

Frozen Food & Ice Cream
Wide Island Merchandisers

TVQ-EXA089K
TVQ-EXA029K
TVQ-EXACK

**INSTALLATION AND SERVICE MANUAL
REMOTE TYPE DISPLAY CASE**



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1 Specifications

Model Name	TVQ-EXA089K		TVQ-EXA029K	
General				
Application	<i>Medium Temperature</i>	<i>Frozen Food</i>	<i>Medium Temperature</i>	<i>Frozen Food</i>
Refrigerant	R-404A	R-404A	R-404A	R-404A
Cooling Capacity	380 BTU/h/ft. (892W)	482 BTU/h/ft. (1130W)	380 BTU/h/ft. (1338W)	482 BTU/h/ft. (1695W)
Discharge Air	24°F (-4.5°C)	-12°F (-24.4°C)	24°F (-4.5°C)	-12°F (-24.4°C)
Evaporator Temperature	19°F (-7.2°C)	-20°F (-28.9°C)	19°F (-7.2°C)	-20°F (-28.9°C)
Defrost (electric)	<i>Medium Temperature & Frozen Food</i>		<i>Medium Temperature & Frozen Food</i>	
Frequency (hr)	12		12	
Temp Term (°F)	50		50	
Failsafe (min)	30		30	
Electrical	<i>Medium Temperature & Frozen Food</i>		<i>Medium Temperature & Frozen Food</i>	
	1-phase 208V		1-phase 208V	
	(W)	(A)	(W)	(A)
Defrost Heater	3600	17.31	5400	25.96
	1-phase 120V		1-phase 120V	
	(W)	(A)	(W)	(A)
Anti-condensation Heater	158.2	1.32	227.8	1.90
Fan Motor	Standard	92	138	2.04
	High Efficiency	22	33	0.66
Components	<i>Medium Temperature & Frozen Food</i>		<i>Medium Temperature & Frozen Food</i>	
Defrost Heater	1-phase 208V 3600W		1-phase 208V 5400W	
Anti-condensation Heater	1-phase 120V 158.2W		1-phase 120V 227.8W	
Fan Motor	Standard	SPFBC51 x 4	SPFBC51 x 6	
	High Efficiency	SSC2B12BRHBV1 x 4	SSC2B12BRHBV1 x 6	
Fan Blade Pitch	#126 x 4		#126 x 6	
Pipe Diameter	Liquid 3/8" Suction 3/4"		Liquid 3/8" Suction 3/4"	
Refrigerant Type	R-404A		R-404A	
Measurements	<i>Medium Temperature & Frozen Food</i>		<i>Medium Temperature & Frozen Food</i>	
Outer Dimensions	35 1/2" (H) x 70 7/8" (W) x 96 3/8" (L)		35 1/2" (H) x 70 7/8" (W) x 144 5/8" (L)	
Display Area	38.8 sq.ft.		58.0 sq.ft.	
Effective Capacity	47.0 cu.ft.		70.5 cu.ft.	
Weight	816 lbs		1213 lbs	
Waste Outlet Dimensions	1 1/2"		1 1/2"	

- Standard Ambient Conditions : Indoor temperature 75°F (24°C), relative humidity 55%, wind speed under 39.4 fpm.
- All specifications are based upon temperature, humidity, and wind speed values equal to or less than Standard Ambient Conditions.
- Products described in this manual are designed for indoor use only. Products should not be exposed to direct sunlight.
- Fan motors are available in standard-type (AC fan motors) or high-efficiency type (DC fan motors).

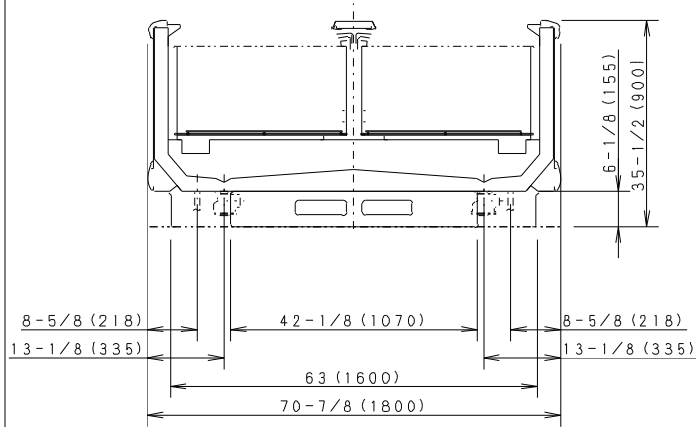
Model Name	TVQ-EXACK	
General		
Applications	<i>Medium Temperature</i>	<i>Frozen Food</i>
Refrigerant	R-404A	R-404A
Cooling Capacity	1194 BTU/h/case (350W)	1501 BTU/h/case (440W)
Discharge Air	24°F (-4.5°C)	-12°F (-24.4°C)
Evaporator Temperature	19°F (-7.2°C)	-20°F (-28.9°C)
Defrost (electric)	Medium Temperature & Frozen Food	
Frequency (hr)	12	
Temp Term (°F)	50	
Failsafe (min)	30	
Electrical	Medium Temperature & Frozen Food	
	1 phase 208V	
	(W)	(A)
Defrost Heater	1445	6.95
	1 phase 120V	
	(W)	(A)
Anti-condensation Heater	82	0.68
Fan Motor	Standard	23
	High Efficiency	5.5
		0.11
Components	Medium Temperature & Frozen Food	
Defrost Heater	1-phase 208V 1445W	
Anti-condensation Heater	1-phase 120V 82.0W	
Fan Motor	Standard	SPFBC51 x 1
	High Efficiency	SSC2B12BRHBV1 x 1
Fan Blade Pitch	#109 x 1	
Pipe Diameter	Liquid Pipe $\frac{3}{8}$ " Suction Pipe $\frac{3}{4}$ "	
Refrigerant Type	R-404A	
Measurements	Medium Temperature & Frozen Food	
Outer Dimensions	35 $\frac{1}{2}$ " (H) x 37 $\frac{1}{4}$ " (W) x 70 $\frac{7}{8}$ " (L)	
Display Area	12.8 sq.ft.	
Effective Capacity	15.6 cu.ft.	
Weight	397 lbs	
Waste Outlet Dimensions	1 $\frac{1}{2}$ "	

- Standard Ambient Conditions : Indoor temperature 75°F (24°C), relative humidity 55%, wind speed under 39.4 fpm.
- All specifications are based upon temperature, humidity, and wind speed values equal to or less than Standard Ambient Conditions.
- Products described in this manual are designed for indoor use only. Products should not be exposed to direct sunlight.
- Fan motors are available in standard-type (AC fan motors) or high-efficiency type (DC fan motors).

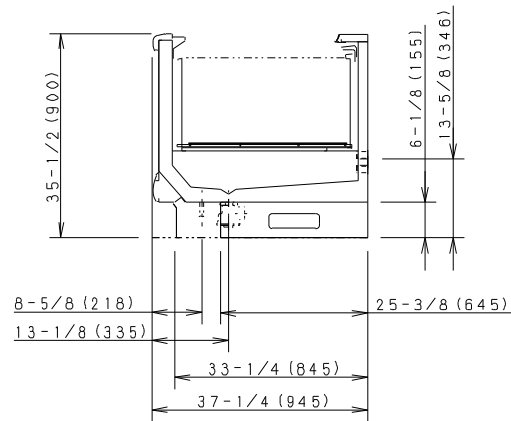
2 Dimensions

* Dimensions given in inches and millimeters (mm in parentheses).

2.1 External Dimensions

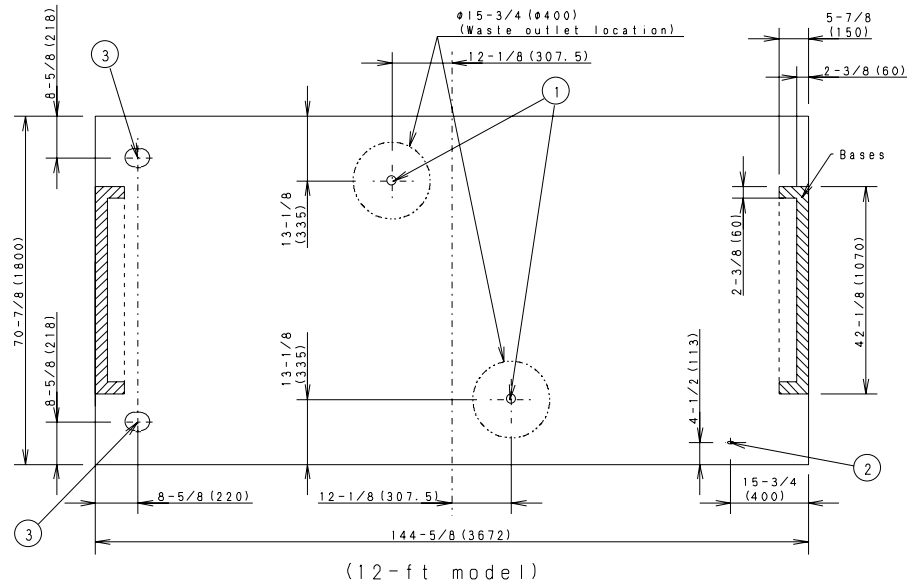


(8-, 12-ft models)

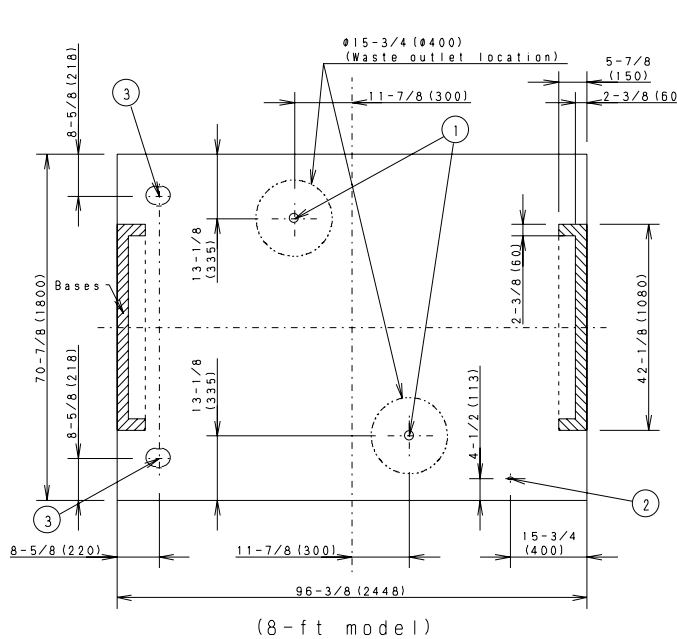


(End Case)

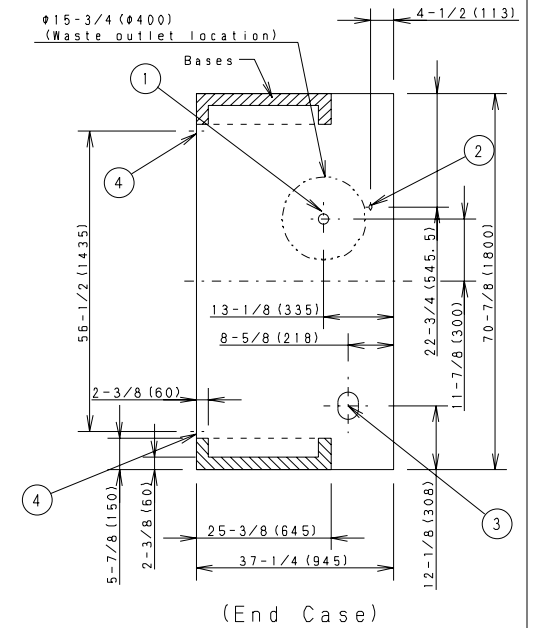
2.2 Footprint



(12-ft model)



(8-ft model)



(End Case)

- ① Waste Outlet
- ② Electrical Field Connection
- ③ Refrigeration Outlet

3 Unloading and Carpentry Procedures

3.1 NSF Certification

The merchandisers described in this manual are built to meet the requirements of American National Standard/NSF International Standard 7. Each merchandiser bears a nameplate identifying the type of application for which it was certified:

Type I display refrigerator / freezer: Intended for use in an area where the environmental conditions are controlled and maintained so that the ambient temperature typically does not exceed 75°F.

3.2 Location

As noted above, the merchandisers described in this manual are design for the display of products in interior spaces with climate control, with ambient conditions typically maintained below 75°F and 55% relative humidity. Proper merchandiser performance cannot be guaranteed when ambient temperature and/or humidity exceeds this level.

Merchandisers should not be exposed to direct sunlight or other sources of heat.

Merchandisers should not be exposed to strong air currents, as these may disrupt the air curtain used to maintain proper temperature inside the merchandiser display area.

3.3 Shipping Damage

All equipment should be examined for shipping damage prior to and during offloading. All equipment goes through outgoing inspection upon leaving our warehouse, and the carrier assumes responsibility for the safe arrival of our merchandisers.

APPARENT DAMAGE: Any obvious loss or damage should be noted immediately at the time of receipt on the freight bill or express receipt and signed by the carrier's agent. Failure to do so may lead to rejection of the claim by the carrier.

CONCEALED DAMAGE: If damage that is not apparent during unloading is found after unpacking, retain all packing materials and submit a written request to the carrier for inspection within 15 days.

LOST ITEMS: Any claims related to lost or missing items must be made to SANYO Commercial Solutions within 48 hours of receipt of equipment.

3.4 Unloading Instructions & Precautions

WARNING

Cases are heavy and bulky, and require at least two people for unloading, moving, and installation.

8-ft and 12-ft merchandisers have wooden beams mounted on each side (no beams on end cases). Do not remove the wooden beam from the bottom edges of each case until the cases have been moved into place in the store lineup.

Do not walk on the top of the merchandisers. Walking on the top of the merchandiser may lead to serious injury and/or damage to the merchandiser. Do not place other heavy loads on the top of the merchandiser.

Recommended Practices for Unloading Merchandisers:

1. Use a J-bar (Johnson bar) to lift one end of the merchandiser.
2. Insert one or more dollies under the base leg.
3. Lift the other side with the J-bar.
4. (Optional) Insert one or more dollies.
5. Move merchandiser out of container.
6. Use dollies on both ends of the merchandiser to move to lineup location after unloading from container.

3.5 Aligning Cases

WARNING

Cases are heavy and bulky, and require at least two people for unloading, moving, and installation.

Do not walk on the top of the merchandisers. Walking on the top of the merchandiser may lead to serious injury and/or damage to the merchandiser. Do not place other heavy loads on the top of the merchandiser.

1. Review layout drawings for spaces where merchandisers are to be installed.
2. Based on the layout drawings and the merchandiser footprint drawings, mark the floor to indicate the exact locations of the base legs (back edge and front edge) on each merchandiser. Multiple merchandisers should be aligned based upon the position of the base legs.
3. Snap chalk lines for the front and rear positions of the legs on each row of merchandisers.
4. Mark the location showing the outside edge of each base leg on each merchandiser.

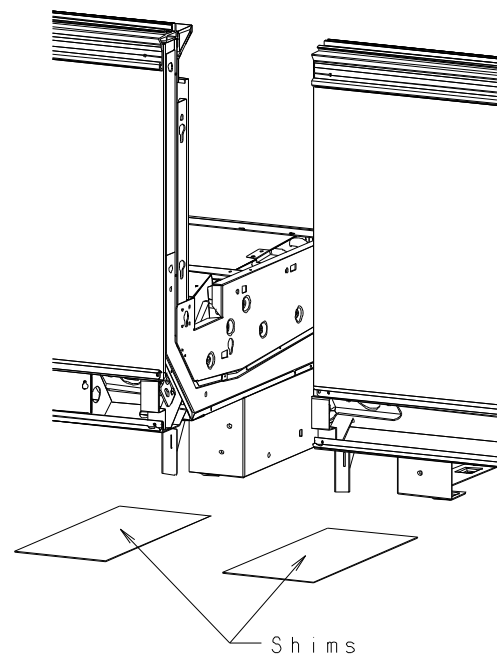
3.6 Case Leveling

Merchandisers must be installed level in order to ensure proper performance and drainage.

1. For each lineup of cases to be joined, use a level (preferably a laser level) to find the highest point on the front and rear chalk lines marked in step 3 above (during Case Alignment).
2. Determine which of the two points marked on the line is higher. This is the highest point in the case lineup.
3. Estimate the number of shims needed for the four corners of each case position, in order to bring all positions to the same height as the highest point found in step 2.
4. For each row, place the first merchandiser case where it will sit over the highest point in the lineup. Ensure that the case is level, using shims as needed.

NOTE: Each base leg should rest on solid supports. Insert shims as needed if there are any gaps between the floor and each base leg.

5. Continue placing cases in the lineup, working outward to both sides from the position of the first case placed. Use shims to ensure that all cases in the lineup are level.



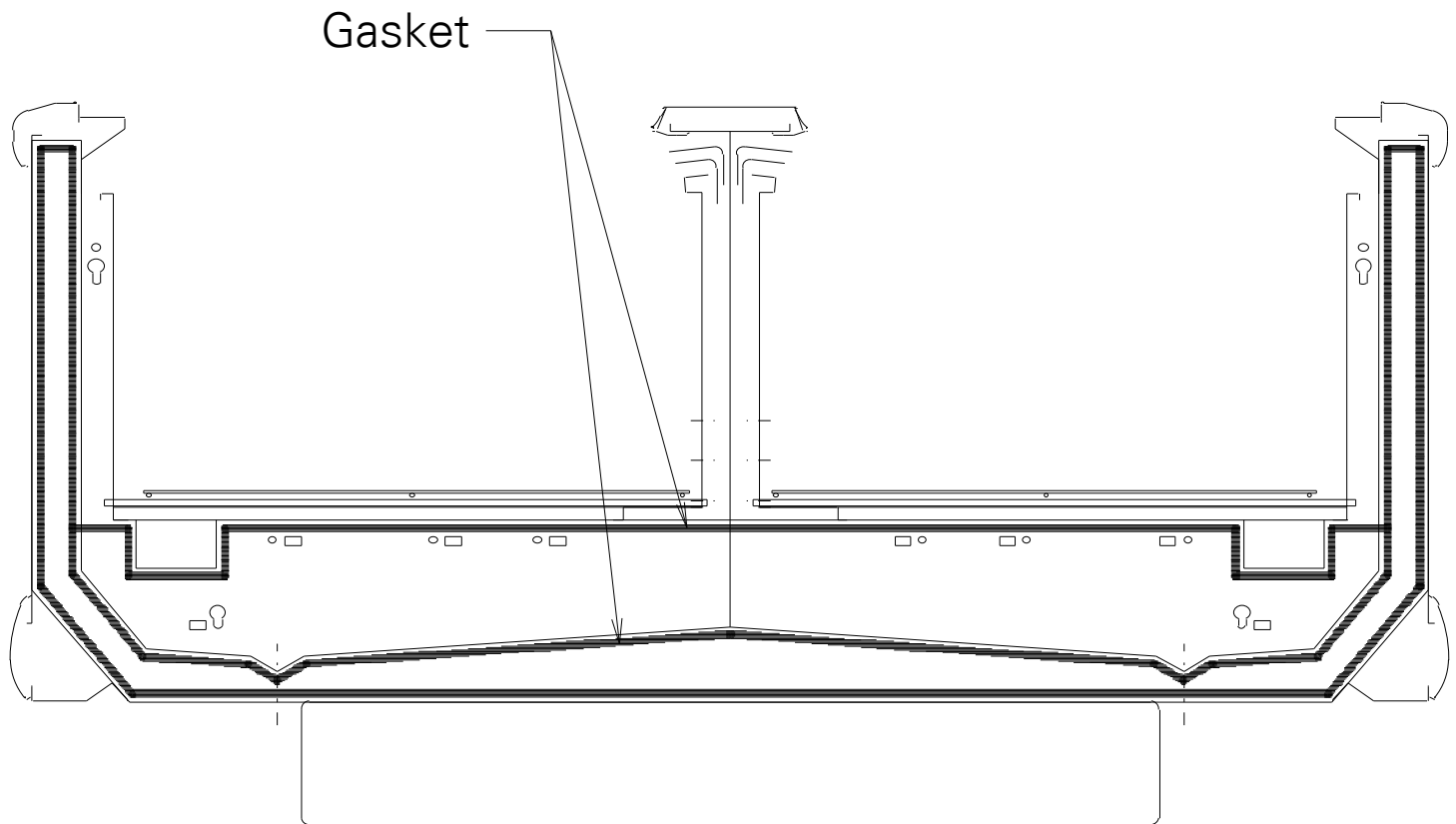
3.7 Joining Instructions

3.7.1 Applying gasket (for connecting cases or installing side panels).

- ① Make sure that all merchandisers are resting level.
- ② Make sure that all required parts for joining are present (gasket, bolts, joint covers, nuts, etc.).
- ③ Remove wire racks, deck pans, and air grilles from the far right and left ends of each case being joined.
- ④ Place gasket along the areas shown in bold in the drawing at right. When connecting two cases, apply gasket to one case only.

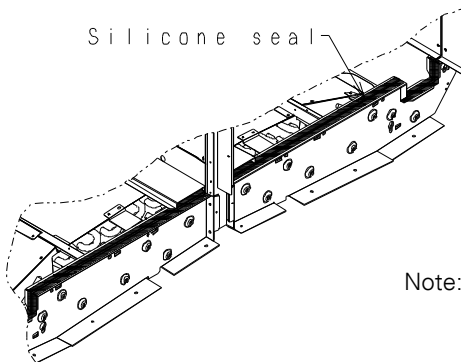
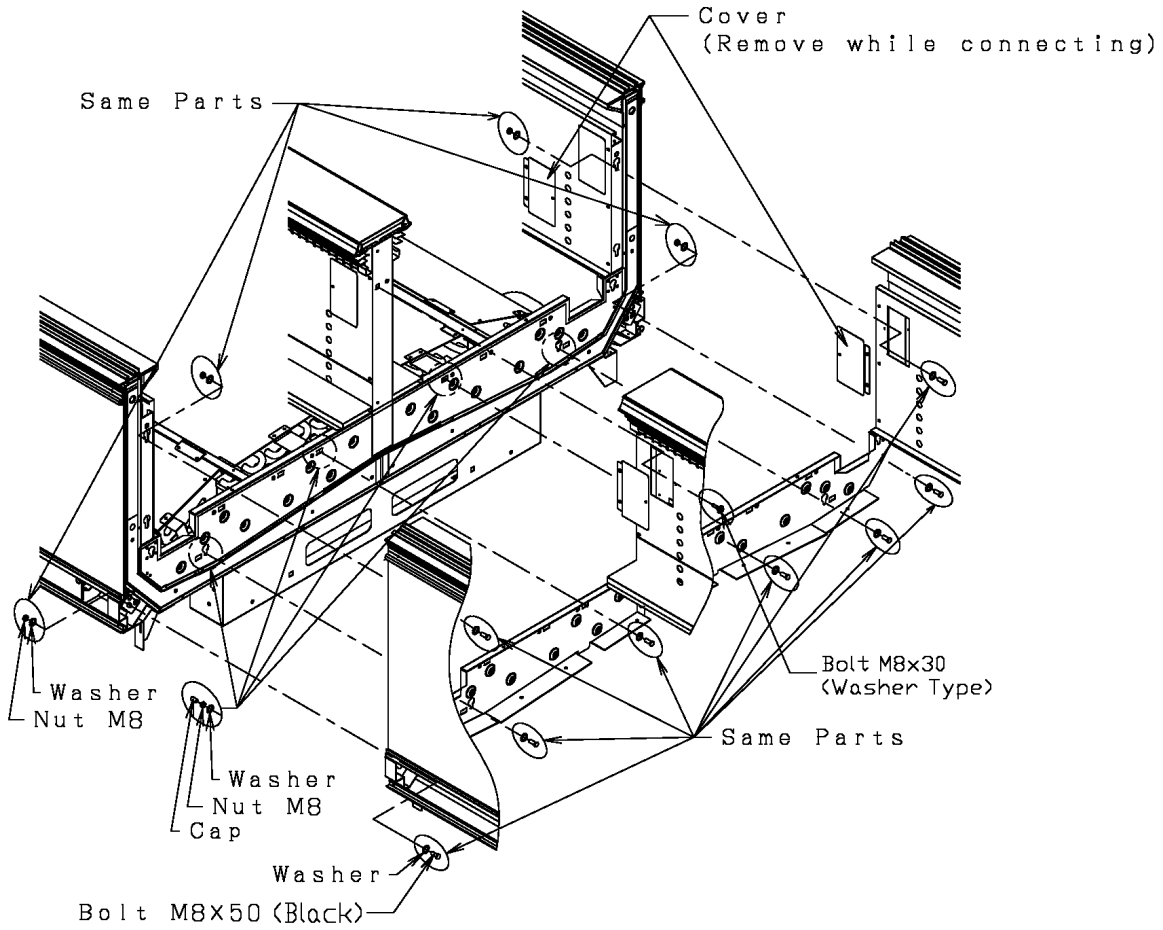
- **Perimeter gasket is required by NSF.**
- Do not stretch or twist gasket when applying.
- Do not leave gaps. Always overlap gasket rather than leaving gaps.
- Gasket ends that are open must be sealed off by applying silicone at the installation site.

Insufficient or improper sealing may lead to insufficient cooling and condensation.



3.7.2 Connecting cases (8-ft and 12-ft cases)

- ① Apply gasket as described above.
- ② Connect cases by using the attached bolts, joint covers, nuts and caps.

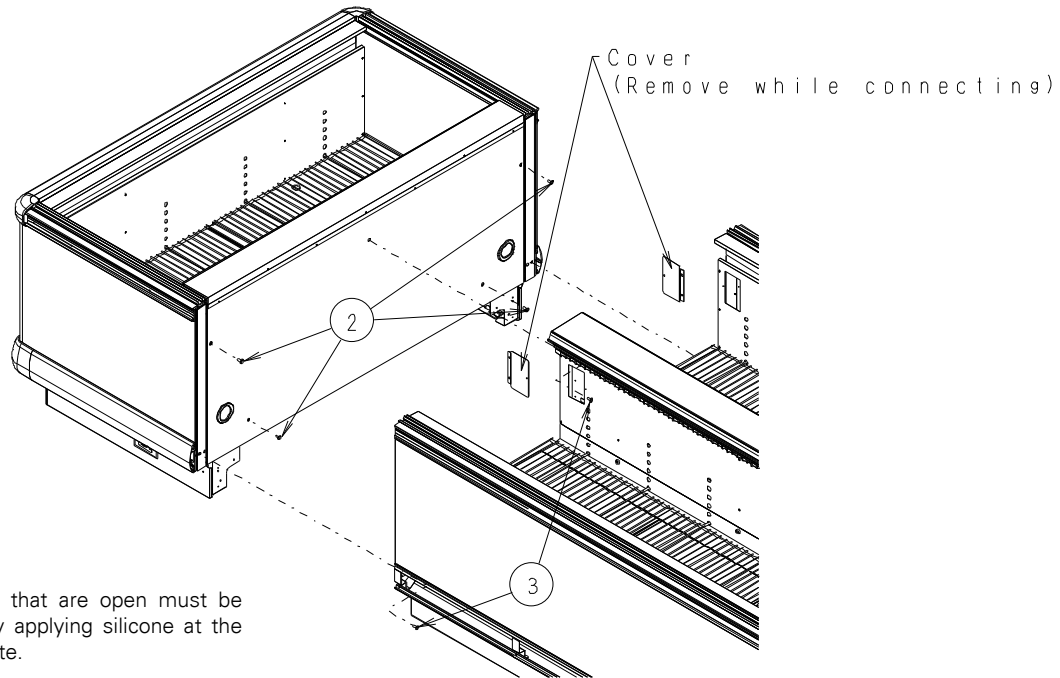
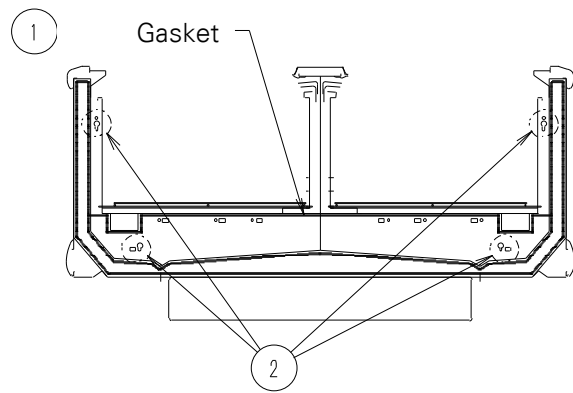


Note: Connection points must be silicone sealed.

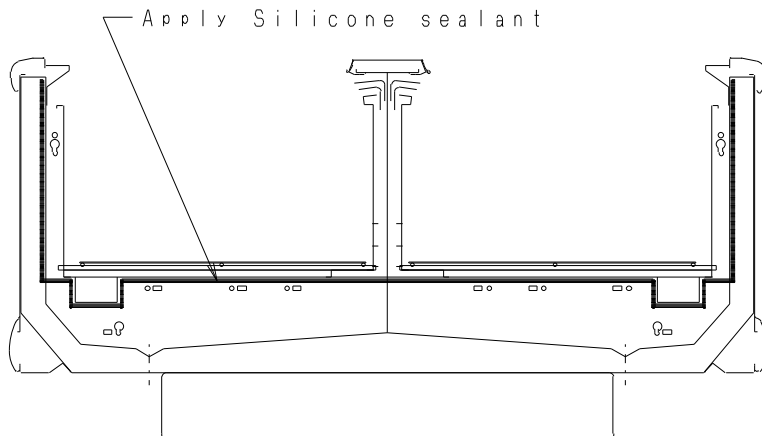
Note: Gasket ends that are open must be sealed off by applying silicone at the installation site.

3.7.3 Connecting cases (End cases)

- ① Apply gasket as shown at right.
- ② Partially set M8 bolts in place at the four positions shown at right, insert through connecting holes in the sides of 8-ft or 12-ft wide island cases, then set firmly in place from the 8-ft/ 12-ft unit side.
- ③ Fix the end case in position with the M8 bolts.
- ④ Fix the hand rail joints in place.
- ⑤ Fix the bumper joints in place.

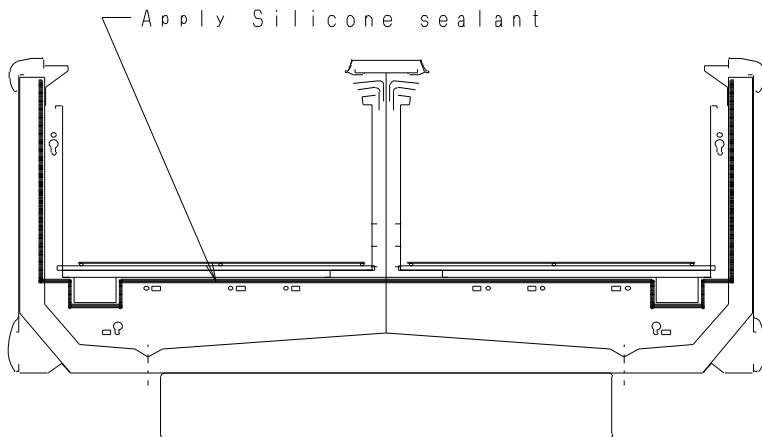
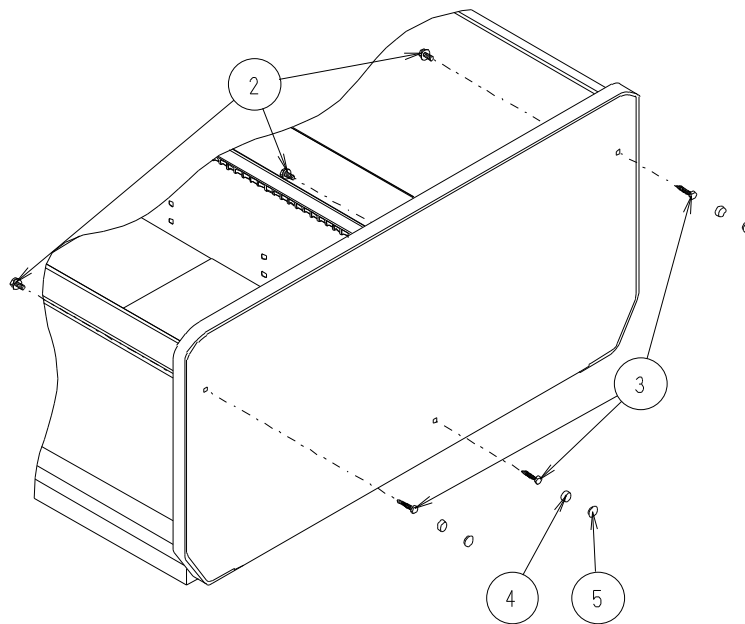
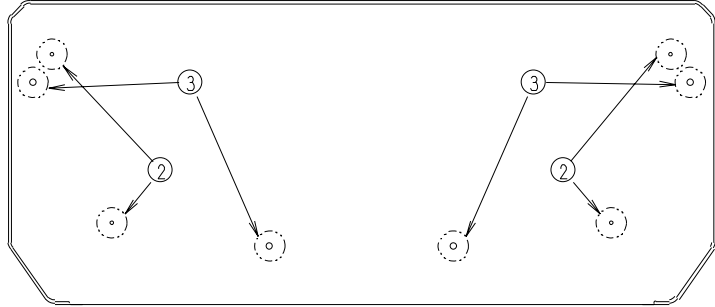


Note: Gasket ends that are open must be sealed off by applying silicone at the installation site.



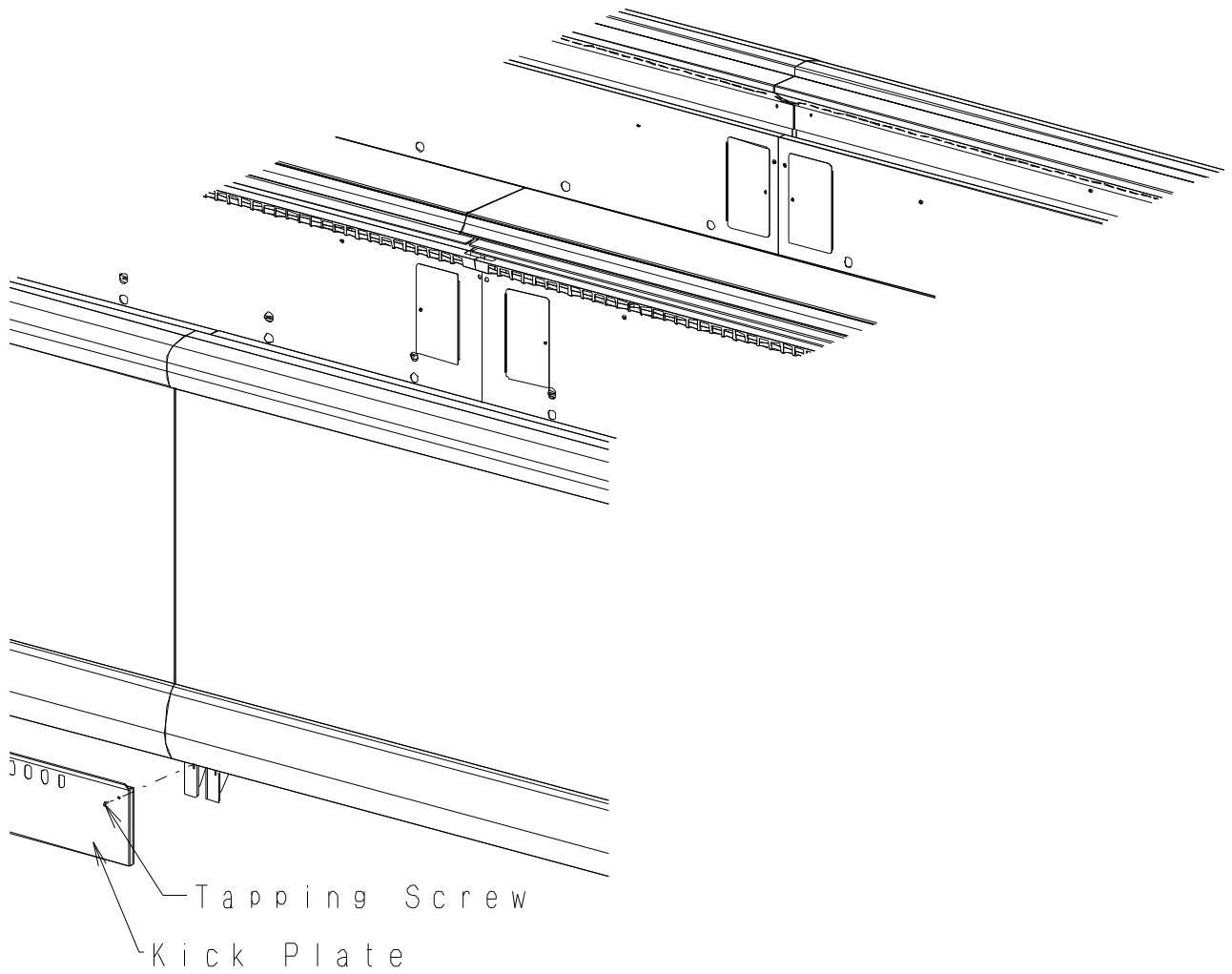
3.8 Installing side panels

- ① Apply gasket as indicated below.
- ② Temporarily fix the side panel in place with M8 bolts as indicated (see right). Pass bolts through connection holes in the sides of the 8-ft/ 12-ft wide island cases, then finish fixing the bolts in place from the 8-ft/ 12-ft case side.
- ③ Fix in place with screws as indicated (see right).
- ④ Apply foam plugs to bolts.
- ⑤ Attach side panel caps.

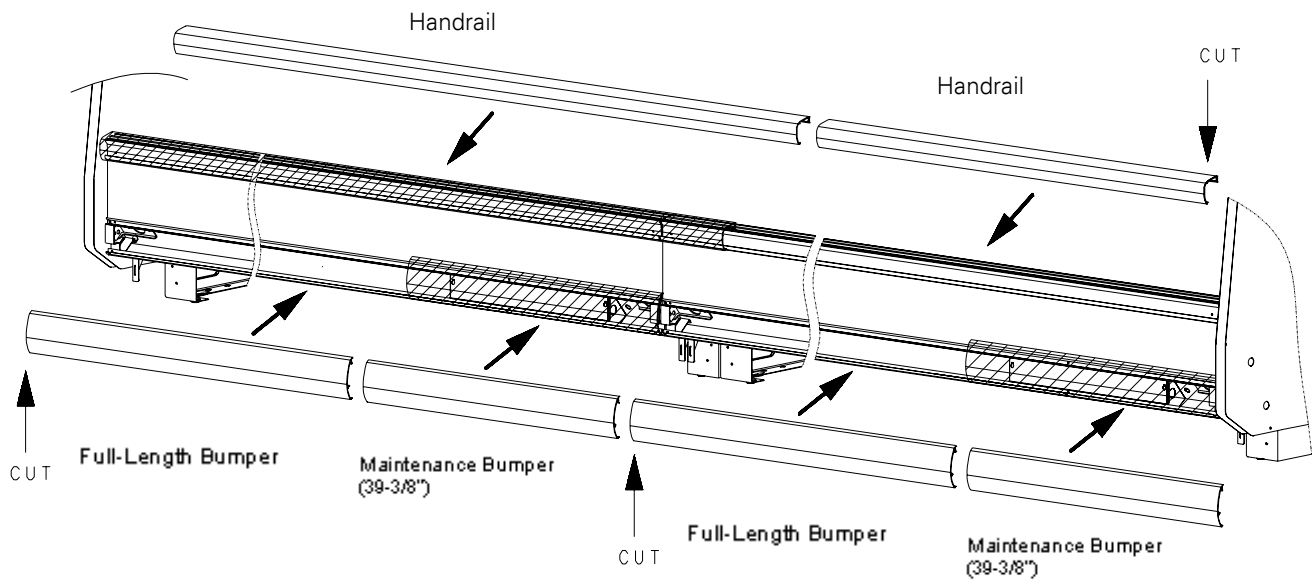


Note: Gasket ends that are open must be sealed off by applying silicone at the installation site.

3.9 *Installing Kickplate*



3.10 *Installing handrail and bumper*



Attaching the Bumper

1. Attach Maintenance Bumper (length 39-3/8 inches) to bumper brackets over the electrical connection box ("raceway") on each merchandiser. The raceway is located on the right end of each merchandiser.
2. Attach Full-Length Bumpers between Maintenance Bumpers on separate merchandisers, and also between Maintenance Bumpers and patch ends.

* Cut Full-Length Bumpers to size on-site. Cut to correct size so that no gaps remain between pieces.

Attaching the Handrail

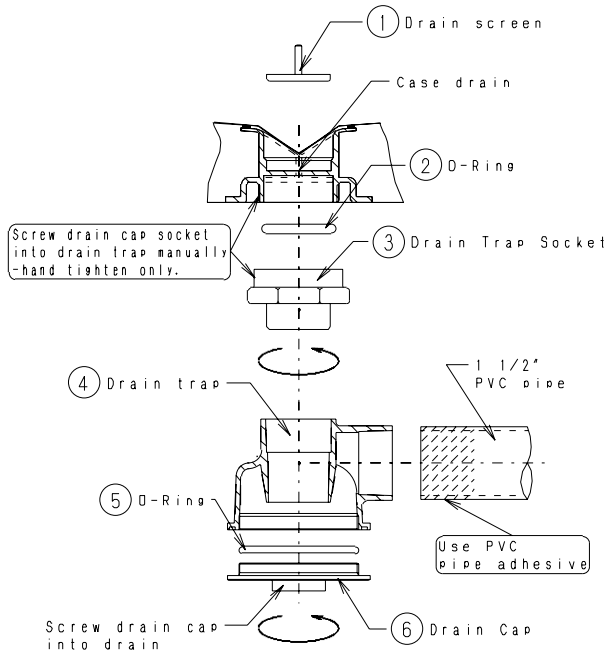
1. Starting at one end of merchandiser line-up, attach pieces of Handrail to handrail retainer, butting the pieces end-to-end without gaps.
2. When you reach the final piece of Handrail to be installed between the last merchandiser in the line-up and the patch end, cut that piece to length so there are no gaps between handrails or between handrails and patch ends.

4 Refrigeration, Plumbing & Electrical Procedures

4.1 Piping (Plumbing, Refrigeration)

- U-trap installation

Install U-trap referring to the drawing below.

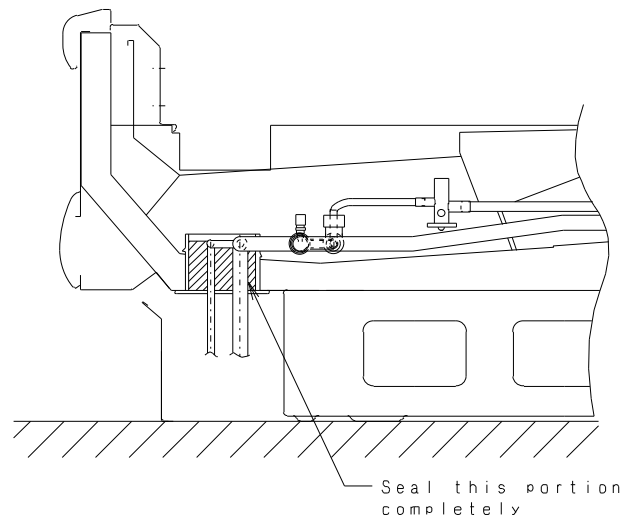


- Sealing the refrigerant pipe opening

Seal pipe completely.

Insufficient sealing may cause the following problems:

- Insufficient cooling
- Excessive frost
- Icing over
- Condensation on the bottom of case.



	Part Name	Part Number
①	Drain Screen	845-0-1962-001-00
②	O-Ring	845-2-6946-001-00
③	Drain Trap Socket	845-2-6959-003-00
④	Drain Trap	845-2-1437-103-00
⑤	O-Ring	845-2-0183-107-00
⑥	Drain Cap	845-2-1345-110-00

4.2 Electrical Data

Please refer to Specifications section and nameplate attached to merchandiser for electrical information.

4.3 Electrical – Guidelines & Precautions

All wiring and electrical field work must comply with the National Electrical Code (“NEC”) and other applicable local codes. All electrical connections must be made inside the raceway area.

4.4 Wiring

4.4.1 Wiring Color Code

WIRING COLOR CODE	CORD DE COULEUR DE CABLAGE
Leads for all electric circuits are identified by a colored plastic band; neutral wire for each circuit has either white insulation or a white plastic sleeve in addition to the color band.	Les cables de tous les circuits électriques sont identifiés par une bande de plastique de couleur; le fil neutre de chaque circuit comporte une isolation blanche ou un manchon de plastique blanc en plus de la bande de couleur.
BLUE.....FAN MOTORS	BLEU.....MOTEURS DU VENTILATEUR
ORANGE.....LIGHTS	ORANGE.....ECLAIRAGE
YELLOW.....CONDENSATE HEATERS	JAUNE.....CHAUFFAGE ANTI-CONDENSATION
RED.....DEFROST HEATERS, 208V	ROUGE.....CHAUFFAGE DE DEGIVRAGE, 208V
GRAY.....DEFROST TERMINATION THERM.	GRIS.....THERM. D'ARRÊT DE DEGIVRAGE
GREEN.....GROUND	VERT.....MISE A LA TERRE
ELECTRICIAN NOTE: Use copper conductor wire only. Case must be grounded.	REMARQUE A L'ELECTRICIEN: Utilisez uniquement du fil électrique avec des conducteurs de cuivre. Le réfrigérateur doit être mis à la terre.

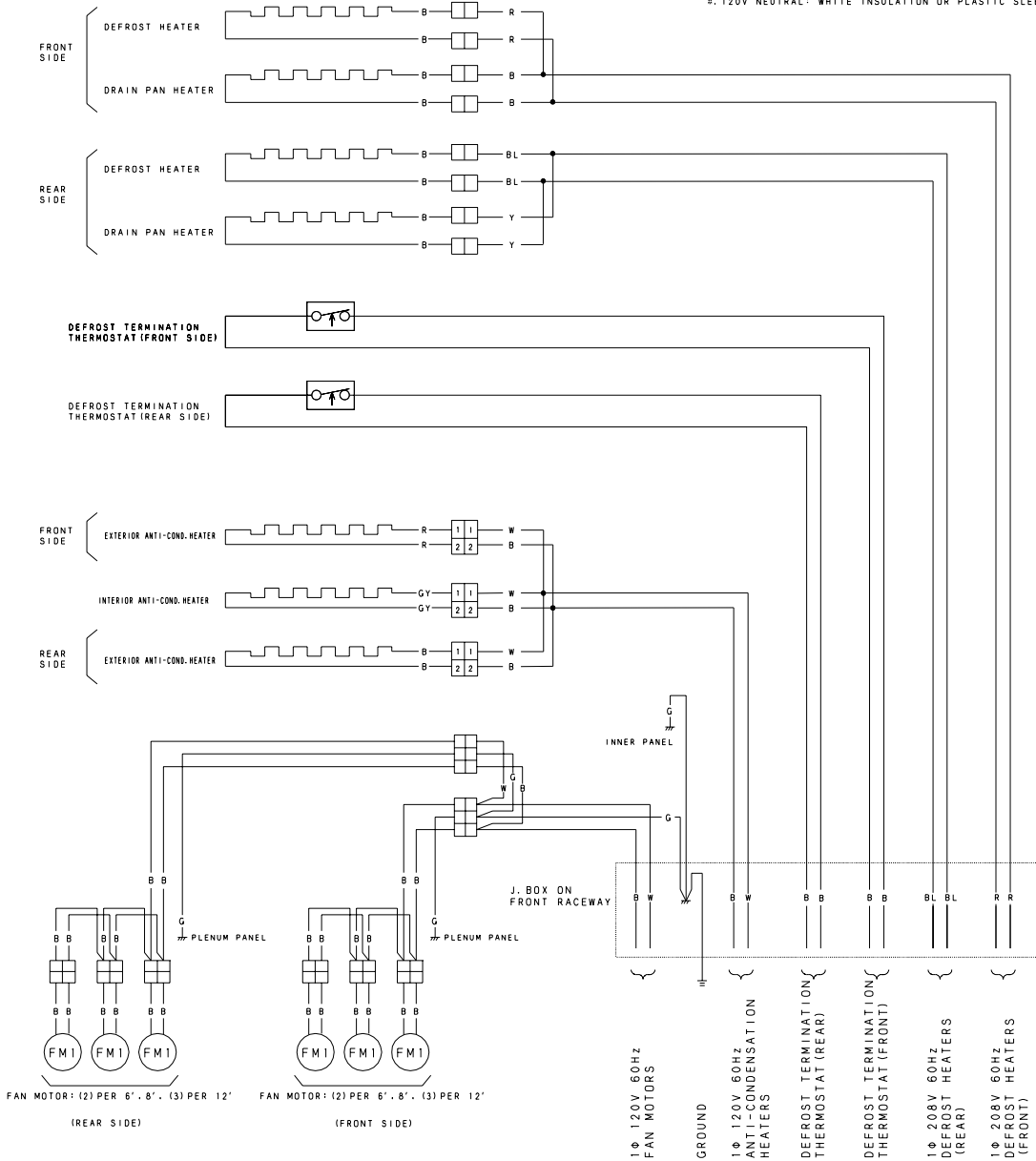
4.4.2 Wiring diagram - 8-ft and 12-ft cases

EXA089KWM
TVQ-EXA029KWM ELEC WIRING DIAGRAM

NOTE1. ALL CASES MUST BE GROUND.
NOTE2. USE COPPER CONDUCTOR WIRE ONLY.
NOTE3. WIRING COLOR

WIRING COLOR			
R	RED	G	GREEN
W	WHITE	BL	BLUE
B	BLACK	GY	GRAY
Y	YELLOW		

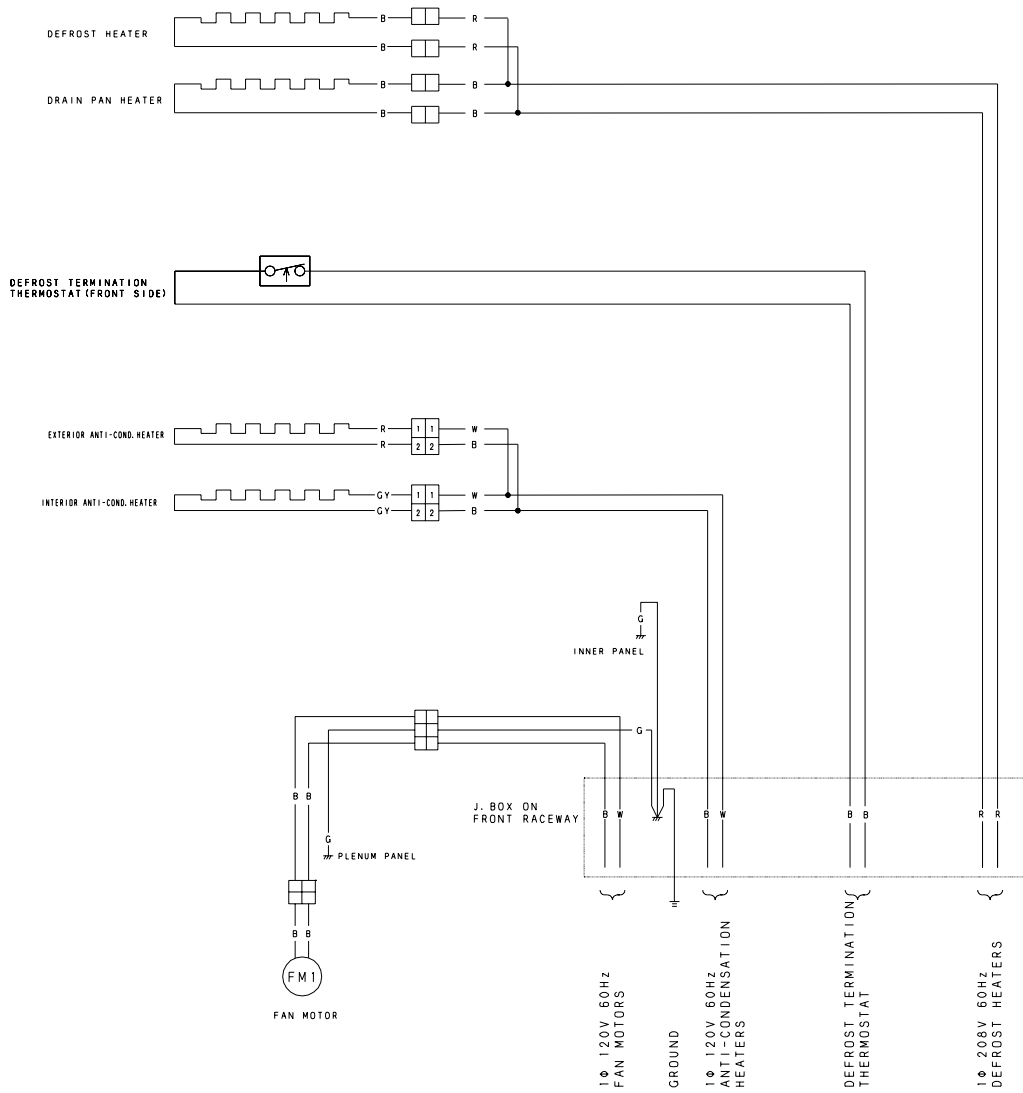
Ø. 120V NEUTRAL: WHITE INSULATION OR PLASTIC SLEEVE



8FC-2-5300-000-30

4.4.3 Wiring diagram - end cases

TVO-EXACKWM ELEC WIRING DIAGRAM



NOTE1. ALL CASES MUST BE GROUND.
 NOTE2. USE COPPER CONDUCTOR WIRE ONLY.
 NOTE3. WIRING COLOR

WIRING COLOR			
R	RED	G	GREEN
W	WHITE	GY	GRAY
B	BLACK		

*. 120V NEUTRAL: WHITE INSULATION OR PLASTIC SLEEVE

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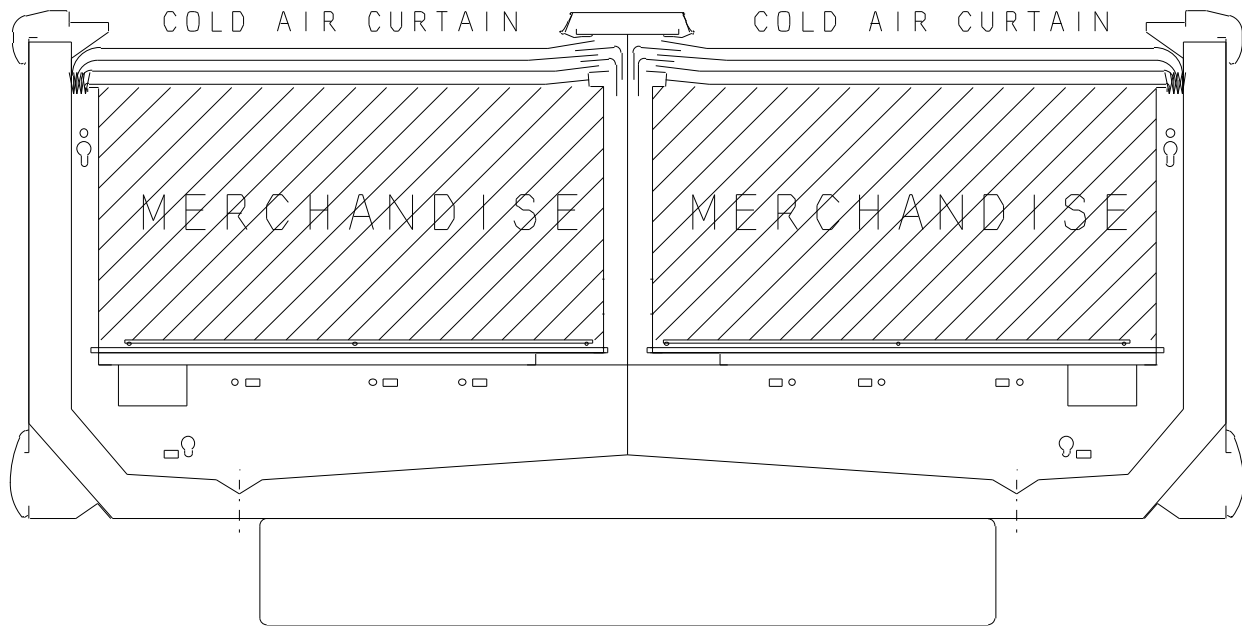
5 Operation

5.1 Load Limits

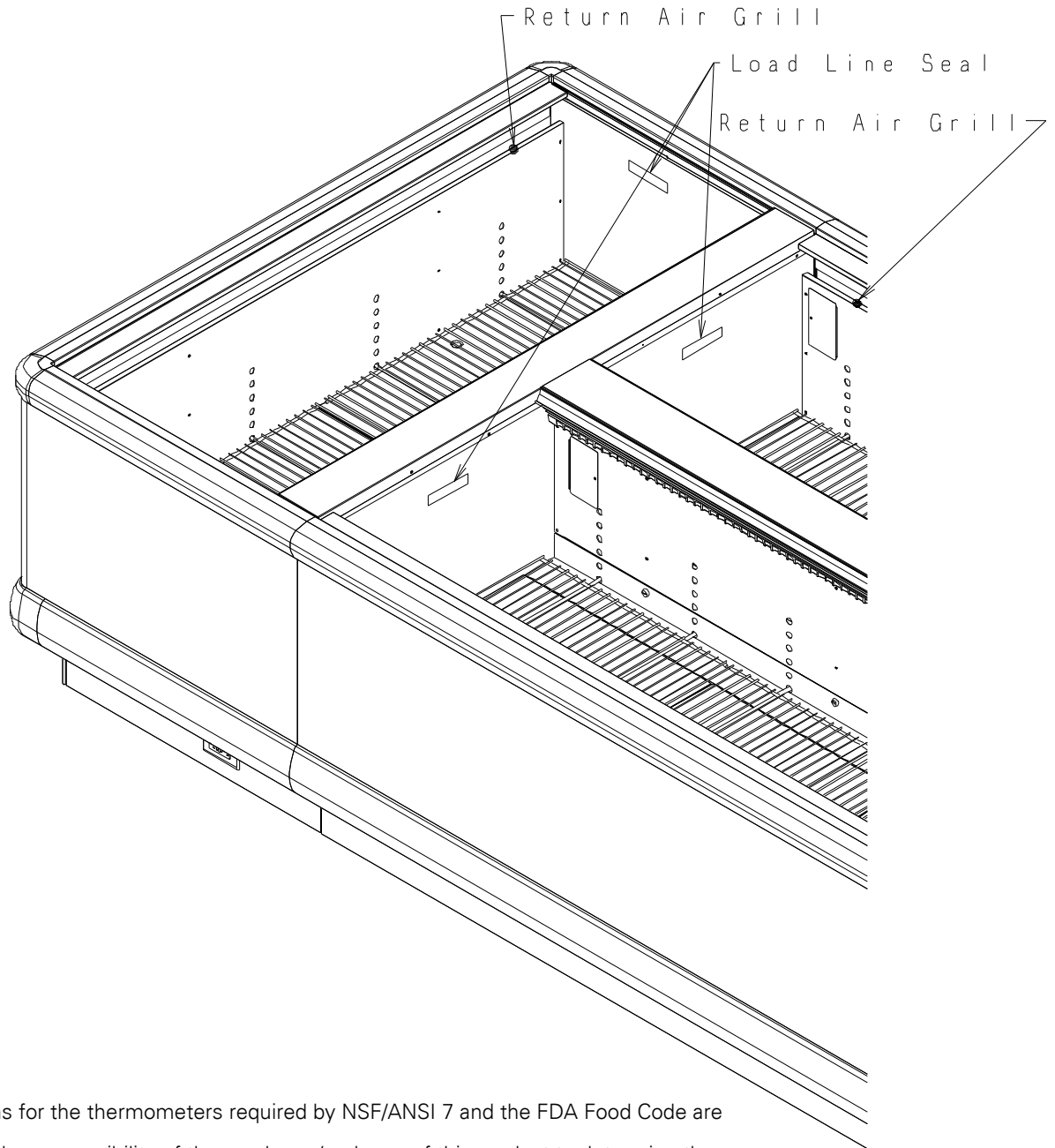
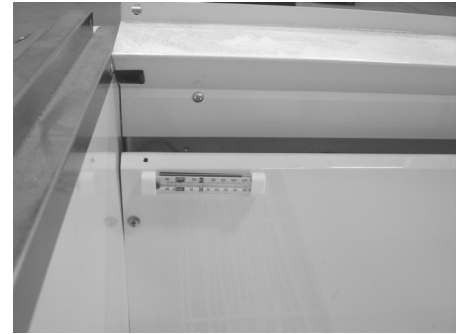
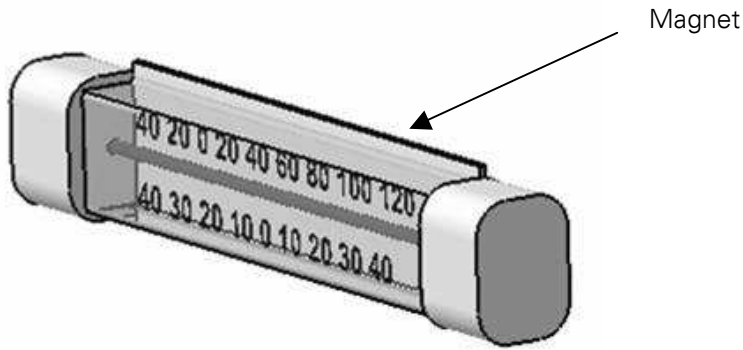
In order to maintain proper temperature and unit performance, the air curtain in each merchandiser must remain unobstructed:

- Do not stock shelves beyond the marked load limits.
- Do not block discharge or return air grilles.
- Do not block airflow in any other way (with signs, tools, packages, etc.)

Failure to follow these precautions will lead to insufficient temperature control, spoilage of stored merchandise, and excessive frost.



5.2 Installing FDA/NSF Thermometer



The suggested locations for the thermometers required by NSF/ANSI 7 and the FDA Food Code are indicated above. It is the responsibility of the purchaser/end user of this product to determine the locations within the food storage area that best meet these code requirements .

6 Care and Cleaning Guidelines

In order to keep merchandisers sanitary and in good working order, we recommend thorough periodic cleaning as follows:

6.1 Daily Cleaning

6.1.1 Exterior Panels



- Exterior panels should be cleaned with water only. Wet a soft cloth and wring it out to wipe down panels.
- If required, you may use a mild detergent and warm water to remove stains. You should follow by wiping down with water only in order to prevent discoloration.
- Take particular care to clean areas that may be exposed to salt or saline solutions.
- DO NOT use scrapers, blades or other sharp objects to remove adhesive, as you may damage panels. You may use rubbing alcohol to remove adhesive if water and mild detergents alone are insufficient.

6.2 Monthly Cleaning

WARNING:

- Make sure to turn merchandiser power off and close hand valve before cleaning deck pans or drain trap.
- Take care not to touch the fans or wiring.
- Use gloves.

Failure to take these precautions may lead to electric shock and accidents with fan blades.

You should turn power on and open hand valve ONLY AFTER you have completed cleaning and put parts back in place.

6.2.1 Deck Pan

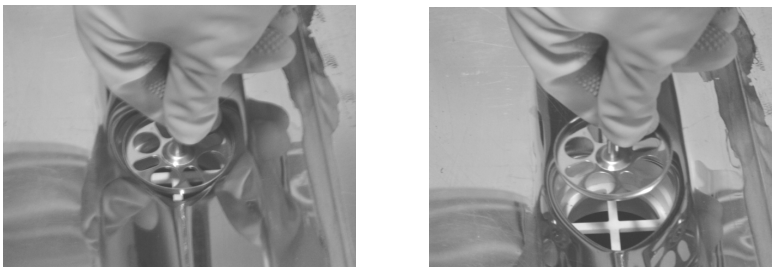


Clean the entire deck pan surface, preferably with water only. If required, you may use a mild detergent and warm water to remove stains. You should follow by wiping down with water only in order to prevent discoloration.

6.2.2 Drain Trap

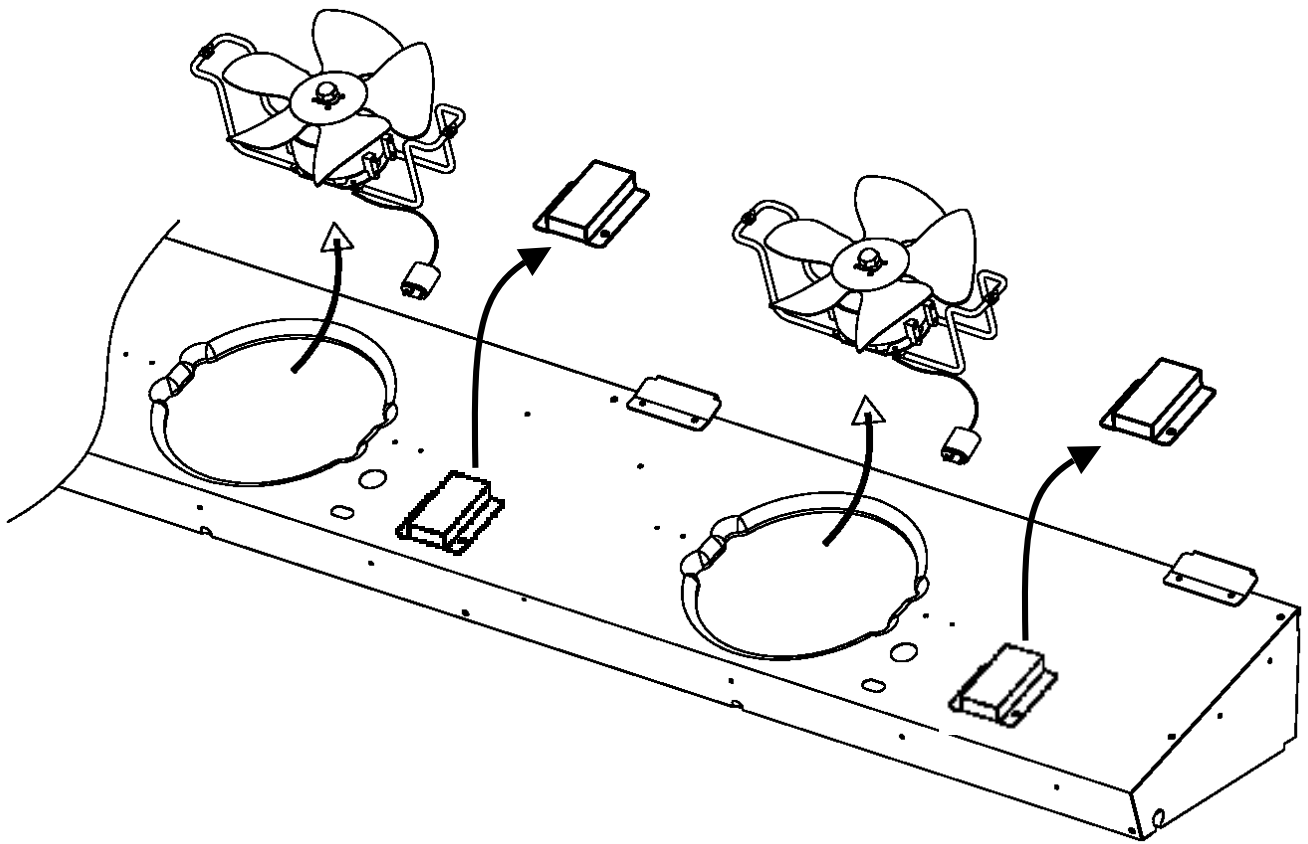
Check and clean the drain trap at least once a month.

You may access the drain trap by removing the deck pans. Remove any material that has gathered in the drain trap and dispose of it. Clean the drain trap and put it back in its original position.



7 Service

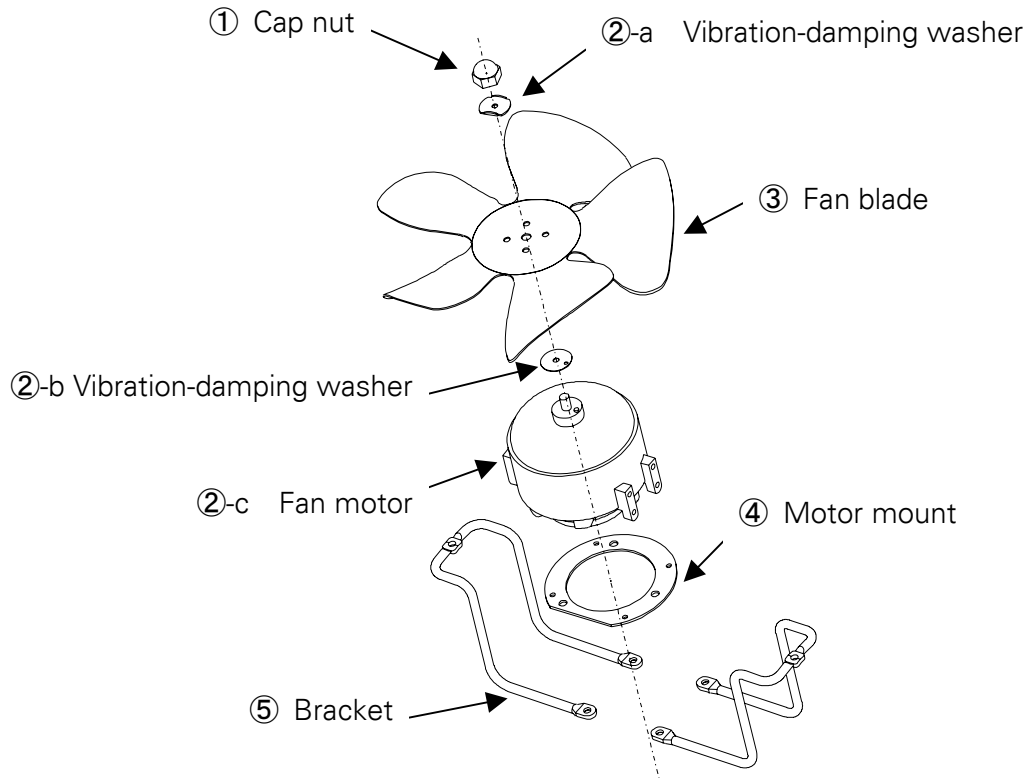
7.1 Replacing Fan Motors and Blades



To replace the fan motors:

- ① Unplug the fan motor harness and remove socket covers.
- ② Push fan motor harness through hole in plenum.
- ③ Detach fan motor mounting bracket from plenum and pull up to remove.

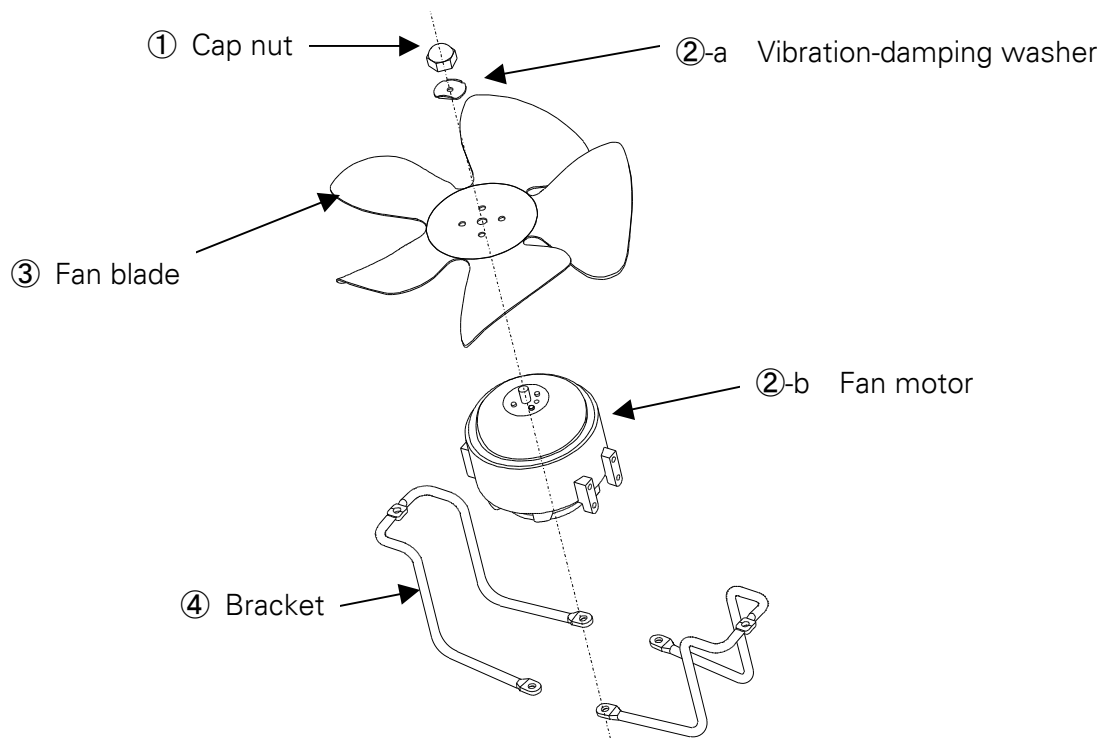
Fan Motor Assembly Part Codes (Standard-Type Fan Motors)



For models with standard-type (AC) fan motors:

No.	Part Name	Model	Part Code	TVQ-EXA029K	TVQ-EXA089K	TVQ-EXACK
				Quantity used	Quantity used	Quantity used
①	Cap nut	-	9FL-2-6450-001-00	6	4	1
②-a ②-b ②-c	Fan motor	SPFBC51	8FC-4-M140-000-30	6	4	1
③	Fan blade	#126	9FL-2-4230-004-00	6	4	-
		#109	9FL-2-4230-005-00	-	-	1
④	Motor mount	-	9FL-2-8140-001-00	6	4	1
⑤	Bracket	-	9FL-2-1750-008-01	12	8	2

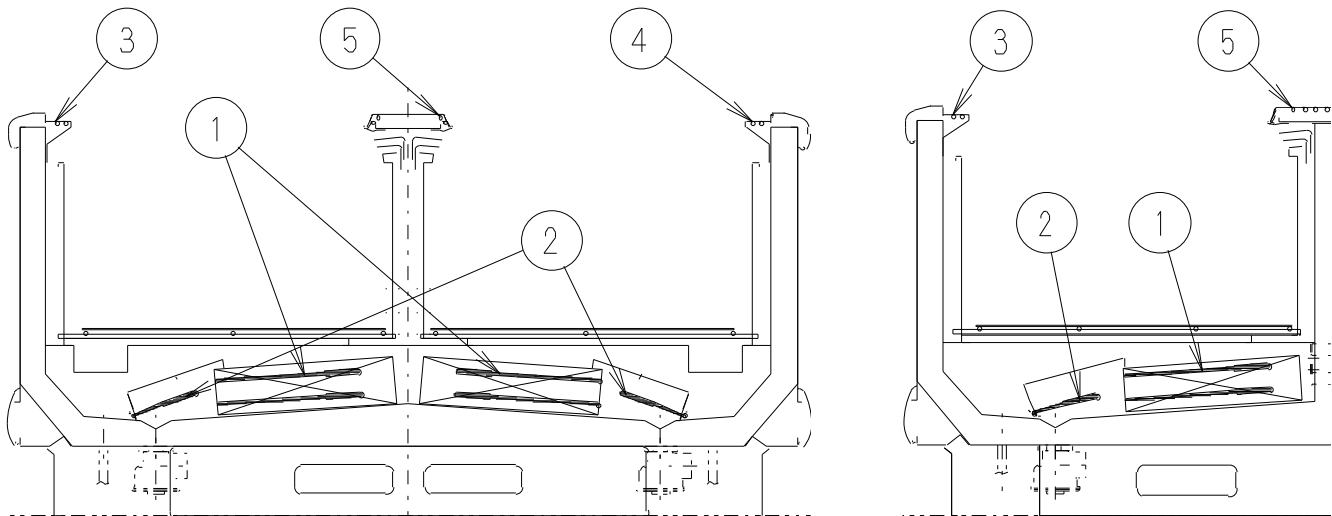
Fan Motor Assembly Part Codes (High-Efficiency-Type Fan Motors)



For models with high-efficiency-type (DC) fan motors:

No.	Part Name	Model	Part Code	TVQ-EXA029K	TVQ-EXA089K	TVQ-EXACK
				Quantity used	Quantity used	Quantity used
①	Cap nut	-	9FL-2-6450-001-00	6	4	1
②-a ②-b	Fan motor	SSC2B12BRHBV1	8FC-4-M100-000-30	6	4	1
③	Fan blade	#126	9FL-2-4230-004-00	6	4	-
		#109	9FL-2-4230-005-00	-	-	1
④	Bracket	-	9FL-2-1750-018-01	12	8	2

7.2 Replacing Heaters



Heater Part Codes

No	Part Name	Part Code	TVQ-EXA029K	TVQ-EXA089K	TVQ-EXACK
			Quantity used	Quantity used	Quantity used
①	Defrost Heater	8FC-4-H110-000-30	2	-	-
		8FC-4-H110-000-10	-	2	-
		8FC-4-H110-000-50	-	-	1
②	Drain Heater	8FC-4-H110-000-40	2	-	-
		8FC-4-H110-000-20	-	2	-
		8FC-4-H110-000-60	-	-	1
③	Exterior Anti-Condensation Heater (Front)	8FC-4-H120-000-40	1	-	-
		8FC-4-H120-000-10	-	1	-
		8FC-4-H120-000-70	-	-	1
④	Exterior Anti-Condensation Heater (Rear)	8FC-4-H120-000-50	1	-	-
		8FC-4-H120-000-20	-	1	-
⑤	Interior Anti-Condensation Heater	8FC-4-H120-000-60	1	-	-
		8FC-4-H120-000-30	-	1	-
		8FC-4-H120-000-80	-	-	1

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