dEF° = 47°	Fan = NA	ALLo = 27
ALHi = 60			

## Condensate Evaporation Pan Heater

The Condensate Evaporation Pan Heater has the following features:

- Electrical Rating: 208V / 60Hz / 1 Phase, 6 ft case: 7.21A, 1500 W, 8 ft case: 14.42A, 3000W  
12 ft case: 14.42A, 3000W
- Condensate Dissipation Rate: 6 ft case: 9.3 gallons per day, 8 ft case: 18.5 gallons per day  
12ft case: 18.5 gallons per day
- 3.75 Gallon Pan: (A) 6 ft: 1 pan, (B) 8 ft: 2 pans, (C) 12 ft: 2 pans
- Evaporation pan heater is UL Listed.

## Buck and Boost Transformer (Optional)

A 1.5 KVA Buck & Boost transformer is an available option. The primary and secondary of the Buck & Boost transformer can be interconnected for use as an autotransformer to slightly step up or down voltages. When used as an autotransformer to slightly adjust voltage, the Buck & Boost Transformer can carry loads in excess of its nameplate rating.

Example: With the transformer wired to provide 208V output with 195V input, the load capacity of the transformer is 19.5 KVA.

When the Buck & Boost transformer option is chosen, the transformer is factory wired to provide 208V output with 195V input. The transformer connections can be rewired in the field to provide alternative buck and boost percentages. Wiring instructions are provided on the transformer cover. Transformer is UL listed.

# STRATUS Multi-Deck Display Case

## Case Data

### DX6LN-MCU

### SINGLE DECK MERCHANDISER



**KYSOR WARREN**

General Case Data	Case Length (ft)		
	6'	8'	12'
Total Display Area (ft <sup>2</sup> )	28.10	37.40	56.20
Cubic Capacity (ft <sup>3</sup> )	71.60	96.50	143.20
Max Shelf Depth (in) [Top/Bottom]	22/22	22/22	22/22
Weight (lb)	-	-	-
<b>Thermal Load (General)</b>			
Evaporator Temperature (°F)	22	22	22
Discharge Air Temp (°F)	35	35	35
Discharge Air Velocity (fpm)	200-300	200-300	200-300
Fan Speed (rpm)	2200	2200	2200
Refrigerant Type	R-448A	R-448A	R-448A
Estimated Refrigerant Charge (lbs)	8.00	10.00	14.00
Conventional Thermal Load, Single (Btuh) unlighted	8007	10676	16014
Superheat Setpoint (°F)	6 - 8	6 - 8	6 - 8
<b>Electrical Data (Amps/Watts)</b>			
Power Supply (Volts/Hertz/Phase)	208V/60HZ/1PH 115V/60HZ/1PH	208V/60HZ/1PH 115V/60HZ/1PH	208V/60HZ/1PH 115V/60HZ/1PH
Evaporator Fan Motor Amps (115 V)	0.60	0.60	0.90
Anti-sweat Heater Amps (115 V)	N / A	N / A	N / A
Lights Amps (115V)	0.43	0.47	0.71
Defrost Heater Amps	N / A	N / A	N / A
Condensate Pump Amps (115 V)	1.90	1.90	1.90
Condensate Pan Heater Amps	7.21	14.42	14.42
Compressor RLA	12.00	15.70	23.20
Condenser Fan Motor Amps	2.20	2.20	2.20
Refrigeration Cycle Amps	2.03	2.12	2.69
Defrost Cycle Amps	2.03	2.12	2.69
Case Circuit Minimum Circuit Ampacity	2.54	2.65	3.36
Case Circuit Maximum Overcurrent Protection	15	15	15
Condensing Unit Minimum Circuit Ampacity	17.20	21.83	31.20
Condensing Unit Maximum Overcurrent Protection	25	35	50

Defrost Data (IOff Cycle)			
Defrosts per Day	Failsafe Duration (min) <sup>1</sup>	Termination Temp (°F)	Drip Time (min)
6	25	47	0

<sup>1</sup> At ASHRAE conditions. For conditions above 75°F, 55% RH, increase defrost time by 15 min. Type I refrigerator, intended for use in an area where the environmental conditions are controlled and maintained that conditions do not exceed 75°F and 55% relative humidity. Heatcraft Worldwide Refrigeration, whose policy is one of continuous improvement, reserves the right to change at any time specifications, designs, or prices without incurring obligation. DOE 2017 Compliant

**The fail safe time may be extended to a maximum of 28 minutes to allow for store condition variations, refrigeration system variations, and heavy shopping traffic. If the fail safe time is extended, the termination temperature must remain at 47°F.**

#### APPLICATIONS



ANSI / NSF 7  
The above case model has case lengths that are UL and NSF approved.

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## Maximum Top Shelving Size Recommended: 22”

*NOTE: The refrigerated air curtain is very important to the performance of this case. The load limit line (see operation section) is the indicator of the inside edge of the air curtain and at no time should shelving, product, signs, debris, etc., interfere with the air curtain.*

*NOTE: Temperature is measured in discharge air. Defrost frequency is at design conditions. Higher temperature or humidity may require more defrosts per day and longer fail-safe times. These cases are not designed to operate in environments where the ambient temperature does not exceed 75°F dry bulb temperature with 55% relative humidity.*

*NOTE: Off-cycle defrost is the recommended defrost type. Refer to [www.kysorwarren.com](http://www.kysorwarren.com) for other electrical data and information.*

*CAUTION: Failure to maintain store air conditions below 75°F dry bulb temperature with 55% relative humidity may result in operational issues such as the following: increased thermal (Btuh) load, high product temperatures, coil icing, product frosting, and external surface condensation.*

*CAUTION: Failure to properly install electrical wiring and control wiring per wiring diagrams, defrost settings, and temperature set-points may result in operational issues such as: increased thermal (Btuh) load, high product temperatures, coil icing, product frosting, and external surface condensation.*

## Case Installation

These display cases are installed individually.

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.
3. Verify at least 2 feet of distance between hot and cold cases.
4. Ensure floor loading will support the case and the case contents.
5. Ensure proper AC power is available. Refer to case AC input requirements located in the electrical connections section of this manual.
6. Ensure location will allow connection to drain lines and the drain line, when installed, will meet the recommendations as set forth in the refrigeration piping and dehydration section of this manual.
7. Ensure expansion valve in case is the proper valve for the type of refrigerant used at the installation site.

*CAUTION: To prevent condensation on the end panels of cases, a minimum of 3.0 inches between walls or other cases is required for airflow. If 3.0 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.*

## 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

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

1. Remove all shipping tape from lamps and ensure that all lamp ends are snapped firmly in place.
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 ends while moving the case. Use the case lift points on the case to move it to the proper location.*

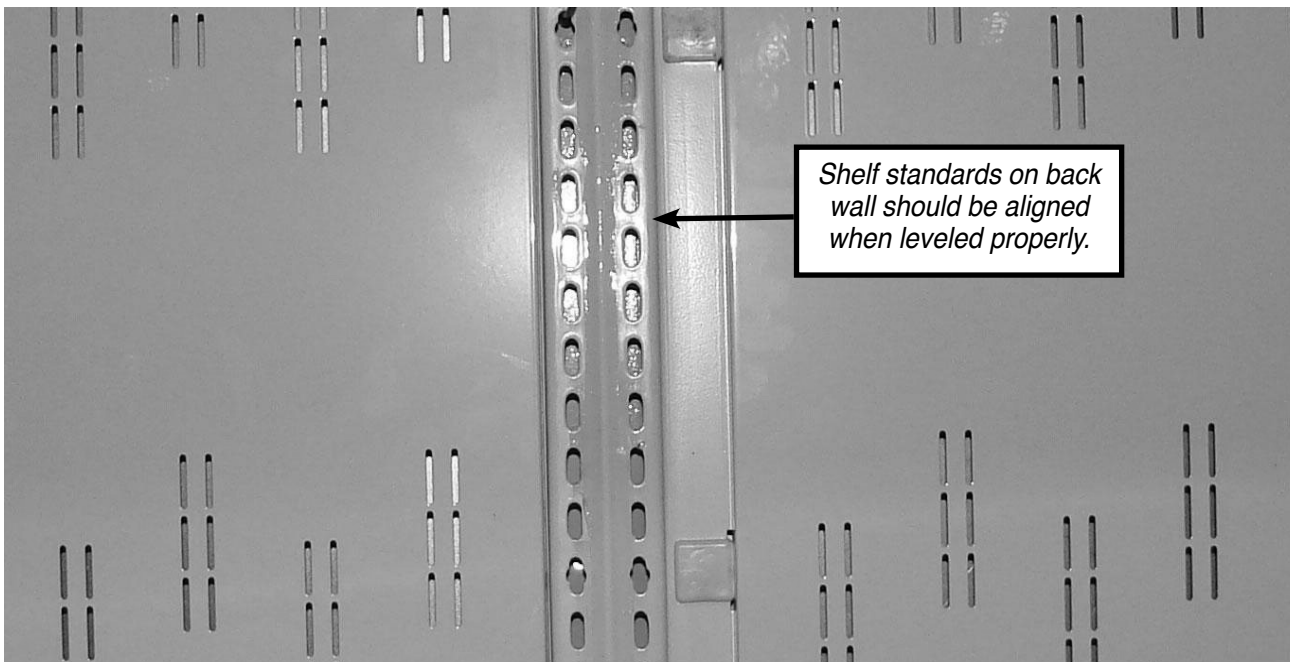


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## Installing Case

1. Ensure all preparation for installation, as outlined in the above paragraphs, have been fully complied with and are complete.
2. If multiple cases are to be installed, find the highest area of the floor to place the first case.
3. All cases must be located on a firmly based floor and be leveled within plus or minus 1/16 inch.
4. Use metal shims where required to support entire length of the cases at each base leg (front and back). All base legs must be shimmed under the skid rail where the base leg meets the lower rails (typically every 4' on 4' and 8' cases, and every 6' on 6' and 12' cases). If the case is equipped with adjustable leveling legs, all legs should be adjusted so that all are making equal contact with the floor for equal weight distribution. **WARNING!** If any part of the case rail or leveling leg is not supported at each base leg, the case can appear out of level or become damaged when product weight is added.
5. If multiple cases are to be installed, refer to the floor plan and install the first case in the lineup by snapping a chalk line where the front and rear of the cases are to be located.
6. Continue the chalk line if multiple cases are to be installed. The first case is typically the case that is at the highest area on the floor.
7. Connect water drain line. Reference waste outlet (drip pipe) description and location procedure later in this manual.
8. Connect input AC power. Reference electrical installation procedure later in this manual.
9. Connect refrigerant lines. Reference procedure later in this manual.
10. Install all ends, caps, and trim per the applicable instructions contained in this manual.
11. Remove shipping tape on fluorescent lamps and remove all other shipping material.
12. Refer to the operational start up procedures later in this manual. If multiple cases are to be installed, refer to the following paragraph for installing subsequent cases.

CASE MUST BE LEVELED FROM FRONT TO BACK AND END-TO-END AND SUPPORTED CONTINUOUSLY AS NEEDED WITH SHIMS UNDER EACH BASE LEG



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## Waste Outlet (Drip Pipe) Description and Location

These cases are equipped with a 1-1/2" PVC waste outlet connection that terminates in the center of the display case below the insulated bottom. The water seal trap, elbow and cap are shipped loose for field installation.

*NOTE: Improperly installed drain piping can seriously affect the operation of the case and result in increased maintenance cost and operation issues. Listed below are some general rules for drain piping installation.*

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

## Case Freezing

Do not allow drain piping to come into contact with uninsulated suction lines that will cause drain water inside the drain piping to freeze.

## Drain Strainer

*NOTE: Not all Kysor Warren cases have drain strainers. Drain strainers are optional. This information applies only to cases equipped with drain strainers. The drain strainer is used to keep debris or foreign objects from entering the PVC drain, which could cause blockage. To install, insert into the drain until the drain strainer stops. It will not be flush with the top of the drain bushing. The strainer will extend above the hub by 1". DO NOT flatten the drain strainer.*

## Modular Condensing Unit

### Mounting Base and Enclosure

The control box and Buck & Boost transformer are attached to the top of the case. The condensing unit, defrost water evaporation pan and valance panels are shipped loose and are field installed. (Refer to pictures)

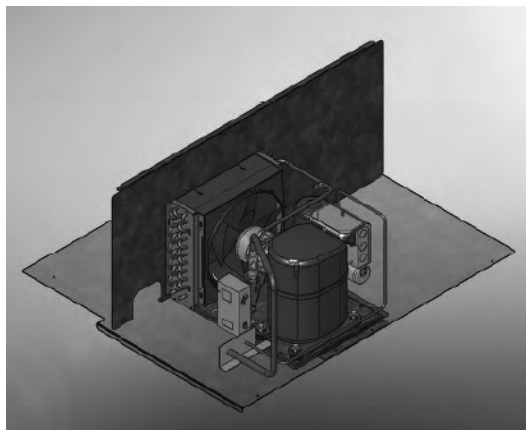
### Assembly—Modular Condensing Case

The top front valance panel has a rectangular knock out provided for the controller display to be inserted into. The top valance panel must face the front of the case. The controller display rectangular knockout will be located at the bottom left front corner of the valance panel.

1. All the components must be installed in the locations as shown in the photo.
2. The condensing unit must be positioned on top of the case in the position so that the condenser coil faces the right end of the case when viewed from the front of the case. The condensing unit must be aligned so that the refrigeration piping quick connect couplings can be attached to the condensing unit. The condensing unit should be screwed down to the top of the case after connecting the refrigeration piping quick connect couplings.
3. When the condensing unit is installed properly, there must be a minimum air gap of 12" or more between the air inlet side of the condenser coil and the end valance panel. A minimum space of 5" or more must be provided between the rear of the condensing unit and the rear valance panel.
4. There must be a minimum clearance of 12" between top of all fascia panels and the ceiling to allow proper air circulation to and from the condensing unit for the case to operate without experiencing performance issues.
5. All electrical wires must be routed inside flexible metallic conduit.

### Refrigeration Piping Connections

This case is designed to operate with a 208-230 Volt single condensing unit located on top of the case. Condensing units are supplied with refrigeration line quick connects (See installation of quick connect refrigeration line coupling for reference).

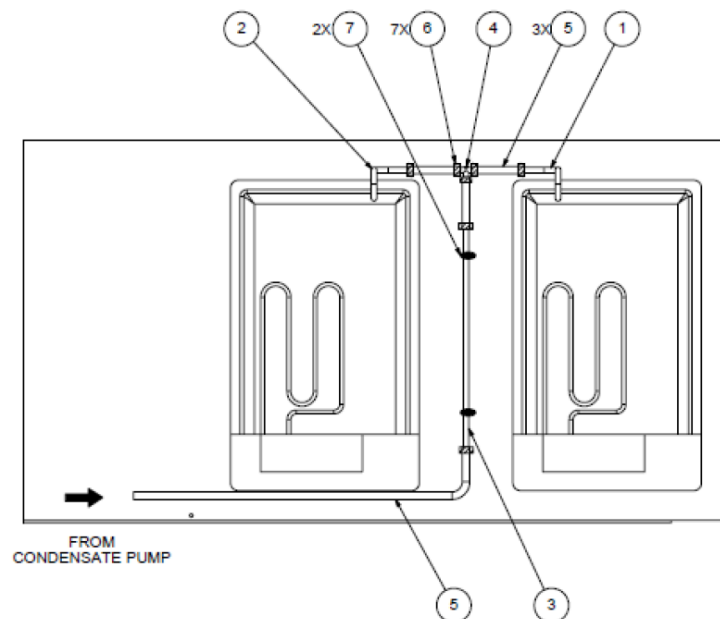
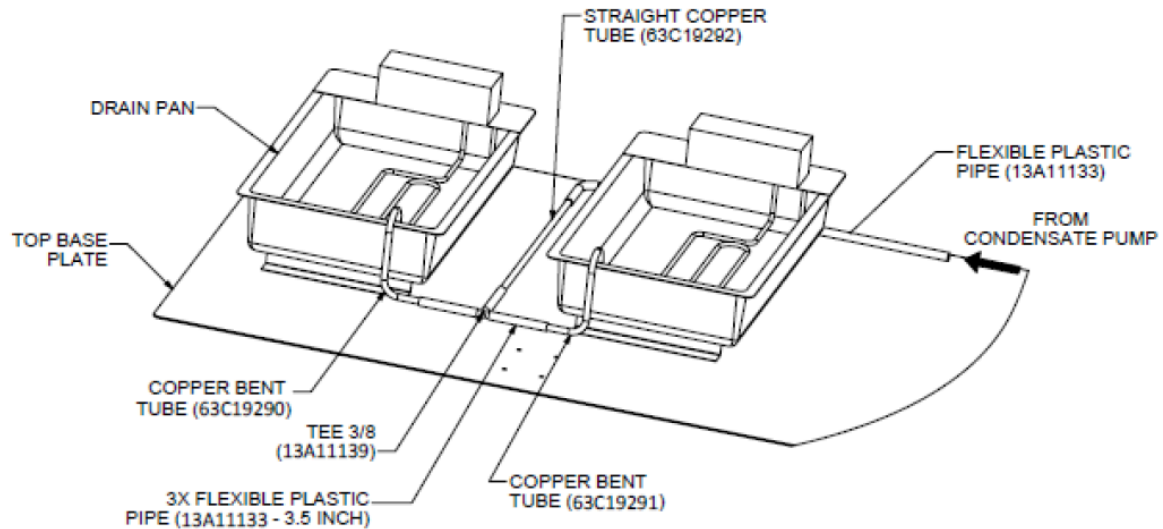


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## Assembly—Condensate Pump

The DX6LN case has around 1.54 lb condensate/ft/day. Special cares are required to make sure the condensate can be evaporated or drained to the swage. It can save a lot of energy by draining the condensate to the swage. If there is no access for drainage, please install the drain-evaporator mechanism in the following way to eliminate the water overflow to the floor. Please follow the instructions to have the right installation:

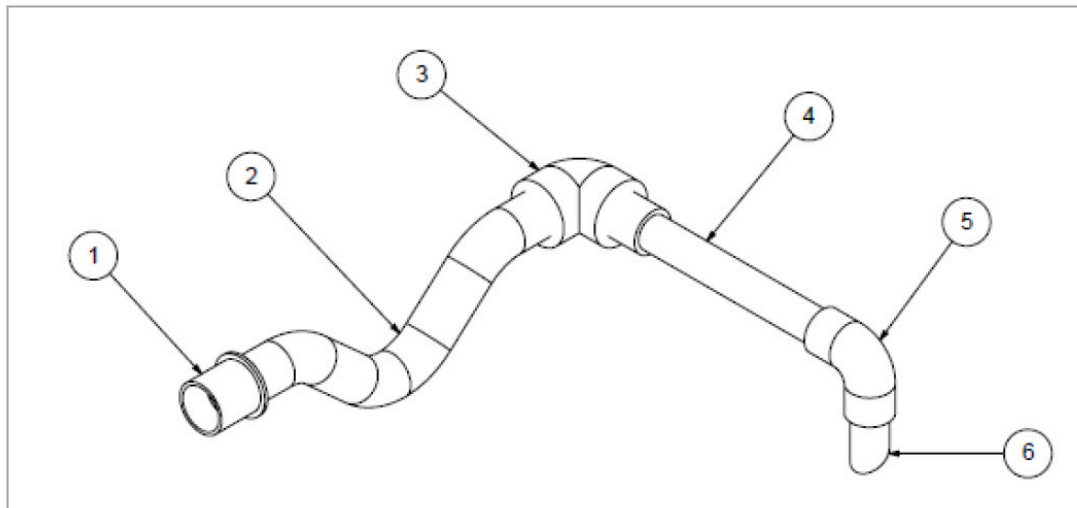
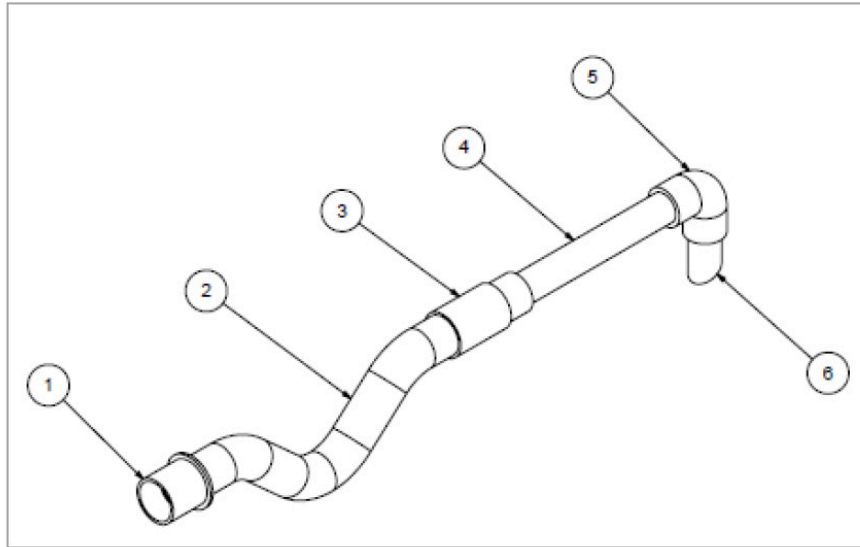
1. Mount the condensate pan heater on the top of the case.
2. Assemble the condensate plumbing as shown below.



ASSY PPG CNDS TOP DX6LN				
ITEM	PART NO	QTY	UM	DESCRIPTION
1	63C19290	1	EA	TUBE 3/8 TEE TO RH DRNPN DX6LN
2	63C19291	1	EA	TUBE 3/8 TEE TO LH DRNPN DX6LN
3	63C19292	1	EA	TUBE STR 3/8 16.00
4	13A11139	1	EA	TEE 3/8 X 3/8 X 3/8 HDPE
5	13A11133	20	FT	TUBING 3/8"ID 1/2"OD PVC BLK 20'
6	X73404	7	EA	#4 HOSE CLAMP (5/8-7/32)
7	16K12050	2	EA	CLAMP-TUBE 3/8 OD COL0607Z1

## Assembly—Condensate Pump (cont.)

3. Condensate is collected into the condensate pump with the following diagram.
4. Please make sure that the condensate flows into the pump pan. Make sure no leakage at the joints.



ITEM NO.	PART NO.	DESCRIPTION	QTY
1	07E10043	ELBOW PVC 1" SLIP X 1" SLIP	1
2	07E10131	TRAP PVC 1" DRAIN SCH40	1
3	07C10021	ELBOW-PVC 90DG 1" SLIP X 1" SL	1
4	89B12039	PVC 3/4" CPLNG FLXBL 18" FRC007	1
5	07C12015	PVC 3/4" SCH-40 90 DEG ELBOW	1
6	89B12040	PVC 3/4" SCH-40 PIPE	1
7	48A10007	PUMP CONDENSATE CP-22LP	1

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## Refrigeration Piping Coupling Connection Instructions

The couplings on the ends of the pre-charged line sets are self-sealing when installed properly. Follow these instructions carefully. An EPA Certified Type II or higher technician must perform these steps.

### Initial Connections

1. Remove the protector caps and plugs. Wipe the seats and threaded surfaces with a clean cloth to remove any possible foreign matter.
2. Thoroughly lubricate the threads, O-rings, diaphragms, and all internal coupling surfaces with polyester refrigerant oil.

**CAUTION:** Lubricating is very important. Couplings will leak without lubrication.



**Swivel Nut Before Connecting**



**Male End Before Connecting**



**Clean and Lubricate Couplings**

3. Position the condenser with the fittings facing the female fittings on the case. See picture above for locations and fitting size in table below.
4. Begin to tighten the couplings together by hand. Continue to turn the swivel nuts by hand until it is certain that the threads are properly engaged.
5. Using two wrenches, one to rotate the swivel nut and one to hold the tubing in place, tighten each coupling.

**CAUTION:** It is **CRITICAL** that **ONLY** the **NUT** on the pre-charged tube be turned, or the diaphragms will be torn by the piercing knives and become loose in the refrigeration system causing severe operational problems.

**NOTE:** As the coupling is tightened, the diaphragms in the quick connect couplings will begin to be pierced. As that happens, there will be increased resistance to tightening the swivel nut.

6. Continue tightening the swivel nut until it bottoms out or a very definite increase in resistance is felt (no threads should be showing). **DO NOT OVER-TIGHTEN.**
7. Use a marker or pen to mark a line on the coupling nut and unit panel. Then tighten the coupling nut an addition one-quarter turn.
8. After all connections have been made, check the couplings for leaks.

### Tighten Swivel Nut



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## Coupling Description

The following pages show the stages of coupling assembly as the swivel nut and male fitting are drawn together.

The swivel nut end contains one diaphragm in the center post. The male fitting contains the knife blades and its own diaphragm.

*NOTE: 3/8 male ends have one knife blade.*

No sealing takes place until the final stage, when the outer edge of the center post in the swivel nut is forced against the bottom of the male fitting, creating a mechanical seal.

Below appears to be a completed assembly with only two threads showing, but the diaphragms have just begun to be pierced. This causes severe operational issues as well as refrigerant leaks.

Rotate Swivel Nut 1/4 Turn More



**Two Threads Showing**



**Knives Just Showing**



**Barely Pierced**



Below shows an even more complete assembly, with only one thread showing. However, this assembly is still not complete. If not tightened further, there will be refrigeration restrictions and leaks.

**One Thread Showing**



**Knives Exposed**



**Partly Pierced**



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Below shows the two parts almost together; the threads are flush. At this point the main problem will be refrigerant leaks.

**Threads Flush**



**Knives Visible**



**Pierced, but will leak**



**Correctly Tightened**



**Knives Fully Open**



**Fully Pierced**



*NOTE: Couplings that are screwed together but have threads showing are not only leaking refrigerant, they are restricting the flow of refrigerant through the small slits in the membranes or diaphragms.*

*NOTE: The condensate drain pan will slide under the case. The pump will be located on the top of the case. An outlet is provided under the case to plug the pump into. Under no conditions should anything else be plugged into this outlet.*

A 3/8" plastic drain tube is supplied with the case and must run from the drain pan pump up the back of the case to the top of the case and into the evaporative condensate pan.

The copper loop on the end of the tube hangs over the edge of the evaporative pan.



## Electrical Connections—General

*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 items such as fans, heaters, thermostats, and light bulbs. Failure to disconnect the electrical power may result in personal injury or death.*

*CAUTION: Failure to properly install electrical wiring and control wiring as per wiring diagram(s), defrost settings, and temperature set-points may result in operational issues such as the following: increased BTUH load, high product temperature, coil icing, product frosting, and external sweating.*

## Shelf Light Installation—T8 Shelf Lights

- Make sure plugs are FULLY SEATED before applying power.
- Due to the nature of rapid start ballasts, it is highly recommended that lights are plugged in BEFORE power is applied to cases, and BEFORE cases are at temperature.
- If lights flicker when first started up, cut power to lights, verify plug is fully seated, and then make sure power is off for at least 20 seconds before re-applying power.

*CAUTION: Failure to follow these instructions may result in premature bulb and ballast failure.*

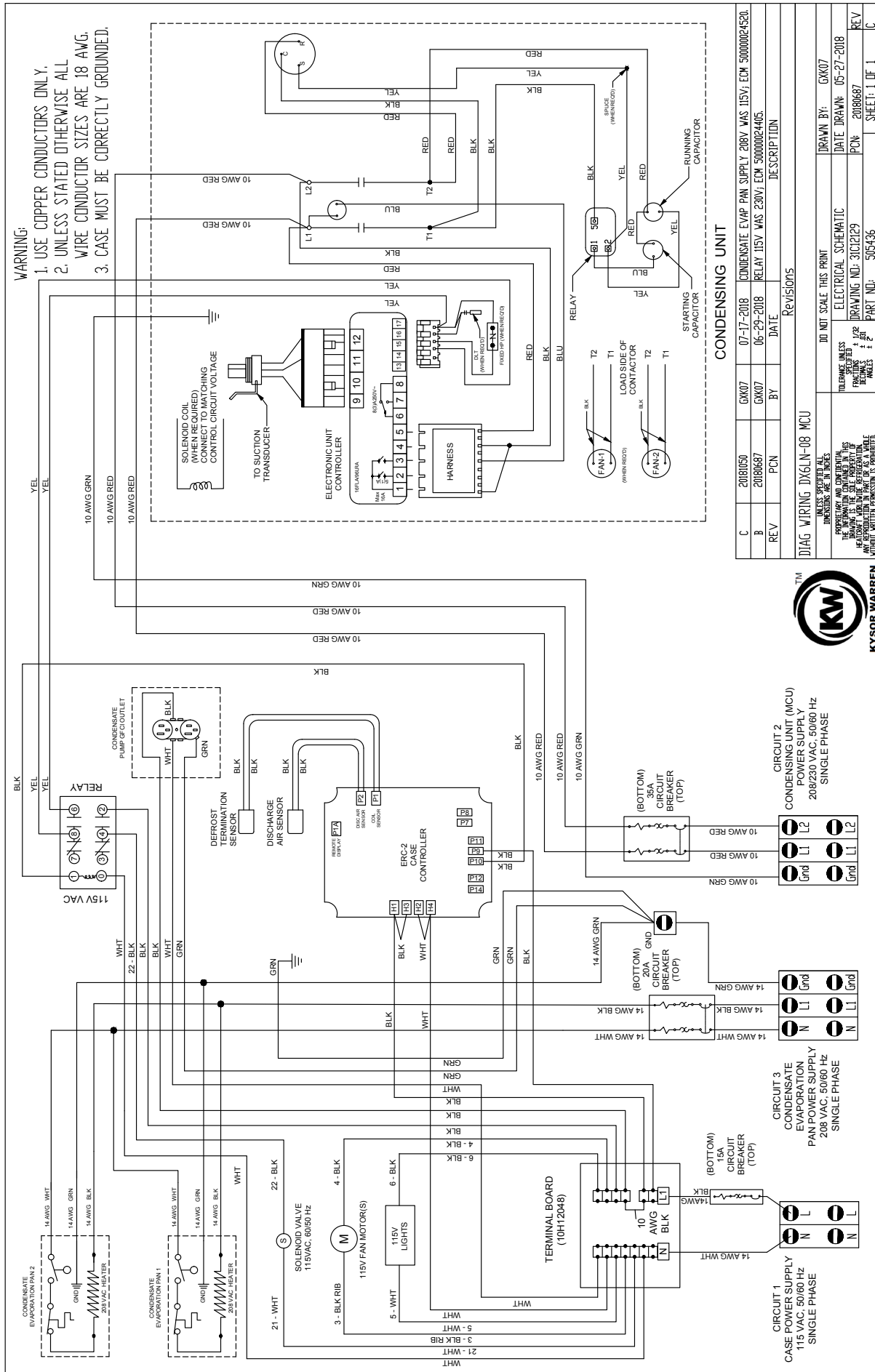
*NOTE: Failure to follow installation instructions may void standard warranty.*

## Electrical Termination

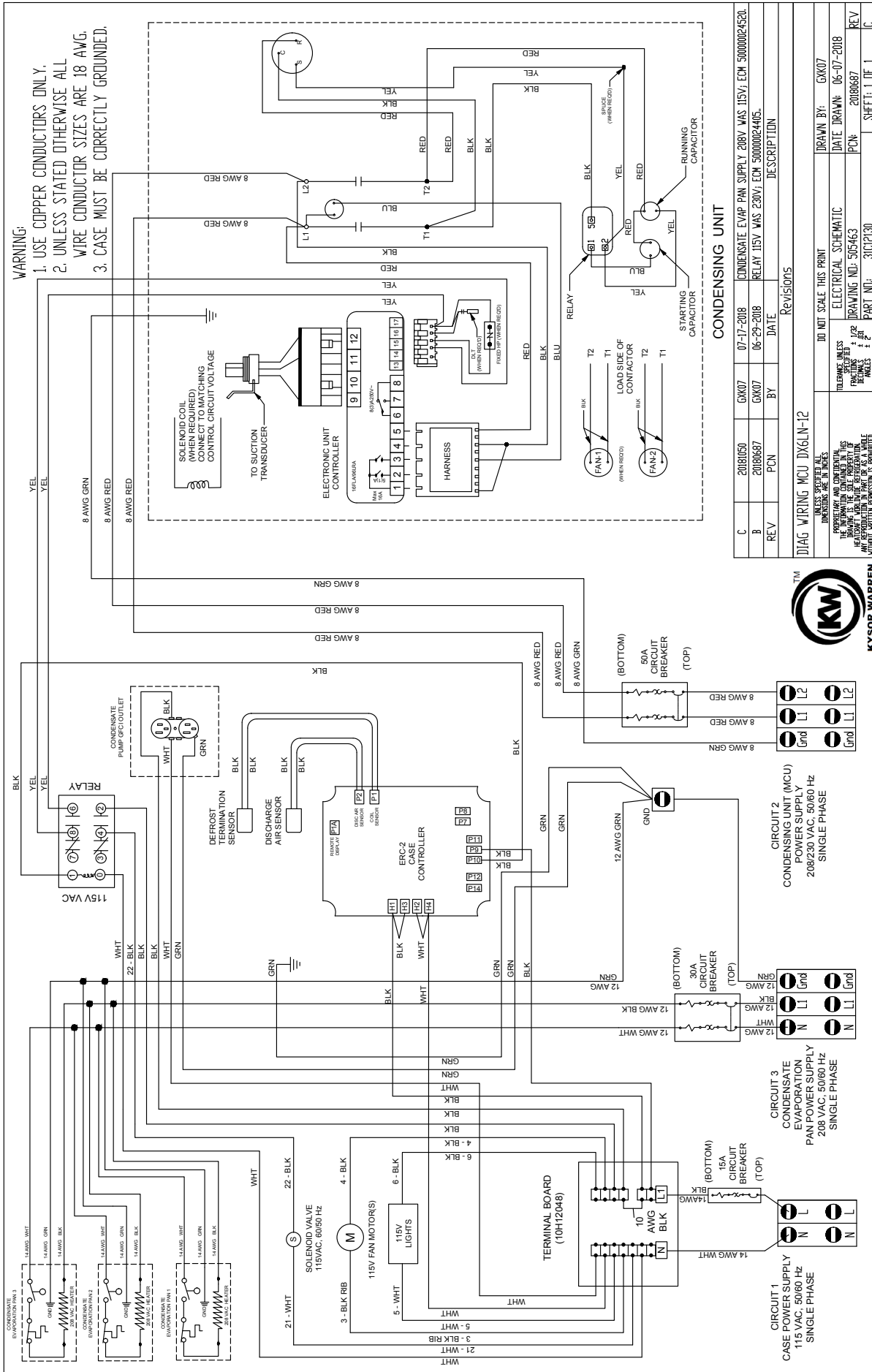
There are three field power supply connections consisting of: (A) condensing unit; (B) case power supply and (C) defrost water evaporation pan. (see Wiring Diagrams in this section)

# Installation and Operation Manual

## Wiring Diagram / 6 Ft. Model

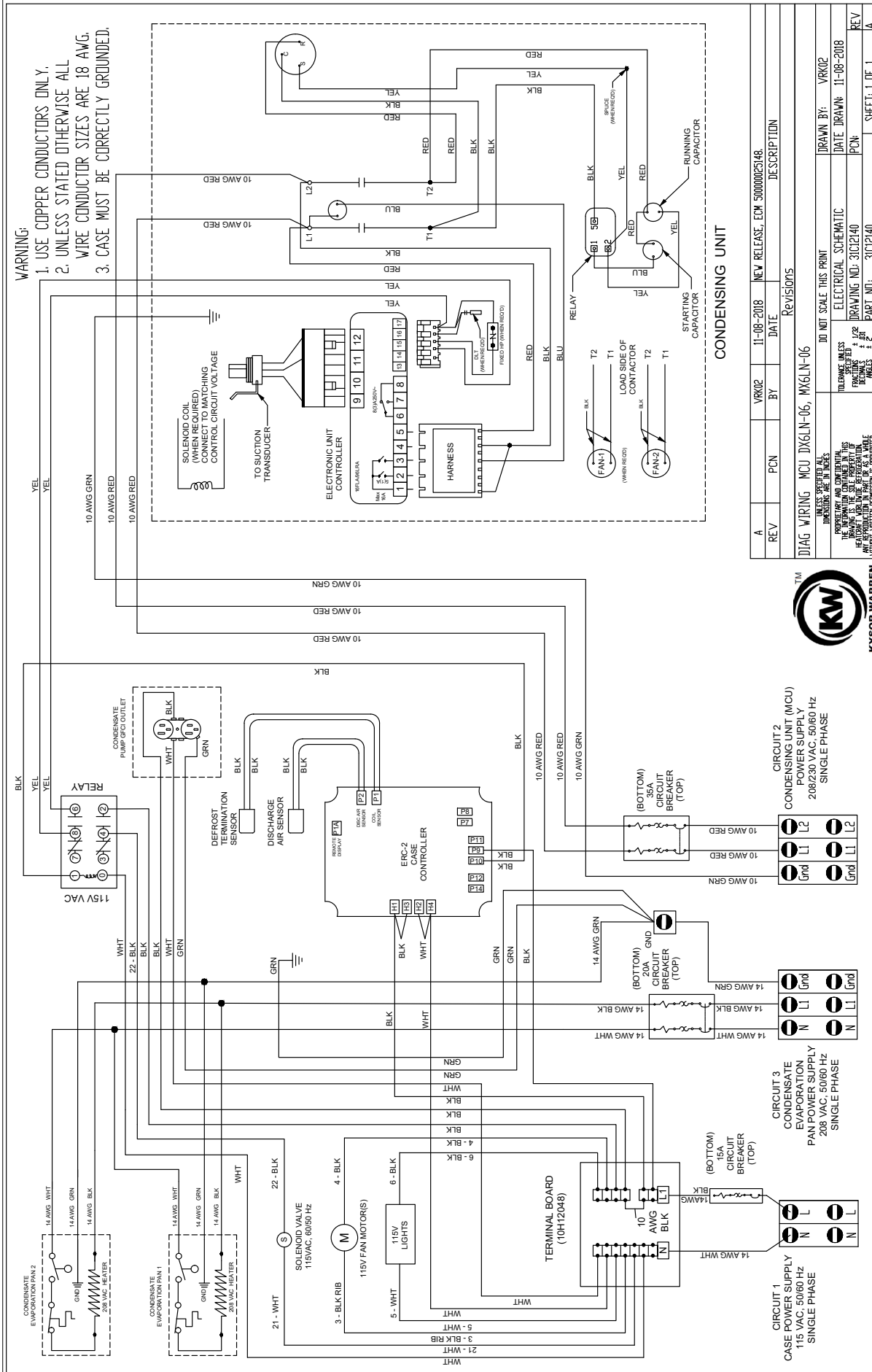


## Wiring Diagram / 8 Ft. Model



# Installation and Operation Manual

## Wiring Diagram / 12 Ft. Model



KYSOR WARREN

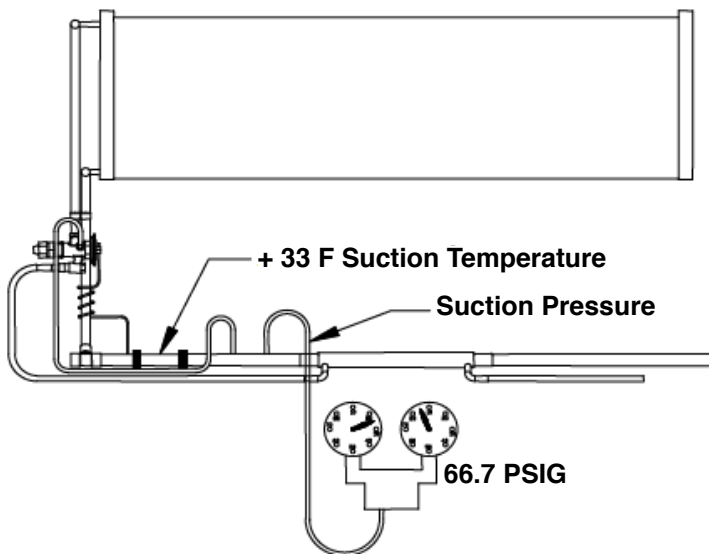
## Expansion Valve and Superheat

**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 closest is at the condensing unit, 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 the 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 at 6-8°F.
5. After the initial setting, the superheat should be rechecked when product is stocked and at designed temperature.

## Superheat Calculations



**Example: R404**

**+ 33 F Suction Temperature**

**+ 28 F Suction Pressure Converted to Temperature**

**= +5 F Superheat**

# Installation and Operation Manual

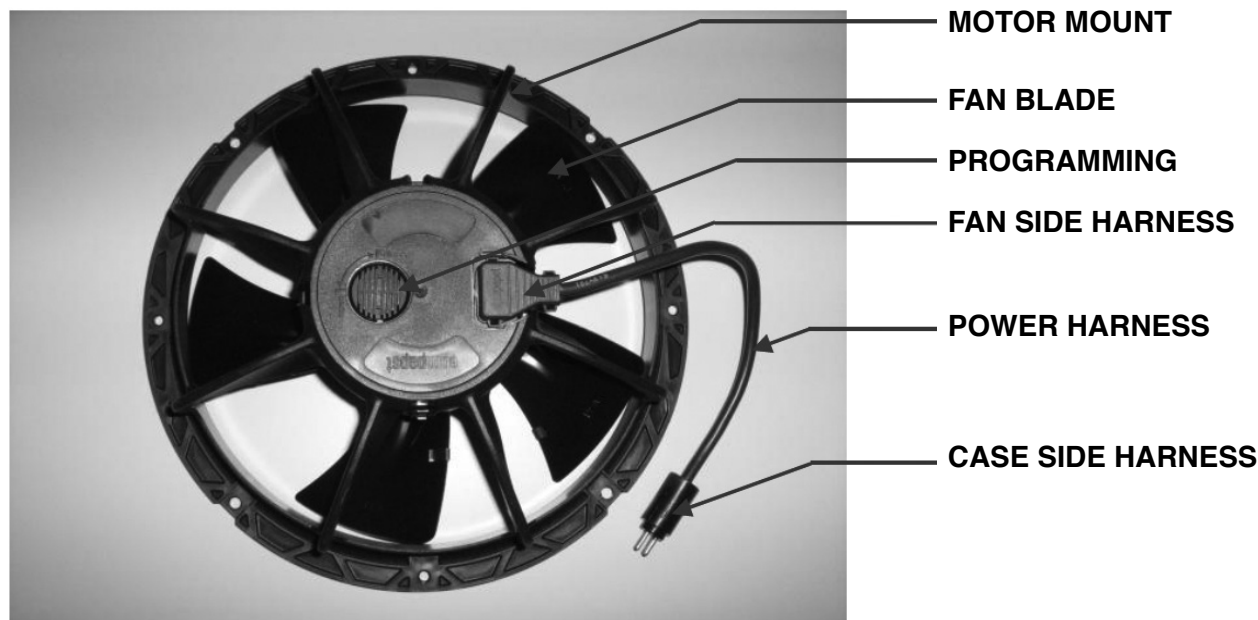
## ECM Evaporator Fan

### Product Overview

This troubleshooting guide covers the evaporator fan. The fan is supplied as a complete assembly (fan blade, motor mount and power harness) with no replaceable components. An electronically commutated (brush-less) motor powers the fan.

### The following problems are addressed:

- motor is not spinning at the correct speed
- motor is not spinning
- motor sounds noisy



### Procedures—Fan mounted in the case

#### Motor is not spinning at the correct speed

- Disconnect fan power. Use the handheld speed programmer P/N HX0C-003-000-01 and the instructions in the accompanying operating manual to confirm that the fan speed setting is correct for the case model. If the setting is incorrect, reprogram the fan as needed, disconnect the programmer and reconnect fan power. If the setting is correct, continue with the troubleshooting.

#### Motor is not spinning

- Perform a hard reset of the electronics by removing power to the fan for at least 10 seconds.
- Check that the fan blades are completely free of obstruction by manually spinning the fan blade.
- If any obstruction is found, remove it and inspect the fan blades for damage.
- Replace any fan with bent or gouged blades. Small nicks in the blades are acceptable.
- Check that the correct power is being applied at the case side of the fan harness and that the harness is firmly connected to the power line.
- Reapply fan power and check if the problem has been resolved.

*NOTE: If the above actions do not solve the problem, disconnect power to the fan and remove the fan from the case along with its harness.*

## Procedures—Fan removed from the case

1. Disconnect the fan plug from the case wire harness and inspect the pins. If they appear bent, straighten them out and reconnect the plug. If pins are broken, replace the power harness.
2. Remove the fan side harness plug from the back of the fan. This is generally best accomplished by placing a thumb under the plug and applying steady pressure outwards from the fan.
3. Check for liquid in the slot where the harness plugs into the fan. If any liquid is present, check that the seal around the perimeter of the slot is completely intact. Replace any fan with a damaged seal. If the seal is good, completely dry out the slot and the harness pins before proceeding further.
4. Check the resistivity across the L1 & N fan side male pins with the common lead from the ohmmeter on the N pin. Check the resistivity across the speed selection and L1 pins with the common lead on the L1 pin. Both measurements should have a value of  $M\Omega$ 's (typically 2-3 $M\Omega$ ). If either reading is zero or infinity, replace the fan.

### 2. FAN HARNESS PLUG



### 4. RESISTIVITY



SPEED SELECTION

L1 (LINE)

N (NEUTRAL)

SEAL

5. If the resistivity measurements are good, reconnect the power on the case side of the fan harness and check that the correct voltage is being applied at the fan side harness pins.
6. If a problem is found with the voltage at the fan side of the harness, perform a continuity test on each leg of the harness. Replace the fan if the harness is found to be bad.
7. If the continuity test is good, check the fan side harness connections for any damage or corrosion to the female pins in the harness or the male pins in the fan. Replace the fan if any damage or corrosion is seen.

*NOTE: If the above checks / changes do not fix the motor issues, the motor should be replaced.*

*NOTE: Any time the fan side harness connector is plugged back into the fan, be sure to press it all the way down in order to make a good seal.*

# Installation and Operation Manual

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## Operation

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 THE ADJUSTABLE SHELVES.**

*CAUTION: 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.*

*CAUTION: Do not allow any product, signs, debris, etc., to block these grilles.*

*CAUTION: 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.*

1. Off-Cycle Defrost is standard on these models. The fans run continuously and defrost termination is by termination Klixon.
2. Electric Defrost Models are standard for low temperature cases. Electric heaters are utilized to melt the frost and ice on the coil. The heaters are located in the air stream underneath the coil. The defrost cycle is time initiated and temperature terminated. Case fans shut off during defrost. During refrigeration the fans start after the evaporator coil temperature reaches 10°F and run continuously thereafter. As a safety precaution, a safety cutoff Klixon is wired in series with the defrost heater to turn the heater off at temperatures above 65°F.
3. 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

As a general rule, always use mild soap and water to wipe the case down, including the sliding doors at the back of the case. 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.*



# STRATUS Multi-Deck Display Case

CAUTION—The following could damage the case:

- Use of cleaning products containing chlorine, chloride ion, the words Bleach, is not recommended for unpainted stainless steel surfaces as it may cause rust to form. The operational warranty of the equipment will be voided if these products cause rust to form on the stainless steel parts or any other parts of the equipment.
- 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 the shelves 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.

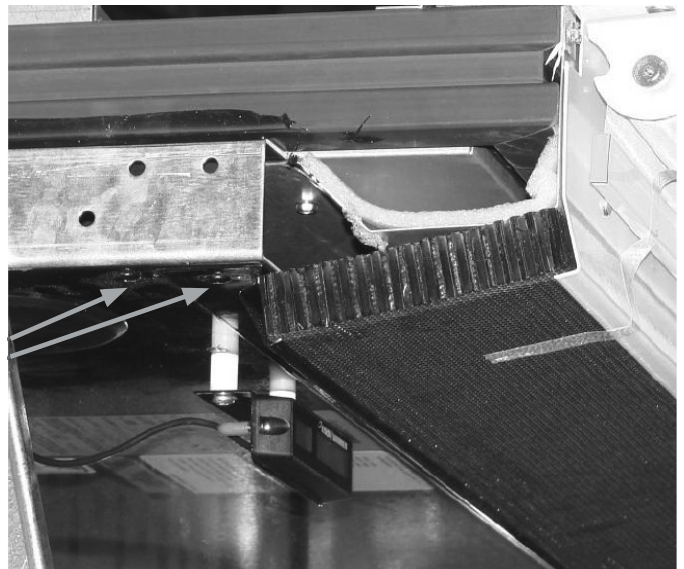
To help prolong the life of the mirrors:

- Use only mild cleaning solutions (Windex, or a weak solution of vinegar and water).
- Do NOT spray liquids on mirrors. Dampen the cleaning cloth, and 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.

## Honeycomb Assembly

The 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. Note the position and angle of the honeycomb when removing from the case. Honeycomb must be replaced at the same angle.

SCREWS



# Installation and Operation Manual

## Parts List

Description	Part No.	Quantity			
		4 FT	6 FT	8 FT	12 FT
Fan Motor ECM	09A10114	1	2	2	3
Honeycomb - White	13A15153	1	2	2	3
Honeycomb - Black	13A15154	1	2	2	3
Deck Pan PTD	54N18604	2	3	4	6
Deck Pan BRT	55M16178	2	3	4	6
External Drain Trap	96H46371	1	1	NA	1
External Drain Trap	96H46370	NA	NA	1	NA

*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 Heatcraft Worldwide Refrigeration for replacement parts.*

## Warranty—Rev. January 2015

### Standard Warranty:

Seller warrants to its direct purchasers that Products, including Service Parts, shall be of a merchantable quality, free of defects in material or workmanship, under normal use and service for a period of one (1) year from date of original equipment start-up, or eighteen (18) months from date of shipment by Seller, whichever first occurs. This warranty runs to only the original purchaser of equipment or part. Any Products covered by this warranty found to Seller's satisfaction to be defective upon examination at Seller's factory will at Seller's option, be repaired or replaced and returned to Buyer via lowest common carrier Ex-Works Seller's dock. This is buyer's sole and exclusive remedy and, except as provided in the next sentence, seller's sole and exclusive liability in connection with the warranty. Or Seller may, at its sole option, grant Buyer a credit for the purchase price of the defective Product. Buyer must prepay all costs for transportation of Products to Seller's factory.

Seller shall have no liability for expenses incurred for repairs made by Buyer except by prior, written authorization. Any claim under this warranty shall be made to Seller in writing within the warranty period specified above – otherwise such claim shall be deemed waived. Seller shall have no warranty obligation whatsoever if its products have been subjected to alteration, misuse, negligence, free chemicals in system, corrosive atmosphere, accident, or if operation is contrary to Seller's or manufacturer's recommendations, or if the serial number has been altered, defaced, or removed.

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 SELLER ARE HEREBY DISCLAIMED.

### Additional Warranties:

The Standard Warranty specified above applies to all Products and Service Parts unless modified by the following:

#### THERMO-FLEX™ OR FLOATING TUBETM DESIGN COIL

Seller warrants the Thermo-Flex/Floating Tube Design Coil of the "BM", "BH", "CM", "CH", "HM", "HH", "MM", "ML" or "LH" series of Unit Coolers; coil section of the "BLV", "BDVS", "BBV", "JLD", "JDDS", "JBD", "BDT", "BDN", "BDS", "BDB", "BZT", "BZN", "BZS", "BZB", "CDD", "CDDS", "CDT", "CDN", "CDS", "CZT", "CZN", "CZS", "HDD", "HDDS", "HDT", "HDN", "HDS", "HZN", "HZN", "HZN", "LDV", "LDVS", "LDD", "LDDS", "LDT", "LDN", "LDS", "LZT", "LZN", "LZS" condensing units; and coil section of the "BN", "CN", "HN" or "LN" models of Air-cooled Condensers for a period of five (5) years from shipping date, in the event of any documented and verified (by Seller's representative)

# STRATUS Multi-Deck Display Case

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leaks in the coil tubes containing refrigerant at the point of and caused by tube contact with the end or center coil support sheets.

Seller will also reimburse the replacement cost of lost refrigerant for a period of five years from the date of shipment from leaks specifically caused by the reasons stated above. The replacement cost will be limited to one full system charge. The warranty specifically excludes leaks at header and weld joints, split tubes or leaks caused by failure to operate the product in accordance with published guidelines for operation and installation of equipment. The cost of replacement refrigerant will be limited to Seller's indexed nationwide average of refrigerant cost per pound. The warranty excludes any fines/fees related to refrigerant leaks.

## Air-cooled CONDENSERS "BN", "CN", "HN", "LN" or "NRG" Models"

Seller warrants Air-cooled Condensers "BN", "CN", "HN", "LN" or "NRG" Models" for a period of two (2) years from date of original installation, or 30 months from the date of shipment by Seller, whichever first occurs.

## Optional EC Condenser Fan Motors EC Motors

Seven (7) Blade motor assemblies – for a period of four (4) years from date of original installation, or fifty-four (54) months from date of shipment by Seller, whichever first occurs.

Five (5) Blade motor assemblies – for a period of three (3) years from date of original installation, or forty-two (42) months from date of shipment by Seller, whichever first occurs.

## Unit Cooler EC Fan Motors

Seller warrants EC Motors (made by McMillan) for a period of two (2) years from date of original installation, or thirty (30) months from date of shipment by Seller, whichever first occurs.

## Beacon II™ CONTROL SYSTEMS

Seller warrants the Beacon II™ Control System for a period of three (3) years from the date of original installation, or forty-two (42) months from the date of shipment by Seller, whichever first occurs.

## PRO3 PACKAGED REFRIGERATION SYSTEM:

Seller warrants the PRO3 Packaged Refrigeration System for a period of two (2) years from date of original installation, or thirty (30) months from date of shipment by Seller, whichever first occurs.

## HYPERCORE™ Microchannel Coil

Seller warrants the Hypercore™ Microchannel Condenser Coil for a period of two (2) years from date of original installation, or thirty (30) months from date of shipment by Seller, whichever first occurs.

## SMART DEFROST KIT™

Seller warrants the Smart Defrost Kit™ for a period of two (2) years from date of original installation, or thirty (30) months from date of shipment by Seller, whichever first occurs.

## MOTOR COMPRESSORS:

Motor compressor replacements or exchanges shall be made through the nearest authorized wholesaler of the motor compressor manufacturer (not at Seller's factory) and no freight shall be allowed for transportation of the motor compressor to and from the wholesaler. The replacement motor compressor shall be identical to the model of the motor compressor being replaced. Additional charges which may be incurred throughout the substitution of other than identical replacements are not covered by this warranty. An optional, non-assignable, three (3) or four (4) year extended compressor warranty may be purchased for extra cost within the boundaries of the United States of America, its territories and possessions, and Canada. With this extended compressor warranty, replacements are administered by an authorized compressor distributor only. Replacements within the time period of the standard Warranty (as modified in some instances as stated above) are available through the distributor; for the remaining years, the purchaser must submit a proof-of-purchase of a compressor and supply it to Heatcraft Warranty Claims for reimbursement.

# Installation and Operation Manual

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## THIS WARRANTY SHALL NOT APPLY:

1. 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.
2. BULBS: Light bulbs, fluorescent lamp tubes and LEDs are not covered by any warranty for length of life or for any type of breakage.
3. To the condensing unit used with refrigerated equipment unless same was sold and shipped by Seller
4. When this equipment or any part thereof is damaged by accident, fire, flood, act of God, alteration, abuse, misuse, tampering, when the original model and serial number plate has been altered, defaced, or removed or used other than the recommended application by Seller.
5. When this equipment or any part thereof is subject to operation on low, high or improper voltages. Low and high voltage is defined as more than a 5% drop below or 10% higher than name plate voltage ratings. NOTE: Proper field supply voltage to the equipment is the responsibility of the owner (end user).
6. To damage caused by overloading shelves or wire racks beyond the specified weight limits. The maximum weight limit for Seller's standard shelves and wire racks is 30lbs per square foot.
7. When this equipment or any part thereof is damaged, or when operation is impaired, due to failure to follow installation manual. NOTE: Proper installation is the responsibility of the installer, owner (end user).
8. Operational issues caused by ambient environmental conditions outside of the specified limits. Seller's indoor equipment is specified to operate in a conditioned ambient environment not to exceed 75 degrees Fahrenheit or 55% relative humidity. NOTE: Providing specified ambient environmental conditions are the responsibility of the owner (end user).
9. To equipment with final destinations unknown to seller as indicated on the original sales order.
10. To labor cost for repair or replacement of parts.
11. To special or expedited freight or shipping charges or to customs duties to any country.
12. 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.

Extended Service Agreements are provided by a third party not affiliated with Seller. The services provided by the third party are subject to the terms and conditions of the Extended Service Agreements and Seller is not responsible for those services or the third party's performance of its obligations.

IT IS EXPRESSLY UNDERSTOOD AND AGREED THAT SELLER SHALL NOT BE LIABLE TO BUYER, OR ANY CUSTOMER OF BUYER, FOR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING LOSS OF PROFITS, ADDITIONAL LABOR COSTS, LOSS OF REFRIGERANTS OR FOOD PRODUCT, OR ANY INJURY TO PERSON OR PROPERTY CAUSED BY DEFECTIVE MATERIAL OR PARTS OR FOR ANY DELAY OR MISPERFORMANCE IN THE PERFORMANCE DUE TO CAUSES BEYOND ITS CONTROL OR FOR ANY EXPENSES INCURRED BY REASON OF THE USE OR MISUSE BY BUYER OR THIRD PARTIES OF THE PRODUCTS. SELLER'S MAXIMUM LIABILITY FOR DIRECT DAMAGES IS LIMITED TO THE AMOUNT PAID BY THE BUYER FOR THE PARTICULAR ITEM OF EQUIPMENT OR PART INVOLVED.

NOTE: 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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