

HUSSMANN®

INSTALLATION & SERVICE INSTRUCTIONS FOR

DDS – DDSS SELF-CONTAINED AND REMOTE Multi-deck, Spot display Refrigerator Merchandisers

HUSSMANN®

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**P/N OII – DDS, DDSS Merchandisers
January 2006**

TABLE OF CONTENTS

SECTION 1	General Information	Page 3
SECTION 2	Installation	Page 4
SECTION 3	Refrigeration Self Contained Models	Page 5
SECTION 4	Refrigeration Remote Models	Page 6
SECTION 5	Electrical	Page 12
SECTION 6	Replacement Parts List	Page 14
SECTION 7	User Instructions	Page 20
SECTION 8	Service Tips and Wiring Diagrams	Page 22

SECTION 1

GENERAL INFORMATION

MODEL DESCRIPTION

The DDS model series are multi-deck, spot merchandisers designed for medium temperature applications such as: deli/dairy/beverage/floral. They are available as either remote type models, which require separate condensing unit connections, or self-contained models. Each self-contained model will have it's own condensing unit, factory installed beneath the display area of the case ready for operation when electrical service is connected.

The following table lists the standard models with a brief description of each, including the electrical requirements of the self-contained model. Unless otherwise specified, the electrical requirements for the remote model will be 120 volt, 60 hertz (Hz).

MODEL ELECTRICAL DESCRIPTION

MODEL	DESCRIPTION	ELECTRICAL SERVICE
DDS/DDF-4B	Self-Contained 4' Merchandiser	115 / 60 Hz / 1Ø
DDS/DDF-4D/G	Self-Contained 4' Merchandiser	230v - 208v / 60 Hz / 1Ø
DDS/DDF-6D/G	Self-Contained 6' Merchandiser	230v - 208v / 60 Hz / 1Ø
DDS/DDF-8D/G	Self-Contained 8' Merchandiser	230v - 208v / 60 Hz / 1Ø
DDS/DDF-4R	Remote Type 4' Merchandiser	115 / 60 Hz / 1Ø
DDS/DDF-6R	Remote Type 4' Merchandiser	115 / 60 Hz / 1Ø
DDS/DDF-8R	Remote Type 4' Merchandiser	115 / 60 Hz / 1Ø
DDSS-4D/G	Self-Contained 4' Merchandiser	230v- 208v / 60 Hz / 1Ø
		Symbol Ø denotes

APPLICATION

These models are designed for use only in air-conditioned stores where temperature is 75°F or less and relative humidity does not exceed 55%.

SECTION 2

INSTALLATION

SHIPPING DAMAGE

All equipment should be examined for shipping damage before and during unloading. If there is any damage, the carrier should be notified immediately and an inspection requested. The delivery receipt must be noted that equipment was received damaged. If damage is of a concealed nature, we suggest the carrier be contacted immediately, or no later than (3) days following delivery. The consignee for all damages must file a claim with the carrier.

SHIPPING BRACES

Move the fixture as close as possible to its permanent location then remove all packaging and shipping braces. Remove all separately packed accessories such as kits, shelves, etc.

EXTERIOR LOADING

These cases are not structurally designed to support excessive external loading such as the weight of a person, therefore, do not walk on the top of these refrigerators or damage to the refrigerator and serious personal injury could occur.

LOCATION

These refrigerators, like other open refrigerators, are sensitive to air disturbances. Air currents passing around them will seriously impair their operation. Do not allow air-conditioning, electric fans, open doors or windows, etc. to create air currents around these cases.

DO NOT INSTALL THE VENTED PANELS OF THE SELF-CONTAINED MODELS AGAINST A WALL OR OTHER STORE FIXTURE.

Located in the lower front and rear of the self-contained models are vented panels. These panels allow air circulation to the condensing unit. Blocking or restricting air circulation through these panels can cause poor performance and damage the refrigeration system.

INSTALL THE REFRIGERATOR NO CLOSER THAN (4) FOUR INCHES FROM A WALL OR OTHER STORE FIXTURES.

SECTION 3

REFRIGERATION - SELF CONTAINED MODELS

Each self-contained model is equipped with its own condensing unit located beneath the display area. The unit will be charged per nameplate refrigerant and shipped from the factory with all service valves open, completely ready for operation when electrical power has been connected.

REFRIGERANT CHARGE

MODEL	REFRIGERANT	POUNDS	OUNCES
DDS/DDF-4B	R - 22	5	8
DDS/DDF-4D/G	R - 22	5	8
DDS/DDF-6D/G	R - 22	7	11
DDS/DDF-8D/G	R - 404A	8	2
DDS - 4D/G c/w Hp Condensing Unit	R - 22	5	0
DDSS - 4D/G	R-22	5	8

CONTROLS and ADJUSTMENTS

REFRIGERATION CONTROLS	DEFROST CONTROLS		
	DEFROST FREQUENCY	PRESSURE TERMINATION	FAILSAFE
28° to 34° F	Every 6 Hours	90 psig (R-22) 105 psig (R-404A)	45 Minutes

A refrigeration thermostat controls refrigeration temperature. The control is factory installed in the control panel. Adjust this thermostat to maintain the discharge air temperature shown. Measure discharge air temperatures at the center of the discharge honeycomb.

Defrosts are time-initiated and pressure terminated. The defrost timer is factory set as shown. Check that the above settings are implemented and correct, and that the clock indicated the correct time of day.

Defrost must be terminated by defrost termination setting.

SECTION 4

REFRIGERATION - REMOTE MODELS

REFRIGERANT PIPING

Refrigerant line connection sizes: All models LIQUID LINE 3/8" OD

SUCTION LINE 5/8" OD for 4' & 6' Models; 1 1/8" for all other models

These connections are made at the right hand end of the cases (facing front) beneath the refrigerated display area. Refrigerant lines should be sized as shown on the refrigeration legend (furnished by the owner). If a legend has not been furnished, refer to Section 12 of the Hussmann Application Engineering Manual for guidance.

OUTLET LOCATION

The refrigerant line outlet is located at the right hand end of the refrigerator beneath the display pans. After connections have been made, seal this outlet thoroughly both on the inside and the outside. An aerosol dispensed urethane type of insulation is recommended.

LINE SIZING

Refrigerant lines should be sized as shown on the refrigeration legend prepared for the store and as (furnished by the owner). If a legend has not been furnished, refer to Section 12 of the Hussmann Application Engineering Manual for guidance.

OIL TRAPS

P-traps (oil traps) must be installed at the base of all suction line vertical risers.

PRESSURE DROP

Pressure drop reduces capacity of the refrigeration system. To minimize pressure drop, use proper size tubing, keep the refrigerant line runs as short as possible and use a minimum number of elbows. Where elbows are needed, use long radius elbows only.

PIPING INSULATION

For refrigerators with other than KOOLGAS defrost, the suction and liquid lines should be clamped and/or taped together and insulated for a minimum of 30 feet from the refrigerator. Refrigerators with KOOLGAS defrost should not have their liquid and suction lines in contact with each other but are to be separately insulated for a minimum of 30 feet from the refrigerator. Additional insulation for the balance of the refrigerant lines is recommended and required wherever condensation and dripping would be objectionable.

EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to fully feed the evaporator. Before attempting to adjust valves, make sure the evaporator is either clear of / or only lightly covered with frost, and that the fixture is within 10° F of it's expected operating temperature.

Adjust the valve as follows:

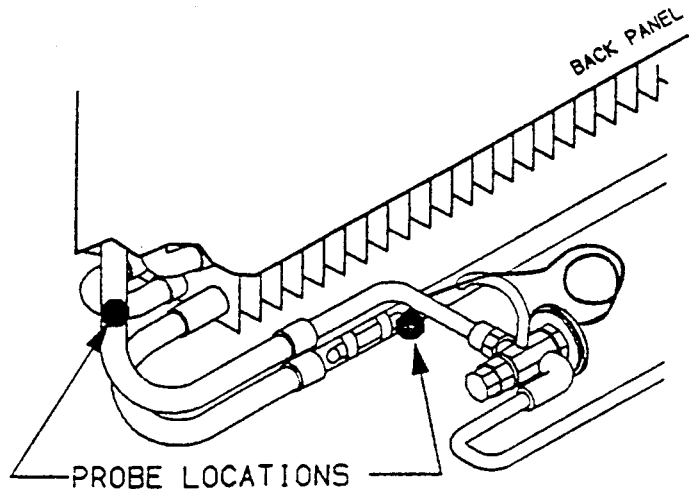
- A. Attach a probe to the suction line near the expansion valve bulb.
- B. Obtain a pressure reading from the factory installed Schraeder valve. Convert the pressure reading to a saturated temperature for the appropriate refrigerant

$$\text{Temperature B minus Temperature A} = \text{Superheat}$$

Some “hunting” of the expansion valve is normal. The valve should be adjusted so that during the hunting **the greatest difference between the two temperatures is 3° F to 5° F.**

With this adjustment, during a portion of the hunting the temperature difference between the probes will be less than 3° F (at times as low as 0° F).

Make adjustments of no more than (1/2) turn of the valve stem at a time and wait for at least fifteen minutes before rechecking the probe temperature and making further adjustments.



EXPANSION VALVE IS LOCATED
UNDER THE FAN PLENUM IN
THE LEFT HAND END OF THE
CASE.

REFRIGERATION & DEFROST CONTROLS FOR CONVENTIONAL OPERATION (Single Compressor System)

Refrigeration temperature may be controlled by either the condensing unit’s low-pressure control or by refrigeration thermostat (optional / one per condensing unit). Thermostatic control is preferred since it will provide a more constant year-round control of temperature. The thermostat may be field or factory installed, must have a differential of 3° F to 6° F and have its sensing bulb located to monitor the air leaving the evaporator. One thermostat per condensing unit is required and should be wired into the compressor motor contactor control circuit.

A pump down system is recommended for outdoor condensing units.

DEFROST:

DDS models have defrost cycles that are time initiated and time terminated.

REFRIGERATION CONTROLS						DEFROST CONTROLS④		
Discharge Air Temp (Cut-out)	Convert Temperatures to Pressures for type of Refrigerant Used	LOW PRESSURE CONTROL SETTINGS				DEFROST TIMER		
		If used to control ② temperature		If thermostat controls ③ temperature		Defrost Frequency	Failsafe Length	Termination Pressure
		(Cut-out)	(Cut-in)	(Cut-out)	(Cut-in)			
28°F①		12°F	30°F	-7°F	26°F	Every 6 Hours	45 Min	90 psig

- ① Measure discharge air temperatures at the center of the honeycomb. If thermostat is used to control temperature, set thermostat to open contacts at the discharge air temperature given in the table.
- ② Adjust the cutout on the low-pressure control to stop the compressor at the discharge temperature given in the table. Final adjustment should be made after refrigerator is stocked with product. If cycle frequency is more than 4 times per hour, cycling should produce an average discharge air temperature as shown above.
- ③ These settings are acceptable for outdoor unit applications when the coldest expected ambient does not go below 0° F. If colder ambient temperatures are expected, set control accordingly per “Hussmann Condensing Unit Installation Instructions.
- ④ If these spot display refrigerators are to be multiplexed with a different type refrigerator, compare these defrost settings with those specified for the other refrigerator. If the settings are not compatible, refer to page 15 (Controls & adjustments – Mixed Multiplexing).

REFRIGERATION & DEFROST CONTROLS FOR CONVENTIONAL OPERATION - Mixed Multiplexing (Parallel Racks)

Refrigeration temperature may be controlled by a refrigeration thermostat sensing discharge air temperature. The thermostat controls a liquid line solenoid (optional) or a suction line solenoid (optional). The use of an evaporator pressure regulator (EPR) is recommended to allow fixture to refrigerate at steady levels.

DEFROST:

DDS models have defrost cycles that are time initiated and time terminated.

MODEL	REFRIGERATION CONTROLS	DEFROST CONTROLS ②		
	DISCHARGE AIR TEMP ① (Cut-out)	DEFROST TIMER		
		DEFROST Frequency	Length of Defrost	
			Off-Time/Electric	KOOLGAS
ALL	28° F	Every 6 Hours	45 Min ③	14 Min ④

- ① Discharge air temperature is to be measured by attaching a service thermometer to the discharge honeycomb at the centre of the case.
- ② Adjust the refrigeration thermostat or EPR valve to maintain the discharge air temperature shown above.
- ③ If these spot display refrigerators are to be multiplexed with a different type refrigerator, compare these defrost settings with those specified for the other refrigerator. If these settings are not compatible, refer to the following page.
- ④ KOOLGAS defrost is time initiated and time terminated. The defrost lengths listed above are based upon laboratory testing but operation under actual store conditions may require that they be lengthened to accomplish a thorough defrost. Some of the store conditions that can contribute to a longer defrost are: low head pressure, long runs of refrigerant lines, store ambient, fixture temperature operating lower than that recommended, seasonal ambient changes etc.

Each system shown on the “store legend” must have staggered defrosts to maintain stable compressor loading and a sufficient supply of defrost gas.

REMOTE CONTROL KIT (Optional)

The control settings listed in the preceding tables are those that will provide proper case performance. If these spot display refrigerators are to be multiplexed with different types of refrigerator models, we suggest that each spot display refrigerator be equipped with a "REMOTE CONTROL KIT".

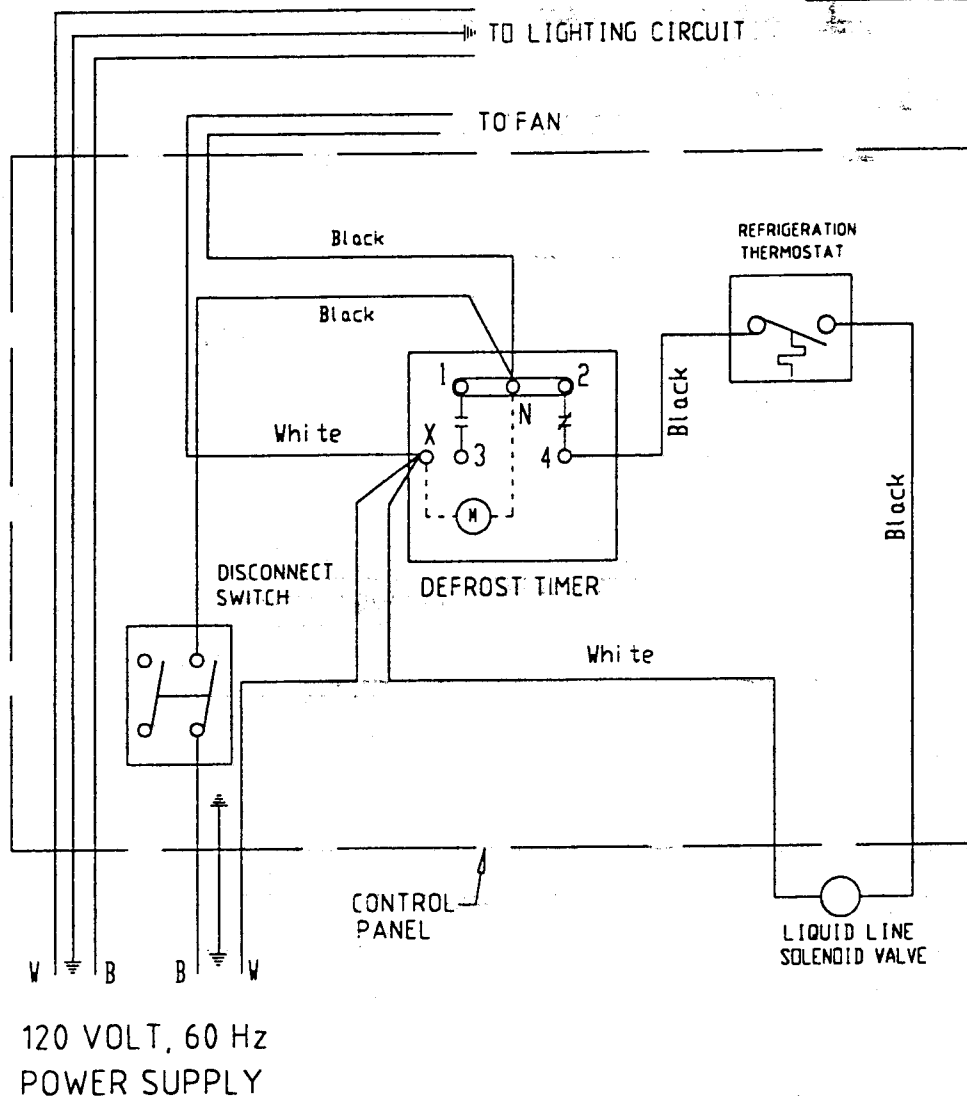
The remote control kit will insure better control of refrigeration temperature and provide additional defrost controls that maybe needed since most other refrigerators do not have similar defrost frequencies and terminations (fail safeguards) with these spot display refrigerators.

The remote-control kit will be factory installed below the display area of the spot display refrigerator. A liquid line solenoid valve will also be installed.

The liquid line solenoid valve will open when energized. During refrigeration, the valve is controlled by the refrigeration thermostat (close-on-rise of temperature) providing better and more specific control of refrigeration temperature. The defrost timer controls the valve for defrost; closing the valve for initiation; opening the valve at termination.

The remote control kit timer must be synchronized with the timer of the unit.

SEE: WIRING DIAGRAMS
IN ELECTRICAL SECTION



DESCRIPTION	HUSSMANN PART #	MANUFACTURING PART #
LIQUID LINE SOLENOID VALVE	286237	SPORLAN 120/208/240/1 (or Equivalent)
REFRIGERATION VALVE	261933	WHITE ROGERS 1710-4 (or Equivalent)
ON / OFF SWITCH	294226	CUTLER HAMMER 7599K1 (or Equivalent)
DEFROST TIMER	165480	PARAGON 8045-0B (or Equivalent)
SOLENOID c/w COIL	286237	SPORLAN MK1 - 1 (or Equivalent)

SECTION 5

ELECTRICAL

CONNECTIONS

Electrical power connections are made at the left hand end of the case, behind the removable front or rear base panels.

REMOTE MODELS

All electrical connections for remote models will be made in the junction box located behind the removable front base panel, at the left hand end of the case.

SELF CONTAINED MODELS

All electrical connections for self-contained models will be made in the control panel of the case. All electrical connections have been terminated inside the control panel and “pig-tailed” for ease of connecting field wiring. See appropriate wiring diagram in this section.

CAUTION: THE FIXTURE MUST BE ELECTRICALLY GROUNDED.

NOTE: ALL WIRING AND CONNECTIONS MUST COMPLY WITH N.E.C., STATE, PROVINCIAL AND LOCAL CODES.

SERIAL PLATE AMPERAGES

Serial plate amperes are the amperage figures that are stamped on the fixture's Serial Plate. Although all field installed wiring must be sized to the Serial Plate amperages, the actual current or amps may be less than specified. DDS Serial Plate is located on the upper left hand corner of the top interior panel inside the case.

REMOTE MODELS - R			
MODEL	ELECTRICAL SERVICE	CIRCUIT REQUIREMENTS	
		LIGHTS (amps)	FANS (amps) ①
DDS / DDF- 4R	115 v / 60 Hz	2.7	1.3
DDS / DDF- 6R	115 v / 60 Hz	6.2	2.6
DDS / DDF- 8R	115 v / 60 Hz	4.7	2.6

SELF CONTAINED MODELS – B, D/G			
MODEL	ELECTRICAL SERVICE	CIRCUIT REQUIREMENTS	
		LIGHTS (amps)	Condensing Unit, Evaporator Pan Heater, Fans (amps) ①
DDS / DDF- 4B	115 v / 60 Hz	2.70	19.0
DDS / DDF- 4D/G	230 v - 208 v / 60 Hz / 1Ø	2.70	10.3
DDS / DDF- 6D/G	230 v - 208 v / 60 Hz / 1Ø	6.2	18.0
DDS / DDF- 8D/G	230 v - 208 v / 60 Hz / 1Ø	5.2	22.65
DDSS-4D/G	115V/208V/230V/1Ø/60 Hz	0.43	12.01
DDSS-4D/G	115/208/230V/1Ø/60 Hz	0.43	12.01

- ① Fans are to be continuously energized.
The amperage figure shown includes the maximum number of lighted shelves where applicable

SECTION 6

REPLACEMENT PARTS LIST: DDS-4B, DDS-4R		
ITEM #	HUSSMANN	DESCRIPTION
	PART #	
1	21-S-138	Fan Motor,
2	21-S-136	Fan Blade
3	06-S-214	Bulb
4	06-S-187	Ballast –
5	17-s-390	Expansion Valve - R-22
	17-S-541	R-404/507
6	04-S-067	Temperature Ctrl
7	03-S-286	Power Switch
8	19-S-757	Condensate Pan Htr. 570W 120V
	19-S-766	Condensate Pan Htr. 500W 208V
9	02-S-631	Compressor R22 115V
10	17-S-507	Drier
11	03-S-562	Fuse (Elect. Box)
12	14114	Pressure Control
13	03-S-559	Timer 120V 60Hz
	03-S-560	208-203V 60Hz
s		
NOTE: Items 1 through 5 are standard parts for both the DDS-4B and DDS-4R		

SECTION 6

REPLACEMENT PARTS LIST: DDS – 4 D/G		
ITEM #	HUSSMANN PART #	DESCRIPTION
1	21-S-138	Fan Motor
2	21-S-136	Fan Blade
3	06-S-214	Bulb
4	06-S-187	Ballast -
5	17-S-390 17-S-541	Expansion Valve – R-22 R-404/507
6	04-S-067	Temperature Ctrl
7	03-S-286	Power Switch
8	03-S-559 03-S-560	Defrost Timer – 120V 60Hz 208-230V 60 Hz
9	17-S-507	Drier
10	14114	Pressure Control
11	03-S-568	Contactator
12	02-S-632	Compressor R22 208-230V
13	19-S-757 19-S-766	Condensate Pan Htr. 570W 120V 500W 208V

SECTION 6

REPLACEMENT PARTS LIST: DDS - 6 D/G and DDS - 6R		
ITEM #	HUSSMANN PART #	DESCRIPTION
1	21-S-138	Fan Motor,
2	21-S-136	Fan Blade
3	06-S-233	Bulb
4	06-S-187	Ballast
5	17-S-535 17S545	Expansion Valve R-22 R404
6	17-S-565 04-S-067	R401 Temperature Control
7	03-S-286	Power Switch
8	03-S-559 03-S-560	Defrost Timer 120V 60 Hz 208-230V 60Hz
9	19-S-757	Condensate Pan Htr. 570W 120V
	19-S-766	500W 208V
10	17-S-507	Drier -
11	03-S-562	Fuse – Electrical Box
12	03-S-568	Contactator
13	02-S-633	Compressor R22 208/230V
NOTE: Items 1 through 5 are standard parts for both the DDS-6D/G and DDS-6R Models		
Items 6 through 13 are standard parts for only the DDS-6D/G Model		

SECTION 6

REPLACEMENT PARTS LIST: DDS - 8 D/G and DDS - 8R		
ITEM #	HUSSMANN	DESCRIPTION
	PART #	
1	21-S-138	Fan Motor
2	21-S-136	Fan Blade
3	06-S-214	Bulb
4	06-S-187	Ballast
5	17-S-545	Expansion Valve R404
6	04-S-067	Temperature Control
7	03-S-286	Power Switch
8	03-S-560	Defrost Timer 208-240V 60 Hz
9	19-S-757	Condensate Pan Htr. 570W 120V
	19-S-766	Condensate Pan Htr 500W 208V
10	17-S-507	Drier -
11	03-S-563	Fuse Electrical Box
12	03-S-298	Contactor
13	02-S-638	Compressor R404 208/230V

SECTION 7

USER'S INSTRUCTIONS

STOCKING

Merchandise should not be placed in the refrigerator until it is at the designed operating temperature, approximately 2-3 hours. When stocking, never allow product to extend beyond into the lower return grill.

AIR DISCHARGE AND RETURN AIR FLUES MUST BE UNOBSTRUCTED AT ALL TIMES, TO PROVIDE PROPER REFRIGERATION AND AIR CURTAIN PERFORMANCE.

Since all food items are perishable, packages should be periodically rotated to maintain freshness.

DO NOT BLOCK OR RESTRICT THE VENTED LOWER BASE PANELS LOCATED AT EACH END OF THE SELF-CONTAINED MODELS.

These vented areas are for air circulation to the condensing unit area located behind the panels.

CARE AND CLEANING

Long life and satisfactory performance of any equipment is dependent upon the care given to it. To ensure long life, proper sanitation and minimum maintenance, the fixture should be thoroughly cleaned, debris removed and the interior washed down monthly.

CAUTION:

- DO NOT USE STEAM OR EXTREMELY HOT WATER TO WASH THE INTERIOR BOTTOM OF THE CASE.
- WHEN CLEANING, DO NOT USE A HIGH PRESSURE HOSE.
- NEVER INTRODUCE WATER INTO THE FIXTURE FASTER THAN THE WASTE OUTLET CAN CARRY IT AWAY.
- THE WASTE OUTLET OF THE OF THE SELF-CONTAINED MODEL DOES NOT EMPTY INTO A FLOOR DRAIN BUT INTO A LIMITED CAPACITY EVAPORATOR PAN WHICH WILL OVERFLOW IF EXCESS WATER IS USED IN CLEANING.
- SOME PANS ARE EQUIPPED WITH A SIDE OUTLET DRAIN TUBE, OTHERS HAVE A TUBE COMING DOWN FROM THE DRAIN.

CARE AND CLEANING CONTINUED:**CAUTION:**

- WHEN CLEANING, STORE PERSONNEL SHOULD CONNECT THIS TUBE TO A REMOTE HOSE TO CARRY WATER AWAY.
- BE SURE TO CRIMP AND RE-INSERT THE TUBE BACK INTO ITS HOLDING CLIP ON THE EVAPORATOR PAN, OR PLACE DRAIN TUBE BACK INTO THE EVAPORATOR PAN AFTER CLEANING.

The interior bottom of this case is an easy to clean, corrosion resistant material designed for maximum sanitation. All domestic detergents, even ammonia based cleaners are recommended. Sanitizing solutions will not harm the case interior bottom, however, these sanitizers should be used in accordance with manufacturer's directions.

To preserve the exterior finish of the fixture, use warm water and a mild detergent.

DO NOT USE ABRASIVE CLEANERS OR STEEL WOOL SCOURING PADS TO CLEAN THE FIXTURE, AS THESE WILL MARR THE FINISH.

To maintain good refrigeration performance, a refrigeration service person should be called periodically (at least twice a year) to clean the discharge honeycomb and remove any accumulated dirt from the condenser coil and condensate evaporator pan on self-contained models.

POOR CIRCULATION OF AIR THROUGH THE CONDENSER COIL WILL RESULT IN POOR REFRIGERATION PERFORMANCE.

Dirt accumulation inside the condensate evaporator pan will reduce the pan's capacity and affect the efficiency of the heater causing a burned out heater and an overflow of defrost water onto the store floor.

SECTION 8

SERVICE TIPS

WARNING

ALWAYS DISCONNECT THE ELECTRICAL POWER AT THE MAIN DISCONNECT WHEN SERVICING OR REPLACING ANY ELECTRICAL COMPONENT OF THIS REFRIGERATOR. THIS INCLUDES, BUT IS NOT LIMITED TO SUCH ITEMS AS FANS AND THERMOSTATS.

FAN BLADE REPLACEMENT

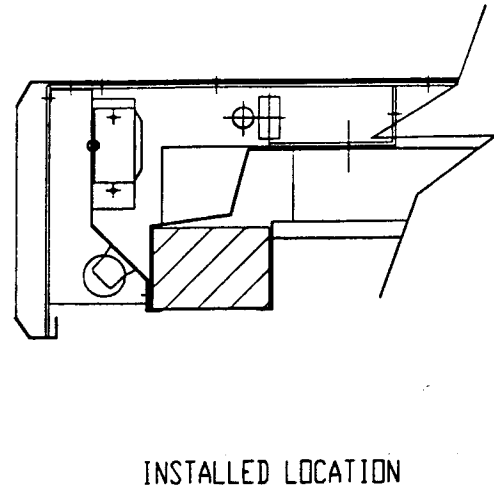
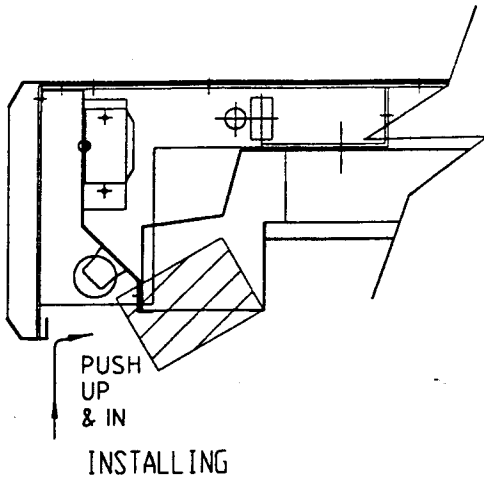
The evaporator fan is located at the back of the case directly beneath the display pan. Should the fan blade ever need servicing, ALWAYS REPLACE THE FAN BLADE WITH THE RAISED EMBOSSING SIDE OF THE BLADE INSTALLED TOWARD THE MOTOR.

HONEYCOMB REMOVAL & CLEANING

CAUTION: DO NOT TEAR THE HONEYCOMB

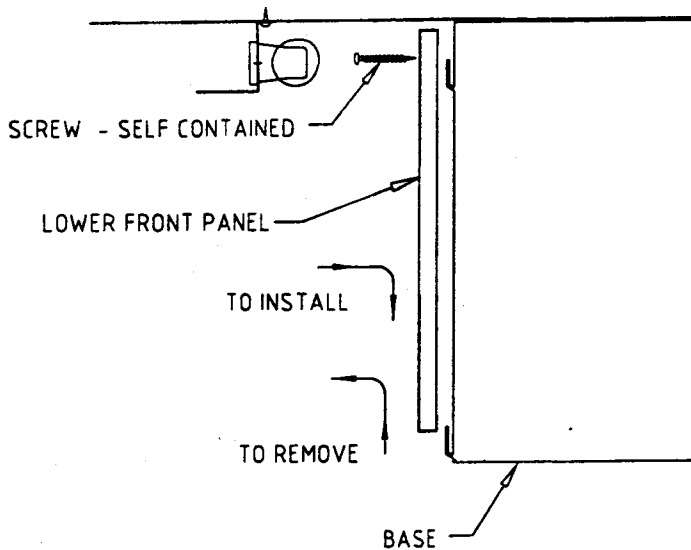
- 1) Remove the honeycomb assembly as follows:
Insert a small Phillips screwdriver behind the rear edge of the honeycomb on the right hand end and gently pull down. The bottom of the honeycomb will drop down. Continue down the length of the case, lifting the honeycomb out.
- 2) To clean honeycomb:
 - Mix powdered detergent, in warm water. (5 to 7 Tablespoons per gallon)
 - Immerse or spot clean the honeycomb. Use care not to damage the cell structure of the honeycomb.
 - Rinse thoroughly in clean water. Shake excess water from the honeycomb and dry. (if heat is used, do not exceed 140° F dry heat)
- 3) Install honeycomb by inserting the notched side up against the deflector and press upwards inserting the bottom of the honeycomb into the back ledge. Slide along the honeycomb, pressing the front edge upward into the ledge. Be careful no to damage the cells or cut yourself on the edges of the honeycomb
(See diagram on next page)

HONEYCOMB INSTALLATION



LOWER FRONT PANEL REMOVAL

The lower front panel may be removed by lifting the panel straight upward and over the tabs on which it is hanging. In a self-contained case, two screws will have to be removed from either end of the panel. The panel is installed by reversing the above procedure.



Insure lower front panel is flat against the floor when installed to prevent air circulation problems on self-contained cases.

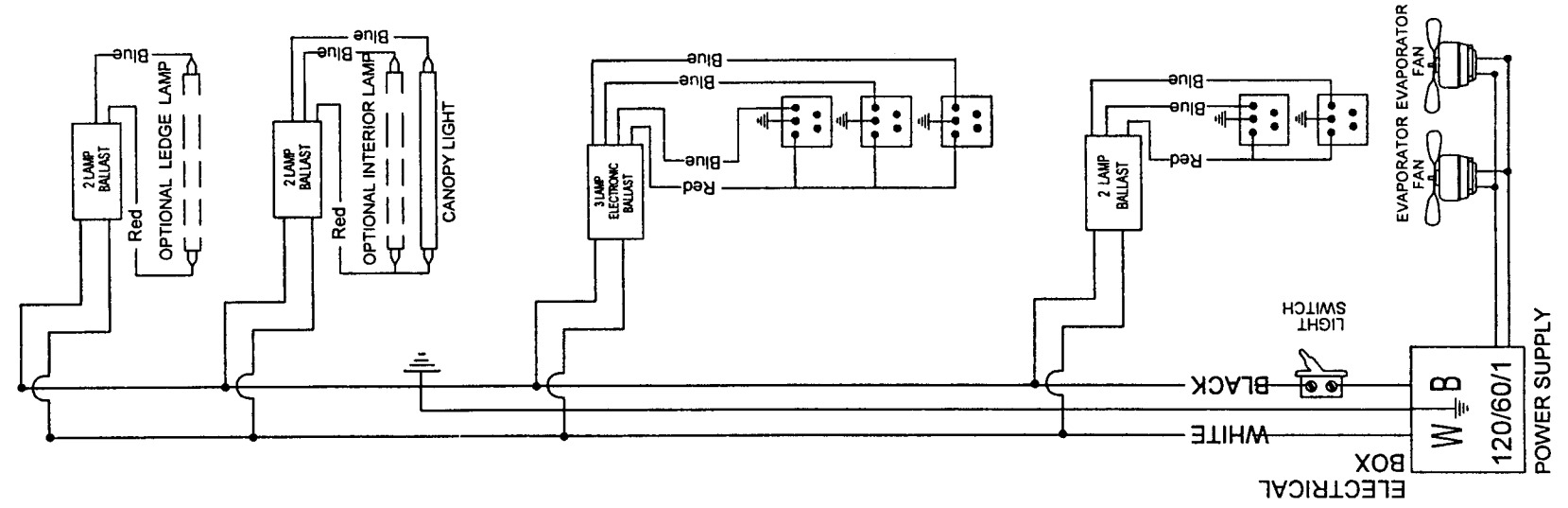
BALLAST REPLACEMENT

The ballast for the canopy fluorescent lamps is located beneath the canopy panel at the left hand end of the case.

For access to the ballast:

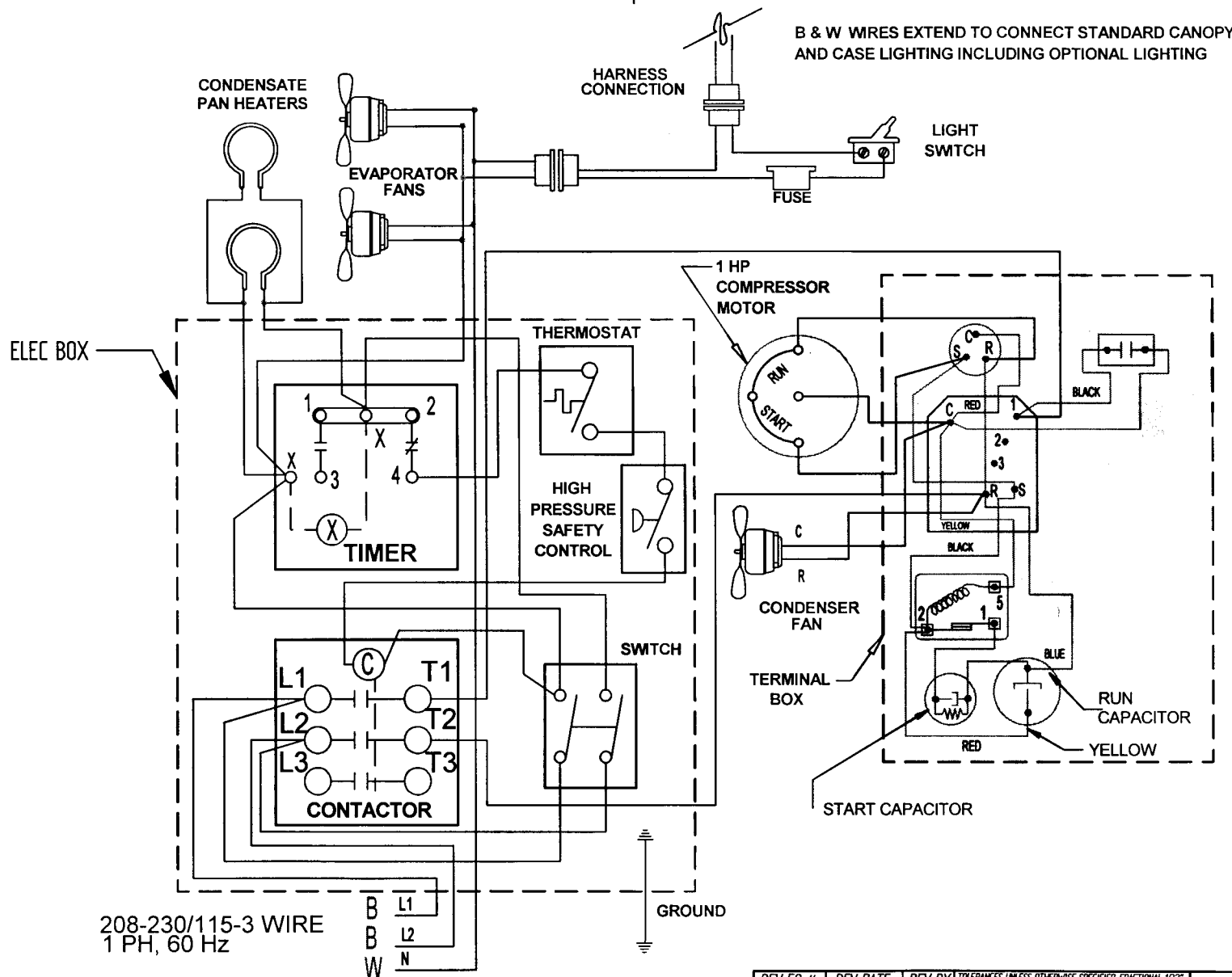
- Remove the screws that fasten the canopy to the exterior top of the case
- Pull the top of the canopy forward and rotate it down to remove it from the case
- Replace or service the ballast as required and replace the canopy in reverse order of removal.

NOTE: CONTINUITY JUMPER
 The bottom two pins of the 5 pin receptacle are the continuity connection point. For any of the lamps to operate a lamp plug or the cover plug must be inserted into the receptacle.
 or by flexible plug acting as a jumper



DDS-4R

TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"			HUSSMANN GLOVERSVILLE, NY 12078		
REV ED #	REV DATE	REV BY	ED NUMBER		WIRING DIAGRAM
-	-	-	-		
APPROVED BY					M100-2285
DRAWN BY	JS	SCALE	INCHES	1 OF 1 SHEET #1 OF 1	
DATE DRAWN	07/18/2002				
APPROVED BY					



208-230/115-3 WIRE
1 PH, 60 Hz


B L1
B L2
W N

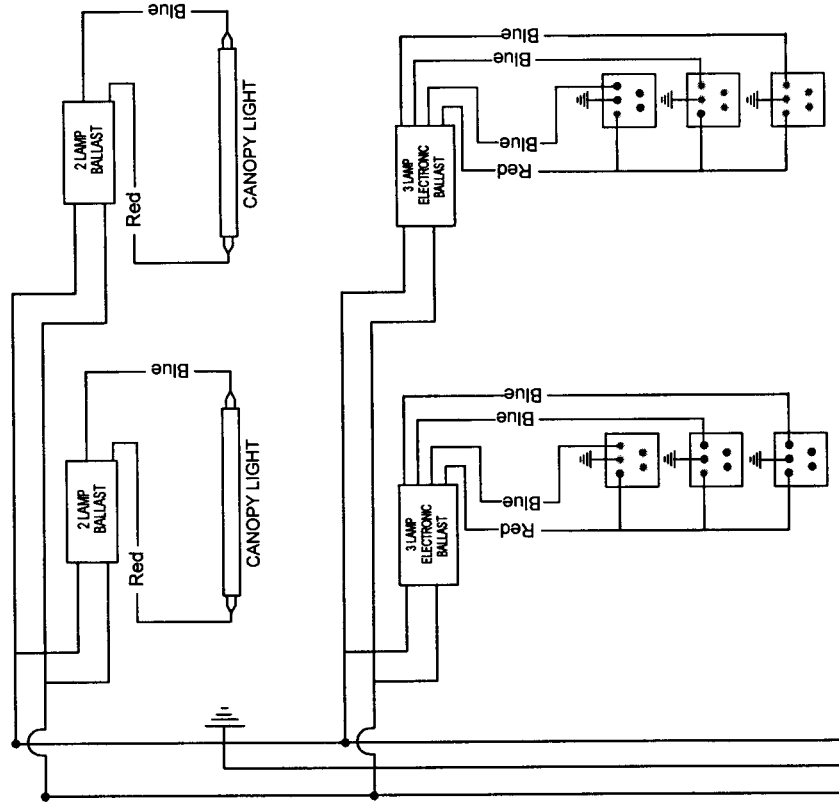
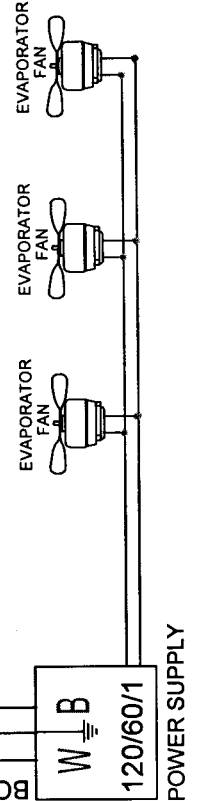
GROUND

DDSS-60/G

REV ED #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"	HUSMANN GLOVERSVILLE, NY 12078	
-	-	-		WIRING DIAGRAM	
APPROVED BY			ED NUMBER	M100-2303	
			DRAWN BY: J.S.	SCALE: 1/8" = 1"	SHEET # 1 OF 1
			DATE DRAWN: 08/26/2002		
			APPROVED BY:		

DDSS-6

REV ED #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED: FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"	HUSMANN GLOVERSVILLE, NY 12078
APPROVED BY			ED NUMBER	
			DRAWN BY: J.S.	 SCALE: INCHES DATE DRAWN: 08/26/2002 SHEET # 1 OF 1
			DATE DRAWN: 08/26/2002	
			APPROVED BY:	

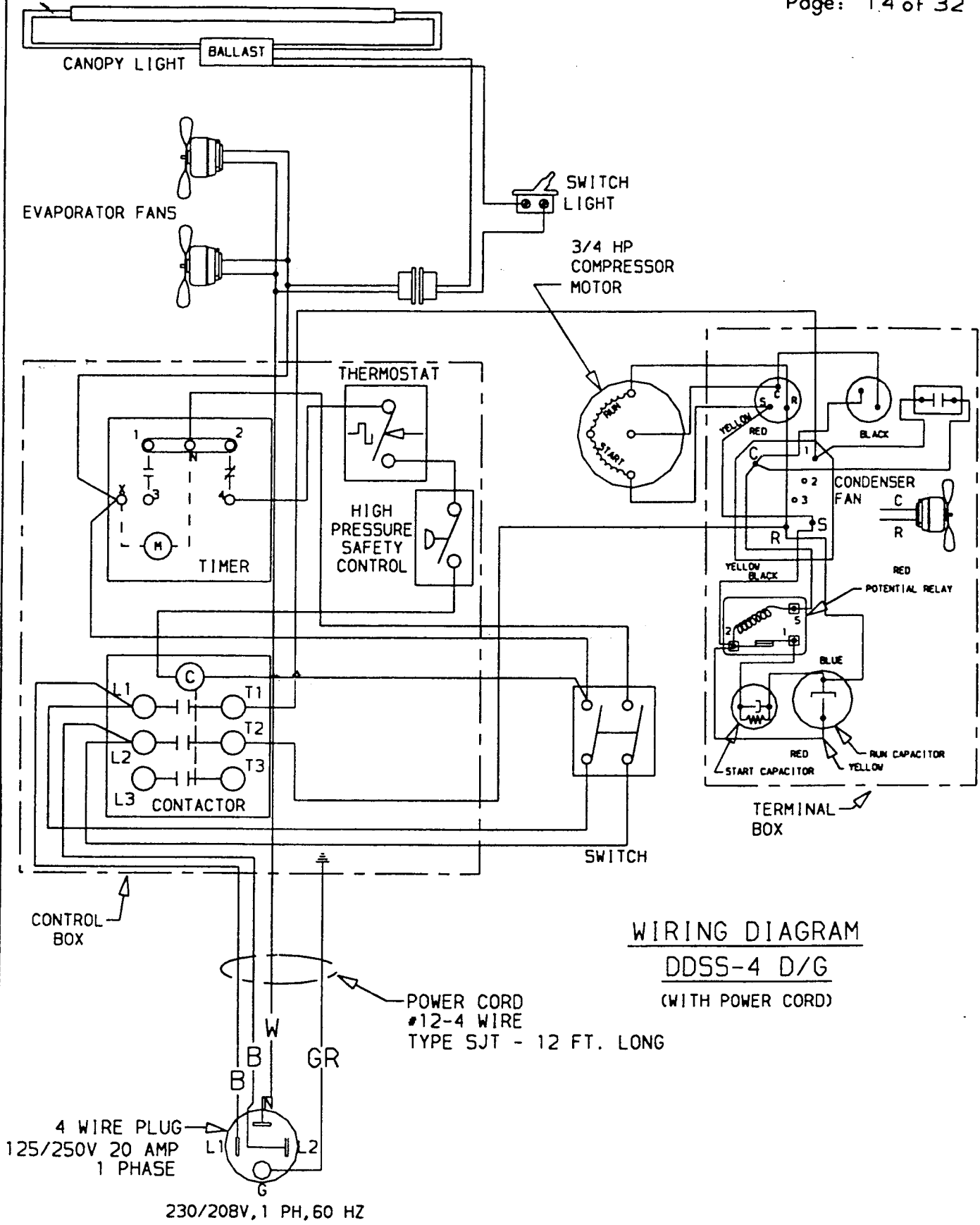


NOTE: CONTINUITY JUMPER

The bottom two pins of the 5 pin receptacle are the continuity connection point. For any of the lamps to operate a lamp plug or the cover plug must be inserted into the receptacle.

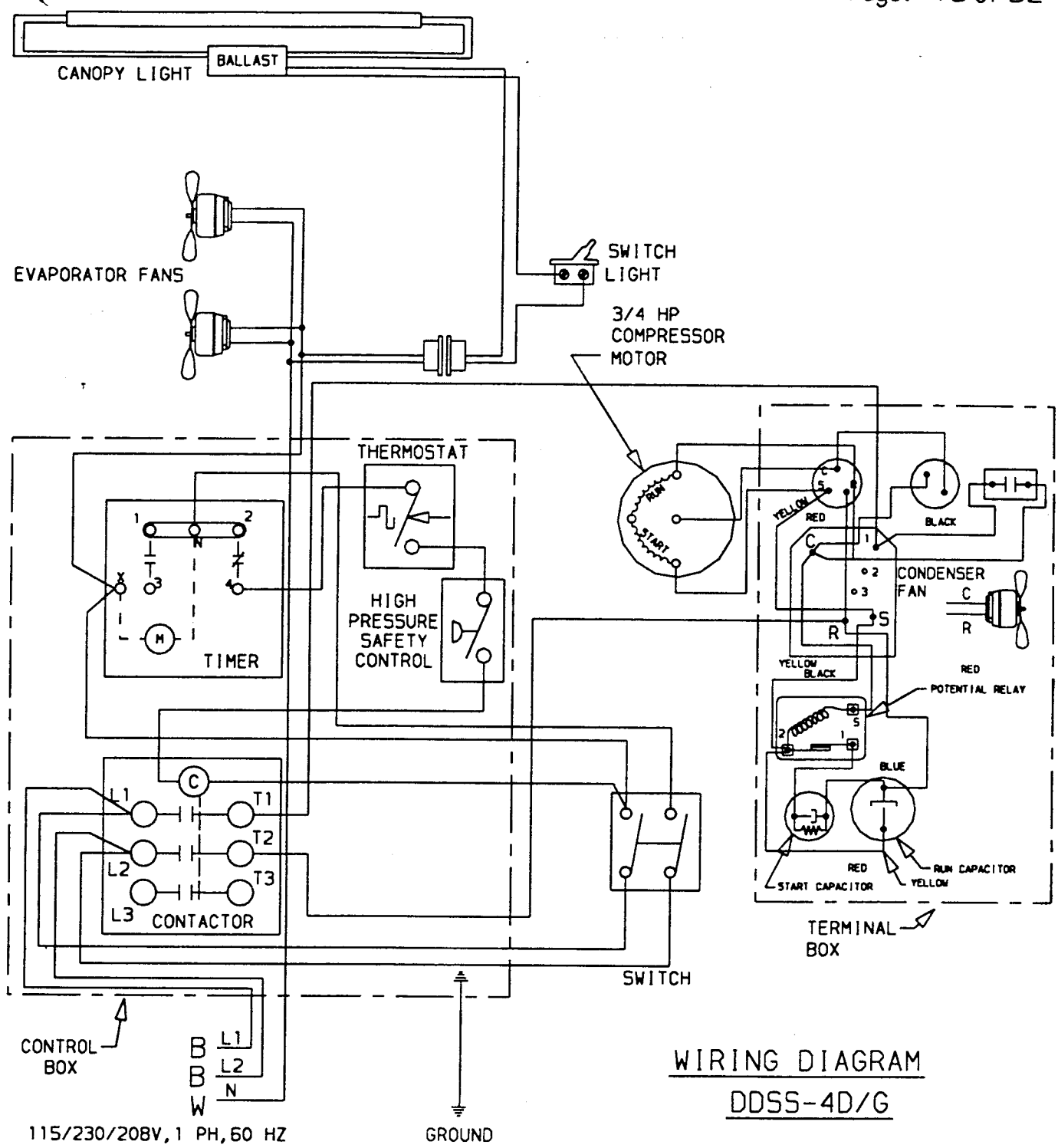


Continuity is accomplished through shelf or by flexible plug acting as a jumper



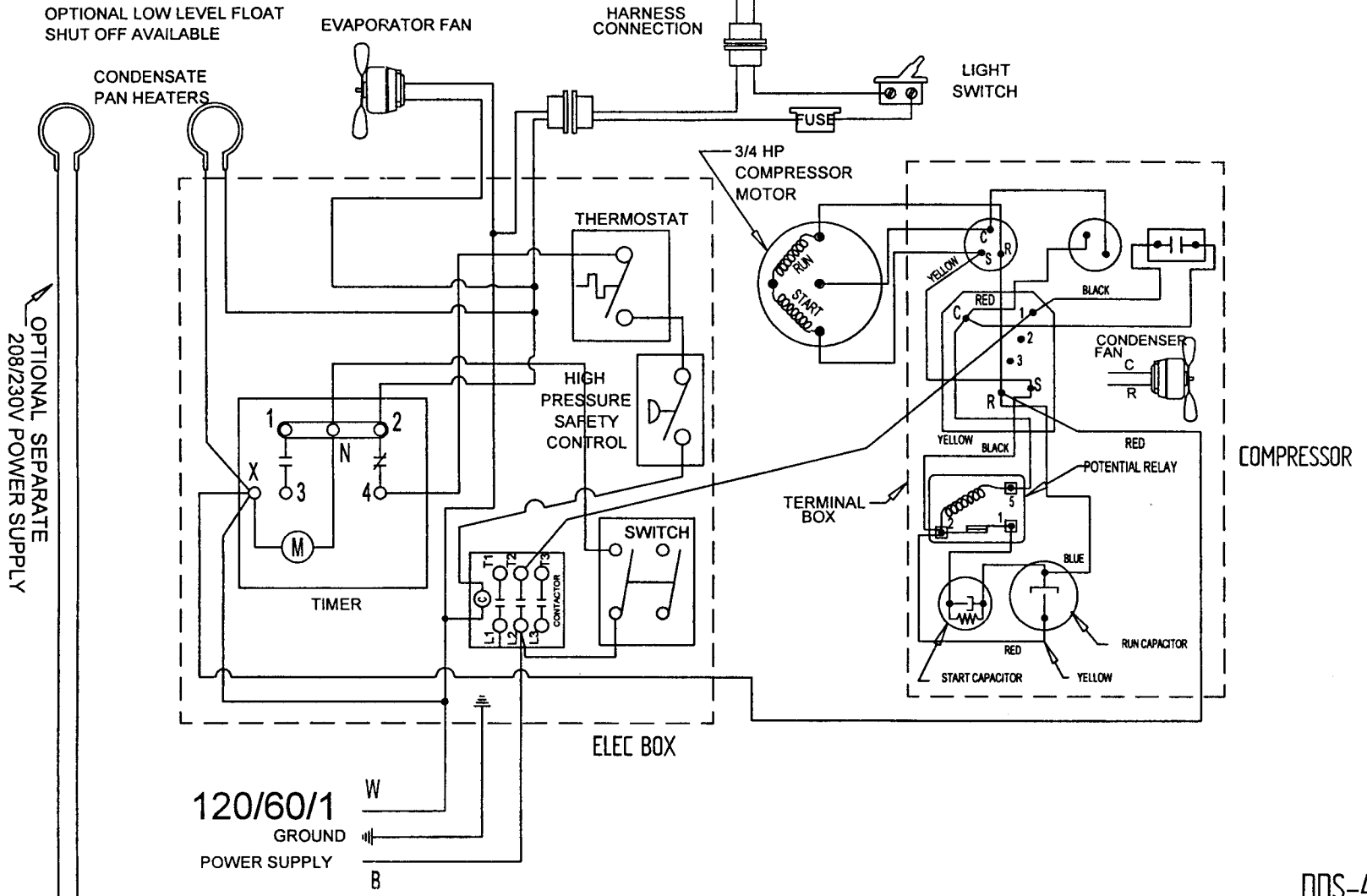
WIRING DIAGRAM
DDSS-4 D/G
 (WITH POWER CORD)

WARNING: REFRIGERATOR MUST BE GROUNDED



WIRING DIAGRAM
DDSS-4D/G

WARNING: REFRIGERATOR MUST BE GROUNDED



DDS-4B

REV E.O. #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1" HOLE LOCATION & SPACING 1/64"	HUSSEMAN GLOVERSVILLE, NY 12078
-	-	-	-	WIRING DIAGRAM
APPROVED BY			E.O. NUMBER	
			DRAWN BY: J.S.	SCALE: INCHES
			DATE DRAWN: 07/16/2002	SHEET # 1 OF 1
			APPROVED BY:	M100-2286

CONDENSATE PAN HEATERS

OTHER TWO MOTORS NOT SHOWN

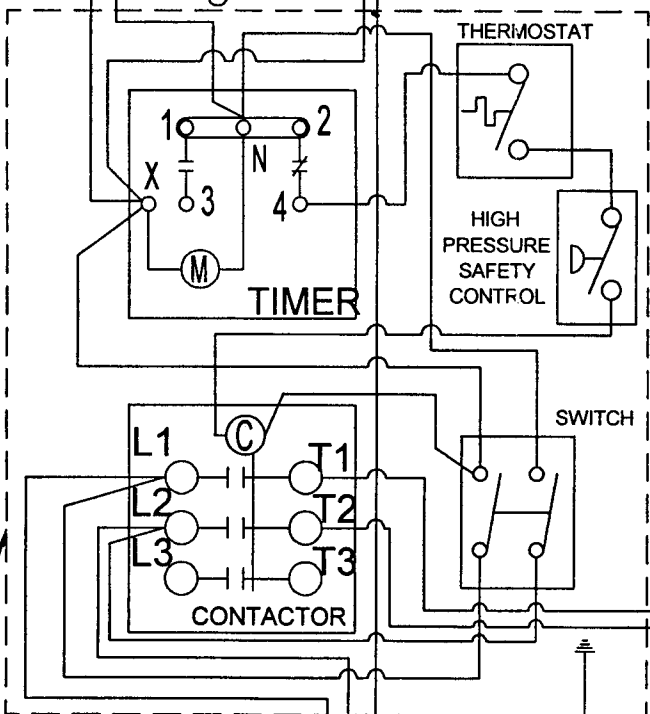
B & W WIRES EXTEND TO CONNECT STANDARD CANOPY AND CASE LIGHTING INCLUDING OPTIONAL LIGHTING

HARNESS CONNECTION

LIGHT SWITCH

EVAPORATOR FANS

FUSE



CRANKCASE HEATERS

COND FAN

YELLOW

COMPRESSOR MOTOR

BLACK

RED

HIGH PRESSURE SAFETY CONTROL

TIMER

SWITCH

4X4 ELEC BOX

YELLOW

BLUE

RELAY ASSEMBLY

ELEC BOX

208-230/115-3 WIRE
1 PH, 60 Hz

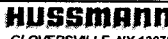

B L1
B L2
B N
W

GROUND

14495-3
WIRE HARNESS

COMPRESSOR ASSEMBLY

DDS-80/G

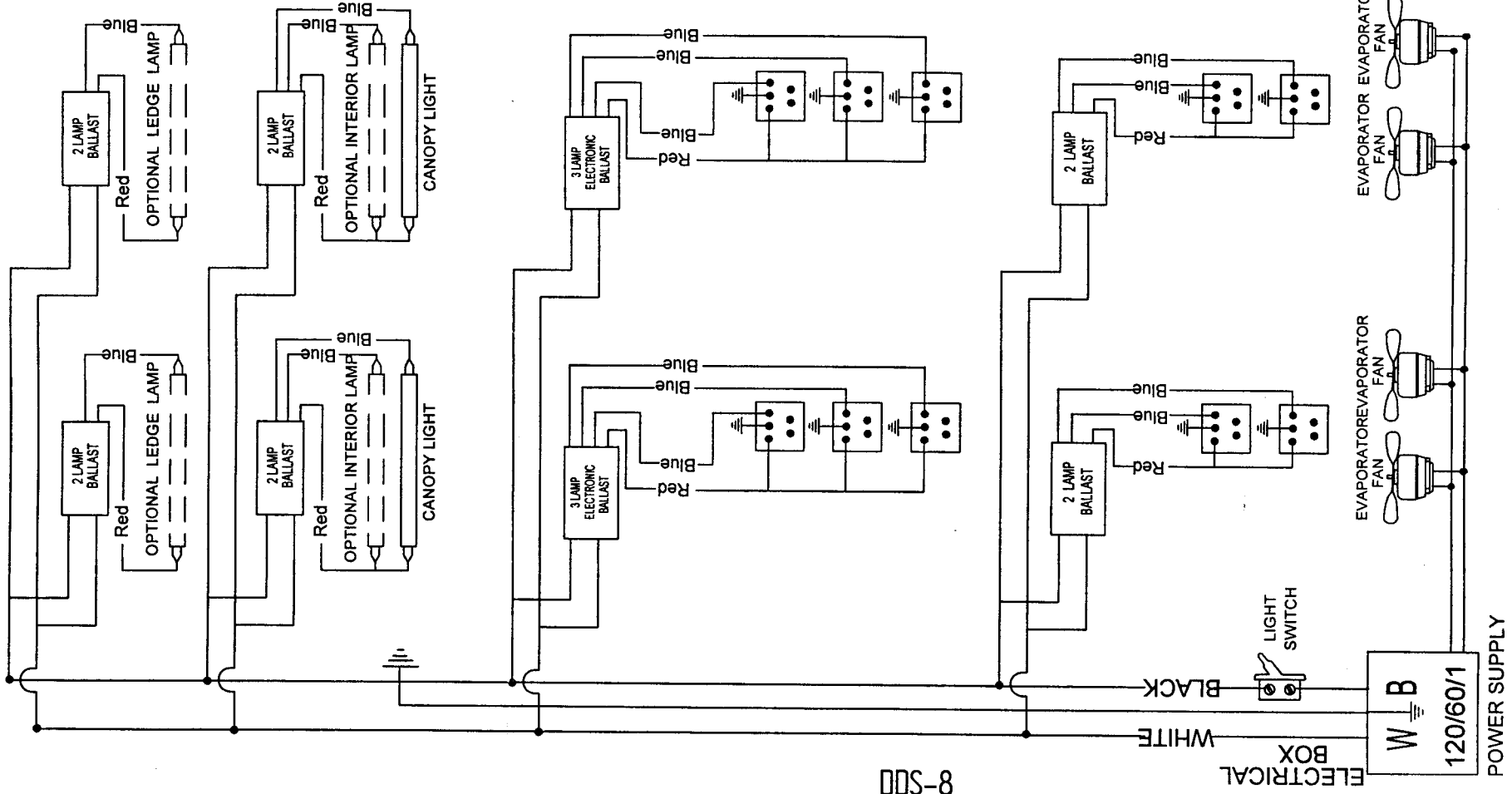
REV E.O. #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"	 HUSSMANN GLOVERSVILLE, NY 12078
-	-	-	-	
APPROVED BY	E.O. NUMBER		 M100-2282	
DRAWN BY	JLS	SCALE	INCHES	
DATE DRAWN	07/17/2002	SHEET	1 OF 1	
APPROVED BY				

NOTE: CONTINUITY JUMPER

The bottom two pins of the 5 pin receptacle are the continuity connection point. For any of the lamps to operate a lamp plug or the cover plug must be inserted into the receptacle.



Continuity is accomplished through shelf or by flexible plug flap acting as a jumper



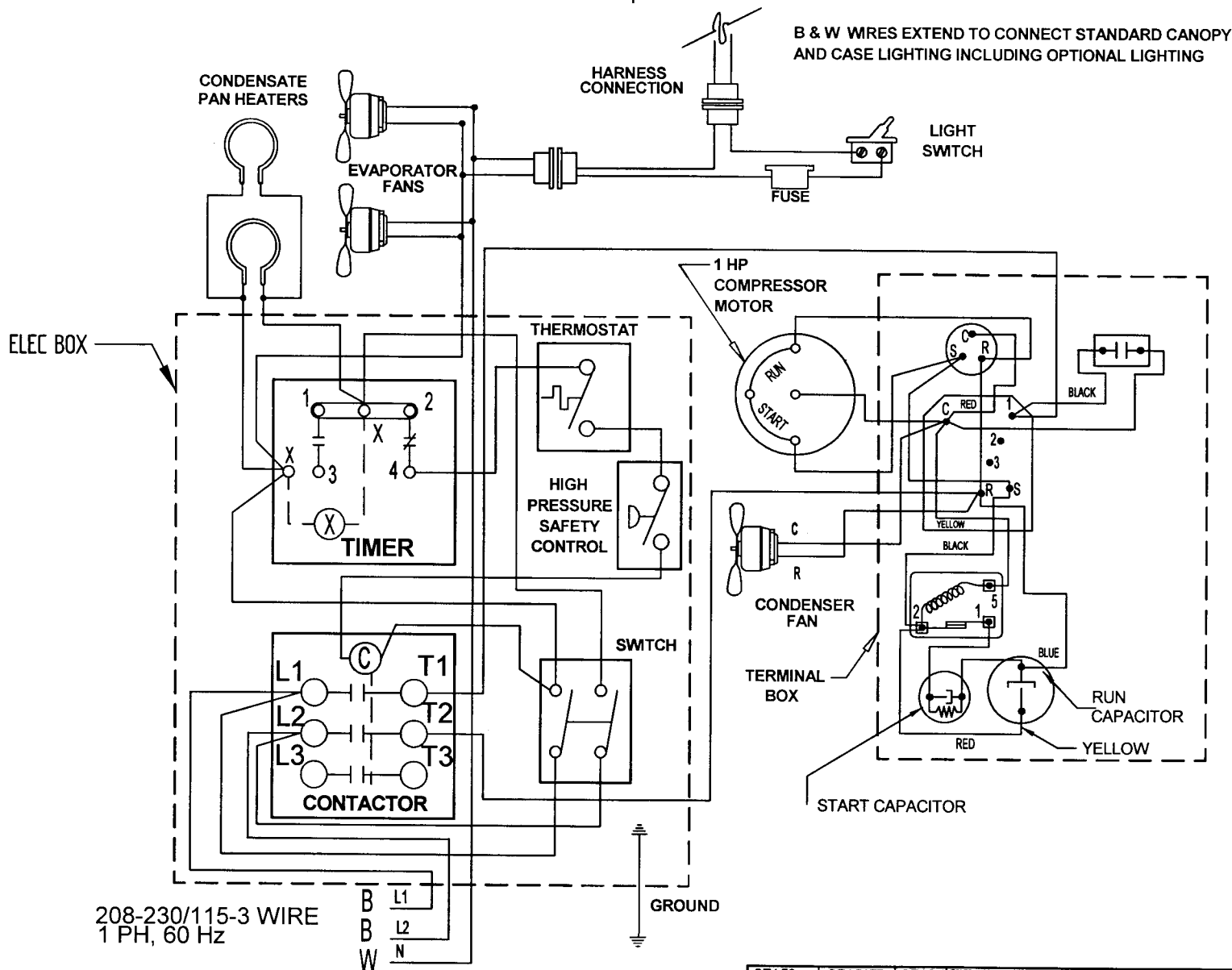
Goes w/ Au 8's

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"	ED NUMBER
-	-	-	-		
APPROVED BY					
DRAWN BY: J.S.					SCALE: INCHES
DATE DRAWN: 07/17/2002					SHEET #1 OF 1
APPROVED BY					



HUSSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2283

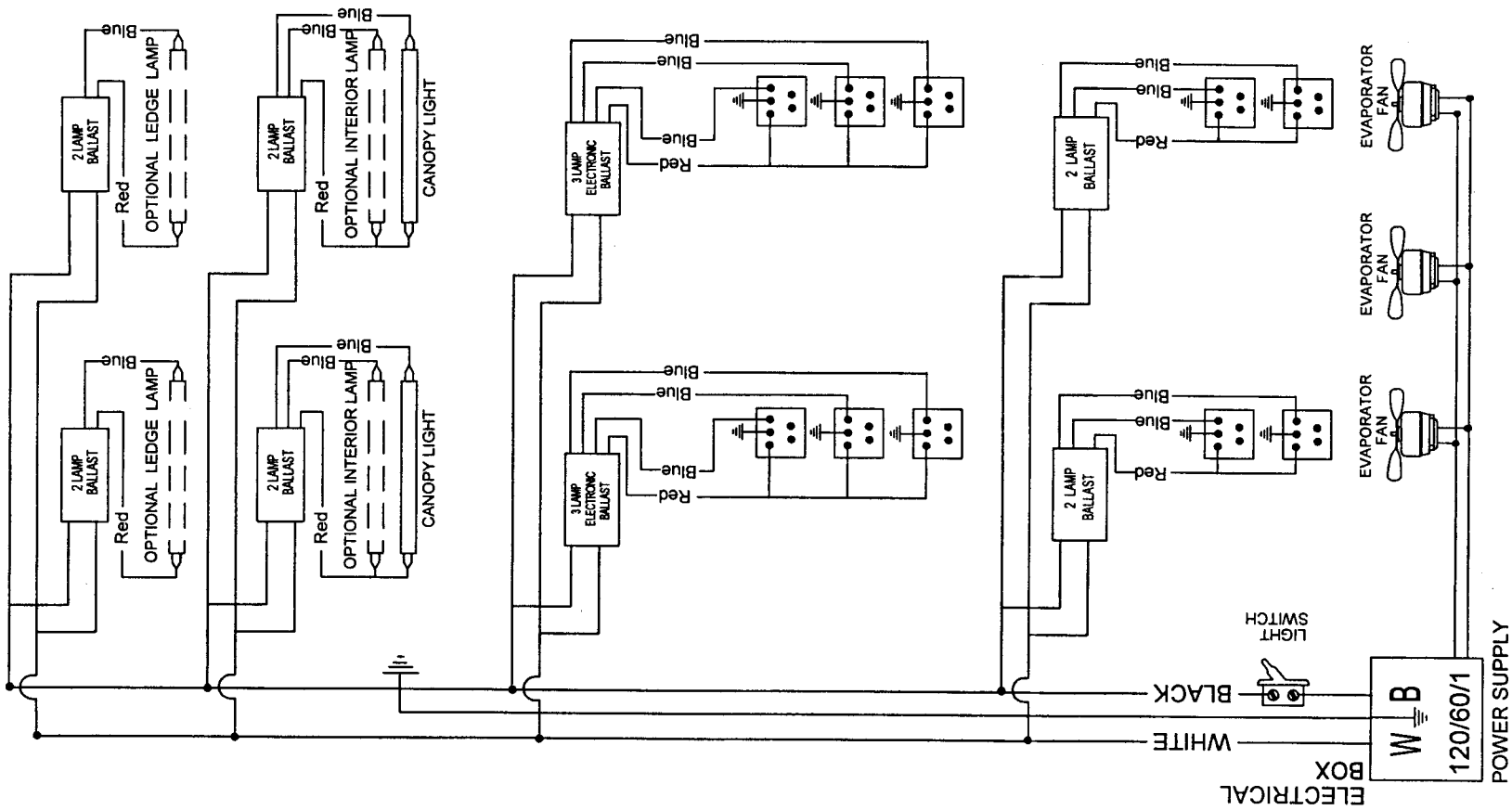


DDS-6D/G

REV ED #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1" HOLE LOCATION & SPACING 1/64"	 HUSMANN GLOVERSVILLE, NY 12078
-	-	-		
APPROVED BY:			ED NUMBER:	 SCALE: INCHES SHEET # 1 OF 1
DRAWN BY:	JLS		DATE DRAWN:	
DATE DRAWN:	08/26/2002		APPROVED BY:	

00S-6

REV E/O #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"	HUSSMANN GLOVERSVILLE, NY 12078 WIRING DIAGRAM M100-2298
APPROVED BY			ED NUMBER	
			DRAWN BY: J.S.	SCALE: INCHES
			DATE DRAWN: 08/26/2002	SHEET # 1 OF 1
			APPROVED BY:	



ELECTRICAL BOX

BLACK
WHITE
LIGHT SWITCH

W/B
120/60/1
POWER SUPPLY

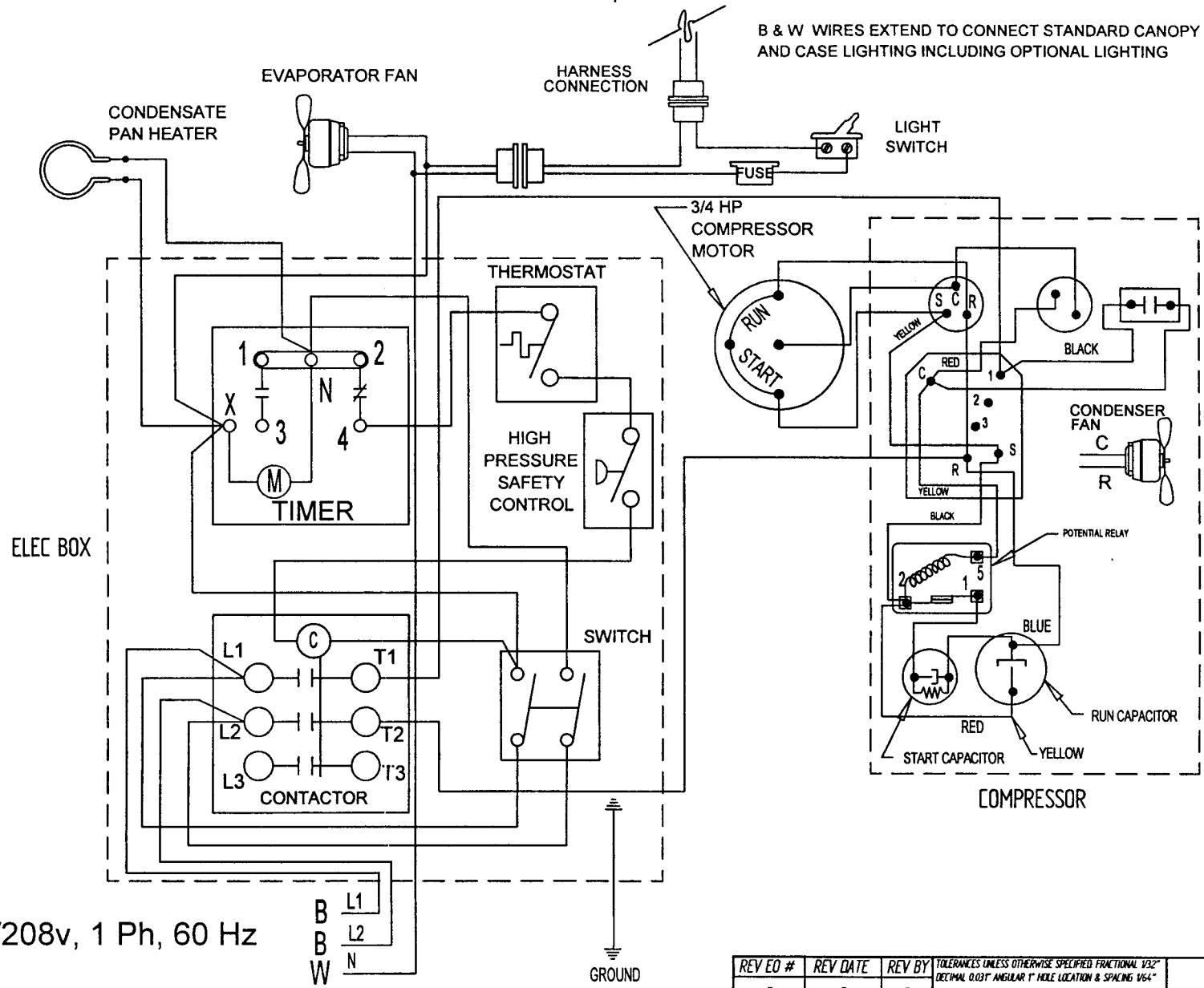
EVAPORATOR FAN
EVAPORATOR FAN
EVAPORATOR FAN

NOTE: CONTINUITY JUMPER

The bottom two pins of the 5 pin receptacle are the continuity connection point. For any of the lamps to operate a lamp plug or the cover plug must be inserted into the receptacle.



Continuity is accomplished through shelf or by flexible plug flap acting as a jumper



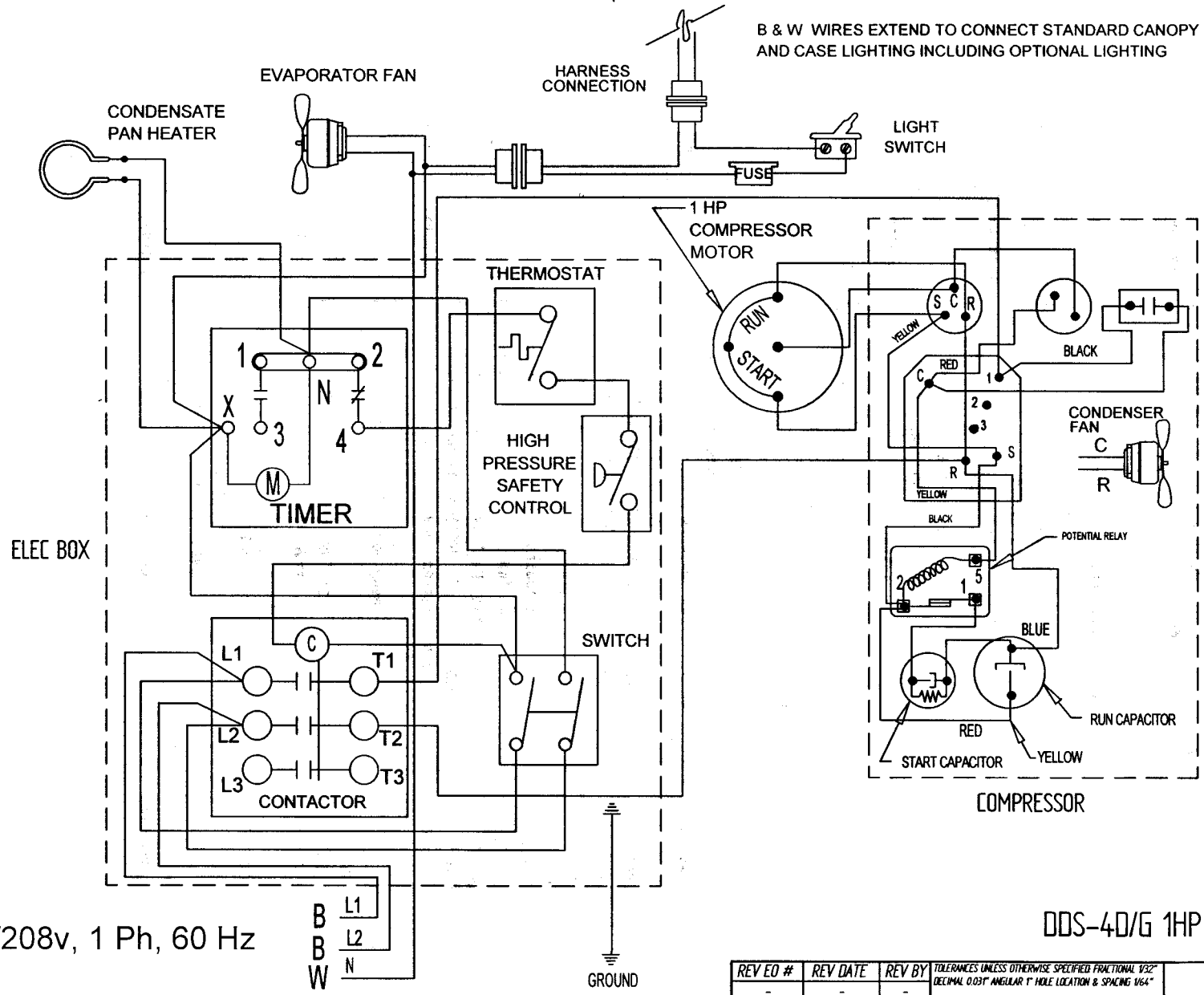
B & W WIRES EXTEND TO CONNECT STANDARD CANOPY AND CASE LIGHTING INCLUDING OPTIONAL LIGHTING

230/208v, 1 Ph, 60 Hz

B L1
B L2
W N

DDS-40/G

REV	EO #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1" HOLE LOCATION & SPACING 1/64"	HUSSEMAN GLOVERSVILLE, NY 12078	
APPROVED BY				EO NUMBER	WIRING DIAGRAM	
				DRAWN BY: JS	SCALE: INCHES	M100-2284
				DATE DRAWN: 07/18/2002	SHEET #1 OF 1	
				APPROVED BY:		



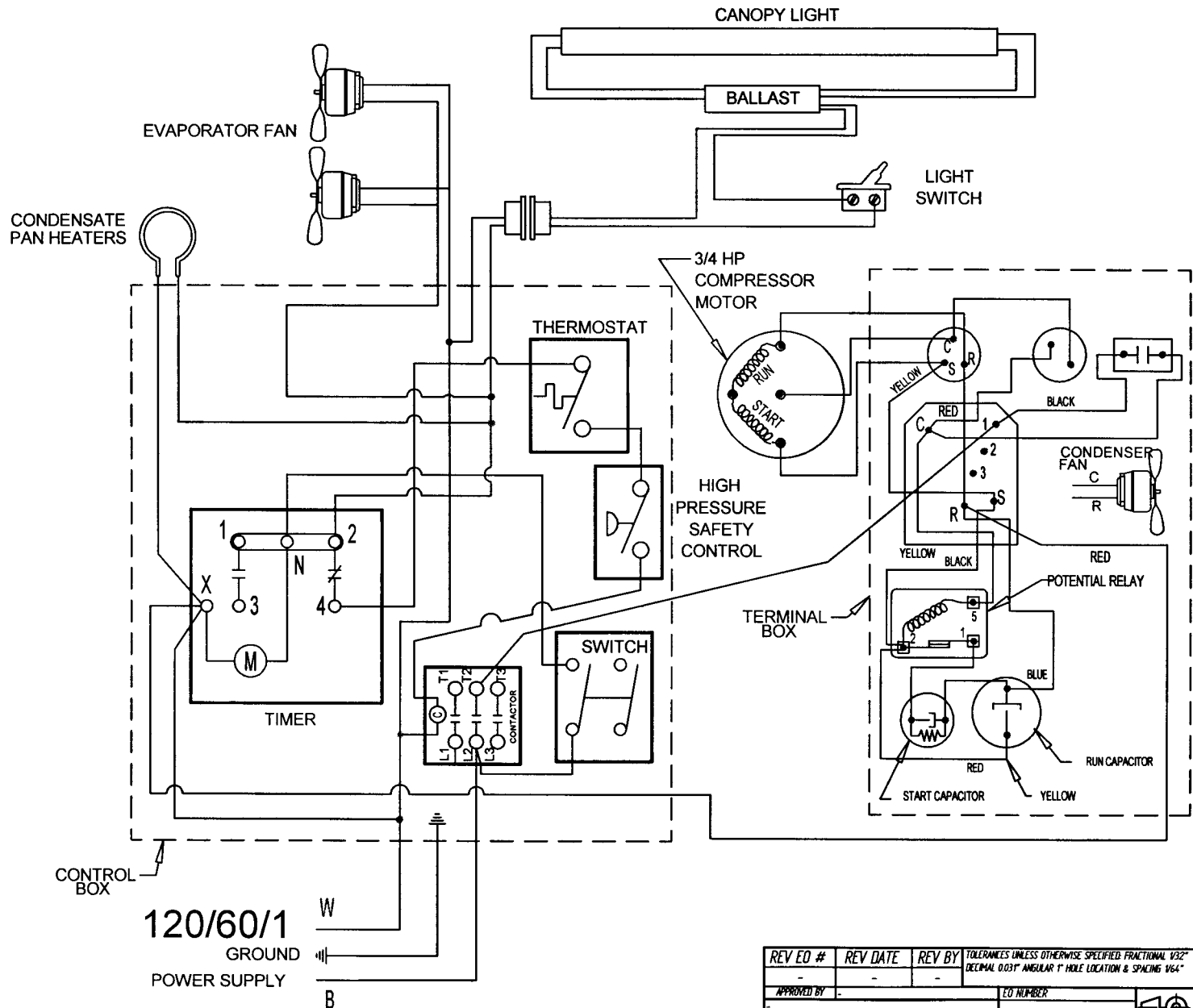
230/208v, 1 Ph, 60 Hz

B L1
B L2
W N

GROUND

DDS-4D/G 1HP COMPRESSOR

REV ED #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1" HOLE LOCATION & SPACING 1/64"	HUSMANN GLOVERSVILLE, NY 12078
-	-	-		
APPROVED BY:			ED NUMBER	WIRING DIAGRAM
				M100-2284-1
			DRAWN BY: JLS	SCALE: INCHES
			DATE DRAWN: 07/18/2002	SHEET #1 OF 1
			APPROVED BY:	



DDSS-4B

REV ED #	REV DATE	REV BY	TOLERANCES UNLESS OTHERWISE SPECIFIED: FRACTIONAL 1/32" DECIMAL 0.031" ANGULAR 1° HOLE LOCATION & SPACING 1/64"
-	-	-	-
APPROVED BY:		ED NUMBER:	
DRAWN BY: JLS		SCALE: INCHES	
DATE DRAWN: 01/17/2003		SHEET # 1 OF 1	
APPROVED BY:		-	

HUSSMANN
GLOVERSVILLE, NY 12078

WIRING DIAGRAM

M100-2301