

**TY3, TY4
(ENTYCE)
ISLAND CASE**

HUSSmann®/CHINO
TY3, TY4 (ENTYCE)
ISLAND CASE

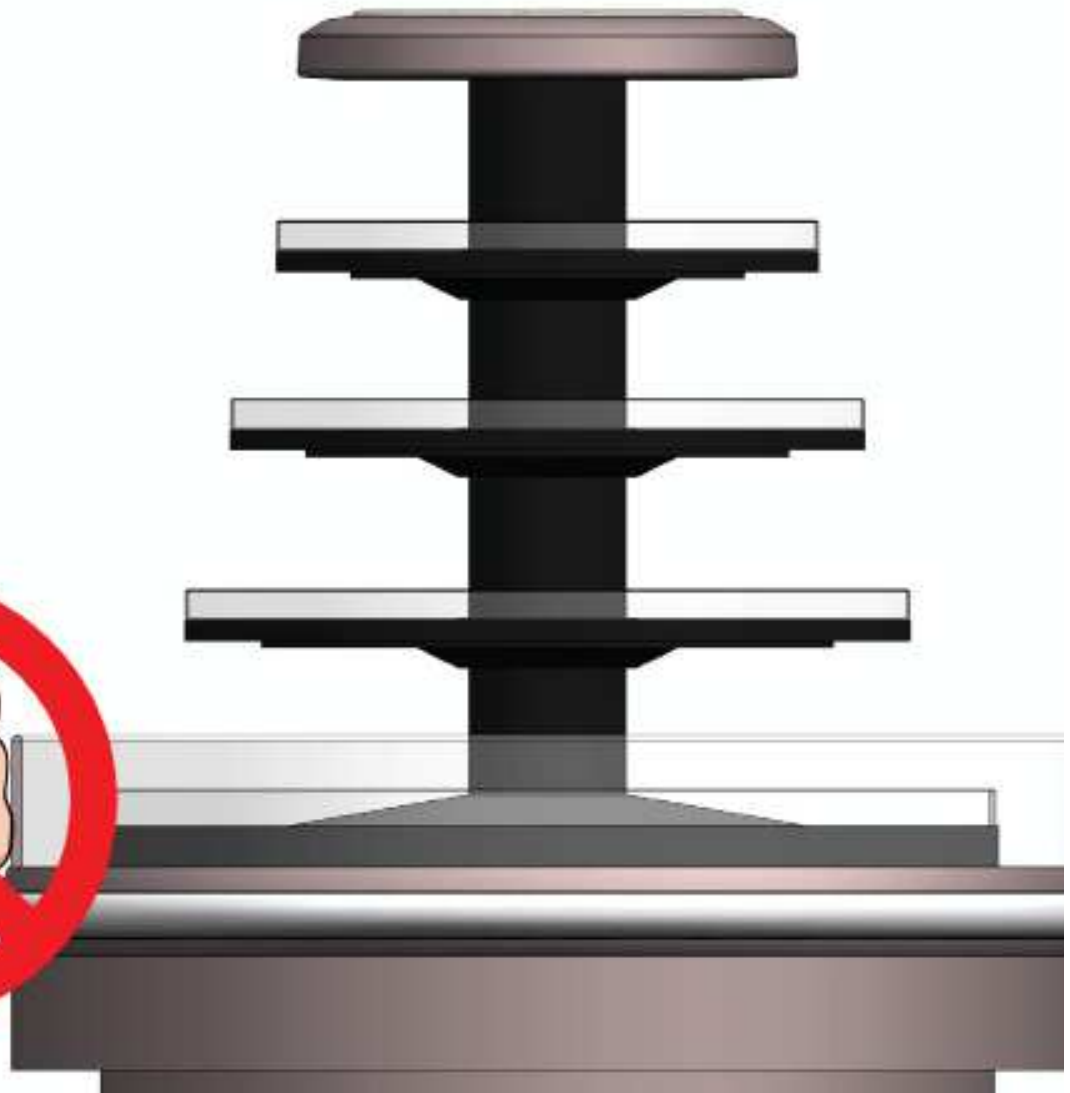
Installation
& Operation
Manual
REV. 0218

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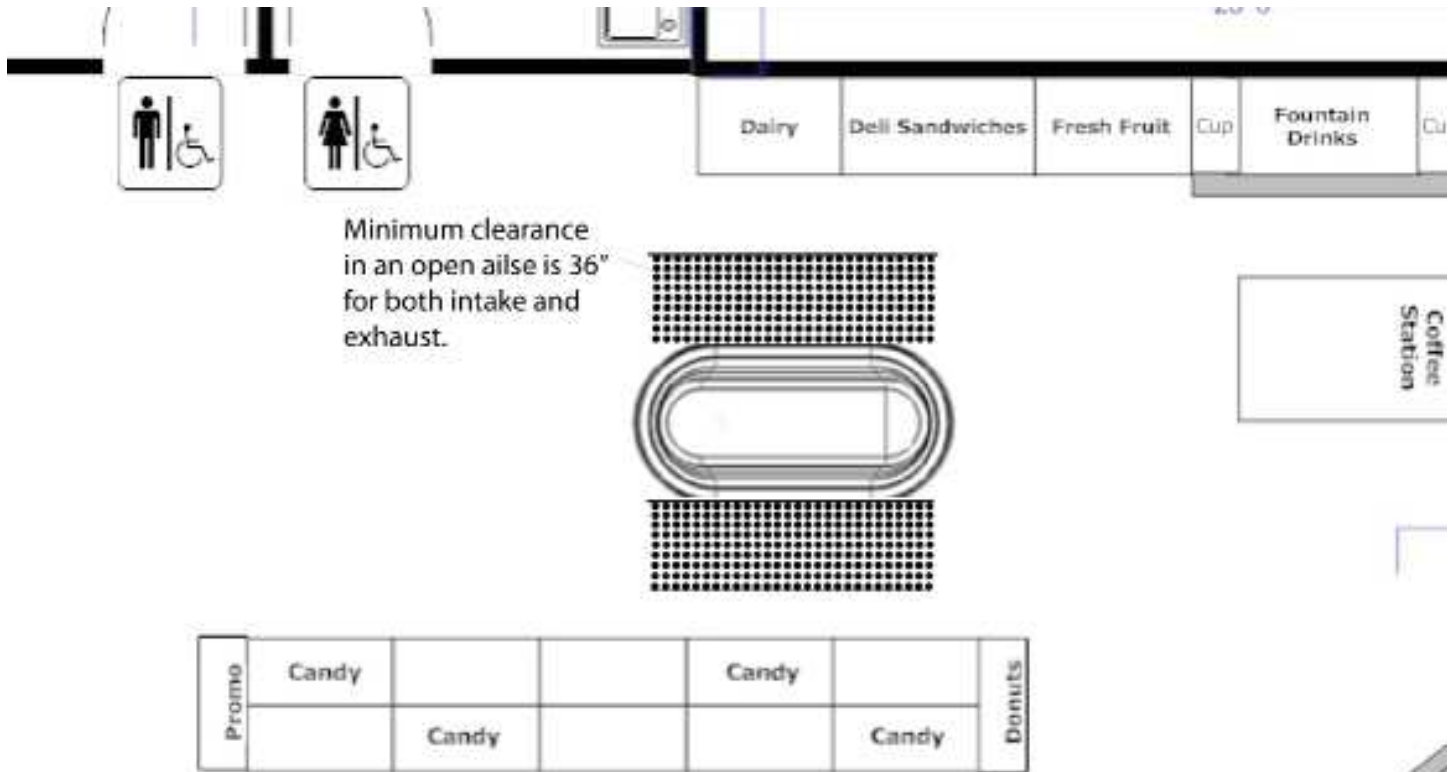
1. Do Not Push, Pull, Adjust, or Manipulate the TY case by any glass component.
 - Doing so will result in severe damage to such components
 - Glass breakage may result in serious injury
2. Never stand on the TY Top, Deck, or any Shelves for any reason.
 - Misusing these surfaces as steps will result in damage to the case
 - Misusing these surfaces as steps may result in serious injury to the user
 - These surfaces are intended for the storage and merchandising of food products
 - Use a ladder or designed structure to work above the case (Do not lean on case)
3. DO NOT remove shelves. WARNING! will adversely impact case performance when merchandising.



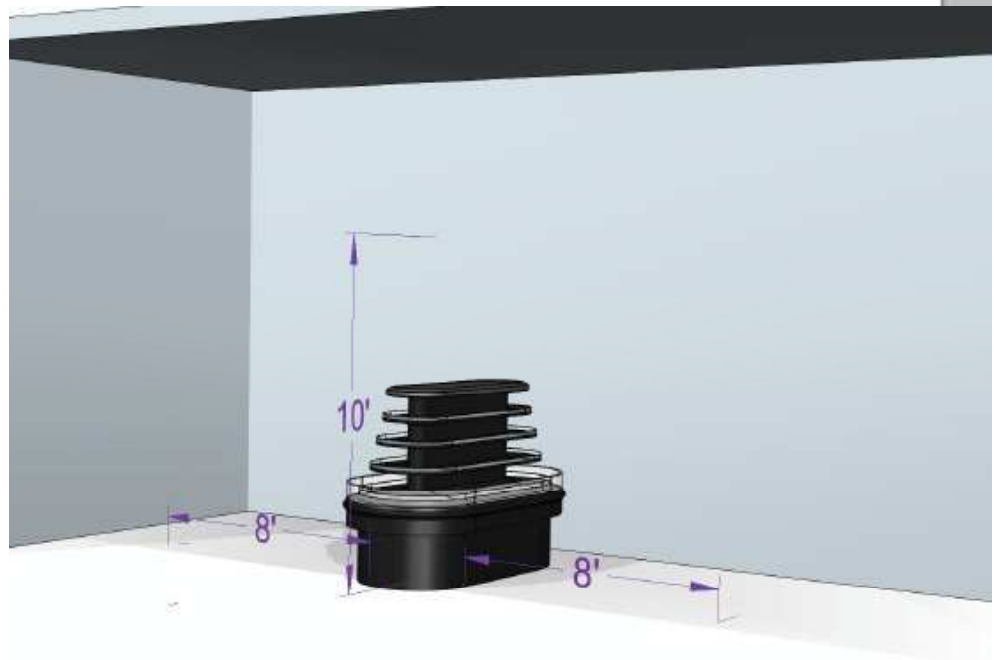
Warning

Minimum Clearances for TY cases are to be followed as instructed for proper placement inside store locations.

- A minimum clearance of 15' from door opening must be maintained in order for case to remain in optimal performance.
- Side clearances are to be a minimum of 8' when placed next to a solid wall.
- Height clearance measured from floor follows as a minimum of 10' vertically.
- Minimum of 36" clearance if near an open aisle is required for optimal Air Curtain cycling.
(Assumed 8' clearance from solid wall)



The following figure demonstrates proper clearances for Entyce cases assuming the surrounding walls are solid to ensure optimal performance of the cases Air Curtain.



General Information

Case Description:

This Booklet specifically covers the following models:

- Entyce - TY3
- TY4

Description: Entyce A multi deck air curtain Self-Service case designed to display pre-packaged Deli, Bakery, Meat, Seafood, and/or Beverage products.

Shipping Damage: All equipment should be thoroughly examined for shipping damage before and during unloading. This equipment has been carefully inspected at our factory and the carrier has assumed responsibility for safe arrival. If damaged, either apparent or concealed, claim must be made to the carrier.

Apparent Loss or Damage: If there is an obvious loss or damage, it must be noted on the freight bill or express receipt and signed by the carrier's agent; otherwise, carrier may refuse claim. The carrier will supply necessary claim forms.

Concealed Loss or Damage: When loss or damage is not apparent until after all equipment is uncrated, a claim for concealed damage is made. Make request in writing to carrier for inspection within 15 days, and retain all packaging. The carrier will supply inspection report and required claim forms.

Location/Store Conditions: The refrigerated merchandisers have been designed for use only in air conditioned stores where temperature and humidity are maintained at 80°F and 55% relative humidity or 75°F and 55% relative humidity. DO NOT allow air conditioning, electric fans, ovens, open doors or windows (etc.) to create air currents around the merchandiser, as this will impair its correct operation.

Shortages: Check your shipment for any possible shortages of material. If a shortage should exist and is found to be the responsibility of Hussmann Chino, notify Hussmann Chino. If such a shortage involves the carrier, notify the carrier immediately, and request an inspection. Hussmann Chino will acknowledge shortages within ten days from receipt of equipment.

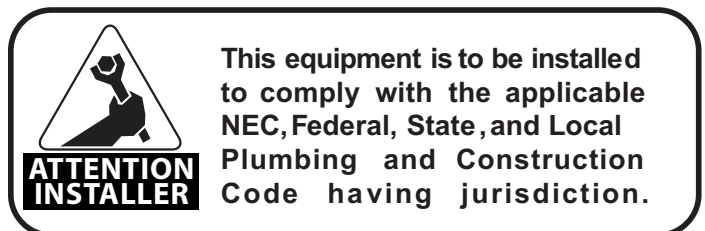
Hussmann Chino Product Control: The serial number and shipping date of all equipment has been recorded in Hussmann's files for warranty and replacement part purposes. All correspondence pertaining to warranty or parts ordering must include the serial number of each piece of equipment involved, in order to provide the customer with the correct parts.

Keep this booklet with the case at all times for future reference.

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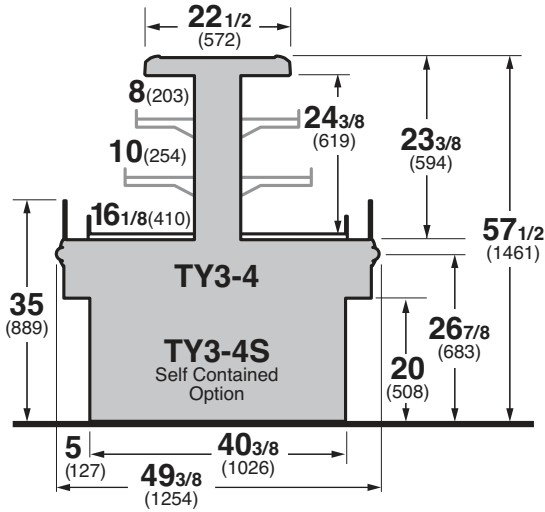
HUSSMANN®/CHINO

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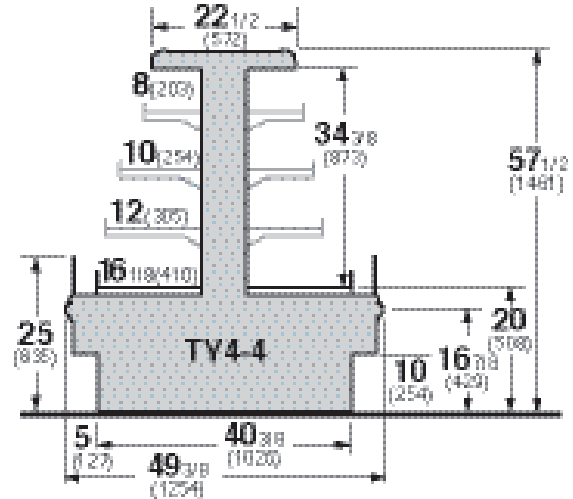


Cut and Plan Views

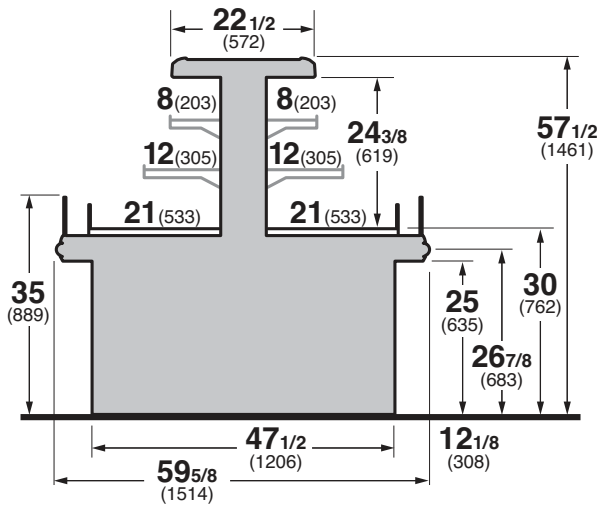
TY3-4 4' wide Merchandiser



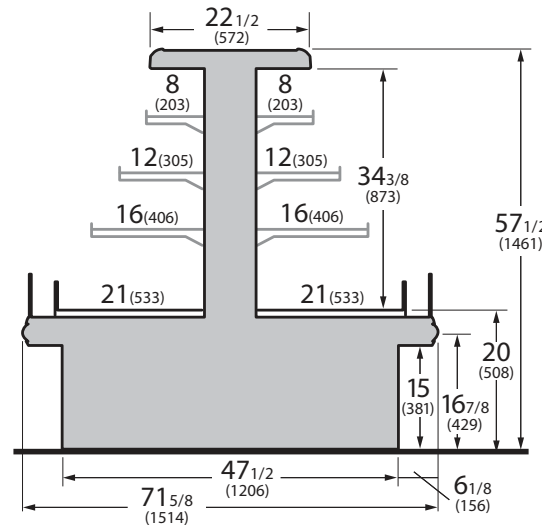
TY4-4 4' wide Merchandiser



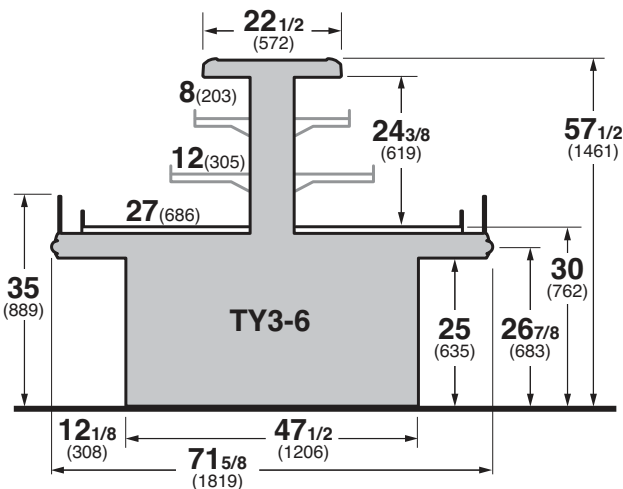
TY3-5 Entyce 3 level 5' wide island



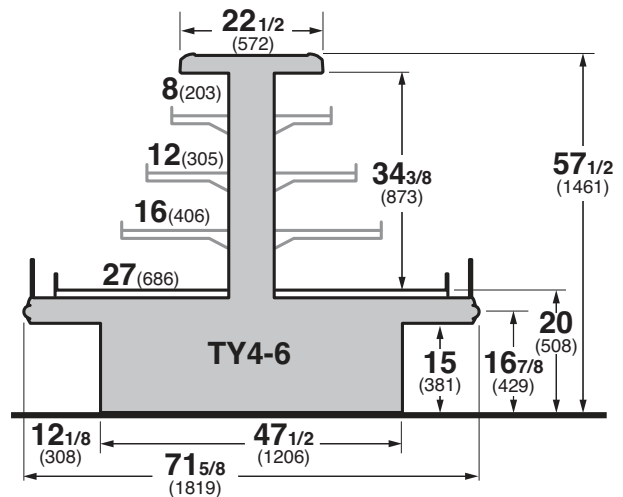
TY4-6 Entyce 4 level 6' wide island



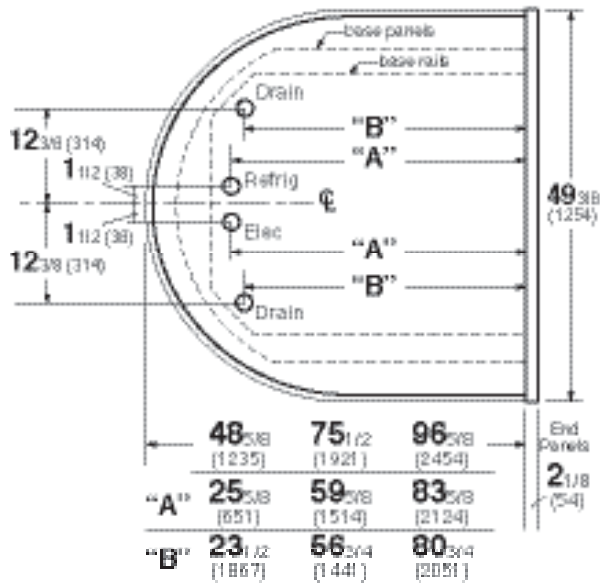
TY3-6 6' wide Merchandiser



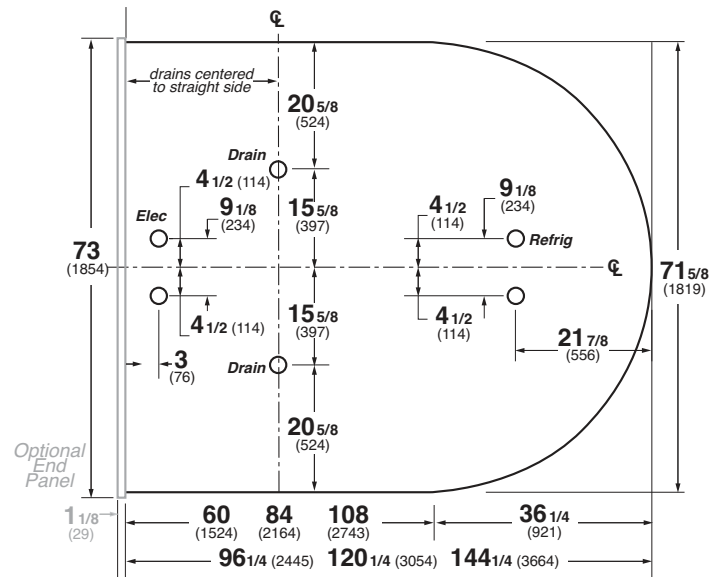
TY4-6 6' wide Merchandiser



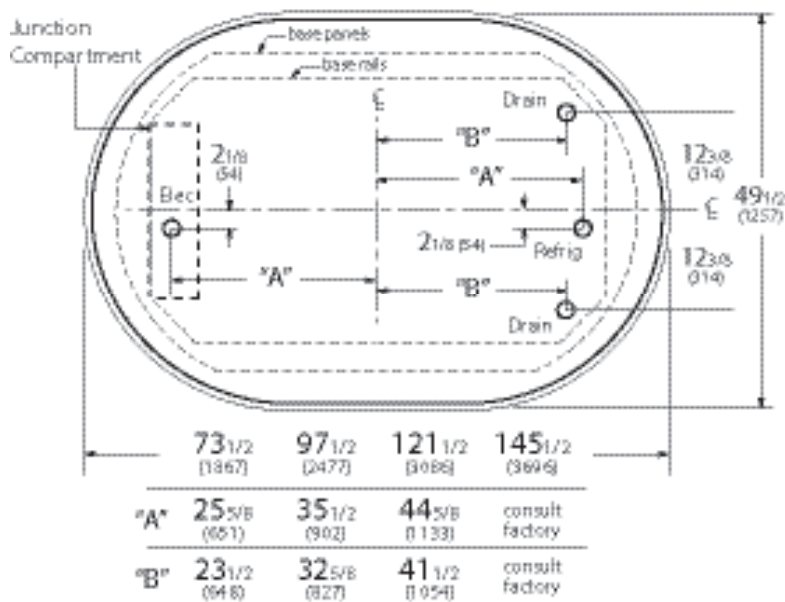
TY-4 4' wide Flat End Merchandiser



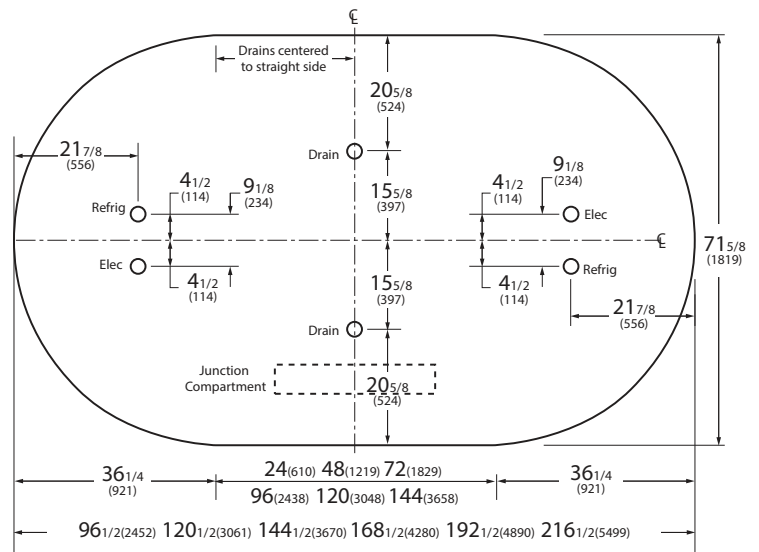
TY3-6X(case length) E - Flat End Merchandiser



TY-4 4' wide Island Merchandiser



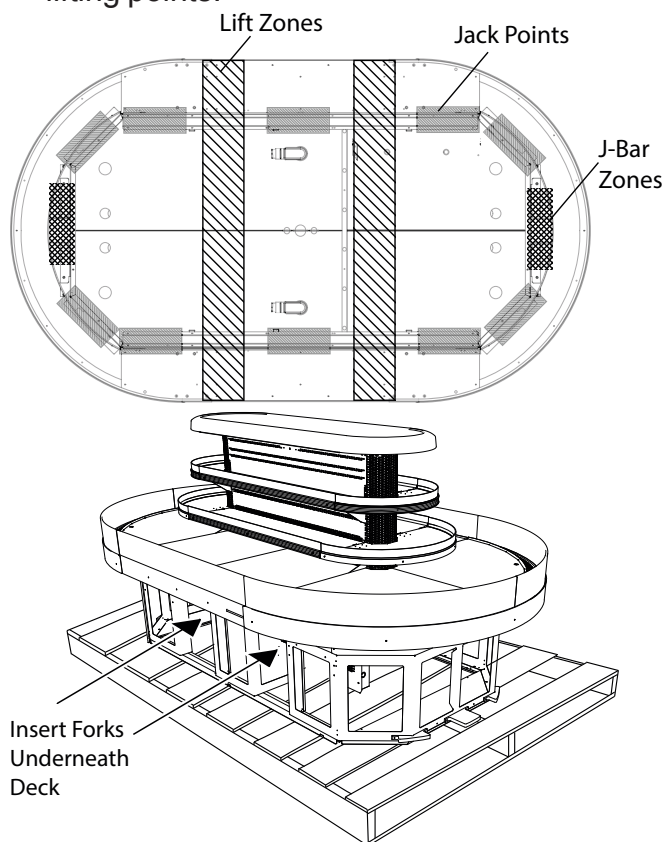
TY3-6X(case length) I - Island Merchandiser



Installation

TY Lifting and Transport Instructions

1. The Entyce can be lifted by a forklift at typical lifting points.



WARNING

Improper placement of forks may damage drainage piping. Use a spotter when placing forks. Make sure that piping will not be damaged. Use J-Bars or Jacks if forks cannot be used safely

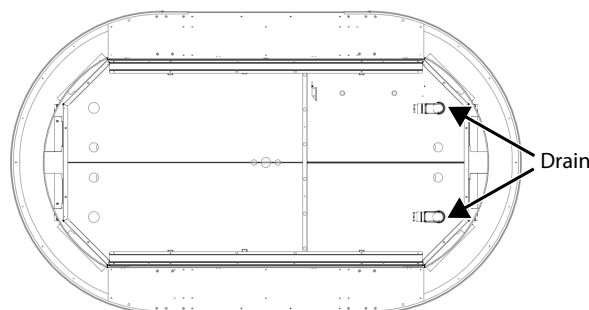
2. Ensure lower body panels are removed before lifting with a forklift. Serious damage will occur if the body panels are not removed.
3. Make sure that fork spacing and width will not damage drain or come in contact with piping, or electrical lines
4. Be sure that the forks are long enough to support beyond the center of the case but not damage near components. Check for proper balance before moving. A minimum fork length of 36" is recommended for 68" wide cases

5. The TY merchandiser can be raised at one end underneath the deck with a forklift to allow the placement of rollers or dollies.
6. Evenly support the entire base structure on rollers or dollies before attempting to move. Each Base Leg must have its own dolly to properly support the case.

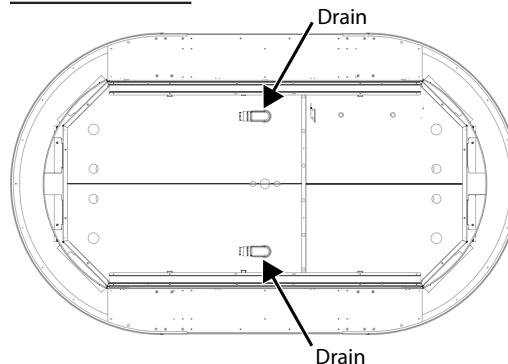
Lifting Points are typical and dependent upon size of case and refrigeration application, drainage configurations will call for alterations in Lifting Zones.

Below are the following drainage configurations and lifting should be altered to the expected model.

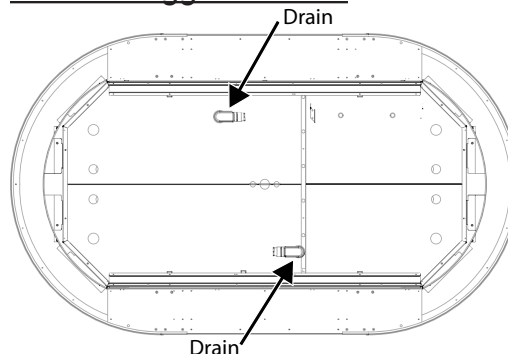
Full Side Drain



Center Drain



Center Staggered Drain



Installation

Location

The refrigerated merchandisers have been designed for use only in air conditioned stores where temperature and humidity are maintained at or 75°F and 55% relative humidity or below 80°F and 55% relative humidity. DO NOT allow air conditioning, electric fans, ovens, open doors or windows (etc.) to create air currents around the merchandiser, as this will impair its correct operation.



Uncrating the Stand

Place the fixture as close to its permanent position as possible. Detach the walls from each other and remove from the skid. Unstrap the case from the skid. The fixture can now be lifted off the crate skid. **Lift only at base of stand!**

Exterior Loading

These models have not been structurally designed to support excessive external loading. **Do not walk on their tops;** This could cause serious personal injury and damage to the fixture.



**ATTENTION
INSTALLER**

It is the contractor's responsibility to install case(s) according to local construction and health codes.

Leveling

A LEVEL CASE IS NECESSARY TO INSURE PROPER OPERATION AND WATER DRAINAGE. Note: A. To avoid removing concrete flooring, begin lineup leveling from the highest point of the store floor.

Plumbing

Waste Outlet and P-TRAP

The waste outlet is located in front and center of the case on both sides which allows for suitable access to each drain allowing drip piping to be run lengthwise under the fixture. A 1-1/2" P-TRAP and threaded adapter are supplied with each fixture. The P-TRAP must be installed to prevent air leakage and insect entrance into the fixture.

NOTE: *PVC-DWV solvent cement is recommended. Follow Hussmann's instructions.*

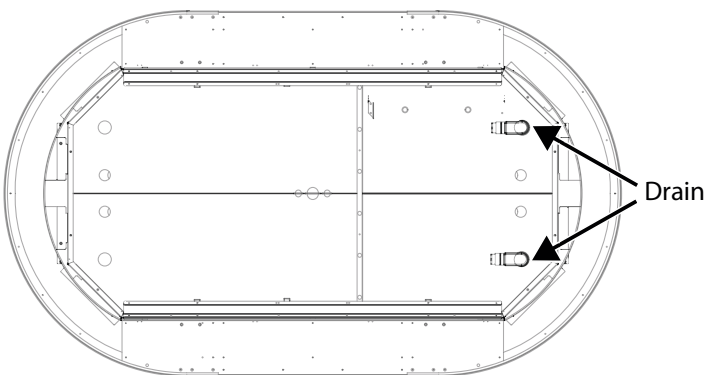
Installing Condensate Drain

Poorly or improperly installed condensate drains can seriously restrict the operation of this refrigerator, and result in costly maintenance and product losses. Please follow the recommendations listed below when installing condensate drains to insure a proper installation:

1. Never use pipe for condensate drains smaller than the nominal diameter of the pipe or P-TRAP supplied with the case.
2. When connecting condensate drains, the P-TRAP must be used as part of the condensate drain to prevent air leakage or insect entrance. Store plumbing system floor drains should be at least 14" off the center of the case to allow use of the P-TRAP pipe section. Never use two water seals in series in any one line. Double P-TRAPS in series will cause a lock and prevent draining.

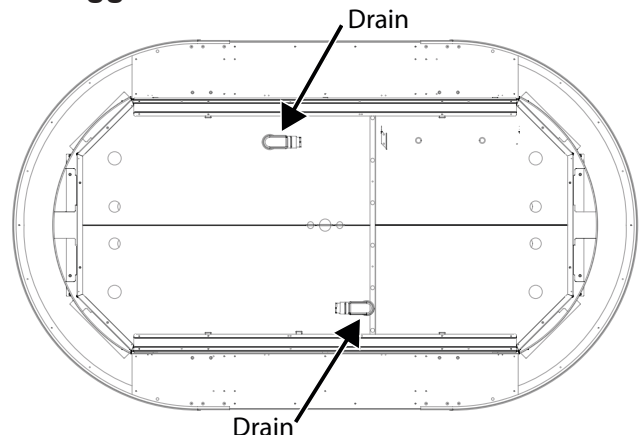
3. Always provide as much down hill slope ("fall") as possible; 1/8" per foot is the preferred minimum. PVC pipe, when used, must be supported to maintain the 1/8" pitch and to prevent warping.
4. Avoid long runs of condensate drains. Long runs make it impossible to provide the "fall" necessary for good drainage.
5. Provide a suitable air break between the flood rim of the floor drain and outlet of condensate drain. 1" is ideal.
6. Prevent condensate drains from freezing:
 - a. Do not install condensate drains in contact with non-insulated suction lines. Suction lines should be insulated with a nonabsorbent insulation material such as Armstrong's Armaflex.
 - b. Where condensate drains are located in dead air spaces (between refrigerators or between a refrigerator and a wall), provide means to prevent freezing. The water seal should be insulated to prevent condensation.

One Sided Drain

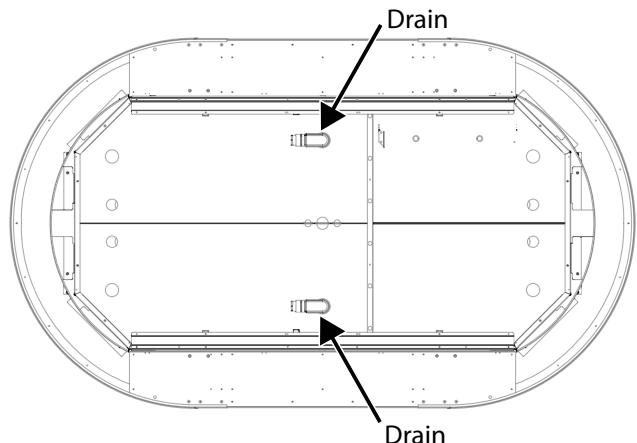


Note: Cases are typical, length of cases vary

Staggered Center Drain



Center Drain



Refrigeration Piping

The standard refrigerant will be R-404 unless otherwise specified on the customer order. Check the serial plate on the case for information. Refrigeration outlet access and the refrigeration components for the Entyce are situated on the left hand side near the centerline of the case to deliver optimal access which provides for easy installation and maintenance purposes without the probability of damaging any components.

Refrigerant lines should be sized as shown on the refrigeration legend furnished by the store. Install P-TRAPS (oil traps) at the base of all suction line vertical risers. Pressure drop can rob the system of capacity. To keep the pressure drop to a minimum, keep refrigerant line run as short as possible, using the minimum number of elbows. Where elbows are required, use long radius elbows only. All refrigeration components are located underneath the left hand side case deck pans.

Refrigeration Lines

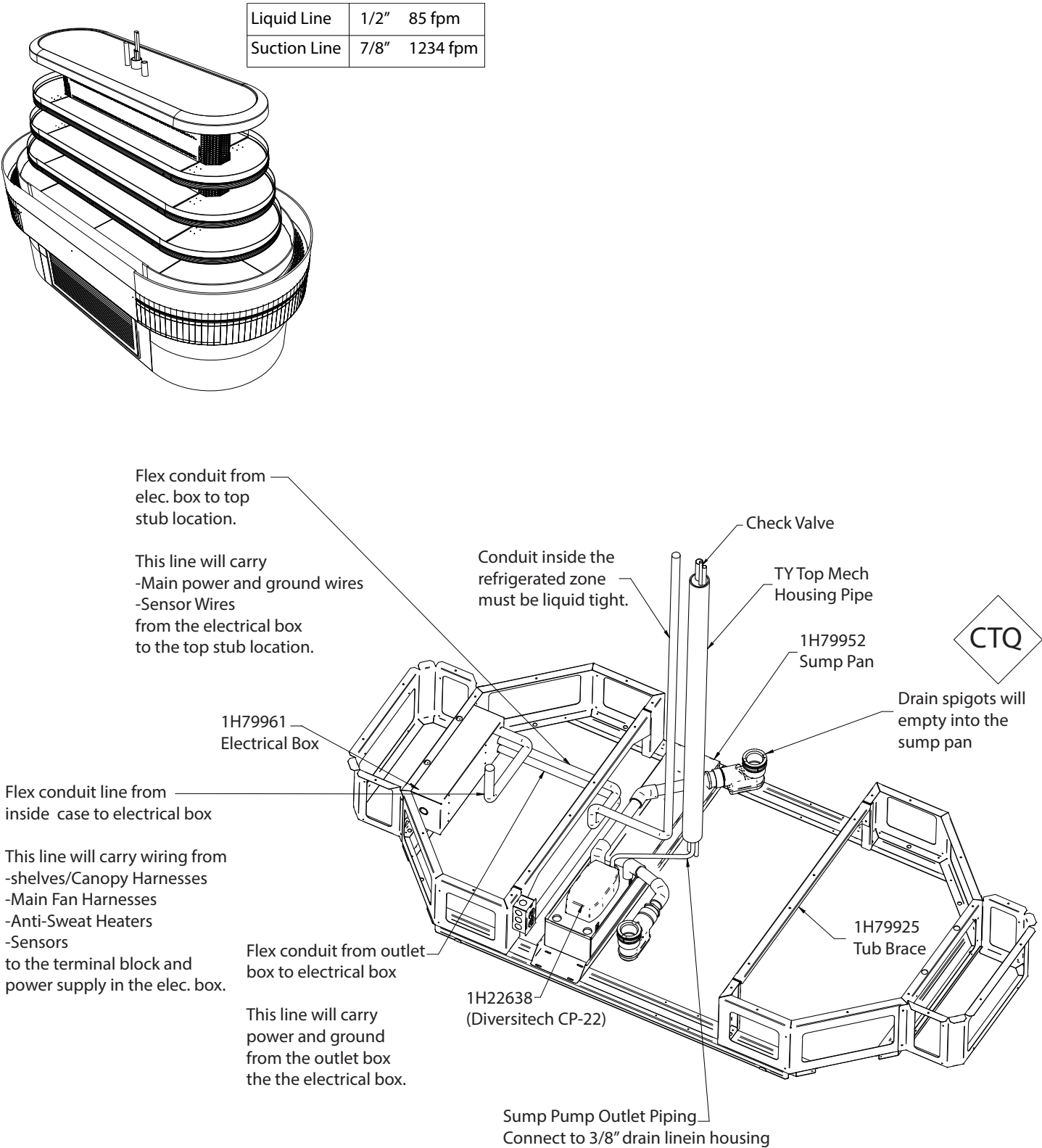
<u>Liquid</u>	<u>Suction</u>
3/8" O.D.	5/8" O.D.

Sump Pump Configuration

Connecting Sump Lines

For Entyce cases with a Sump Pump Configuration connect liquid line, suction line, electrical, and drain line to top case stub-ups (outlets).

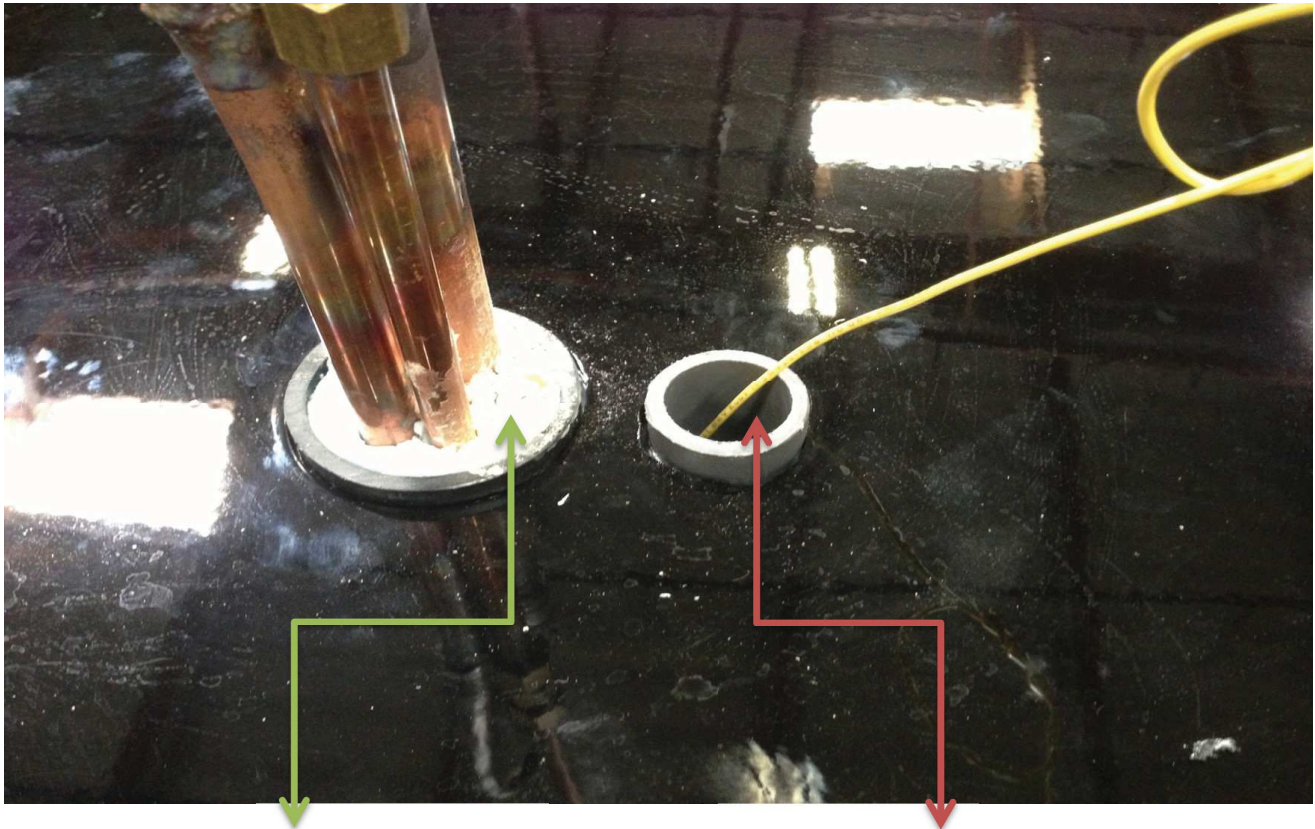
Note: Isolate Drain line from Suction line either by seperating the lines or insulating the suction line.



Sealing Sump Lines

For Entyce cases with a Sump Pump Configuration connect liquid line, suction line, electrical, and drain line to top case stub-ups (outlets).

Note: Example below demonstrates the proper method of sealing refrigeration and electrical access points. Ensure tight seal to eliminate any air penetration.



Sealed refrigeration lines inside of pipe.

This is an EXAMPLE of how to properly seal electrical lines (using silicone) once electrical lines are pulled using provided wire-chase.

Installers: After running electrical you MUST seal top (shown here) and bottom of this pipe to eliminate any air penetration!

Failure to do so will cause condensation inside of pipe and water will drip on floor!

Silicone is an acceptable material to seal pipe.

Specifications



SELF-SERVICE DELI

HUSSMANN - TY1-6 I-ISLAND (CHINO)

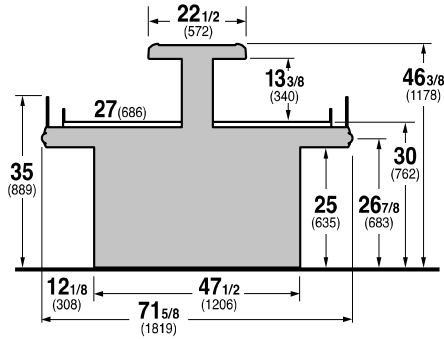


Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

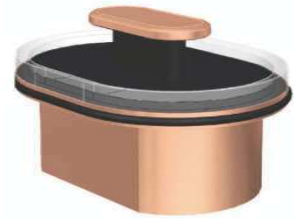
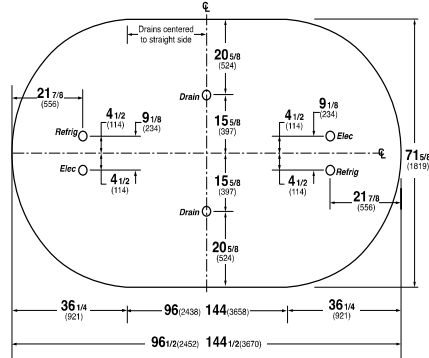
REVISION DATE

02/06/17

TY1-6 Single Level 6' wide Island



TY1-6X(case length) I - Island Merchandiser



REFRIGERATION DATA:

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR) TOTAL		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
8'-I	DELI	9600	9600	24	24	30~32	150~200
12'-I	DELI	14400	14400	24	24	30~32	150~200

CASE LENGTHS	EST. REFG. CHRG. 404A (LBS)	GLYCOL (20°F INLET, 6° RISE)	
		GPM	PSI
8'-I	1.1	3.4	4.6
12'-I	1.8	5.0	4.4

**FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB

***REFRIGERATION NOTES:

- 1) BTUS DO NOT INCLUDE LIGHTS.
- 2) ADD 10 BTU'S PER FOOT OF LED SHELF LIGHTS PER LIGHT MATRIX BELOW.
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY.
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH.

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI	32	29	OFF TIME	16	12	48	TBD	9.5

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125

ELECTRICAL DATA:

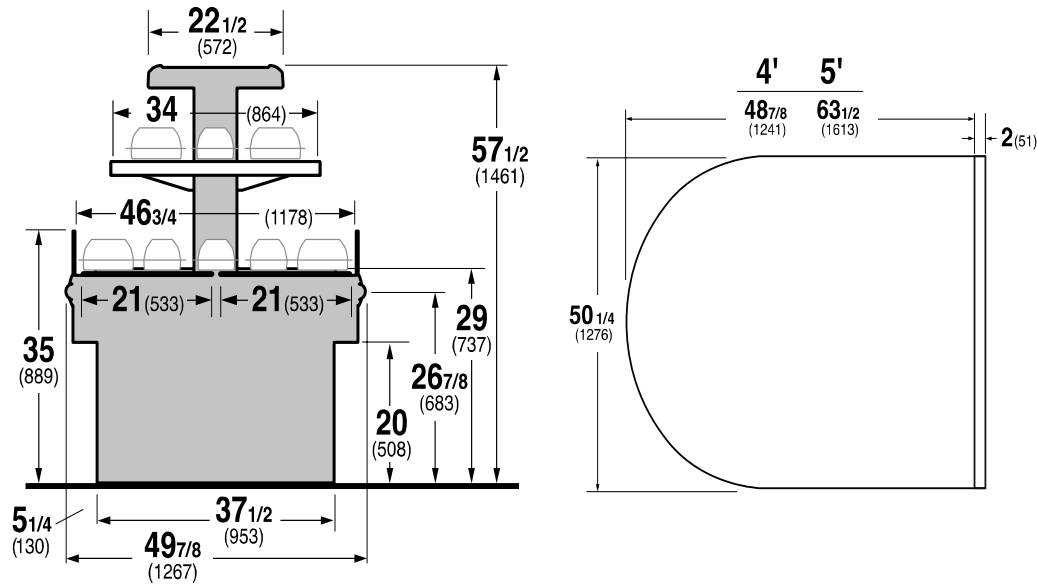
STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
8'-I	6	8	10	1.8	48	0.12	14	N/A	N/A	0.12	14	0.43	50	1	115	15	6
12'-I	10	8	10	3	80	0.30	35	N/A	N/A	0.30	35	0.78	90	1	115	15	14

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
8'-I	N/A	N/A	N/A	N/A	N/A	N/A
12'-I	N/A	N/A	N/A	N/A	N/A	N/A

TY3-4-H Self-Service Hot End



ELECTRICAL DATA:

208 VOLT MODELS	VOLTS	PH	HZ	TOTAL HOT LEVELS ***	WATTS *	AMPS L1	AMPS L2	AMPS L3	WIRES **
TY3-4X4E-H	208	3	60	2	4563	13.7	13.7	10.6	5
TY3-4X5E-H	208	3	60	2	5764	17.5	17.5	13.0	5

240 VOLT MODELS	VOLTS	PH	HZ	TOTAL HOT LEVELS ***	WATTS *	AMPS L1	AMPS L2	AMPS L3	WIRES **
TY3-4X4E-H	240	3	60	2	6069	15.8	15.8	12.2	5
TY3-4X5E-H	240	3	60	2	7809	20.2	20.2	15.0	5

* INCLUDES INCANDESCENT LAMPS

** INCLUDES GROUND WIRE

*** TOTAL HEATED LEVELS = # ROWS OF SHELVES + BOTTOM WARMING SURFACE

LEGEND		
N/A -	NOT AVAILABLE	
TBD -	TO BE DETERMINED	
SBO -	SUPPLIED BY OTHERS	
EXTERNAL END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	2.125	2.125
2	1.125	2.25

OPTIONS/NOTES:

- NOTE: CASE WIDTH INCLUDES END PANELS WITH OPTIONAL INTERIOR END PANELS
- NOTE: CASES MUST BE GROUNDED
- NOTE: LED LIGHTS ARE NOT AVAILABLE ON HOT CASES AT THIS TIME.

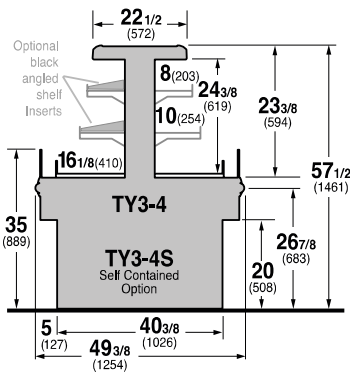
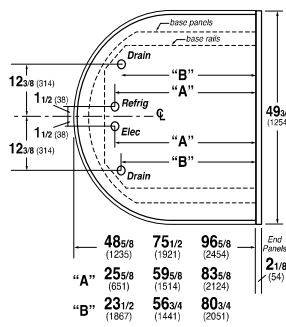
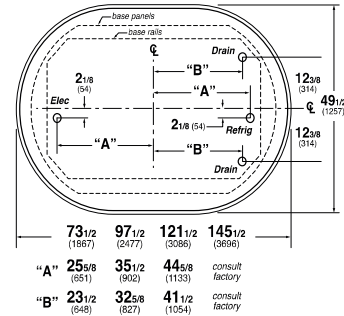
SELF-SERVICE HOT CASE

122614

**SELF-SERVICE DELI****HUSSMANN - TY3-4 I-ISLAND, E-END, REMOTE (CHINO)**

Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE 02/06/17

TY3-4 4' wide Merchandiser**TY-4 4' wide Flat End Merchandiser****TY-4 4' wide Island Merchandiser****REFRIGERATION DATA:**

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR)		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
6I	DELI	9150	7800	26	28	31~33	100~175
8I	DELI	12200	10400	26	28	31~33	100~175
10I	DELI	15250	13000	26	28	31~33	100~175
12I	DELI	18300	15600	26	28	31~33	100~175
4E	DELI	6100	5200	26	28	31~33	100~175
6E	DELI	9200	7800	26	28	31~33	100~175
8E	DELI	12300	10400	26	28	31~33	100~175

CASE LENGTHS	EST. REFG. CHRG. (LBS)	20°F GLYCOL 6° RISE	
		GPM	PSI
6I	1.1	2.8	3.6
8I	1.1	3.7	5.0
10I	1.3	4.5	3.5
12I	1.8	5.4	4.7
4E	0.8	3.5	4.2
6E	1.1	4.3	6.2
8E	1.3	5.1	4.2

****FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB*******REFRIGERATION NOTES:**

- 1) BTUS DO NOT INCLUDE LIGHTS.
- 2) ADD 10 BTU'S PER FOOT OF LED SHELF LIGHTS PER LIGHT MATRIX BELOW.
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY.
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH.

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI	33	30	OFF TIME	16	12	48	N/A	15

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125

ELECTRICAL DATA:**STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)**

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX FT OF LEDS
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
6I	6	8	15	1.8	48	0.12	14	0.25	29	0.37	43	0.61	70	1	115	15	18'
8I	6	8	15	1.8	48	0.22	25	0.44	50	0.65	75	0.78	90	1	115	15	30'
10I	8	8	15	2.4	64	0.30	35	0.61	70	0.91	105	0.78	90	1	115	15	42'
12I	10	8	10	3.0	80	0.40	46	0.79	91	1.19	137	0.96	110	1	115	15	54'
4E	4	8	15	1.2	32	0.10	12	0.21	24	0.31	36	0.26	30	1	115	15	15'
6E	6	8	15	1.8	48	0.20	23	0.40	46	0.60	68	0.61	70	1	115	15	27'
8E	8	8	15	2.4	64	0.28	33	0.57	65	0.85	98	0.78	90	1	115	15	39'

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
6I	N/A	N/A	N/A	N/A	N/A	N/A
8I	N/A	N/A	N/A	N/A	N/A	N/A
10I	N/A	N/A	N/A	N/A	N/A	N/A
12I	N/A	N/A	N/A	N/A	N/A	N/A
4E	N/A	N/A	N/A	N/A	N/A	N/A
6E	N/A	N/A	N/A	N/A	N/A	N/A
8E	N/A	N/A	N/A	N/A	N/A	N/A

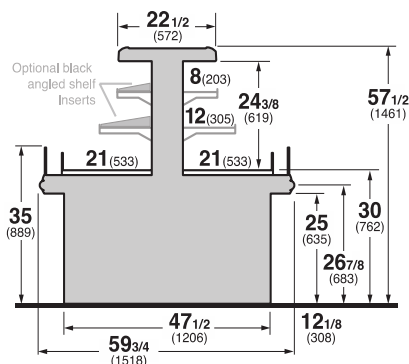
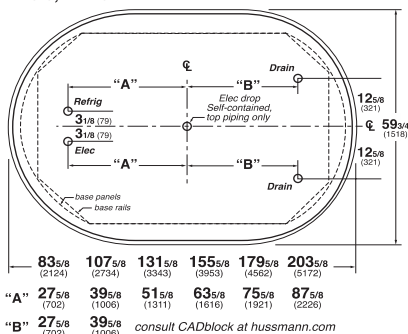
**SELF-SERVICE DELI CHEESE**

HUSSMANN - TY3-5 I-ISLAND (CHINO)



Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE 03/21/17

TY3-5 Entyce 3 level 5' wide island**TY3-5, TY4-5** 5' wide Island Merchandiser**REFRIGERATION DATA:**

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR)		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
71	DELI / CHEESE	10770	10770	26	26	30~33	175~250
91	DELI / CHEESE	13790	13790	26	26	30~33	175~250
111	DELI / CHEESE	16810	16810	26	26	30~33	175~250
131	DELI / CHEESE	19830	19830	26	26	30~33	175~250
151	DELI / CHEESE	22850	22850	26	26	30~33	175~250
171	DELI / CHEESE	25870	25870	26	26	30~33	175~250

CASE LENGTHS	EST. REFG. CHRG. (LBS)	20°F GLYCOL 6° RISE	
		GPM	PSI
71	1.1	3.8	5.2
91	1.3	4.8	3.8
111	1.8	5.8	5.1
131	2.2	6.7	6.7
151	2.7	7.6	4.7
171	3.1	8.5	5.4

****FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB*******REFRIGERATION NOTES:**

- 1) BTUS ARE SHOWN WITHOUT LIGHTS
- 2) ADD 10 BTU/FT OF LED LIGHTS PER LIGHT MATRIX BELOW
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI / CHEESE	33	30	OFF TIME	16	12	48	N/A	11

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:**STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)**

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
71	6	8	15	1.8	48	0.12	14.27	0.29	32.99	0.41	47	0.43	50	1	115	15	22
91	8	8	15	2.4	64	0.22	25.04	0.47	54.52	0.69	80	0.61	70	1	115	15	34
111	10	8	15	3.0	80	0.30	34.87	0.65	74.18	0.95	109	0.78	90	1	115	15	46
131	12	8	10	3.6	96	0.40	45.63	0.83	95.71	1.23	141	0.96	110	1	115	15	58
151	14	8	10	4.2	112	0.49	56.39	1.02	117.23	1.51	174	1.04	120	1	115	15	70
171	16	8	10	4.8	128	0.57	65.29	1.17	135.02	1.74	200	1.22	140	1	115	15	82

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
71	N/A	N/A	N/A	N/A	N/A	N/A
91	N/A	N/A	N/A	N/A	N/A	N/A
111	N/A	N/A	N/A	N/A	N/A	N/A
131	N/A	N/A	N/A	N/A	N/A	N/A
151	N/A	N/A	N/A	N/A	N/A	N/A
171	N/A	N/A	N/A	N/A	N/A	N/A



SELF-SERVICE DELI / PRODUCE

HUSSMANN - TY3-6 I-ISLAND, E-END, C-CENTER (CHINO)

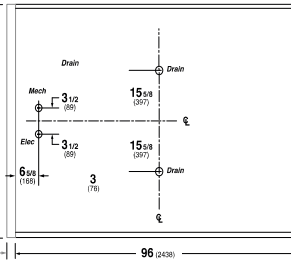


Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

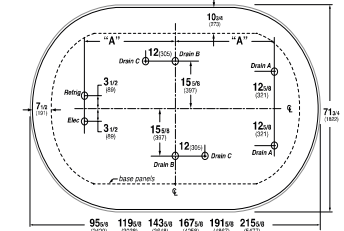
REVISION DATE

05/17/17

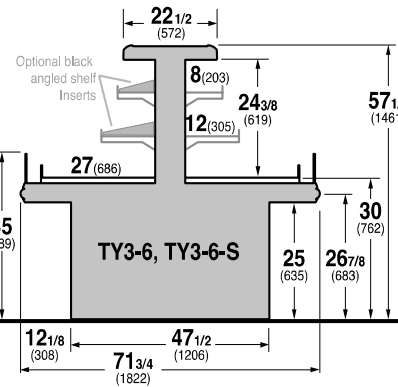
TY -6 C - Center Merchandiser



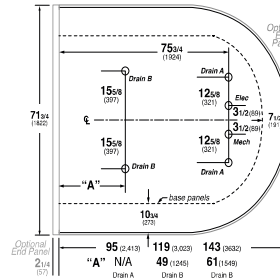
TYX-6 1, 3, or 4 Levels, 6' wide Island



Note: *Shut up locations vary, please refer to Callbook at Hussmann.com



TYX-6 1, 3, or 4 Levels, 6' wide End Case



REFRIGERATION DATA:

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR)		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
8l, 10l, 12l, 14l, 16l, 18l	DELI	1650	1340	20	28	28~30	100~150
8l, 10l, 12l, 14l, 16l, 18l	PRODUCE*	N/A	1340	N/A	28	N/A	100~150
8E, 10E, 12E	DELI	1570	1340	20	28	28~30	100~150

*APPROVED FOR NON-CRITICAL TEMP PRODUCE ONLY

**FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB

***REFRIGERATION NOTES:

- 1) BTU'S ARE SHOWN WITHOUT LIGHTS.
- 2) ADD 10 BTU'S PER FOOT OF LED LIGHTS PER LIGHT MATRIX BELOW.
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY.
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH.

CASE LENGTHS	EST. REFG. CHRG. 404a (LBS)	GLYCOL (20°F INLET, 6° RISE)	
		GPM	PSI
8l	1.1	4.7	6.6
10l	1.3	5.8	4.6
12l	1.8	6.9	6.2
14l	2.2	7.9	7.9
16l	2.7	8.9	5.5
18l	3.1	9.9	6.3
8E	1.3	4.1	3.3
10E	1.8	5.0	4.6
12E	2.2	6.0	6.1

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI	30	26	OFF TIME	16	12	52	N/A	15.8
PRODUCE	38	34	OFF TIME	16	12	52	N/A	15.8

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:

STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
8l	6	8	15	1.8	48	0.1	14	0.3	37	0.4	52	0.4	50	1	115	15	22
10l	8	8	15	2.4	64	0.2	25	0.5	59	0.7	84	0.6	70	1	115	15	36
12l	10	8	15	3.0	80	0.3	35	0.7	79	1.0	113	0.8	90	1	115	15	46
14l	12	8	10	3.6	216	0.4	46	0.9	100	1.3	146	1.0	110	1	115	15	58
16l	14	8	10	4.2	252	0.5	56	1.1	122	1.5	178	1.0	120	1	115	15	70
18l	16	8	10	4.8	288	0.6	65	1.2	139	1.8	205	1.2	140	1	115	15	82
8E	6	8	15	1.8	48	0.2	28	0.5	56	0.7	85	0.3	40	1	115	15	33
10E	8	8	15	2.4	64	0.3	38	0.7	77	1.0	115	0.3	40	1	115	15	45
12E	10	8	15	3.0	80	0.3	33	0.8	98	1.1	130	1.0	110	1	115	15	57

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

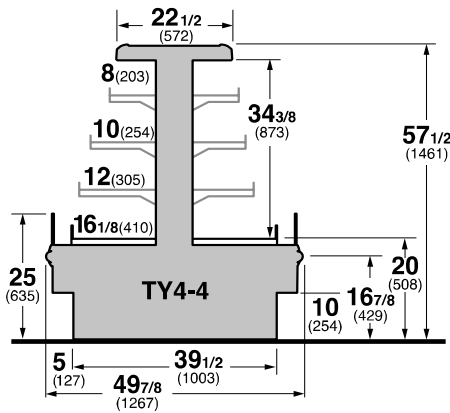
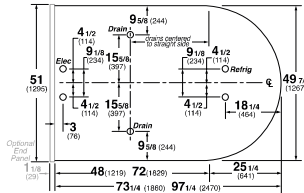
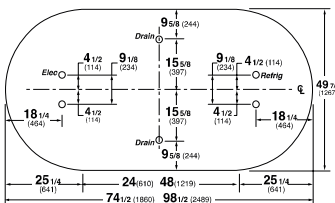
CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
8l	N/A	N/A	N/A	N/A	N/A	N/A
10l	N/A	N/A	N/A	N/A	N/A	N/A
12l	N/A	N/A	N/A	N/A	N/A	N/A
14l	N/A	N/A	N/A	N/A	N/A	N/A
16l	N/A	N/A	N/A	N/A	N/A	N/A
18l	N/A	N/A	N/A	N/A	N/A	N/A
8E	N/A	N/A	N/A	N/A	N/A	N/A
10E	N/A	N/A	N/A	N/A	N/A	N/A
12E	N/A	N/A	N/A	N/A	N/A	N/A

**SELF-SERVICE DELI TYPE I****HUSSMANN - TY4-4 I-ISLAND, E-END (CHINO)**

Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE

07/21/17

**TY4-4X(case length) E - Flat End Merchandiser****TY4-4X(case length) I - Island Merchandiser****REFRIGERATION DATA:**

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR)		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
6I	DELI	11500	11500	24	24	30~32	100~150
8I	DELI	15300	15300	24	26	30~32	100~150
10I	DELI	19100	19100	24	26	30~32	100~150
12I	DELI	20820	20820	24	26	30~32	100~150
4E	DELI	7300	7300	24	26	30~32	100~150
6E	DELI	11100	11100	24	24	30~32	100~150
8E	DELI	14900	14900	24	26	30~32	100~150
10E	DELI	18700	18700	24	26	30~32	100~150

CASE LENGTHS	EST. REFG. CHRG. (LBS)	20°F GLYCOL 6° RISE	
		GPM	PSI
6I	1.1	4.1	5.6
8I	1.3	5.4	7.8
10I	1.3	6.7	5.4
12I	1.8	7.2	6.5
4E	0.8	2.5	2.8
6E	1.1	3.7	5.2
8E	1.1	4.9	4.0
10E	1.3	4.9	4.0

****FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB*******REFRIGERATION NOTES:**

- 1) BTU'S SHOWN ARE WITHOUT LIGHTS
- 2) ADD 10 BTU'S PER FOOT OF LED LIGHTS PER LIGHT MATRIX BELOW
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI	32	29	OFF TIME	16	12	54	N/A	12

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:**STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)**

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	FT OF LED
6I	6	8	15	1.8	48	0.12	14.27	0.45	51.71	0.57	66	0.43	50	1	115	15	26
8I	6	8	20	1.8	48	0.22	25.04	0.73	84.01	0.95	109	0.61	70	1	115	15	42
10I	8	8	15	2.4	64	0.30	34.87	0.99	113.49	1.29	148	0.78	90	1	115	15	58
12I	10	8	15	3.0	80	0.40	45.63	1.27	145.78	1.66	191	0.96	110	1	115	15	74
4E	4	8	20	1.2	32	0.10	12.05	0.35	40.60	0.46	53	0.26	30	1	115	15	22
6E	6	8	15, 20	1.8	48	0.20	22.82	0.63	72.89	0.83	96	0.61	70	1	115	15	38
8E	8	8	15, 20	2.4	48	0.28	32.64	0.89	102.38	1.17	135	0.78	90	1	115	15	54
10E	10	8	15, 20	3.0	64	0.38	43.41	1.17	134.67	1.55	178	0.87	100	1	115	15	70

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
6I	N/A	N/A	N/A	N/A	N/A	N/A
8I	N/A	N/A	N/A	N/A	N/A	N/A
10I	N/A	N/A	N/A	N/A	N/A	N/A
12I	N/A	N/A	N/A	N/A	N/A	N/A
4E	N/A	N/A	N/A	N/A	N/A	N/A
6E	N/A	N/A	N/A	N/A	N/A	N/A
8E	N/A	N/A	N/A	N/A	N/A	N/A
10E	N/A	N/A	N/A	N/A	N/A	N/A



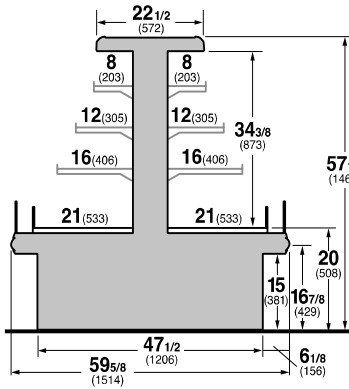
SELF-SERVICE DELI CHEESE HUSSMANN - TY4-5 I-ISLAND (CHINO)



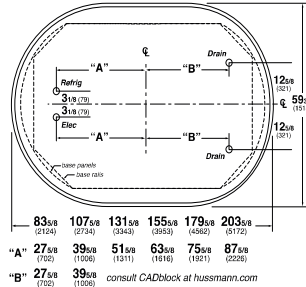
Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE 12/22/2016

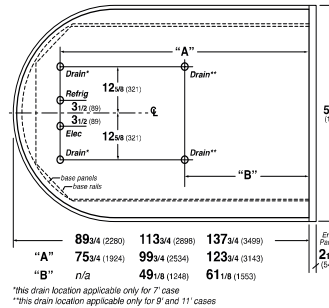
TY4-5 Entyce 4 level 5' wide island



TY-5 5' wide Island Merchandiser



TY-5 5' wide Flat End Merchandiser



REFRIGERATION DATA:

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR) RATING CONDITION		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		NSF 7	AHRI 1200	EVAPORATOR		DISCHARGE AIR ** (°F)	
				NSF 7	AHRI 1200	NSF 7	
71	DELI /	13660	13660	22	22	28~30	100~150
91	DELI /	17500	17500	22	22	28~30	100~150
111	DELI /	21340	21340	22	22	28~30	100~150
131	DELI /	25180	25180	22	22	28~30	100~150
151	DELI /	29000	29000	22	22	28~30	100~150
171	DELI /	32850	32850	22	22	28~30	100~150

CASE LENGTHS	EST. REFG. CHRG. 404A (LBS)	GLYCOL (20°F INLET, 6° RISE)	
		GPM	PSI
71	1.1	4.8	6.8
91	1.3	6.2	4.9
111	1.8	7.4	6.7
131	2.2	8.7	8.7
151	2.7	9.8	6.1
171	3.1	11.0	7.0

**FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB

***REFRIGERATION NOTES:

- 1) BTU'S SHOWN ARE WITHOUT LIGHTS.
- 2) ADD 10 BTU'S PER FOOT OF LED LIGHTS PER LIGHT MATRIX BELOW.
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY.
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH.

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI / CHEESE	31	28	OFF TIME	16	12	52	N/A	12

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:

STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX FT OF LED
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
71	6	8	20	1.8	48	0.12	14	0.57	66	0.70	80	0.43	50	1	115	15	34
91	8	8	20	2.4	64	0.22	25	0.85	98	1.07	123	0.61	70	1	115	15	50
111	10	8	20	3	80	0.30	35	1.11	128	1.41	162	0.78	90	1	115	15	66
131	12	8	15	3.6	96	0.40	46	1.39	160	1.79	205	0.96	110	1	115	15	82
151	14	8	15	4.2	112	0.49	56	1.67	192	2.16	249	1.04	120	1	115	15	98
171	16	8	15	4.8	128	0.57	65	1.90	219	2.47	284	1.22	140	1	115	15	114

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

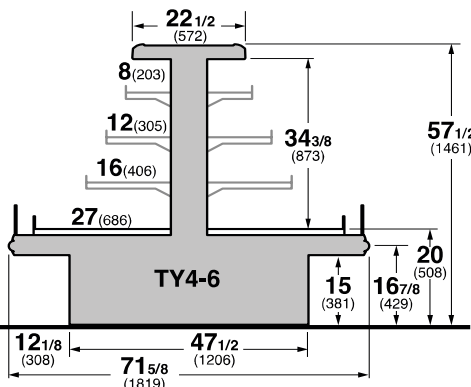
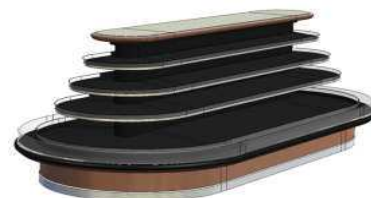
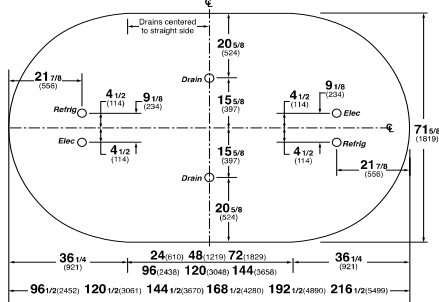
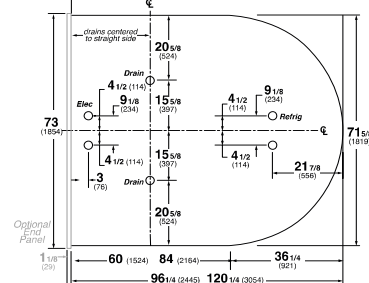
CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
71	N/A	N/A	N/A	N/A	N/A	N/A
91	N/A	N/A	N/A	N/A	N/A	N/A
111	N/A	N/A	N/A	N/A	N/A	N/A
131	N/A	N/A	N/A	N/A	N/A	N/A
151	N/A	N/A	N/A	N/A	N/A	N/A
171	N/A	N/A	N/A	N/A	N/A	N/A

**SELF-SERVICE DELI CHEESE****HUSSMANN - TY4-6 I-ISLAND, E-END, C-CENTER (CHINO)**

Hussmann refrigerated merchandisers configured for sale for use in the United States meet or surpass the requirements of the DOE 2017 energy efficiency standards.

REVISION DATE

12/22/16

**TY4-6X(case length) I - Island Merchandiser****TY4-6X(case length) E - Flat End Merchandiser****REFRIGERATION DATA:**

CASE LENGTHS	CASE USAGE	CAPACITY *** (BTU/HR)		TEMPERATURE (°F)			VELOCITY (FT/MIN)
		RATING CONDITION		EVAPORATOR		DISCHARGE AIR ** (°F)	
		NSF 7	AHRI 1200	NSF 7	AHRI 1200	NSF 7	
8I	DELI / CHEESE	15600	15600	22	22	29~33	100~150
10I	DELI / CHEESE	19500	19500	22	22	29~33	100~150
12I	DELI / CHEESE	23400	23400	20	20	29~33	100~150
14I	DELI / CHEESE	27300	27300	20	20	29~33	100~150
16I	DELI / CHEESE	31200	31200	20	20	29~33	100~150
18I	DELI / CHEESE	35100	35100	20	20	29~33	100~150
8E	DELI / CHEESE	15250	15250	22	26	29~33	100~150
10E	DELI / CHEESE	19150	19150	22	26	29~33	100~150
12E	DELI / CHEESE	23050	23050	20	26	29~33	100~150
8C	DELI / CHEESE	17500	17500	28	28	31~35	180~250

CASE LENGTHS	EST. REFG. CHRG. 404A (LBS)	GLYCOL (20°F INLET, 6° RISE)	
		GPM	PSI
8I	1.1	5.5	7.9
10I	1.3	6.9	5.5
12I	1.8	8.2	7.4
14I	2.2	9.4	9.4
16I	2.7	10.6	6.6
18I	3.1	11.7	7.5
8E	1.3	5.0	4.1
10E	1.8	5.0	4.1
12E	2.2	5.0	4.1
8C	1.3	5.0	4.1

****FRONT DISCHARGE AIR MEASURED INSIDE AIR CURTAIN HONEYCOMB*******REFRIGERATION NOTES:**

- 1) BTU'S PROVIDED ARE WITHOUT LIGHTS.
- 2) ADD 10 BTU'S PER FOOT OF LED LIGHTS PER LIGHT MATRIX BELOW.
- 3) AHRI 1200 RATING POINT FOR ENERGY CONSUMPTION COMPARISON ONLY.
- 4) USE DEW POINT FOR HIGH GLIDE REFRIGERANTS. CARE SHOULD BE TAKEN TO USE THE DEW POINT IN P/T TABLES FOR MEASURING AND ADJUSTING SUPERHEAT. ADJUST EVAPORATOR PRESSURE AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHOWN.
- 5) RATING CONDITION IS NSF TYPE I, 75°F/55% RH.

REFRIGERATION DATA CONTINUED:

ELEC. THERMOSTAT / AIR SENSOR SETTINGS			DEFROST TYPE	TIME (MIN)	DEFROST FREQUENCY (#/DAY)	TERM. TEMP (°F) COIL ONLY	DRIP TIME	DEFROST WATER (LBS/DAY/FT)
USAGE	CUT IN (°F)	CUT OUT (°F)						
DELI / CHEESE	33	30	OFF TIME	16	12	52	N/A	12

END PANEL WIDTH KEY		
# OF END PNLS	END PNL WIDTH (IN.)	TOTAL ADDED LENGTH (IN.)
1	1.125	1.125
2	1.125	2.25

ELECTRICAL DATA:**STANDARD FANS, HEATERS, LED LIGHTS (115 VOLT)**

CASE LENGTH	EVAPORATOR FANS					CANOPY LIGHTS LED		OPTIONAL LED SHELF LIGHTS		MAX. LED LOAD (W/ ALL OPTIONS)		ANTI-SWEAT HEATERS (ON FAN CIRCUIT)		CONVENIENCE OUTLETS (OPTIONAL)			LIGHT MATRIX
	# OF EVAP FANS	BLADE DIA. (IN.)	BLADE PITCH (°)	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS	# OUTLETS	VOLTS	AMPS	
8I	6	8	20	1.8	48	0.12	14.27	0.45	51.71	0.57	66	0.43	50	1	115	15	28
10I	8	8	20	2.4	64	0.22	25.04	0.73	84.01	0.95	109	0.61	70	1	115	15	44
12I	10	8	15	3	80	0.30	34.87	0.99	113.49	1.29	148	0.78	90	1	115	15	60
14I	12	8	15	3.6	96	0.40	45.63	1.27	145.78	1.66	191	0.96	110	1	115	15	76
16I	14	8	15	4.2	112	0.49	56.39	1.55	178.07	2.04	234	1.13	130	1	115	15	92
18I	16	8	15	4.8	128	0.57	65.29	1.78	204.75	2.35	270	1.30	150	1	115	15	108
8E	6	8	20	1.8	108	0.25	28.20	0.84	96.06	1.08	124	0.35	40	1	115	15	49
10E	8	8	20	2.4	144	0.15	17.67	1.10	126.24	1.25	144	0.35	40	1	115	15	65
12E	10	8	20	3	180	0.25	28.20	1.37	157.83	1.62	186	0.96	110	1	115	15	81
8C	8	8	20	2.4	64	0.36	41.18	1.07	123.55	1.43	165	0.70	80	1	115	15	16

OPTIONAL HIGH OUTPUT LED LIGHTS (115 VOLT)

CASE LENGTH	CANOPY LIGHTS H.O. LED		OPTIONAL SHELF		MAX. H.O. LED LOAD	
	AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
8I	N/A	N/A	N/A	N/A	N/A	N/A
10I	N/A	N/A	N/A	N/A	N/A	N/A
12I	N/A	N/A	N/A	N/A	N/A	N/A
14I	N/A	N/A	N/A	N/A	N/A	N/A
16I	N/A	N/A	N/A	N/A	N/A	N/A
18I	N/A	N/A	N/A	N/A	N/A	N/A
8E	N/A	N/A	N/A	N/A	N/A	N/A
10E	N/A	N/A	N/A	N/A	N/A	N/A
12E	N/A	N/A	N/A	N/A	N/A	N/A
8C	N/A	N/A	N/A	N/A	N/A	N/A

Electrical

STANDARD CASE WIRE COLOR CODE CODIGO DE COLORES DE LOS ALAMBRES PARA LAS VITRINAS ESTANDAR CODE COULEUR POUR FILS DE BOITIER NORMALISE		
COLOR DESCRIPTION	DESCRIPCION	DESCRIPTION
GROUND	TIERRA MASA	MASSE
ANTI-SWEAT	ANTICONDENSACION	ANTI-SUINTEMENT
LIGHTS	LUCES	ECLAIRAGE
RECEPTACLES	ENCHUFES	PRISE DE COURANT
T-STAT/SOLENOID 230VAC	TERMOSTATO/SOLENOIDE (230VAC)	SOUPAPE A SOLENOID (230 VAC)
T-STAT/SOLENOID 115VAC	TERMOSTATO/SOLENOIDE (115VAC)	SOUPAPE A SOLENOID (115 VAC)
T-STAT/SOLENOID 24VAC	TERMOSTATO/SOLENOIDE (24VAC)	SOUPAPE A SOLENOID (24 VAC)
FAN MOTORS	VENTILADORES	VENTILATEUR
BLUE CONDENSING UNIT	UNIDAD DE CONDENSACION	UNITE DE CONDENSATION

USE COPPER CONDUCTORS ONLY
UTILISEZ LES CONDUCTEURS DE CUIVRE SEULEMENT
UTILICE LOS CONDUCTORES DE COBRE SOLAMENTE
430-01-0338 R101003

CASE MUST BE GROUNDED

NOTE: Refer to label affixed to case to determine the actual configuration as checked in the "TYPE INSTALLED" boxes.

Standard lighting for all refrigerated models will be full length LED Lights located within the case at the top.

Field Wiring and Serial Plate Amperage

Field Wiring must be sized for component amperes printed on the serial plate. Actual ampere draw may be less than specified. Field wiring from the refrigeration control panel to the merchandisers is required for refrigeration thermostats. Case amperes are listed on the wiring diagram, but always check the serial plate.



**BEFORE SERVICING
ALWAYS DISCONNECT ELECTRICAL
POWER AT THE MAIN DISCONNECT
WHEN SERVICING OR REPLACING ANY
ELECTRICAL COMPONENT.**

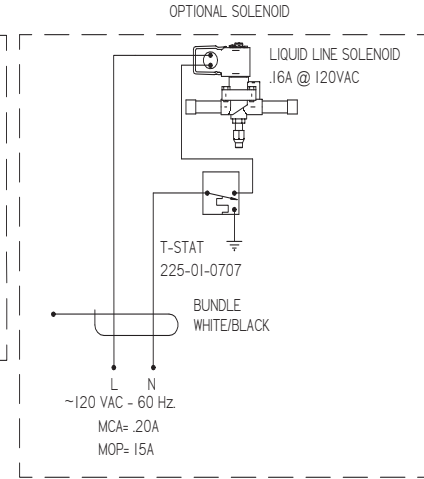
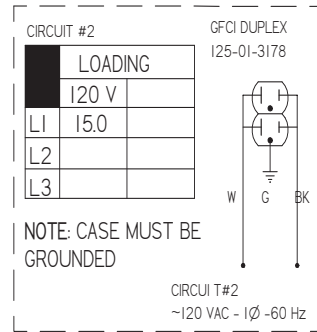
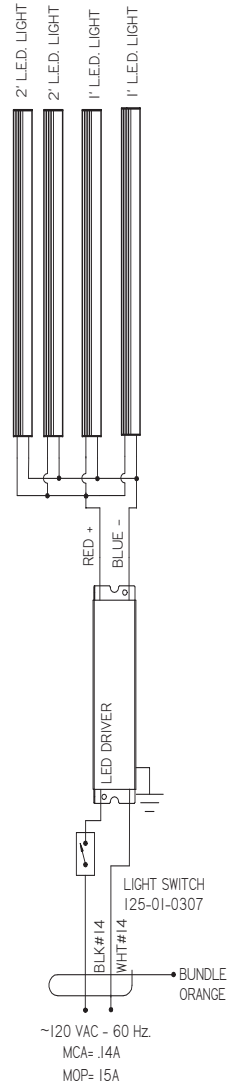
**This includes (but not limited to) Fans, Heaters
Thermostats, and Lights.**

Wiring Diagrams Index

Model	Tier	Description	Size	Diagram #
Entyce	TY 1 Examples	6X8I-R	8'	3008179
		6X12I-R	12'	3014692
	TY 3 Examples	4X4E-R	4'	1H96214
		4X6E-R	6'	1H85148
		4X6I-R	6'	1H85155
		4X8I-R	8'	1H91354
		4X12I-R	12'	3008178
		5X9I-R	9'	2H00213
		6X8C-R	8'	3013478
		6X8E-R	8'	1H87790
		6X18I-R	18'	3013482
	TY 4 Examples	6X12E-R	12'	3016190
		4X6E-S	6'	3042642
		4X8I-S	8'	3046094
		4X10I-R	10'	3013474
		6X8E-R	8'	3013477

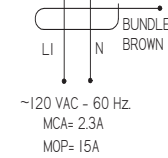
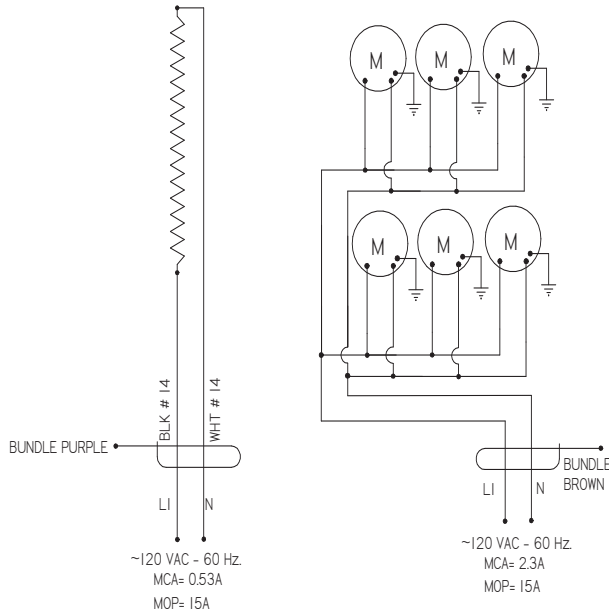
CIRCUIT #1	
LOADING	
120V	
LI 2.5	

LIGHT CIRCUIT
J1A 12.2W @ 120V



ANTI-SWEAT HEATER
50W 0.42A @ 120VAC
0497590

EVAPORATOR FAN
12W 0.30A @ 120VAC (6)
0477655



NOTES:
CASE MUST BE GROUND
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

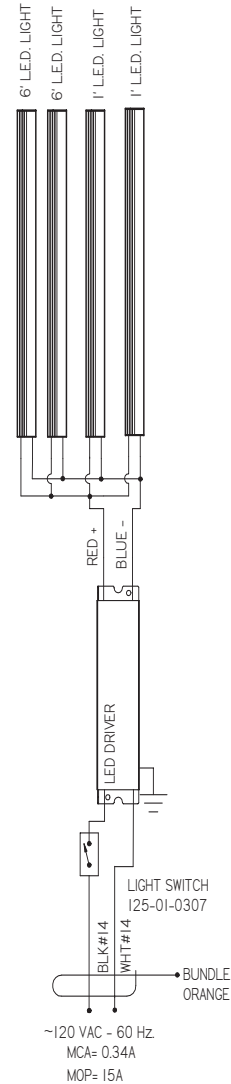
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DATE DRAWN - 6-3-16	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0002200
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	THIRD ANGLE PROJECTION

HUSSMANN®	
DIAGRAM-TYI-6X8I-R	
3008179	A

CIRCUIT #1
LOADING

	120V	
L1	4.1	

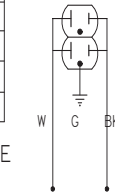
LIGHT CIRCUIT
27A 29.8W @ 120V



CIRCUIT #2	LOADING
	120 V
L1	15.0
L2	
L3	

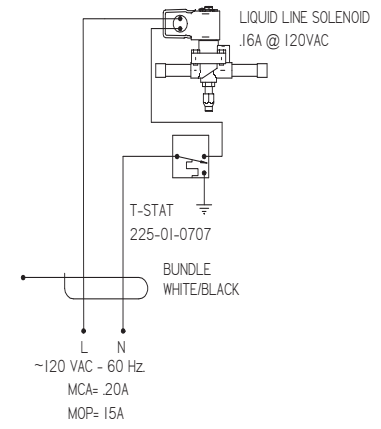
NOTE: CASE MUST BE
GROUNDED

GFCI DUPLEX
125-01-3178

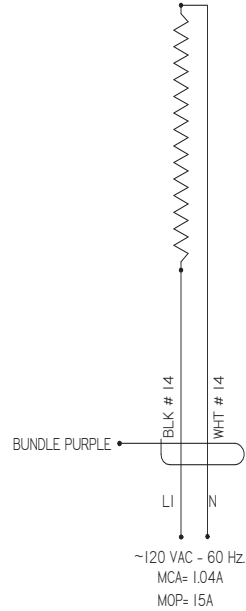


CIRCUIT #2
~120 VAC - 1Ø - 60 Hz

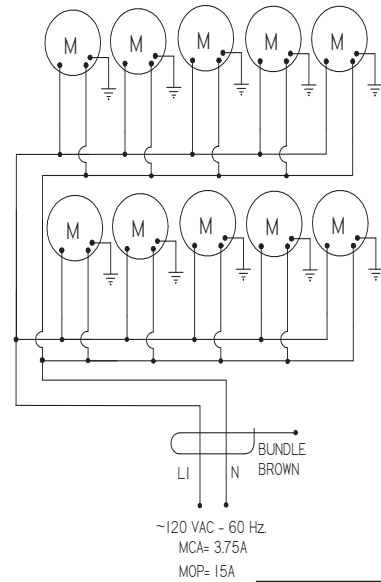
OPTIONAL SOLENOID



ANTI-SWEAT HEATER
90W 0.83A @ 120VAC
111 0497590
111 0495007



EVAPORATOR FAN
12W 0.30A @ 120VAC
1101 0477655



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	DATE DRAWN - 9-8-16
DRAWN BY - CRAIG BOOREY	ECN-CAP-0003964
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	THIRD ANGLE PROJECTION

HUSSMANN®	
DIAGRAM-TY1-6X12I- R	
3014692	A

HUSSMANN-00F-11 SHEET SIZE D

CIRCUIT #1	
LOADING	
L1	120V
L2	1.9
L3	

REVISION HISTORY					
REV	ECN	DATE	REVISION DESCRIPTION	REV BY	CHKD BY
A	768637	2013/12/26	NEW DIAGRAM	CB	CB

CIRCUIT #2

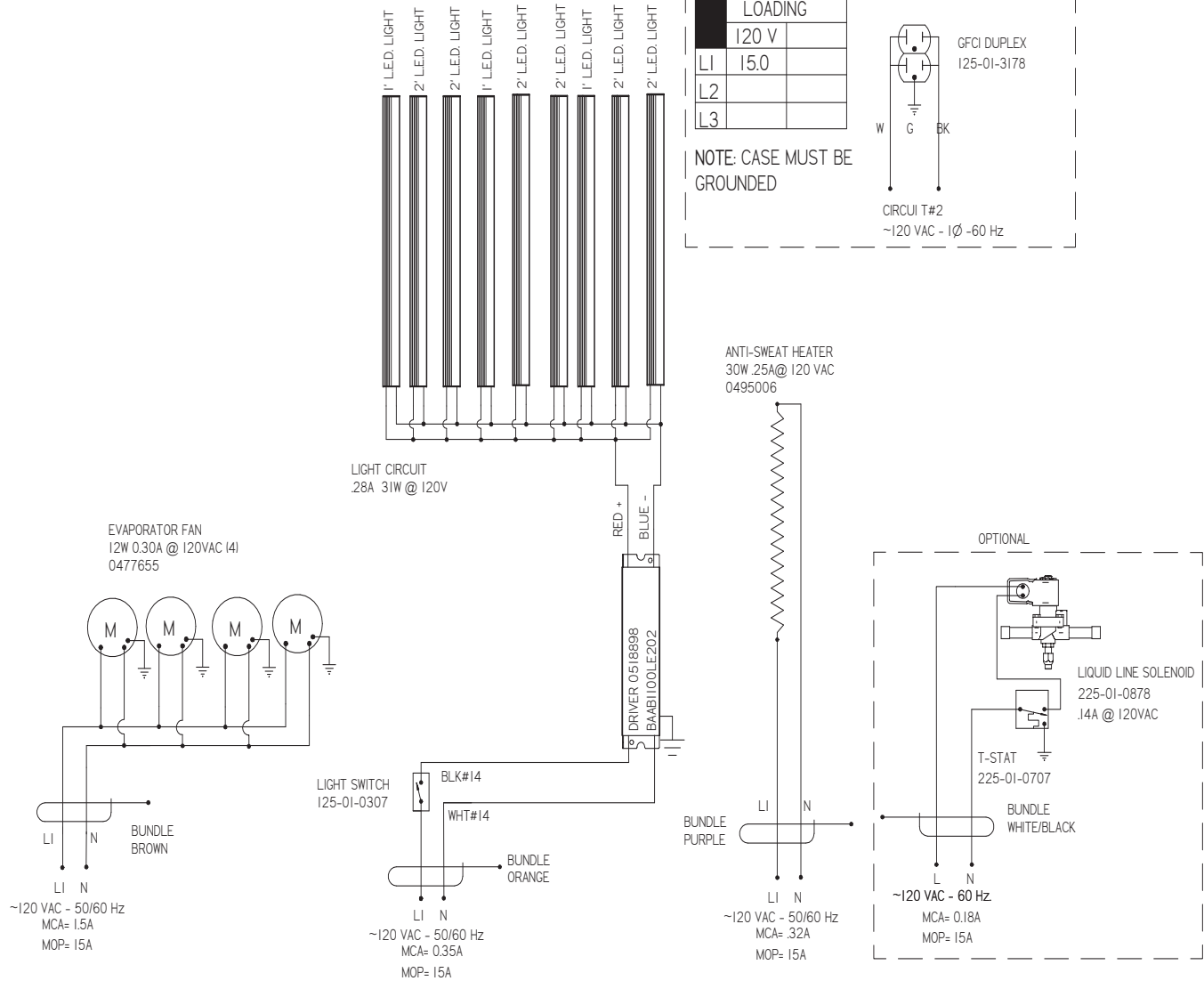
LOADING	
L1	120 V
L2	15.0
L3	

NOTE: CASE MUST BE GROUNDED

GFCI DUPLEX
125-01-3178

W G BK

CIRCUIT #2
~120 VAC - 1Ø - 60 Hz



NOTES:
CASE MUST BE GROUNDED

MATERIAL - N/A	
DATE DRAWN - 12/26/13	
DRAWN BY - CRAIG BOOREY	ECN# - 768637
REVIEWED BY - CRAIG BOOREY	REF - NEW DIAGRAM
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010	
ANGLES ± 2°	



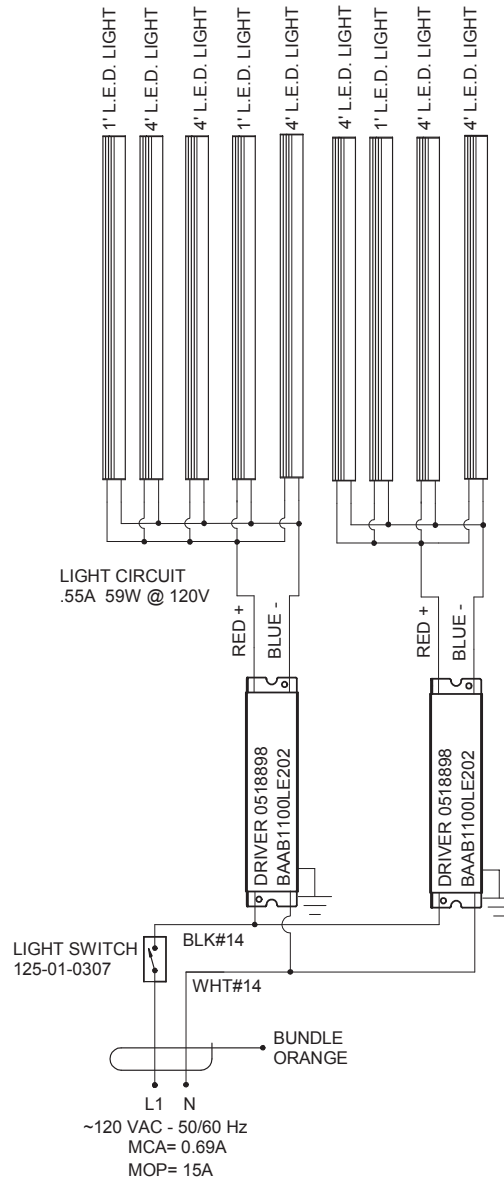
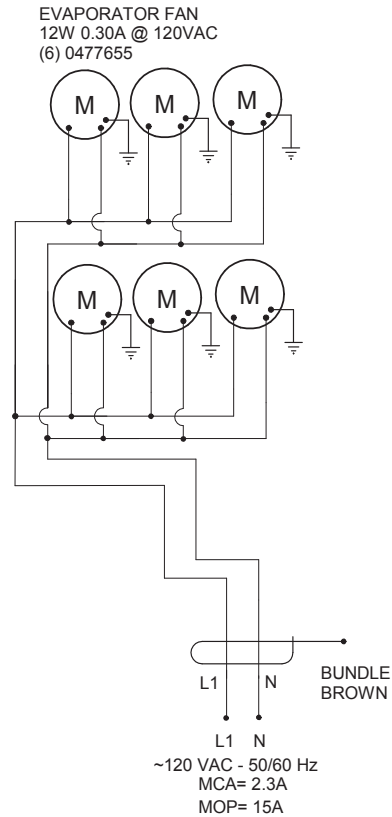
HUSSMANN	
DIAGRAM- TY3-4X4E-R	
IH96214	A

HUSSMANN.GDF-11 SHEET SIZE D

CIRCUIT #1

LOADING		
	120V	
L1	2.9	

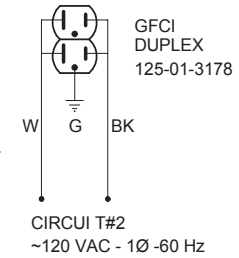
NOTE: CASE MUST BE GROUNDED



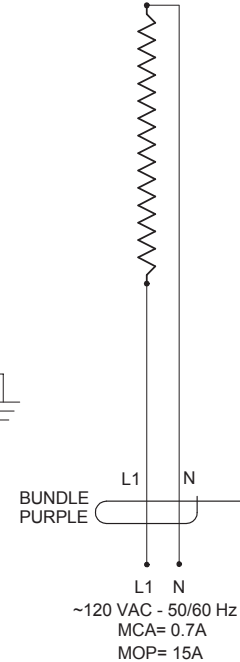
CIRCUIT #2

LOADING		
	120 V	
L1	15.0	
L2		
L3		

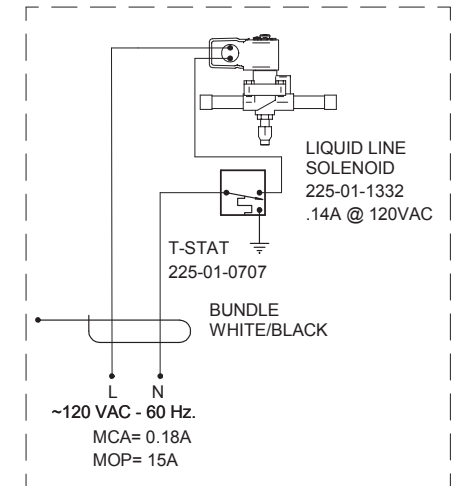
NOTE: CASE MUST BE GROUNDED



ANTI-SWEAT HEATER
60W .56A @ 120 VAC
0495008



OPTIONAL



HUSSMANN®
Hussmann Corporation, Int'l.
13770 Ramona Avenue
Chino, CA. 91710
(909)-590-4910 Lic.#: 644406

REVISIONS:

#	DESCRIPTION:	DATE:	BY:
A	CN#696786	3/12/13	CB

DRAWN BY: CRAIG BOOREY
CHECKED BY: DATE: 3/21/13
PRODUCTION ORDER #: 936374
FILE LOCATION:

PROJECT TITLE: TY3-4X6E-R

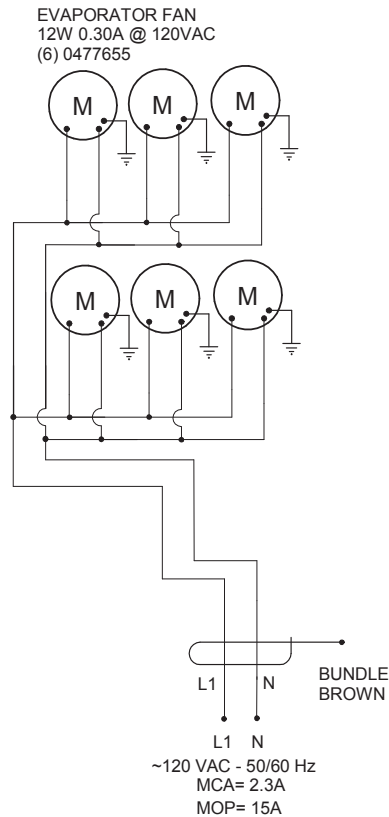
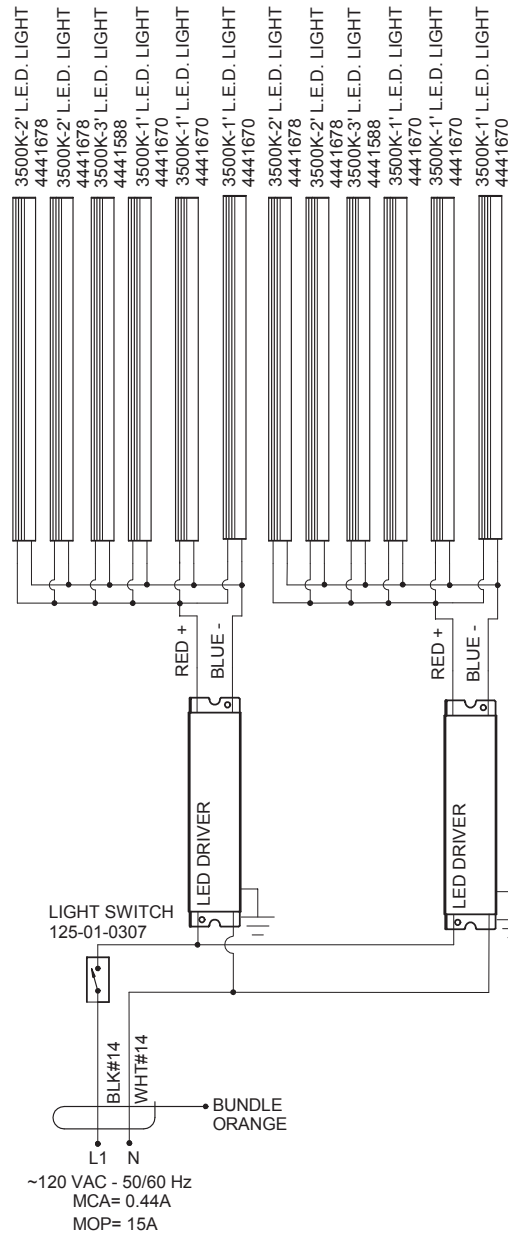
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DRAWING TITLE:
DIAGRAM-TY3-4X6E-R

CIRCUIT #1

LOADING		
	120V	
L1	2.6	

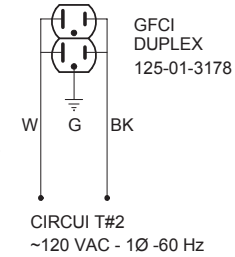
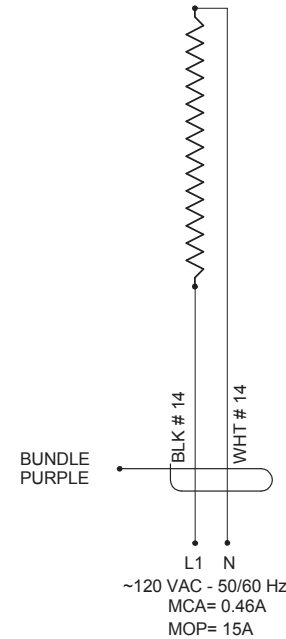
NOTE: CASE MUST BE GROUNDED

LIGHT CIRCUIT
.35A 38W @ 120V

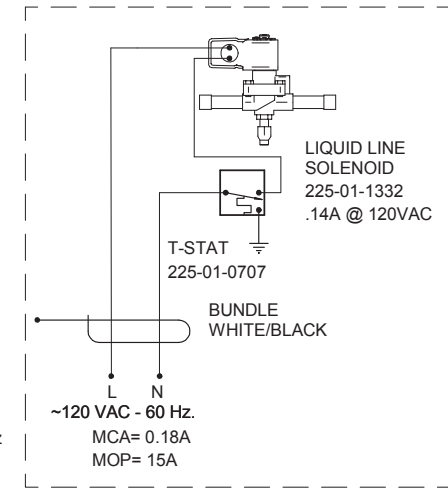
CIRCUIT #2

LOADING		
	120 V	
L1	15.0	
L2		
L3		

NOTE: CASE MUST BE GROUNDED

ANTI-SWEAT HEATER
50W .42A @ 120 VAC
0497590

OPTIONAL



HUSSMANN
Hussmann Corporation, Int'l.
13770 Ramona Avenue
Chino, CA. 91710
(909)-590-4910 Lic.#: 644406

REVISIONS:

#	DESCRIPTION:	DATE:	BY:
A	CN#696786	3/21/13	CB
B	CN#980241 CHANGED ANTI-SWEAT HEATER	4/15/15	CB

DRAWN BY: CRAIG BOOREY
CHECKED BY: DATE: 3/21/13
PRODUCTION ORDER #: 936489
FILE LOCATION:

PROJECT TITLE: TY3-4X6I-R

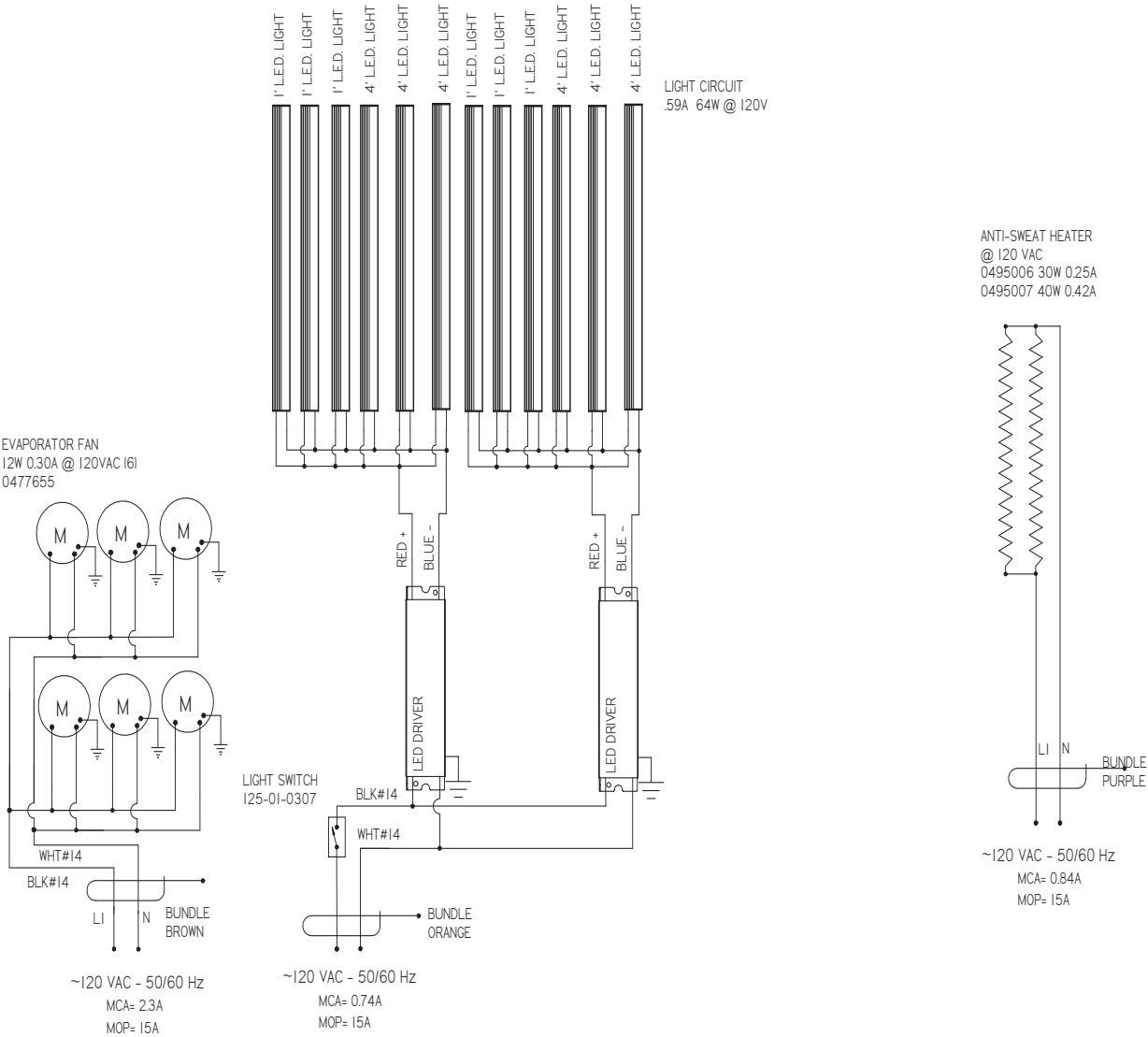
DRAWING #: 1H85155

DRAWING TITLE:
DIAGRAM-TY3-4X6I-R


PAGE 1 OF 1

CIRCUIT #1	
LOADING	
LI 120V	
LI 3.1	

REVISION HISTORY						
REV	ECN	DATE	REVISION DESCRIPTION	REV BY	CHKD BY	APPR BY
A	749653	2013/08/28	NEW DIAGRAM	CB	CB	CB
B	749653	2013/10/02	MATCH PLM REVISION	CT	CT	CT
C	ECN-CAP-0007700	2017/05/10	REVISED ANTI-SWEAT HEATER	CY	CY	CY



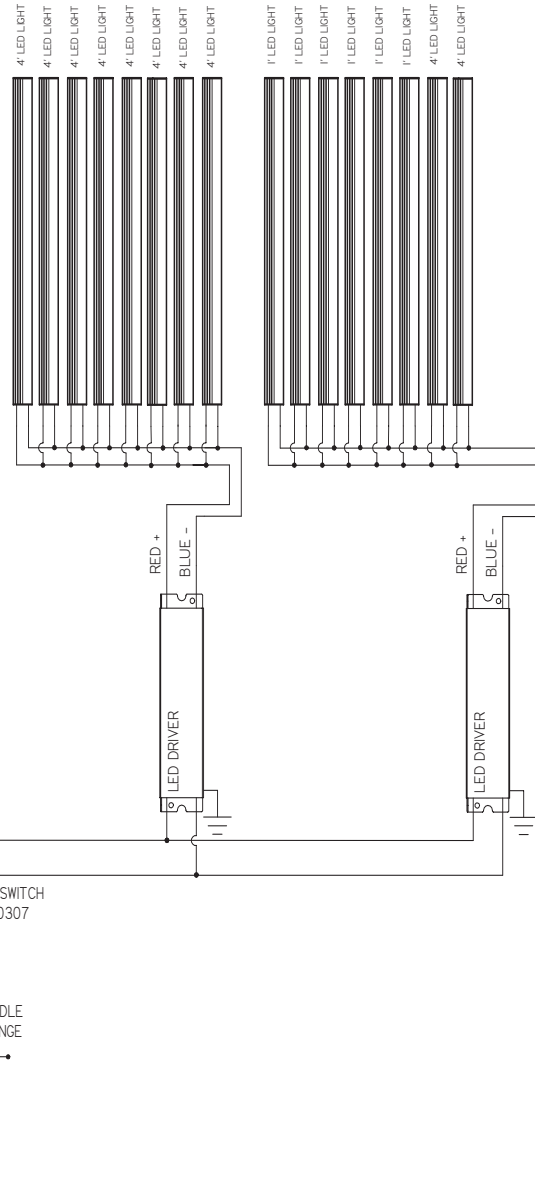
NOTES:
CASE MUST BE GROUNDED

MATERIAL - N/A		HUSSMANN	
DATE DRAWN - 8/28/13			
DRAWN BY - CRAIG BOOREY	ECN# - 749653	DIAGRAM - TY3-4X8I-R	
REVIEWED BY - CRAIG BOOREY	REF - NEW DIAGRAM		
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1	IH91354	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			
TOLERANCES ARE: DECIMALS XX ±0.3, XXX ±0.10 ANGLES ± 2°		THIRD ANGLE PROJECTION	C

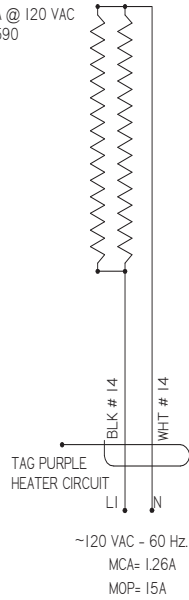
CIRCUIT #1
LOADING

	120V	
L1	5.2	

LIGHT CIRCUIT= 1.08A 117W

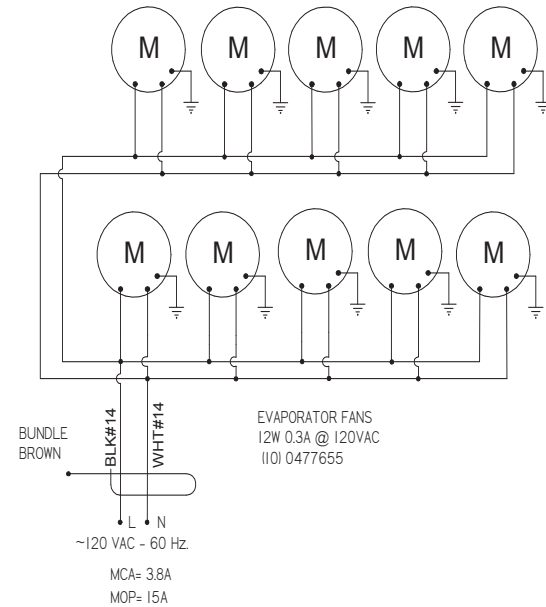
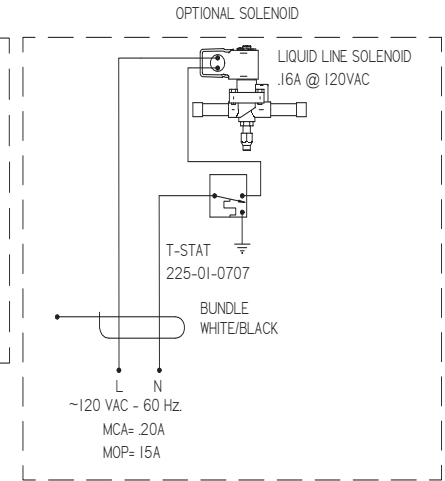
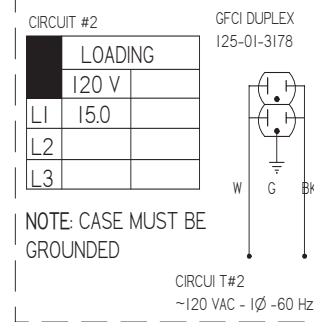


ANTI-SWEAT HEATERS
60W 55A @ 120 VAC
III 0495008
50W 46A @ 120 VAC
III 0497590



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

REVISION HISTORY					
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A	ECN-CAP-0002200	2016/06/03	RELEASED TO PRODUCTION	CB	CB



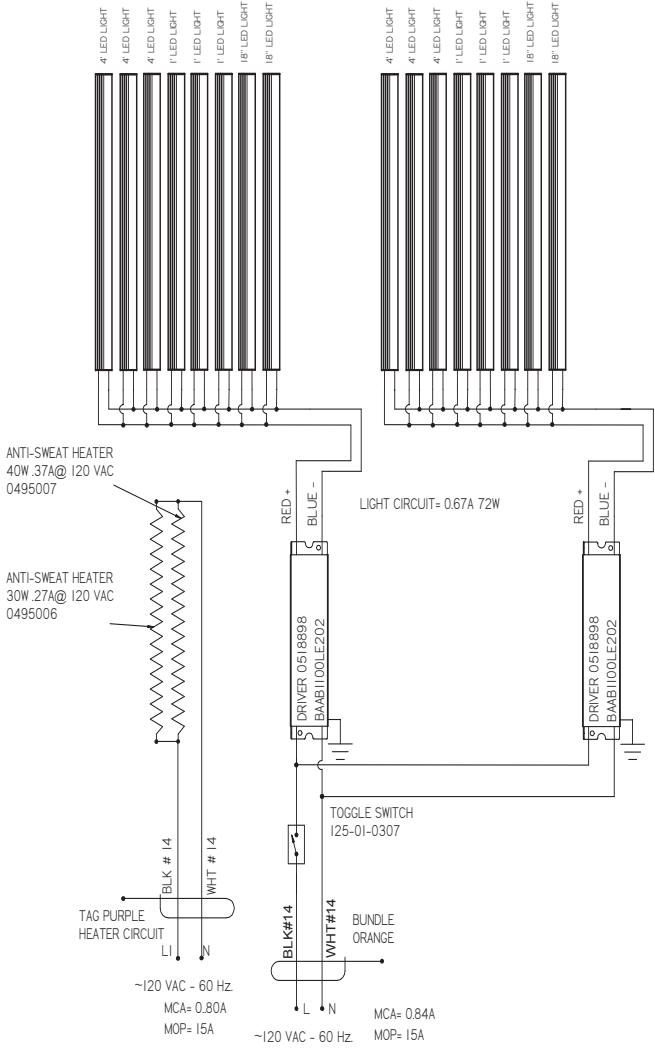
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REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	THIRD ANGLE PROJECTION

HUSSMANN	
DIAGRAM-TY3-4X12I- R	
3008178	A

HUSSMANN_GDF-11 SHEET SIZED

CIRCUIT #1
LOADING

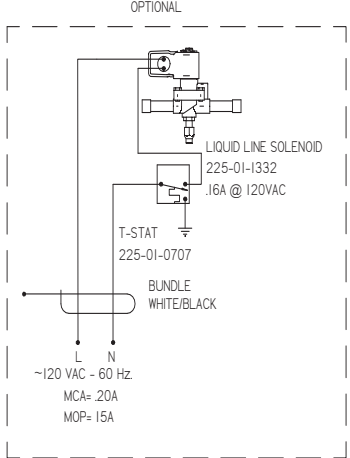
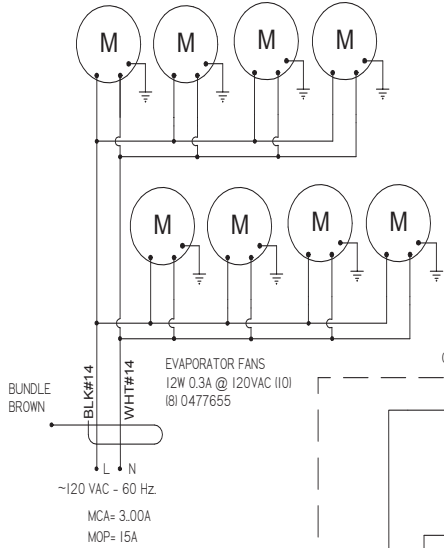
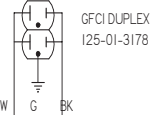
	120V
L1	3.7
L2	
L3	



CIRCUIT #2

LOADING	
	120 V
L1	15.0
L2	
L3	

NOTE: CASE MUST BE GROUNDED



NOTES:
CASE MUST BE GROUNDED

MATERIAL - N/A	
DATE DRAWN - 4/14/14	
DRAWN BY - CRAIG BOOREY	ECN# - 803263
REVIEWED BY - CRAIG BOOREY	REF - NEW DIAGRAM
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE:	THIRD ANGLE PROJECTION
DECIMALS .XX ±.03, .XXX ±.010	
ANGLES ± 2°	

HUSSmann	
DIAGRAM-TY3-5X91-R	
2H00213	A

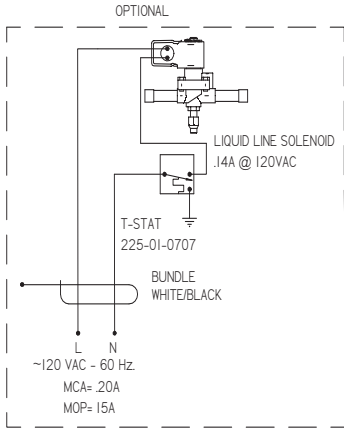
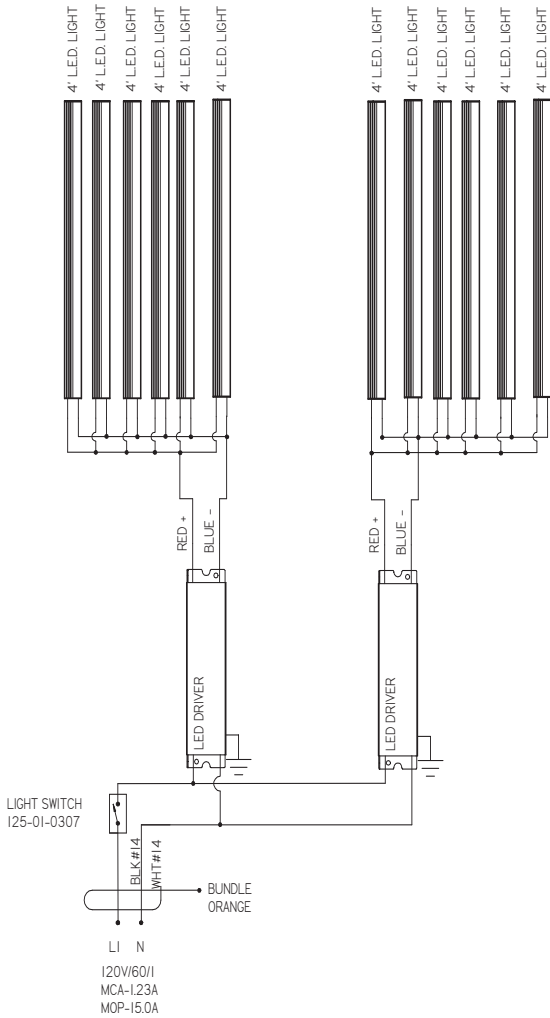
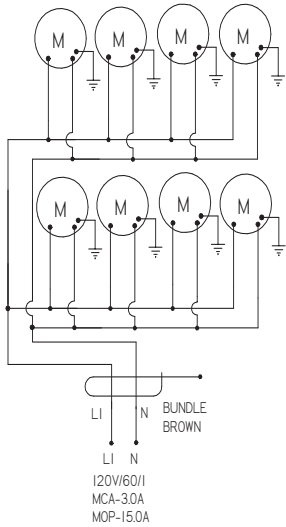
CIRCUIT #1
LOADING

	120V	
LI	4.1	

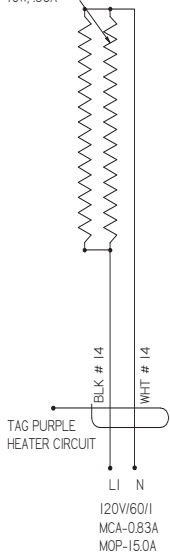
LIGHT CIRCUIT
0.98A 105.6W @ 120V

REVISION HISTORY					
REV	ECN	DATE	REVISION DESCRIPTION	REV BY	CHKD BY
A	ECN-CAP-0003235	20160817	RELEASED TO PRODUCTION	CB	CB

EVAPORATOR FAN
12W 0.30A @ 120VAC I81
0477655



ANTI-SWEAT HEATER
120 VAC
(2) 0495007 40W, .33A

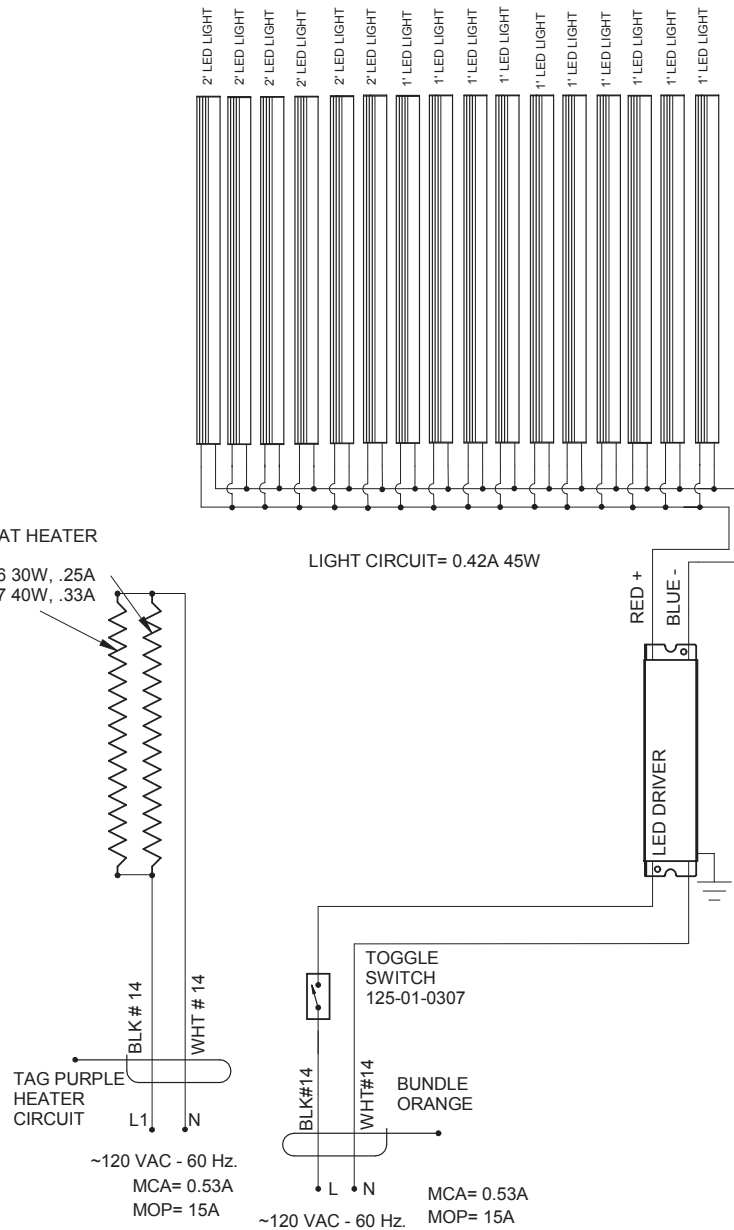


NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	
DATE DRAWN - 8-17-16	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0003235
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	THIRD ANGLE PROJECTION

HUSSMANN	
DIAGRAM-TY3-6X8C-R	
3013478	A

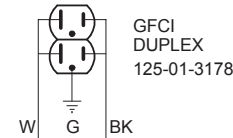
ANTI-SWEAT HEATER
120 VAC
(1) 0495006 30W, .25A
(1) 0495007 40W, .33A



CIRCUIT #2

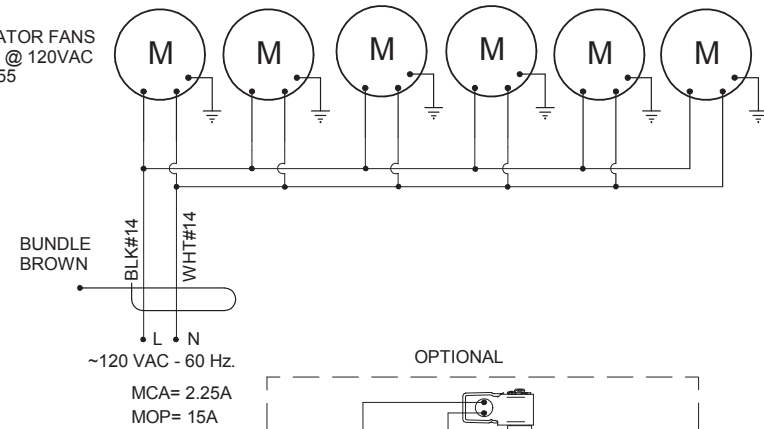
LOADING	
120 V	
L1	15.0
L2	
L3	

**NOTE: CASE MUST
BE GROUNDED**

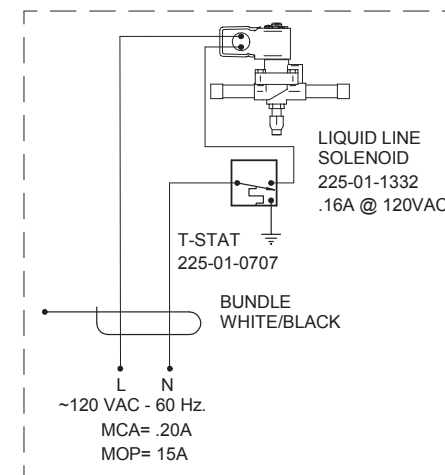


CIRCUIT #2
~120 VAC - 1Ø-60 Hz

EVAPORATOR FANS
12W 0.3A @ 120VAC
(6) 0477655



OPTIONAL



CIRCUIT #1

LOADING	
120 V	
L1	2.9
L2	
L3	

**NOTE: CASE MUST
BE GROUNDED**

HUSSMANN®
Hussmann Corporation, Int'l.
13770 Ramona Avenue
Chino, CA. 91710
(909)-590-4910 Lic.#: 644406

REVISIONS:

#	DESCRIPTION	DATE	BY
A	CN# 720718	6/5/13	CB
B	CN#980241 Revised ANTI-SWEAT HEATER	4/16/15	CB

DRAWN BY: CRAIG BOOREY

CHECKED BY: DATE: 6/5/13

PRODUCTION ORDER #:

FILE LOCATION:

PROJECT TITLE: TY3-CASE

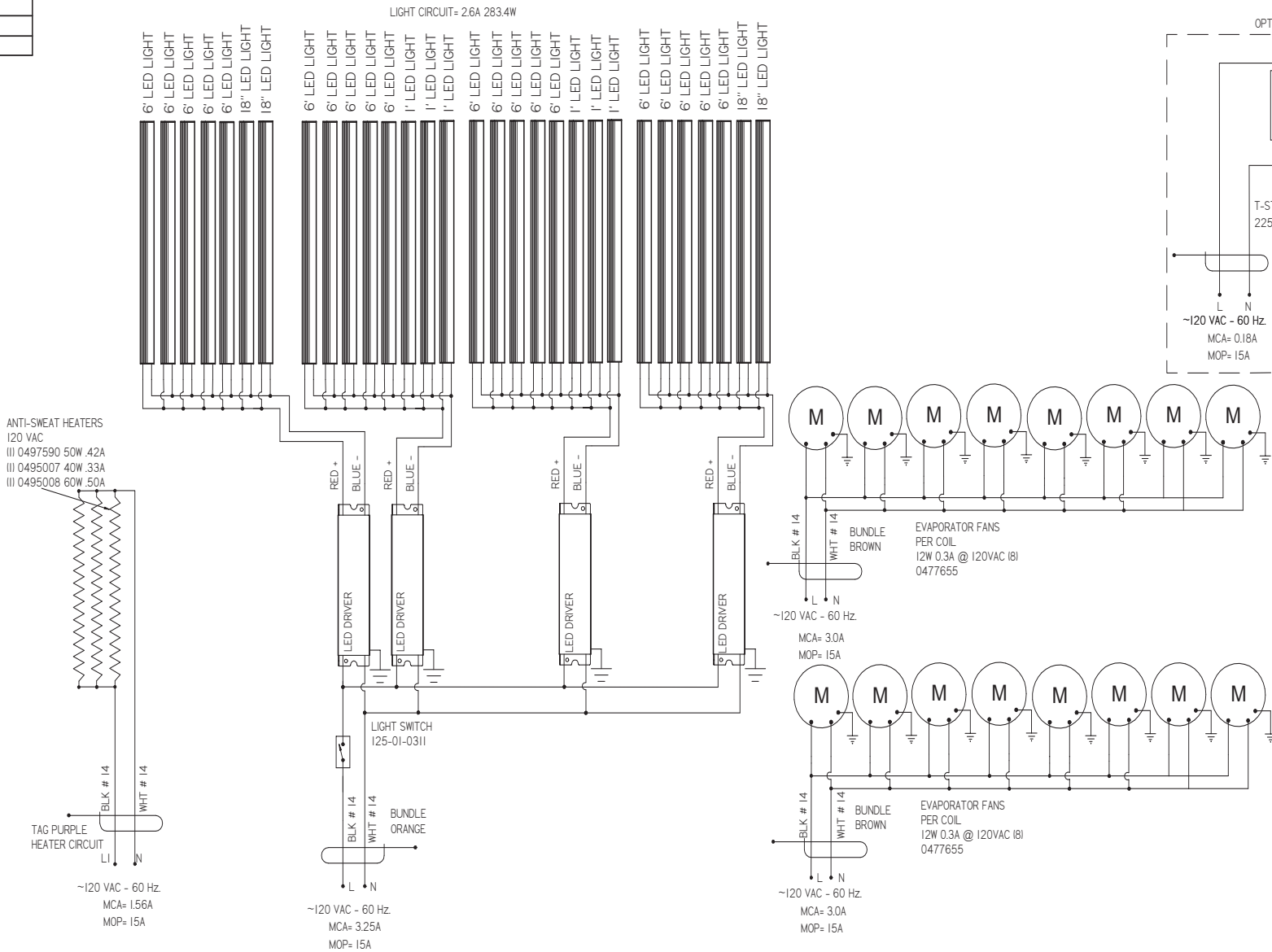
DRAWING TITLE:

DIAGRAM-TY3-6X8E-R

DRAWING #: 1H87790

CIRCUIT #1
LOADING

	120V	
LI	8.7	



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

REVISION HISTORY				
REV	ECN	DATE	REVISION DESCRIPTION	REV BY CHKD BY APPR BY
A	ECN-CAP-0003235	2016/08/17	RELEASED TO PRODUCTION	CB CB CB

MATERIAL - N/A	
DATE DRAWN - 8-17-16	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0003235
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE:	
DECIMALS .XX ±.03, .XXX ±.010	
ANGLES ± 2°	

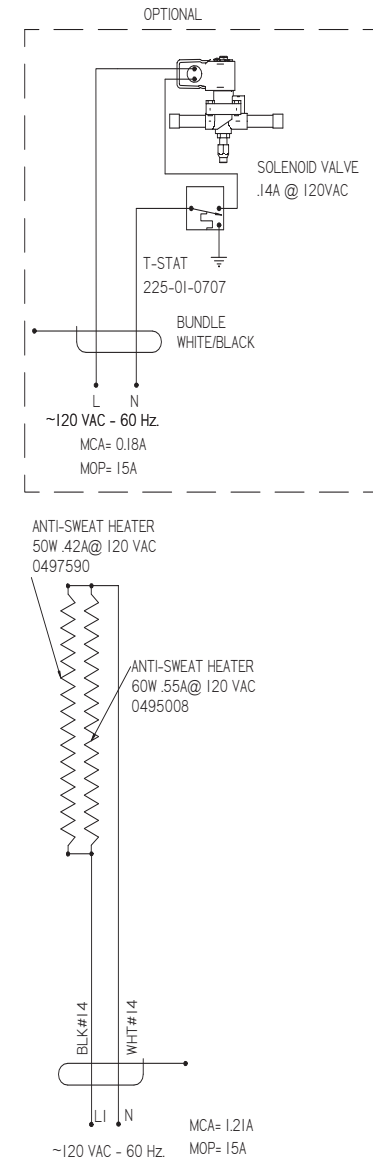
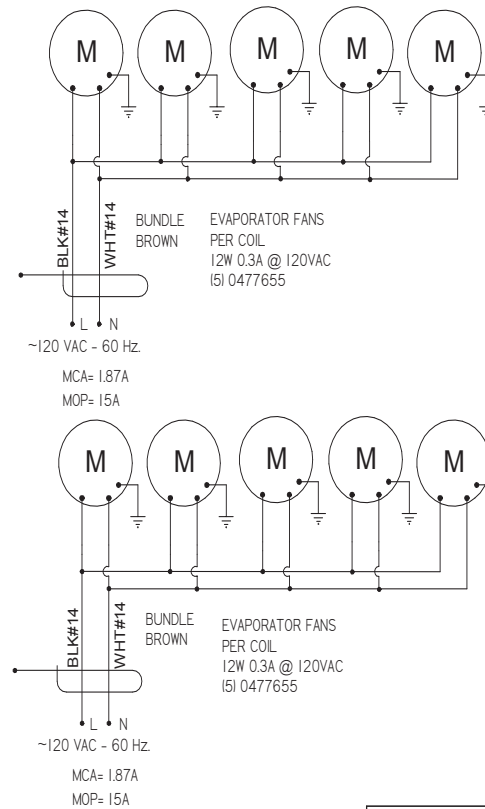
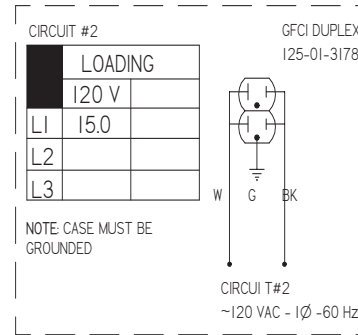
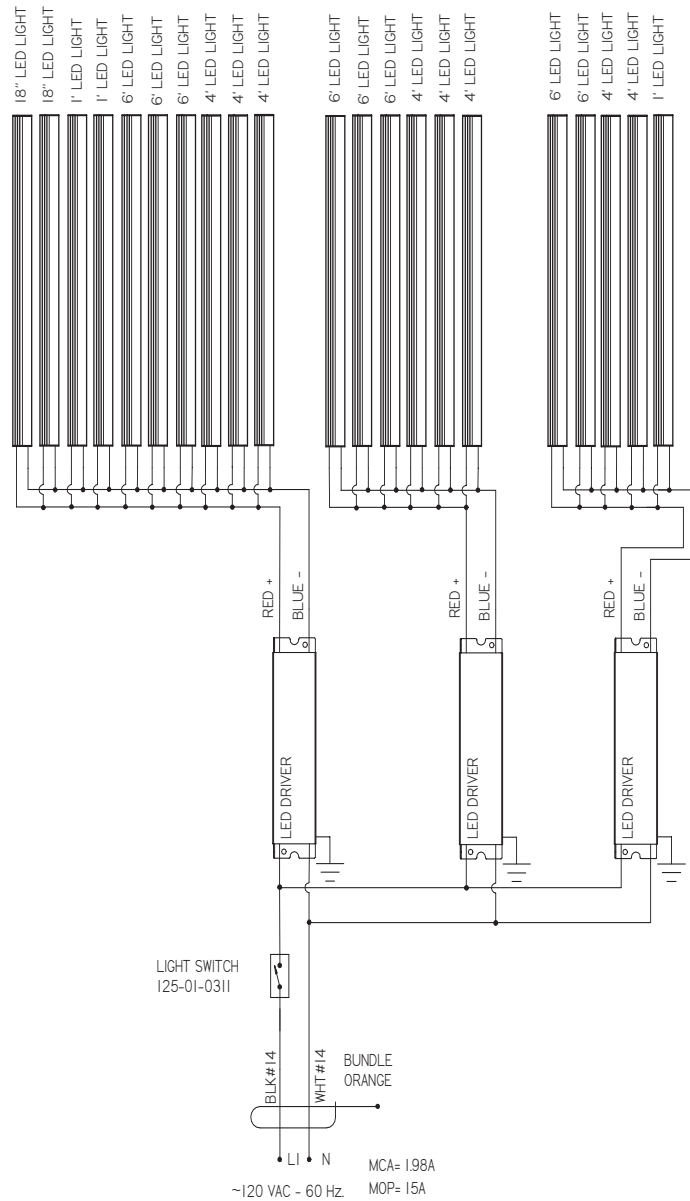


HUSSMANN®	
DIAGRAM-TY3-6X18I-R	
3013482	A

HUSSMANN_GDF-11 SHEET SIZE D


	120V	
LI	5.6	

LIGHT CIRCUIT= 1.58A 171W



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

REVISION HISTORY						
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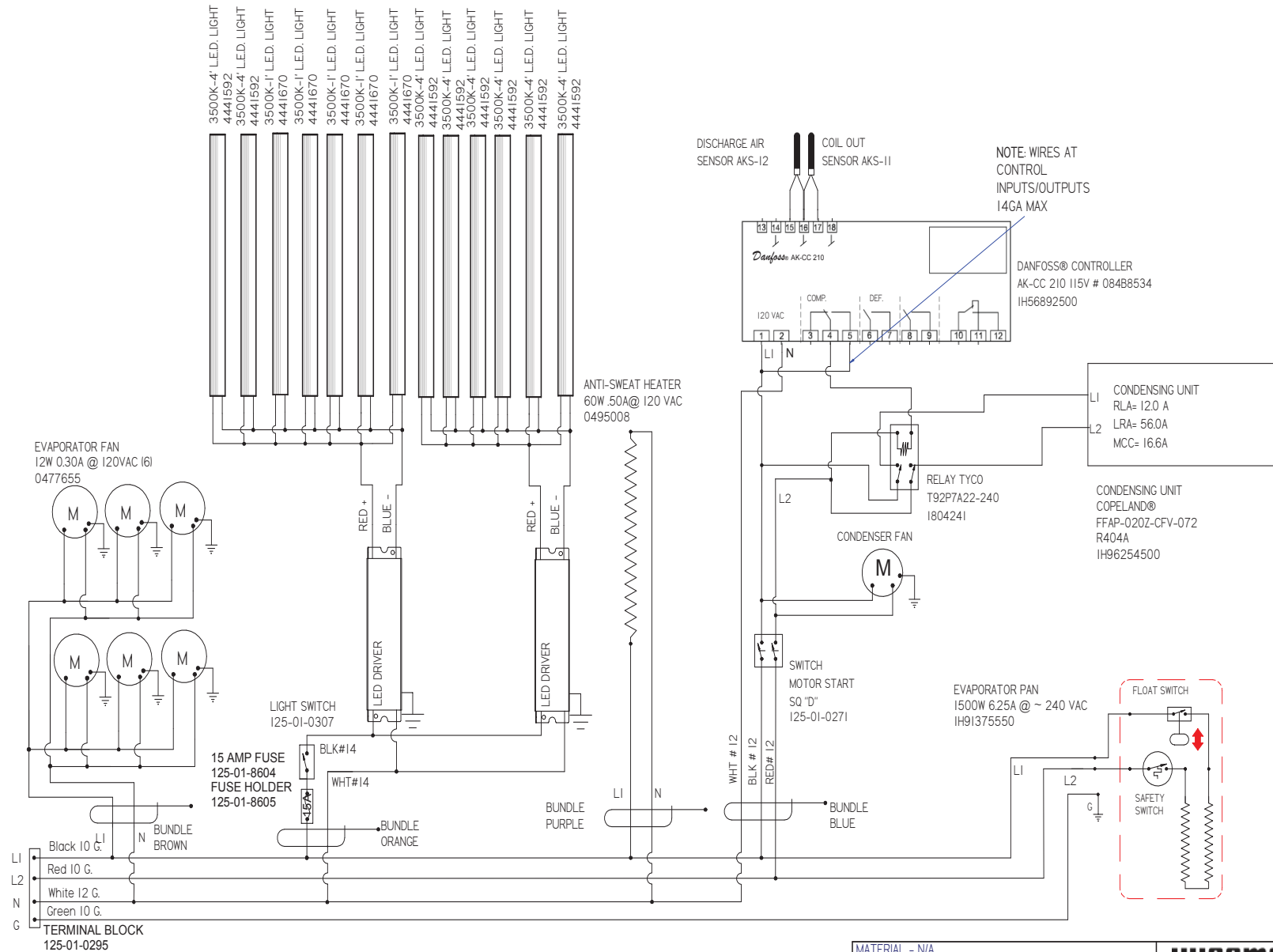
MATERIAL - N/A		HUSSmann®	
DATE DRAWN - 9-28-16			
DRAWN BY - CRAIG BOOREY		ECN-CAP-0003967	DIAGRAM-TY4-6X12E
REVIEWED BY - CRAIG BOOREY		REF -	
APPROVED BY - CRAIG BOOREY		SHEET 1 OF 1	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.		-R	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°			THIRD ANGLE PROJECTION
		3016190	A

CIRCUIT #1


	LOADING	
	208 V	240V
L1	18.6	21.4
L2	15.8	18.3

LIGHT CIRCUIT
.79A 85W @ 120V

REVISION HISTORY						
REV	ECN	DATE	REVISION DESCRIPTION	REV BY	CHKD BY	APPR BY
A	ECN-CAP-0008241	2017/08/22	RELEASED TO PRODUCTION	CB	CB	CB



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	
DATE DRAWN - 8-22-17	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0008241
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX .03, .XXX .010 ANGLES $\pm 2^\circ$	 THIRD ANGLE PROJECTION

HUSSMANN®
DIAGRAM-TY4-4X6E-
S

3042642	A
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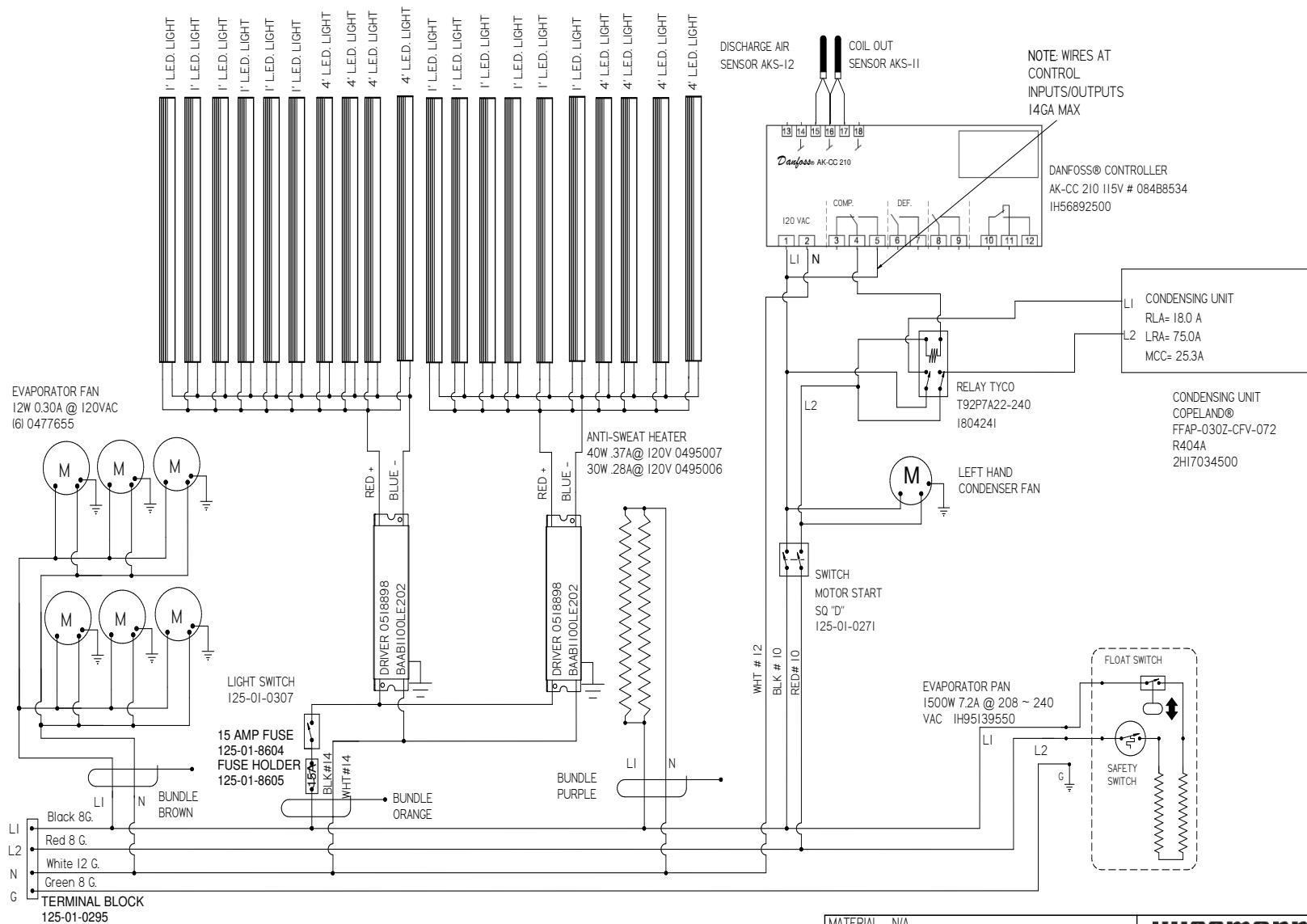
HUSSMANN_GDF_I.1 SHEET SIZE D

CIRCUIT #1
LOADING


	208V	240V
L1	24.7	28.5
L2	21.8	25.2

LIGHT CIRCUIT
0.86A 93W @ 120V

REVISION HISTORY						
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A	ECN-CAP-0009954	2017/10/02	RELEASED TO PRODUCTION	CB	CB	CB
B	ECN-CAP-0010801	2017/11/17	REVISED COMPRESSOR	CB	CB	CB



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	
DATE DRAWN - 10-2-17	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0009954
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	 THIRD ANGLE PROJECTION

HUSSmann®

DIAGRAM-TY4-4X8I-S

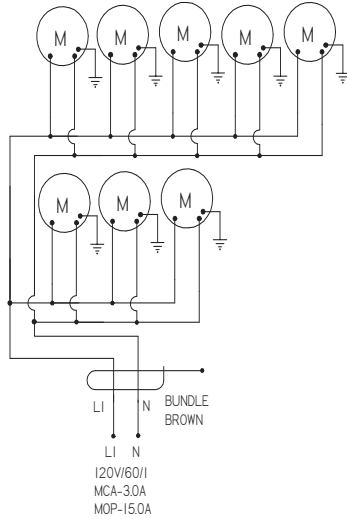
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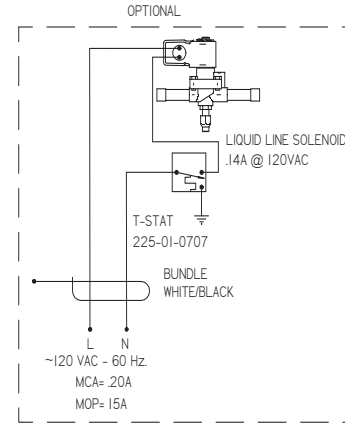
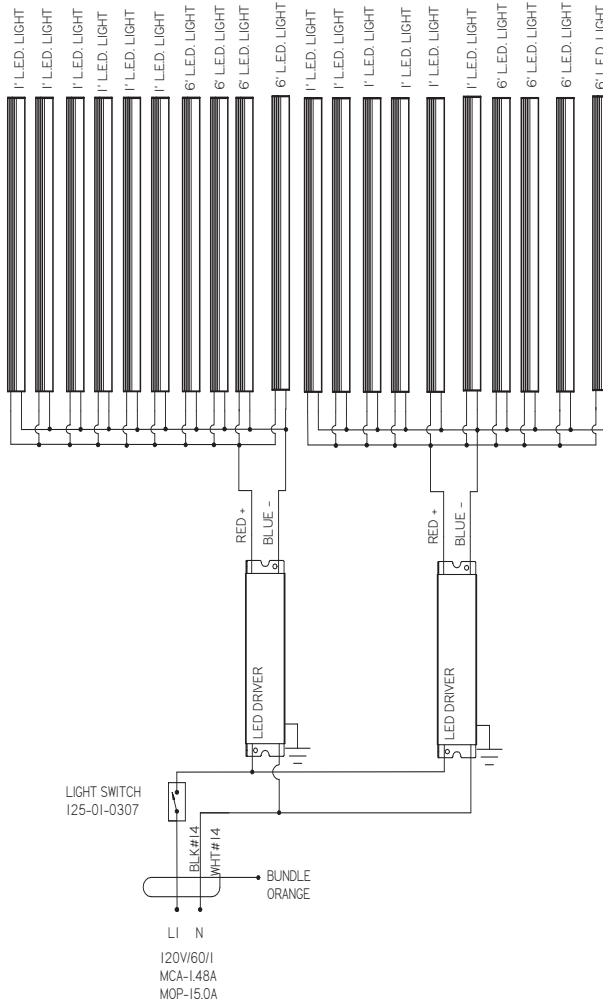
CIRCUIT #1
LOADING

120V	
LI 4.3	

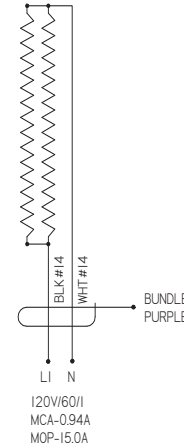
EVAPORATOR FAN
12W 0.30A @ 120VAC (8)
0477655



LIGHT CIRCUIT
1.18A 127W @ 120V



ANTI-SWEAT HEATER
120 VAC
(II) 0495007 40W, 33A
(II) 0497590 50W, 42A



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	
DATE DRAWN - 8-17-16	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0003235
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010 ANGLES ± 2°	THIRD ANGLE PROJECTION

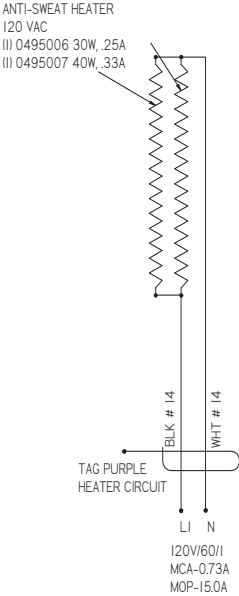
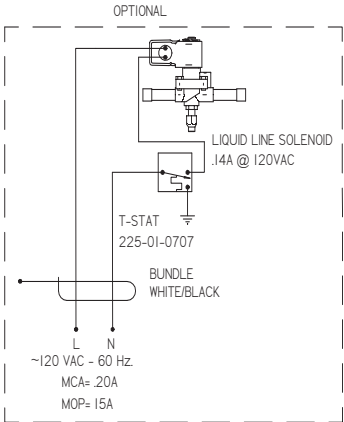
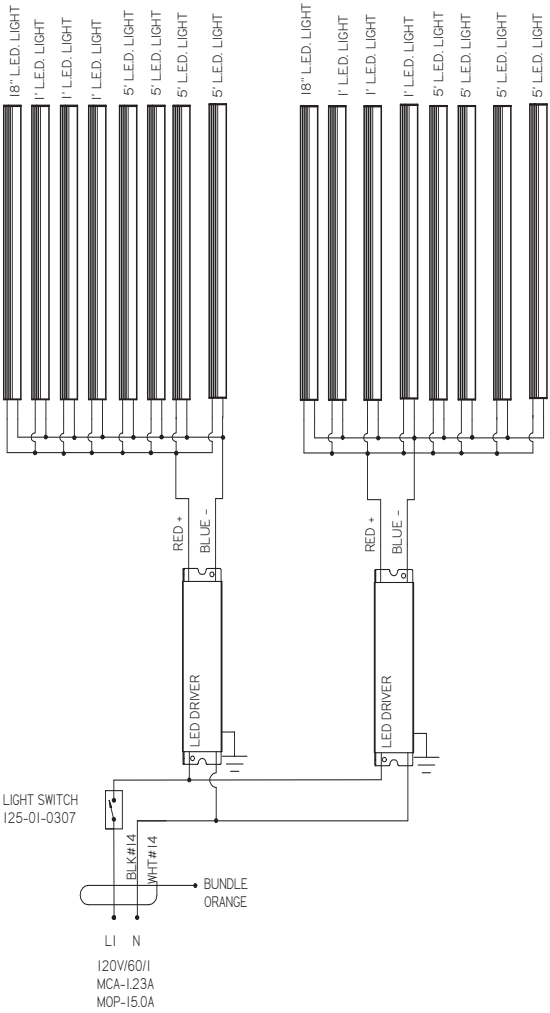
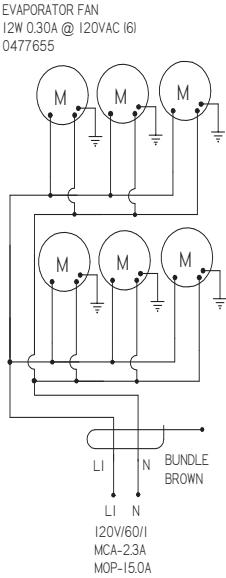
HUSSMANN®	
DIAGRAM-TY4-4X101-	
R	
3013474	A

HUSSMANN-GDF-11 SHEET SIZED

CIRCUIT #1	
LOADING	
120V	
LI 3.4	

LIGHT CIRCUIT
0.98A 106.2W @ 120V

REVISION HISTORY					
REV	ECN	DATE	REVISION DESCRIPTION	REV BY	CHKD BY
A	ECN-CAP-0003235	2016/08/17	RELEASED TO PRODUCTION	CB	CB



NOTES:
CASE MUST BE GROUNDED
WHEN PASSING WIRES THROUGH METAL HOLES A GROMMET MUST BE USED

MATERIAL - N/A	
DATE DRAWN - 8-17-16	
DRAWN BY - CRAIG BOOREY	ECN-CAP-0003235
REVIEWED BY - CRAIG BOOREY	REF -
APPROVED BY - CRAIG BOOREY	SHEET 1 OF 1
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.	
TOLERANCES ARE: DECIMALS .XX ±.03, .XXX ±.010	THIRD ANGLE PROJECTION
ANGLES ± 2°	

HUSSMANN	
DIAGRAM-TY4-6X8E-R	
3013477	A

User Information

Stocking

Improper temperature and lighting will cause serious product loss. Discoloration, dehydration and spoilage can be controlled with proper use of the equipment and handling of product. Product temperature should always be maintained at a constant and proper temperature. This means that from the time the product is received, through storage, preparation and display, the temperature of the product must be controlled to maximize life of the product. Hussmann cases were not designed to “heat up” or “cool down” product - but rather to maintain an item’s proper temperature for maximum shelf life. To achieve the protection required always:

1. Minimize processing time to avoid damaging temperature rise to the product. Product should be at proper temperature.
2. Keep the air in and around the case area free of foreign gasses and fumes or food will rapidly deteriorate.
3. Maintain the display merchandisers temperature controls as outlined in the refrigerator section of this manual.
4. Do not place any product into these refrigerators until all controls have been adjusted and they are operating at the proper temperature. Allow merchandiser to operate a minimum of one (1) hour before stocking with any product.
5. When stocking, never allow the product to extend beyond the recommended load limit. Air discharge and return air fl ue must be unobstructed at all times to provide proper refrigeration.
6. Avoid the use of supplemental fl ood or spot lighting. Display light intensity has been designed for maximum visibility and product life at the factory. The use of higher output fl uorescent lamps (H.O. and V.H.O.), will shorten the shelf life of the product.

Case Cleaning

Long life and satisfactory performance of any equipment are dependent upon the care given to it. To insure long life, proper sanitation and minimum maintenance costs, the refrigerator should be thoroughly cleaned frequently. SHUT OFF FAN DURING CLEANING PROCESS. It can be unplugged within the case, or shut off entire case at the source. The interior bottom may be cleaned with any domestic soap or detergent based cleaners. Sanitizing solutions will not harm the interior bottom, however, these solutions should always be used according to the Hussmann’s directions. It is essential to establish and regulate cleaning procedures. This will minimize bacteria causing discoloration which leads

to degraded product appearance and significantly shortening product shelf life.

Soap and hot water are not enough to kill this bacteria. A sanitizing solution must be included with each cleaning process to eliminate this bacteria.

1. Scrub thoroughly, cleaning all surfaces, with soap and hot water.
2. Rinse with hot water, but do not flood.
3. Apply the sanitizing solution according to Hussmann’s directions.
4. Rinse thoroughly.
5. Dry completely before resuming operation.

Plexiglass and Acrylic Care

Improper cleaning not only accelerates the cleaning cycle but also degrades the quality of this surface. Normal daily buffing motions can generated static cling attracting dust to the surface. Incorrect cleaning agents or cleaning cloths can cause micro scratching of the surface, causing the plastic to haze over time.

Cleaning

Hussmann recommends using a clean damp chamois, or a paper towel marked as “dust and abrasive free” with 210® Plastic Cleaner and Polish available by calling Sumner Labs at 1-800-542-8656. Hard, rough cloths or paper towels will scratch the acrylic and should not be used.

Troubleshooting

Troubleshooting Guide

Problem	Possible Cause	Possible Solution
Case temperature is too warm.	Ambient conditions may be affecting the case operation.	Check case position in store. Is the case located near an open door, window, electric fan or air conditioning vent that may cause air currents? Case must be located minimum 15 Ft away from doors or windows. Cases are designed to operate at 55% Relative humidity and a temperature of 75°F.
	Discharge air temp is out of spec.	Check evaporator fan operation. Check electrical connections and input voltage.
		Fans are installed backwards. Check airflow direction.
		Fan blades are installed incorrectly. Make sure fan blades have correct pitch and are per specification.
		Check to see that fan plenum is installed correctly. It should not have any gaps.
		Check suction pressure and insure that it meets factory specifications.
	Case is in defrost.	Check defrost settings. See Technical Specifications section.
	Product load may be over its limits blocking airflow.	Redistribute product so it does not exceed load level. There is a sticker on the inside of the case indicating what the maximum load line is.
	Coil is freezing over.	Return air is blocked, make sure debris is not blocking the intake section.
		Coil close-offs are not installed. Inspect coil to make sure these parts are on the case.
	Condensing coil or evaporator coil is clogged or dirty.	Clean coil.
Case temperature is too cold.	The t-stat temp is set too low.	Check settings. See Technical Specifications section.
	Ambient conditions may be affecting the case operation.	Check case position in store. Is the case located near an open door, window, electric fan or air conditioning vent that may cause air currents? Case must be located minimum 15 Ft away from doors or windows. Cases are designed to operate at 55% Relative humidity and a temperature of 75°F.
Condensation on glass.	Ambient conditions may be affecting the case operation.	Check case position in store. Is the case located near an open door, window, electric fan or air conditioning vent that may cause air currents? Case must be located minimum 15 Ft away from doors or windows. Cases are designed to operate at 55% Relative humidity and a temperature of 75°F.
	Inadequate air circulation.	Check if air sweep fans are functioning, check electrical connections.
	There is not enough heat provided in the airflow.	Check if air sweep heater is functioning, check electrical connections.
	There are glass gaps on the side of the case.	See glass adjustment section.
	Glass is not completely shut.	Close glass correctly.

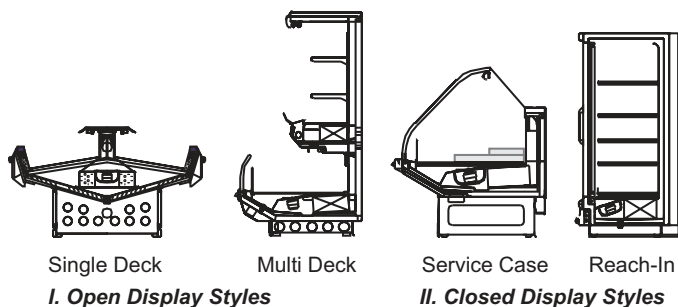
Troubleshooting

Problem	Possible Cause	Possible Solution
Water has pooled under case.	Case drain is clogged.	Clear drain.
	PVC drains under case may have a leak.	Repair as needed.
	Case tub has unsealed opening.	Seal as needed.
	If the case is in a line-up, case to case joint is missing or unsealed.	Install case to case joint and seal as needed.
	Evaporator pan is overflowing (if applicable).	Check electrical connection to evaporator pan. Check float assembly, it should move freely up and down the support stem. Clear any debris.
Case is not draining properly.	Case is not level.	Level the case.
	Drain screen is plugged.	Clean drain screen and remove any debris.
	Drain or P-trap is clogged.	Clear any debris.
Frost or ice on evaporator coil.	Evaporator fans are not functioning.	Check electrical connections.
	Defrost clock is not functioning.	Case should be serviced by a qualified service technician.
	Coil is freezing over.	Return air is blocked, make sure debris is not blocking the intake section.
		Coil close-offs are not installed. Inspect coil to make sure these parts are on the case.
Lights do not come on.	LED Driver/light socket wiring.	Check electrical connections. See Electrical Section and check wiring diagram.
	LED Driver needs to be replaced.	Case should be serviced by a qualified service technician. See Electrical Section.
	Lamp socket needs to be replaced.	Case should be serviced by a qualified service technician.
	Lamp needs to be replaced.	See Maintenance Section.
	Light Switch needs to be replaced.	Case should be serviced by a qualified service technician.

Appendix A. - Temperature Guidelines

The refrigerators should be operated according to the manufacturer's published engineering specifications for entering air temperatures for specific equipment applications. Table 1 shows the typical temperature of the air entering the food zone one hour before the start of defrost and one hour after defrost for various categories of refrigerators. Refer to Appendix C for Field Evaluation Guidelines.

Table 1	
Type of Refrigerator	Typical Entering Air Temperature
I. OPEN DISPLAY	
A. Non frozen:	
1) Meat	28°F
2) Dairy/Deli	32°F
3) Produce	
a. Processed	36°F
b. Unprocessed	45°F
B. Frozen	0°F
C. Ice Cream	-5°F
II. CLOSED DISPLAY	
A. Non frozen:	
1) Meat	34°F
2) Dairy/Deli	34°F
3) Produce	
a. Processed	36°F
b. Unprocessed	45°F
B. Frozen	0°F
C. Ice Cream	-5°F



Appendix B. - Application Recommendations

- 1.0 Temperature performance is critical for controlling bacteria growth. Therefore, the following recommendations are included in the standard. They are based on confirmed field experience over many years.
- 1.1 The installer is responsible for following the installation instructions and recommendations provided by Hussmann for the installation of each individual type refrigerator.
- 1.2 Refrigeration piping should be sized according to the equipment manufacturer's recommendations and installed in accordance with normal refrigeration practices. Refrigeration piping should be insulated according to Hussmann's recommendations.

- 1.3 A clogged waste outlet blocks refrigeration. The installer is responsible for the proper installation of the system which dispenses condensate waste through an air gap into the building indirect waste system.
- 1.4 The installer should perform a complete start-up evaluation prior to the loading of food into the refrigerator, which includes such items as:
 - a) Initial temperature performance, Coils should be properly fed with a refrigerant according to manufacturer's recommendations.
 - b) Observation of outside influences such as drafts, radiant heating from the ceiling and from lamps. Such influence should be properly corrected or compensated for.
 - c) At the same time, checks should be made of the store dry-bulb and wet-bulb temperatures to ascertain that they are within the limits prescribed by Hussmann.
 - d) Complete start-up procedures should include checking through a defrost to make certain of its adequate frequency and length without substantially exceeding the actual needs. This should include checking the electrical or refrigerant circuits to make sure that defrosts are correctly programmed for all the refrigerators connected to each refrigeration system.
 - e) Recording instruments should be used to check performance.

Appendix C. - Field Recommendations

Recommendations for field evaluating the performance of retail food refrigerators and hot cases

- 1.0 The most consistent indicator of display refrigerator performance is temperature of the air entering the product zone (see Appendix A). In practical use, the precise determination of return air temperature is extremely difficult. Readings of return air temperatures will be variable and results will be inconsistent. The product temperature alone is not an indicator of refrigerator performance.

NOTE: Public Health will use the temperature of the product in determining if the refrigerator will be allowed to display potentially hazardous food. For the purpose of this evaluation, product temperature above the FDA Food Code 1993 temperature for potentially hazardous food will be the first indication that an evaluation should be performed. It is expected that all refrigerators will keep food at the FDA Food Code 1993 temperature for potentially hazardous food.

- 1.1 The following recommendations are made for the purpose of arriving at easily taken and understood data which, coupled with other observations, may be used to determine whether a display refrigerator is working as intended:
 - a) **INSTRUMENT** - A stainless steel stem-type thermometer is recommended and it should have a dial a minimum of 1 inch internal diameter. A test thermometer scaled only in Celsius or dually scaled in Celsius and Fahrenheit shall be accurate to 1°C (1.8°F). Temperature measuring devices that are scaled only in Fahrenheit shall be accurate to 2°F. The thermometer should be checked for proper calibration. (It should read 32°F when the stem is immersed in an ice water bath).
 - b) **LOCATION** - The probe or sensing element of the thermometer should be located in the airstream where the air first enters the display or storage area, and not more than 1 inch away from the surface and in the center of the discharge opening.
 - c) **READING** - It should first be determined that the refrigerator is refrigerating and has operated at least one hour since the end of the last defrost period. The thermometer reading should be made only after it has been allowed to stabilize, i.e., maintain a constant reading.
 - d) **OTHER OBSERVATIONS** - Other observations should be made which may indicate operating problems, such as unsatisfactory product, feel/appearance.
 - e) **CONCLUSIONS** - In the absence of any apparent undesirable conditions, the refrigerator should be judged to be operating properly. If it is determined that such condition is undesirable, i.e., the product is above proper temperature, checks should be made for the following:
 1. Has the refrigerator been loaded with warm product?
 2. Is the product loaded beyond the "Safe Load Line" markers?
 3. Are the return air ducts blocked?
 4. Are the entering air ducts blocked?
 5. Is a dumped display causing turbulent air flow and mixing with room air?
 6. Are spotlights or other high intensity lighting directed onto the product?
 7. Are there unusual draft conditions (from heating/air-conditioning ducts, open doors, etc.)?
 8. Is there exposure to direct sunlight?
 9. Are display signs blocking or diverting airflow?

10. Are the coils of the refrigerator iced up?
11. Is the store ambient over 75°F, 55% RH as set forth in ASHRAE Standard 72 and ASHRAE Standard 117?
12. Are the shelf positions, number, and size other than recommended by Hussmann?
13. Is there an improper application or control system?
14. Is the evaporator fan motor/blade inoperative?
15. Is the defrost time excessive?
16. Is the defrost termination, thermostat (if used) set too high?
17. Are the refrigerant controls incorrectly adjusted?
18. Is the air entering the condenser above design conditions? Are the condenser fins clear of dirt, dust, etc.?
19. Is there a shortage of refrigerant?
20. Has the equipment been modified to use replacements for CFC-12, CFC-502 or other refrigerant? If so, have the modifications been made in accordance with the recommendations of the equipment manufacturer? Is the refrigerator charged with the proper refrigerant and lubricant? Does the system use the recommended compressor?

Appendix D. - Recommendations to User

- 1.0 Hussmann Corporation provides instructions and recommendations for proper periodic cleaning. The user will be responsible for such cleaning, including the cleaning of low temperature equipment within the compartment and the cooling coil area(s). Cleaning practices, particularly with respect to proper refrigerator unloading and warm-up, must be in accordance with applicable recommendations.
 - 1.1 Cleaning of non frozen food equipment should include a weekly cleaning of the food compartment as a minimum to prevent bacteria growth from accumulating. Actual use and products may dictate more frequent cleaning. Circumstances of use and equipment design must also dictate the frequency of cleaning the display areas. Weekly washing down of the storage compartment is also recommended, especially for equipment subject to drippage of milk or other liquids, or the collection of vegetable, meat, crumbs, etc. or other debris or litter. Daily cleaning of the external areas surrounding the storage or display compartments with detergent and water will keep the equipment presentable and prevent grime buildup.
 - 1.2 Load levels as defined by the manufacturer must be observed.

1.3 The best preservation is achieved by following these rules:

- a) Buy quality products.
- b) Receive perishables from transit equipment at the ideal temperature for the particular product.
- c) Expedite perishables to the store's storage equipment to avoid unnecessary warm-up and prolonged temperature recovery. Food store refrigerators are not food chillers nor can they reclaim quality lost through previous mishandling.
- d) Care must be taken when cross merchandising products to ensure that potentially hazardous vegetable products are not placed in non refrigerated areas.
- e) Display and storage equipment doors should be kept closed during periods of inactivity.
- f) Minimize the transfer time of perishables from storage to display.
- g) Keep meat under refrigeration in meat cutting and processing area except for the few moments it is being handled in processing. When a cut or tray of meat is not to be worked on immediately, the procedure should call for returning it to refrigeration.
- h) Keep tools clean and sanitized. Since mechanical equipment is used for fresh meat processing, all such equipment should be cleaned at least daily and each time a different kind of meat product comes in contact with the tool or equipment.
- i) Make sure that all refrigeration equipment is installed and adjusted in strict accordance with the manufacturer's recommendations.
- j) See that all storage and refrigeration equipment is kept in proper working order by routine maintenance.

Service Record

Last service date: By:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

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