

CRYSTAL
MERCHANDISER®



ZERO ZONE

CRYSTAL MERCHANDISER® COOLERS

With CoolView® Doors and ChillBrite™ LED Lighting

INSTALLATION & OPERATION MANUAL



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ZERO ZONE WARRANTY

Limited Warranty

Zero Zone, Inc. (Seller) hereby warrants that any products manufactured by it and sold are warranted to be free from defects in material and workmanship, under normal use and service for its intended purpose, for a period of one (1) year from the date of original installation (not to exceed 15 months from the date of factory shipment). Zero Zone ChillBrite™ LED Lighting carries a 5-year parts warranty. Zero Zone CoolView® Doors carry a 10-year glass pack parts warranty. The obligation under this warranty shall be limited to repairing or exchanging any part, or parts, FOB Factory, which is proven to the satisfaction of the Zero Zone Service Department to be defective. Zero Zone reserves the right to inspect the job site, installation, and reason for failure. This limited warranty does not cover labor, freight, or loss of food or product, including refrigerant loss. This warranty does not apply to motors, switches, controls, lamps, driers, fuses, or other parts manufactured by others and purchased by the Seller unless the manufacturer of these items warrants the same to the Seller, and then only to the extent of those manufacturer's warranty to the Seller. Any products sold on an "AS IS" basis shall not be covered by this warranty.

Extended Warranties

In addition to the standard limited warranty, for further consideration, the Seller will extend to the original purchaser prior to shipment, a limited extended warranty on the compressor only, following expiration of the standard warranty. The Seller agrees to repair or exchange, at its option, or provide reimbursement for such exchange as directed, less any credit allowed for return of the original compressor, of a compressor of like or similar design and capacity, if it is shown to the satisfaction of Zero Zone that the compressor is inoperative due to defects in factory workmanship or material under normal use and services as outlined by Zero Zone in its Installation & Operation Manuals and other instructions.

Length of Extended Warranty

Any compressor warranty may be extended for an additional four (4) years, but such extension must be purchased prior to shipment to be effective. In those instances on manufactured systems where factory-installed Zero Zone Oil Management Systems are purchased, the original limited warranty shall be extended automatically to two (2) years total and purchased extended warranties shall be extended automatically for a total of six (6) years from the date of factory shipment. This warranty is only for the compressor and not for any other associated parts of the refrigeration system.

Product Not Manufactured by the Seller

The written warranty, if any, provided by the manufacturer of any part of the refrigeration unit sold by Seller to Buyer, but not manufactured by Seller, is hereby assigned to the Buyer. However, Seller makes no representation or warranty regarding the existence, validity, or enforceability of any such written warranty.

Limitation and Exclusion of Warranties

THE WARRANTIES SET FORTH HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE.

INTRODUCTION

Important User Information

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The information in this manual is subject to change without notice and does not represent a commitment on the part of Zero Zone. Zero Zone does not assume any responsibility for any errors that may appear in this manual. In no event will Zero Zone be liable for technical or editorial omissions made herein, nor for direct, indirect, special, incidental, or consequential damages resulting from the use or defect of this manual.

The information in this document is not intended to cover all possible conditions and situations that might occur. The end user must exercise caution and common sense when installing, using, or maintaining Zero Zone products. Zero Zone products should only be installed by qualified, professional refrigeration technicians. If any questions or problems arise, call Zero Zone at 800-247-4496.

Any change to a Zero Zone product made during the installation, start-up, or at any other time must be submitted in writing to Zero Zone for approval and be approved by Zero Zone in writing prior to commission. The product warranty is voided when any unapproved change is made to a Zero Zone product.

Manufacturer

Zero Zone, Inc.

110 N Oakridge Dr • North Prairie, WI 53153 • 800-247-4496 • www.zero-zone.com

Intended Use

Zero Zone products are intended to be installed and used as described in this manual and other related Zero Zone literature, specifications, drawings, and data. All Zero Zone products must be leveled after being installed.

Display Case Models

The information contained in this manual pertains to the following Zero Zone display cases:

CASE MODEL	DESCRIPTION	DOOR SIZE & TYPE
RVMC24	Standard Case	24" x 74" CoolView® Ultra™ French Doors
RVMC24D	Deep Case	24" x 74" CoolView® Ultra™ French Doors
RVMC24DRL	Deep Rear Load Case	24" x 74" CoolView® Ultra™ French Doors
RVMC24RL	Rear Load Case	24" x 74" CoolView® Ultra™ French Doors
RVMC24UN	Ultra Narrow Case	24" x 74" CoolView® Ultra™ French Doors
RVMC24BBUN	Back-to-Back Ultra Narrow Case	24" x 74" CoolView® Ultra™ French Doors
RVMC30	Standard Case	30" x 74" CoolView® Ultra™ Doors
RVMC30D	Deep Case	30" x 74" CoolView® Ultra™ Doors
RVMC30DRL	Deep Rear Load Case	30" x 74" CoolView® Ultra™ Doors
RVMC30RL	Rear Load Case	30" x 74" CoolView® Ultra™ Doors

INTRODUCTION

Case Features

Zero Zone produces high quality refrigerated display cases using state-of-the-art components. The cases are built with the thickest insulation in the industry and a high efficiency evaporator coil. Case features include:

- Brushless DC electronic motors
- Zero Zone ChillBrite™ LED Lighting
- Zero Zone CoolView® Ultra™ Doors

Testing Standards

These display cases were designed and tested using the following industry standards:

- NSF 7 – Commercial Refrigerators and Freezers (ANSI Approved) (equipment certified by NSF)
- NSF 51 – Food Equipment Materials (ANSI Approved) (equipment certified by NSF)
- UL 471 – Commercial Refrigerators and Freezers (ANSI Approved) (equipment certified by ETL)
- ASHRAE Standard 72 – Method of Testing Commercial Refrigerators and Freezers (ANSI Approved)
- AHRI 1200 – Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets (ANSI Approved)
- DOE Compliant (All U.S. Sales and U.S. Territories)

ASHRAE Standard 72 specifies the test conditions for the equipment. It includes the ambient conditions of 75°F dry bulb and 55% RH. It also specifies the door opening requirements for the performance test. Doors are opened six times in one hour for six seconds. The door opening test period is for eight hours during one 24-hour performance test. As an example, a 5-door case will have 240 door openings during one 24-hour test. Consult the factory if your store exceeds these test conditions.

INSTALLATION & OPERATION

Delivery Inspection

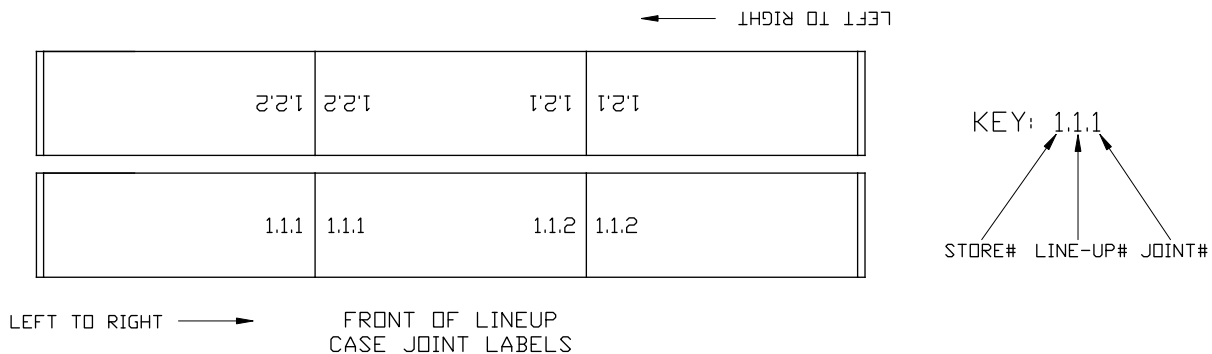
These display cases were carefully factory-tested, inspected, and properly packed to ensure delivery in the best possible condition. The equipment should be unpackaged, uncrated, and checked for damage immediately upon delivery. **DAMAGE MUST BE NOTED AT TIME OF DELIVERY, AND ALL CLAIMS FOR DAMAGES MUST BE FILED WITH THE TRANSPORTATION COMPANY, NOT WITH ZERO ZONE.** The carrier will supply necessary report and claim forms.

Do not leave, store, or hold case outdoors in direct sunlight or high ambient temperature. With the end panels on, the case is airtight; the inside temperature of the case will increase, and the heat will be unable to escape. This could potentially cause any plastic (such as PTM) inside the case to deform or warp.

Packaging

Numbered labels identify the order of cases in a lineup (See Figure 1). The first number indicates the store order number. The second number indicates the lineup. The third number indicates the joint in a lineup (from left to right, when viewed from the front of the case). Back-to-back cases follow the same labeling.

FIGURE 1: Case Label Information



The first case in the lineup (Case 1) has a packet shipped inside the case that contains the manual, special instructions for installing optional features, and touch-up paint for custom-painted cases. Other cases in the lineup contain specific information for that case. The shop order is taped to each case's right-hand door.

Bumpers and kickplates are shipped on top of the case. Shelves are tie-wrapped and blocked inside the case for shipping. Other accessories like drain traps, drain pans, condensate evaporation pans, and hat channel rails are shipped in cases that require those parts.

Materials for joining cases—including caulk, joining bolts, splices, and end filler posts—are shipped in each case to be joined.

The door is prevented from opening during shipment with the use of a door-holding shipping bracket. The bracket is screwed to the top of the case at each door and should be removed when the case is unpacked.

Location

Cases must not be installed in the direct rays of the sun or near a source of radiant heat.

Be certain that the floor under the installation is of sufficient strength to prevent sagging. Uneven surfaces will result in reduced performance.

Cases should be set to allow a minimum 3" of space behind the back of the unit(s). This will allow necessary air to circulate behind the display case(s) and prevent condensation. Higher humidity stores with minimal air circulation require at least a 4" gap. Recommended minimum 2" gap between cases on end-to-end installations.

INSTALLATION & OPERATION

Moving Cases

Various tools and equipment may be used to move cases, including, but not limited to, a forklift, a Johnson bar, a pallet jack, furniture rollers, casters, or a Rol-A-Lift. Be careful to avoid damaging the store flooring. Only certified forklift drivers should use forklifts to move the cases. The case should only be lifted off the floor as high as necessary for transport. The forklift should be driven slowly; avoid abrupt motions or bumps.

- Use the end frame to push/pull the case. **Do not push/pull on the mullions when moving the case.**
- When using a Johnson bar, only contact the sheet metal of the bottom foamed panel. **Do not contact the bumper support. Be careful not to pierce the sheet metal with the corner of the Johnson bar.**
- When using a pallet jack or furniture rollers, only place them under the floor panels. **Do not place them under the bumper support or drain pipe as that will crush the components.**
- The cases have steel protective support plates under the ends (not under insulated dividers) to protect the end panel from J-bar damage.

Make sure that a forklift with the proper fork dimensions is available. **Forks must be 48" long, 1 1/2" to 1 3/4" thick, and no more than 4" wide to fit the bases.** Refer to the table below for instructions.

CASE MODELS	INSTRUCTIONS
2RVMC24	Forks must extend 20" to 24" under the case from either end
3RVMC24	Forks must extend 26" to 30" under the case from either end
4RVMC24	Forks must extend 39" to 43" under the case from either end
6RVMC24	Forks must extend 44" to 47" under the case from either end
2RVMC30	Forks must extend 26" to 30" under the case from either end
3RVMC30	Forks must extend 39" to 43" under the case from either end
4RVMC30	Forks must extend 44" to 47" under the case from either end
5RVMC30	Forks must extend 44" to 47" under the case from either end

OPTIONAL BASES

For low shipping height applications, Zero Zone has optional expandable bases to accommodate up to 1 3/4" thick forks ([See Figure 2](#)). To use a forklift on cases with expandable bases, raise the case with a Johnson bar and place wooden blocks under the case, allowing the base to expand enough for forks to be inserted.

If a case needs to move through an 80" door opening, the case will be factory-installed with a 1" base and will be shipped on a wooden pallet. Remove the case from the pallet to slide the case through the 80" doorway. The drain elbow will be shipped loose and must be installed using extra thick PVC cement after the case is through the doorway. The 1" base will be set into an elevation kit ([See Figure 3](#)).

FIGURE 2: Expandable Base

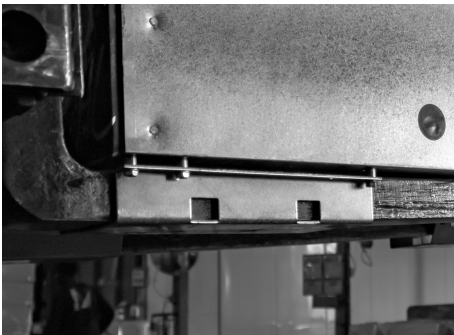
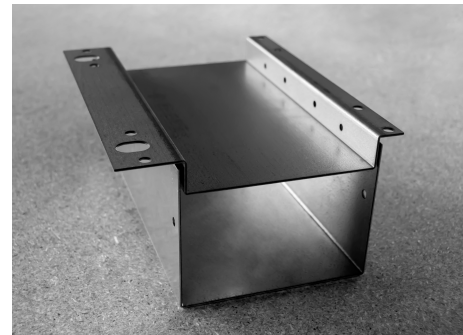


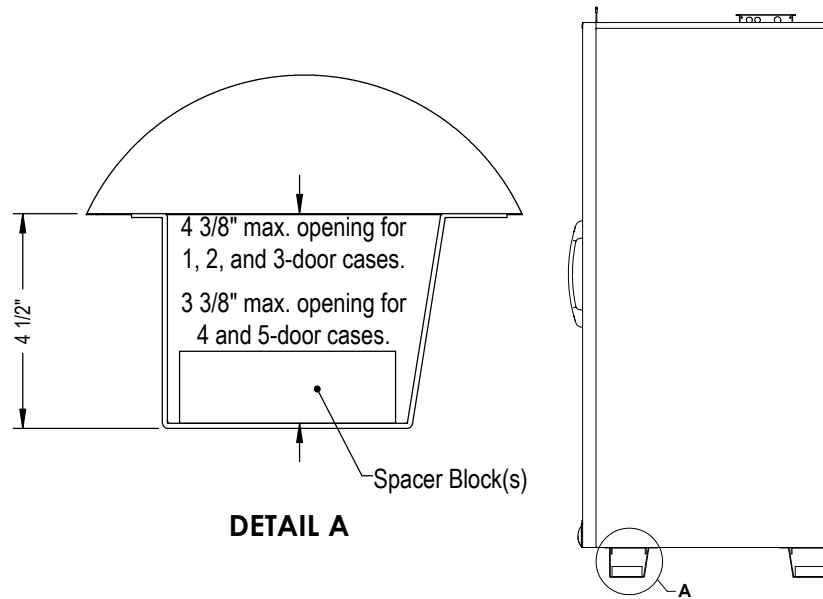
FIGURE 3: Elevation Kit for 1" Base



INSTALLATION & OPERATION

Spacer blocks are factory-installed in the end bases of 4 or 5-door cases that use bases taller than 3 1/2". These blocks limit the case's forward tilt while it is being lifted by a forklift (See Figure 4).

FIGURE 4: Spacer Block



Leveling

Cases should be set level from right to left to allow complete drainage of defrost and condensate water. Since a level floor area is seldom available, the following steps are recommended to ensure a level installation. If your case uses seismic restraints, specific instructions for attaching seismic restraints are included in your document package. Read and understand these instructions before assembling the lineup.

1. Measure off and mark on the floor the exact dimensions of the case lineup (See Figure 5). Refer to the fixture plan or floor plan.
2. Snap a chalk line at the locations for the front and back positions of the bases.
3. Mark locations of all joints, both front and back.
4. Using a laser level or transit, find the highest point along both base position lines. Using the high point as a reference, mark the difference directly on the floor to each base, both front and back (See Figure 6).

FIGURE 5: Measure and Mark Exact Case Outline

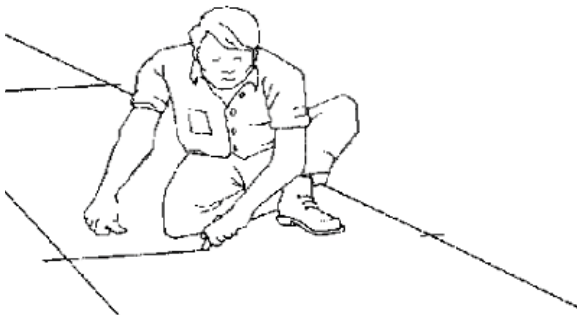
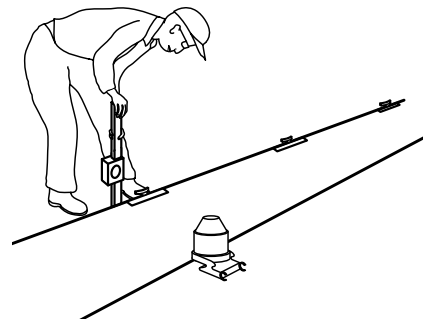


FIGURE 6: Mark Floor Level Difference

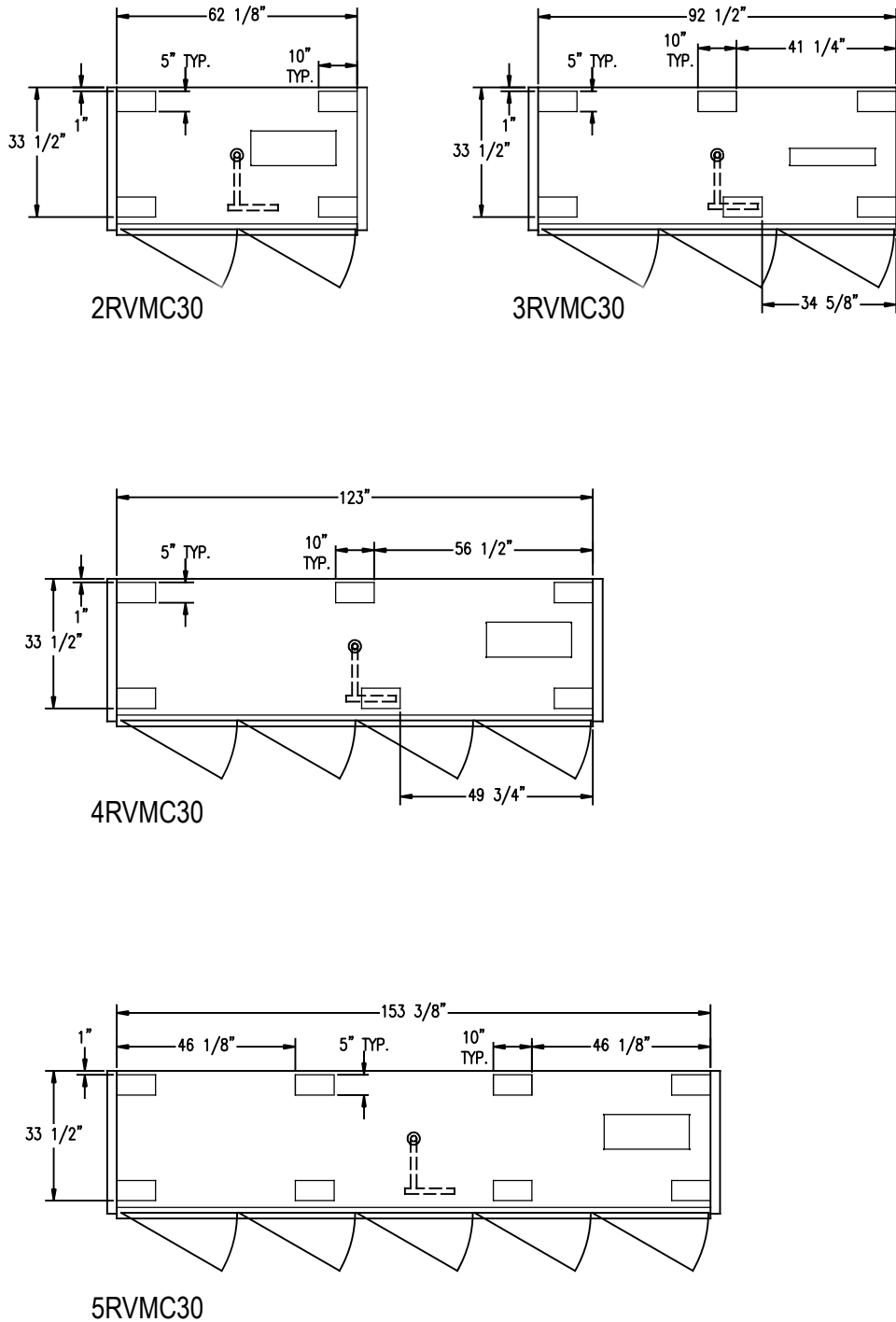


5. If your case uses optional hat channel rails to raise the case height, place shims under the hat channel rails. On 3 and 4-door cases, hat channel rails must be angled slightly to support the front and rear bases because the center bases themselves are not aligned (See Figure 7 through Figure 10 starting on Page 7).

INSTALLATION & OPERATION

FIGURE 7: RMVC30 Base Locations

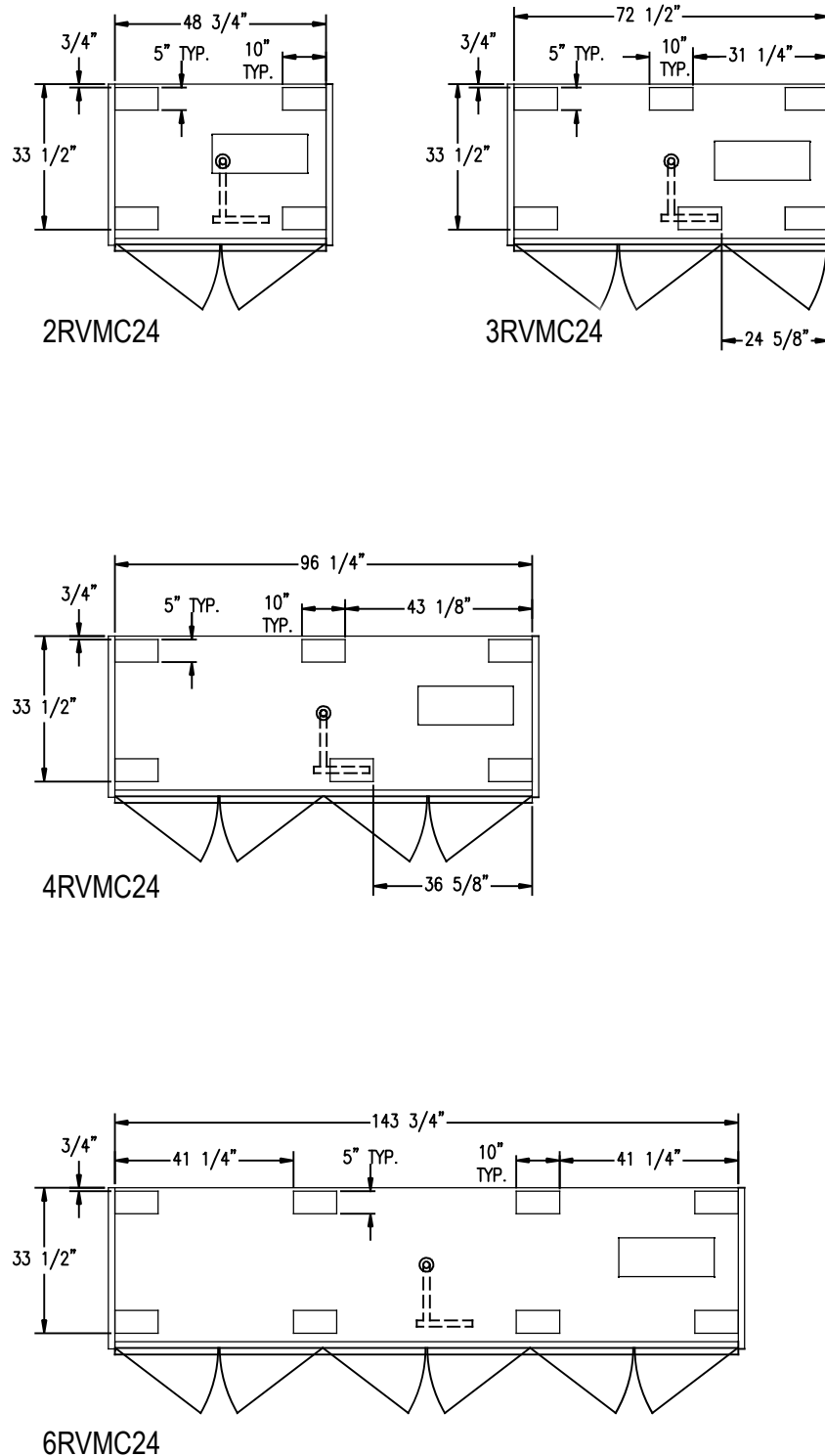
Case length does not include end panels.



INSTALLATION & OPERATION

FIGURE 8: RVMC24 Base Locations

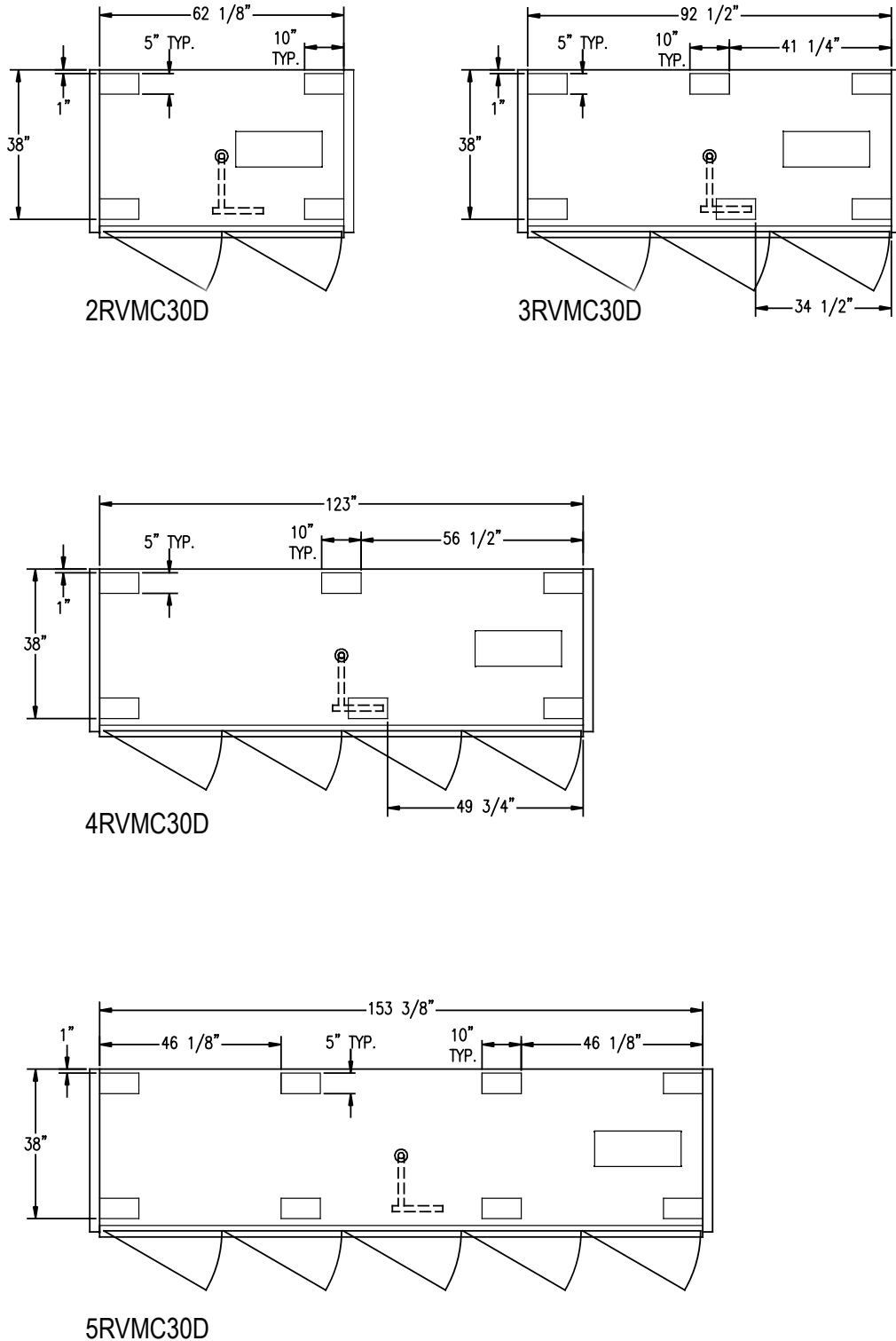
Case length does not include end panels.



INSTALLATION & OPERATION

FIGURE 9: RVMC30D (Deep Case) Base Locations

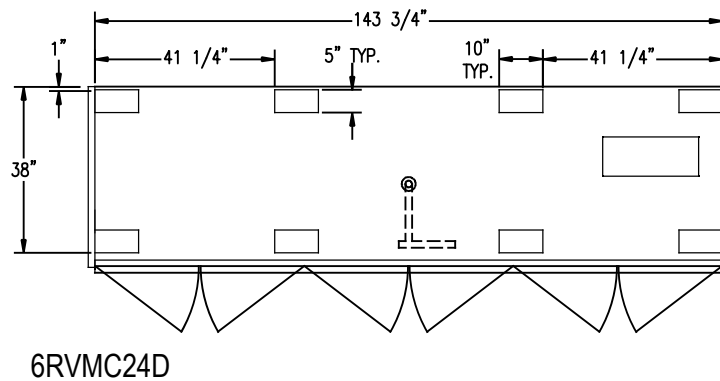
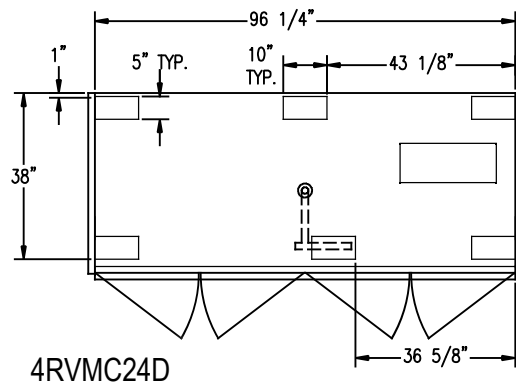
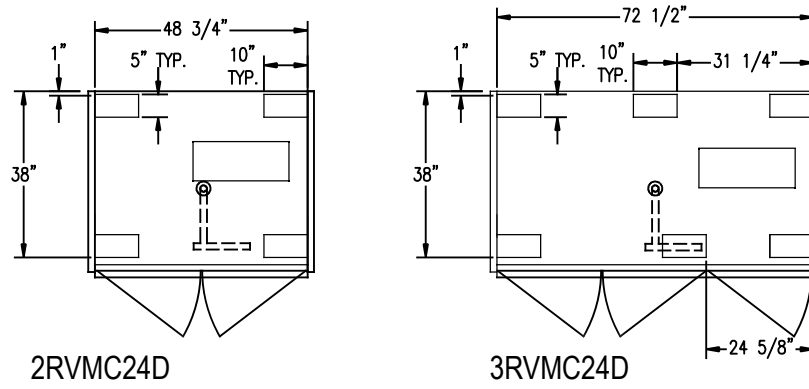
Case length does not include end panels.



INSTALLATION & OPERATION

FIGURE 10: RVMC24D (Deep Case) Base Locations

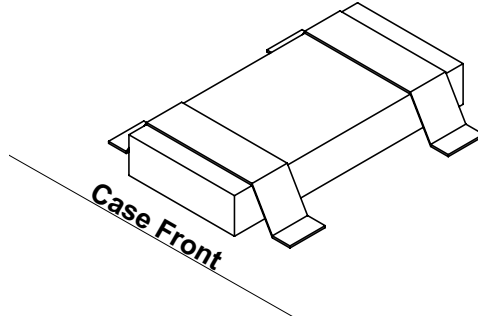
Case length does not include end panels.



INSTALLATION & OPERATION

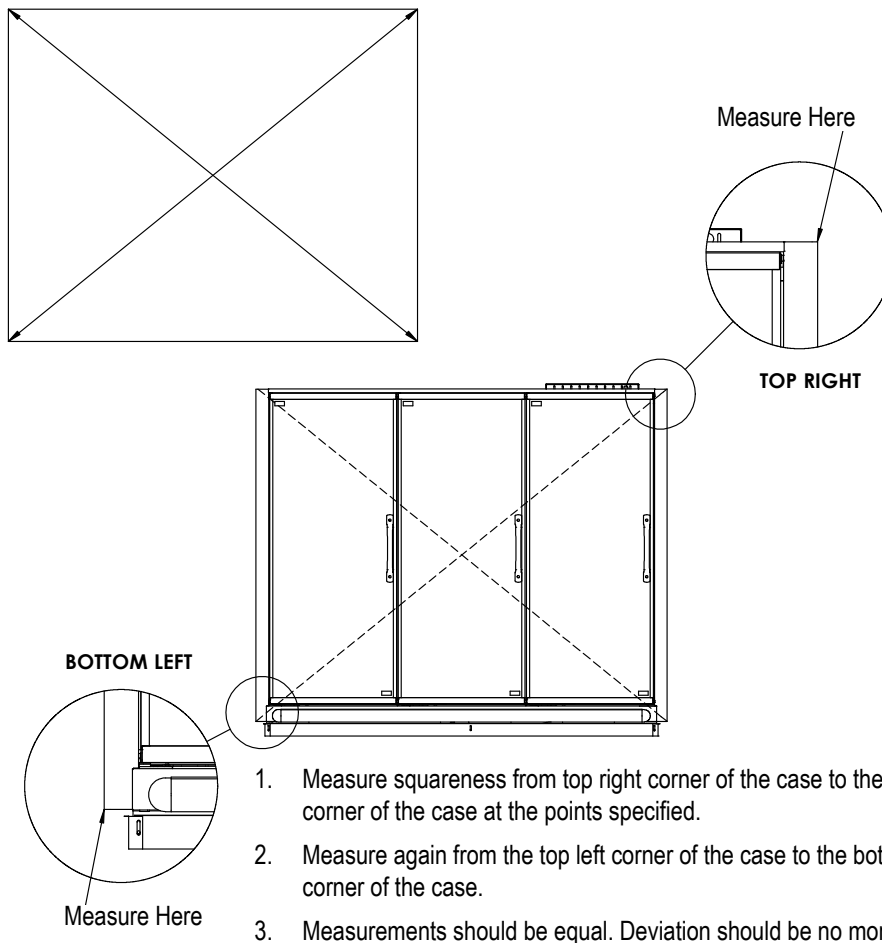
6. Place the required number of shims under each base or optional hat channel rail to equal the highest point. Shims should not extend beyond the front case bases or they will interfere with installing trim. The shims should be oriented to sit under the front and rear bends of each base. Tape all shims in place (See Figure 11).

FIGURE 11: Tape Shims on the Floor Under Each Base or Hat Channel Rail



7. The case is designed with minimal gaps between adjacent doors to provide a clean appearance. To maintain even, consistent gaps and proper door operation, the case must be leveled front-to-back and side-to-side. Ensure that the case is set square to within 1/8" (See Figure 12). After the case is set, use at least a 48" level to ensure the case is level. Add additional shims as needed under specific bases. This will reduce door sag/sawtooth (See "Door Leveling" on page 17).

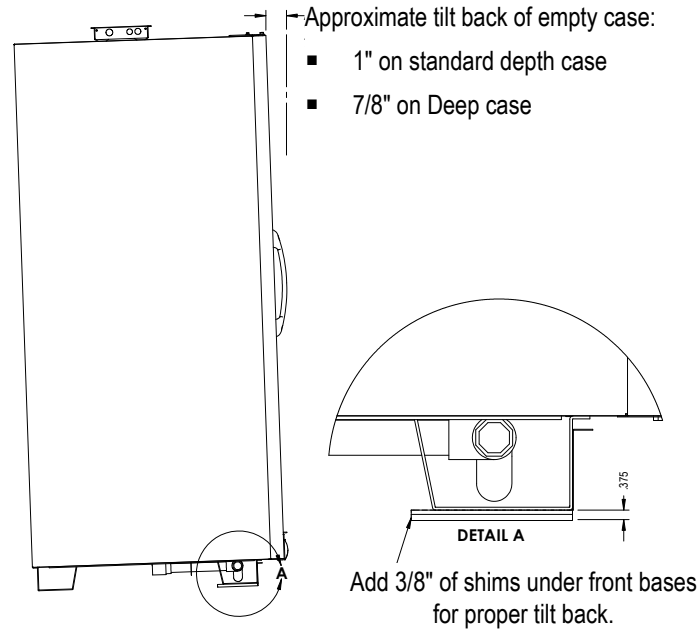
FIGURE 12: Case Squareness



INSTALLATION & OPERATION

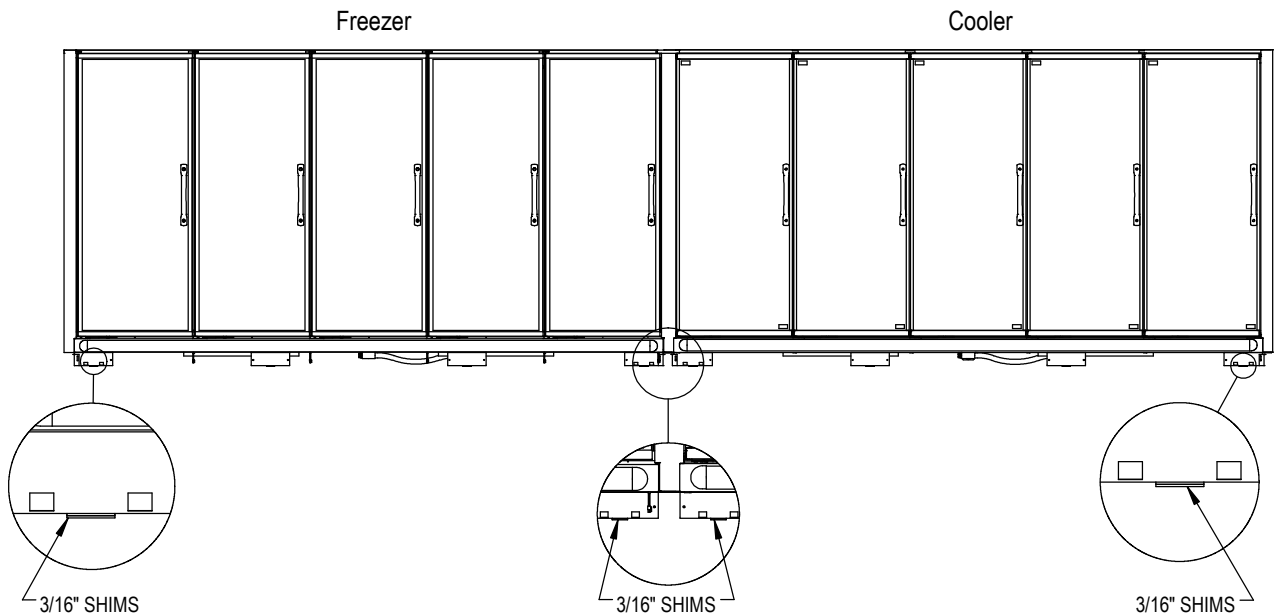
8. Standard depth and Deep cases should be set with a slight backward tilt to offset the forward lean of a fully loaded case. We recommend an additional $\frac{3}{8}$ " of shims be installed under the front bases after the case is leveled (See Figure 13). **Note: Do not add extra shims under Ultra Narrow cases.**

FIGURE 13: Tilt Back



9. When joining a freezer and cooler in a short lineup (2 cases: 1 freezer and 1 cooler), both cases should be tilted back with an additional $\frac{3}{16}$ " of shims under the front bases after the case is leveled (See Figure 14).

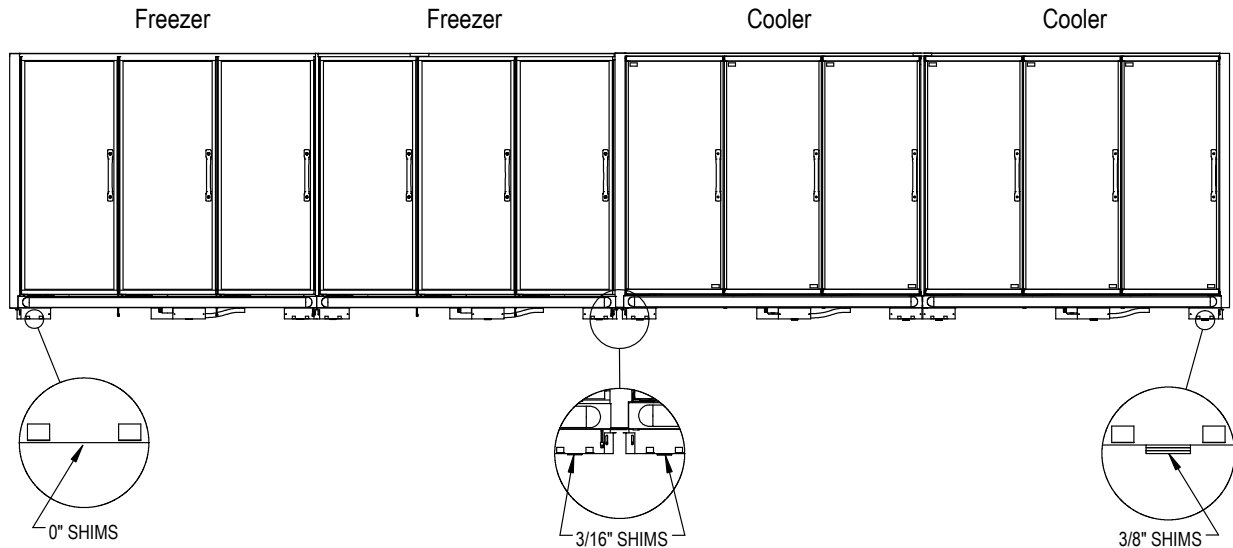
FIGURE 14: Cooler to Freezer Leveling for Short Lineup (2 cases)



INSTALLATION & OPERATION

- When joining a freezer and cooler in a long lineup (3 or more cases: at least 1 freezer and at least 1 cooler), the tilt back on the coolers should gradually increase while working away from the cooler/freezer joint until the last case has an additional 3/8" of shims under the front base and the tilt back on the freezers should gradually decrease to no additional shims while working away from the cooler/freezer joint (See Figure 15).

FIGURE 15: Cooler to Freezer Leveling for Long Lineup (3 or more cases)



- Place additional support shims under any bases or hat channel rails with gaps taller than one shim. **Do not place shims between bases and hat channel rails.**

Lineup Assembly

Zero Zone display cases have been designed for continuous display so that multiple cases may be joined together to create a lineup of any desired length. The bottom of the end panel is protected with a removable steel plate that must be removed after the lineup is set.

The cases will be ready for assembly after removing the packaging material. A 1" wide trim piece is shipped inside the case to seal the vertical gap between cases being joined. It needs to be attached on the right of the first case using the top and bottom joining holes in the extrusion. The next case in the lineup should slide up to the trim piece so that the door seals against the trim piece.

Case caulking instructions are shipped with every case, explaining the proper procedure for joining cases (See Figure 16 on page 14). A case must be prepared with Butyl caulk before setting the next case in the lineup.

Move the next case into position and bolt it to the first case using the 4 joining bolts that are provided. Begin tightening the bolts at the top rear, working down the back of the case and up the front, making sure that the seams are flush. **Do not pull cases together using joining bolts.**

For NSF case installation compliance, the interior case seams must be sealed using NSF-approved caulk (See Figure 17 on page 15). Do not allow Butyl sealant and NSF-approved caulk to contact one another as this may affect adhesion or color of each.

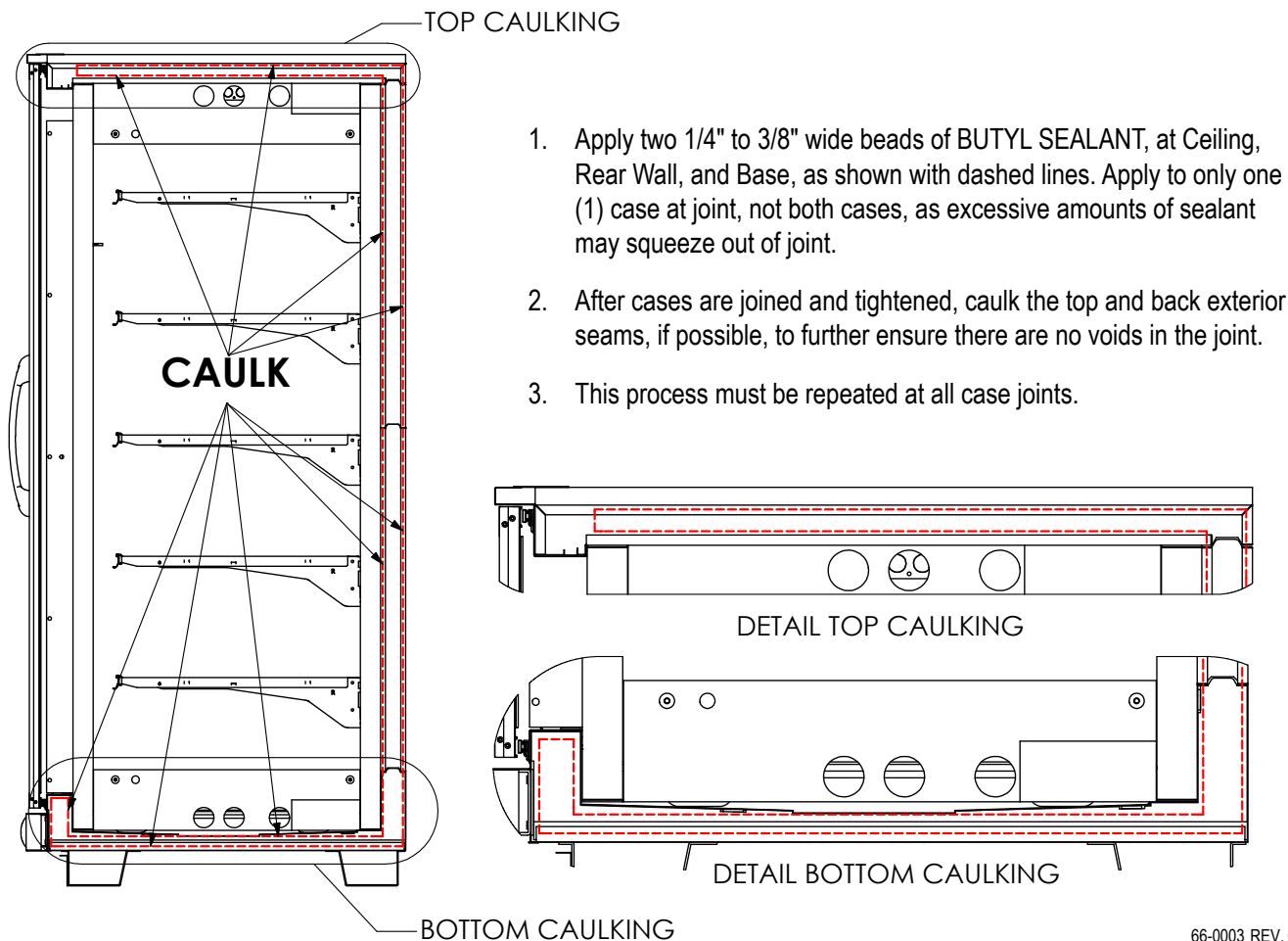
An insulated divider is used to join two different case models or two different temperature cases. The divider is typically factory-installed to one of the cases. There are 2 types of insulated dividers:

- Between a Crystal™ cooler and a different case: The insulated divider has a panel on each side with nut inserts in the panels; each side is bolted to the respective end frames.
- Between 2 Crystal™ coolers: The insulated divider uses a thru-bolt design. The divider is attached to one of the cases using short bolts for shipping. When the cases are installed, the short bolts are removed and longer joining bolts are installed to bolt the cases together. **Do not pull cases together using joining bolts.**

INSTALLATION & OPERATION

FIGURE 16: Case Joint Caulking Instructions

FOLLOWING THIS PROCEDURE IS CRITICAL FOR SEALING JOINED CASES CORRECTLY!



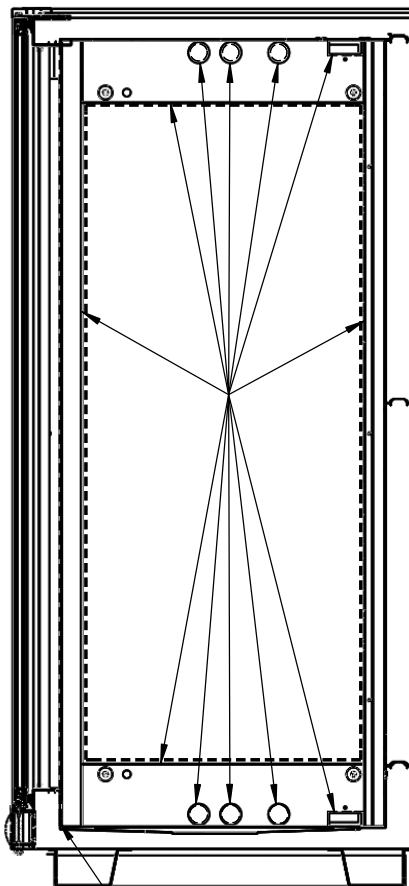
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INSTALLATION & OPERATION

FIGURE 17: NSF Compliance Sealing

SURFACES OF AREAS TO BE CAULKED SHOULD BE CLEAN, DRY, AND FREE OF FROST. SURFACE TEMPERATURE OF THESE AREAS SHOULD BE ABOVE 40°F.

RVMC30 AND 24



FRONT OF END FRAME

1. Cases to be joined properly before continuing to step 2. Refer to CASE – JOINT CAULKING INSTRUCTION for more information. This document is included in your information packet. Avoid excess caulk during this step to prevent it from coming out of the joints. This will affect step 2 as butyl and silicone sealants do not mix.
2. Apply silicone-based caulk-sealant bead to areas shown at left to meet sealant requirements for NSF-approved installations.
3. Apply small beads of sealant smoothly at seams between end frame of case and end panel or insulated divider, but do not thin or feather excessively, because it may affect adhesion.

*Seal between all access holes and cut-outs between end frame of case.

NOTE: Caulk sealant lines are shown dashed in views at left. Field caulk sealant must be applied in a continuous fashion to seal the affected area with the desired bead width and penetration.

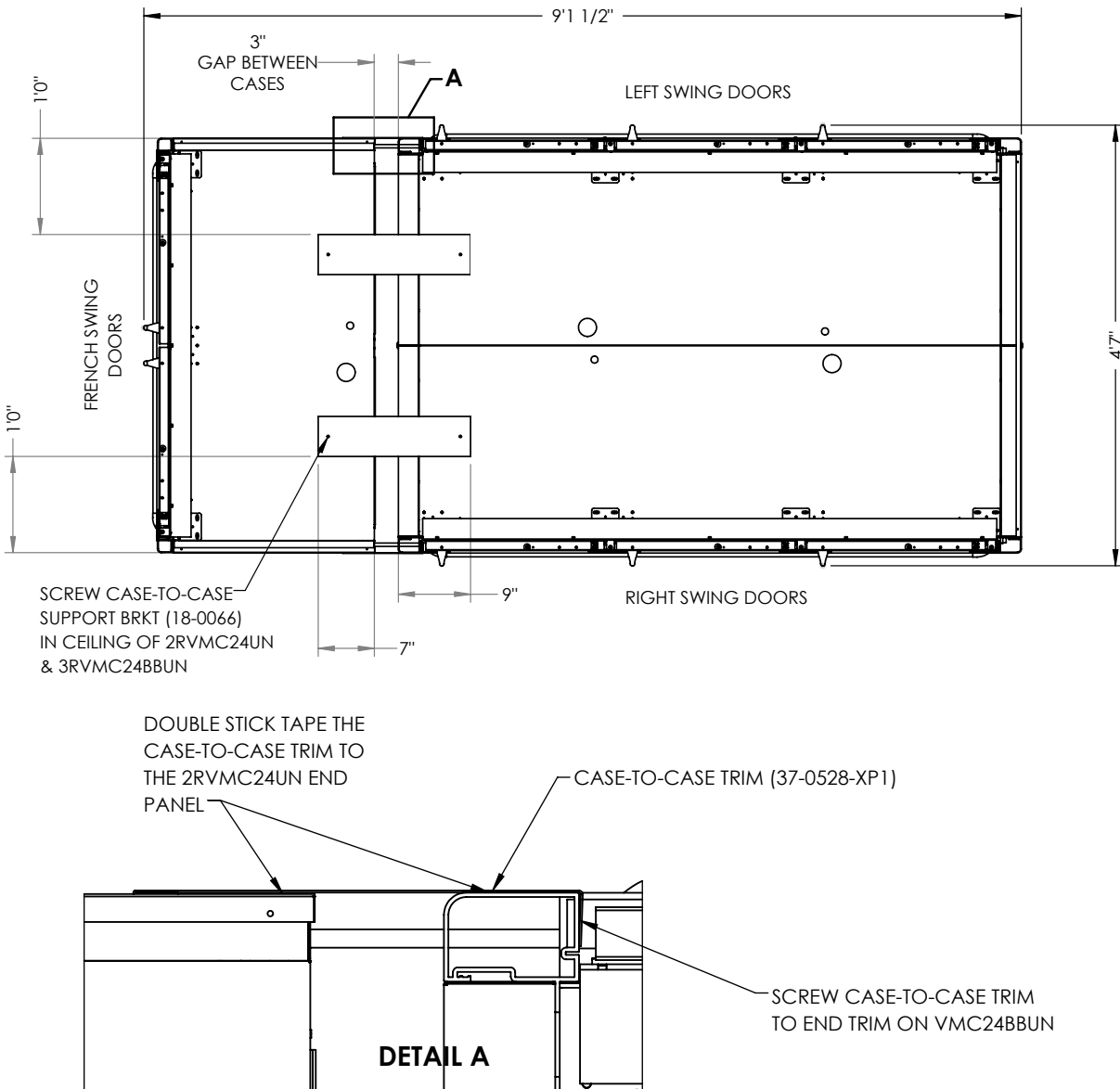
INSTALLATION & OPERATION

Ultra Narrow Case Anchoring

The Crystal™ Cooler Ultra Narrow (RVMC24UN) must be anchored to either another case or a wall to ensure the case will not tip forward. The Back-to-Back Ultra Narrow (RVMC24BBUN) does not require anchoring. It may be used as the anchor for the Ultra Narrow case.

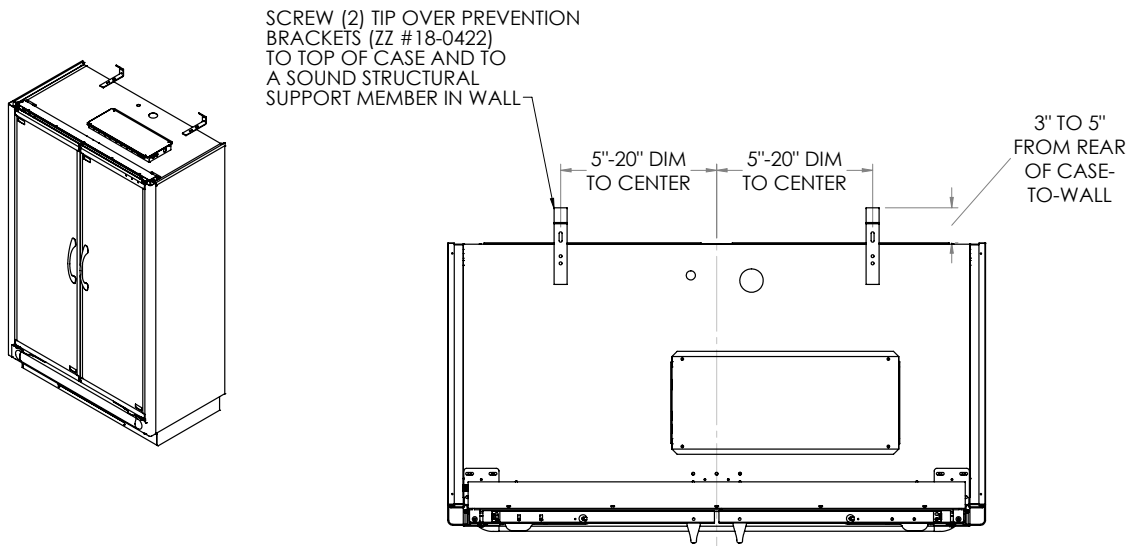
Two case-to-case support brackets will be provided when anchoring the Ultra Narrow to another case. The Ultra Narrow case must be set 3" away from the other case for proper ventilation, so a provided trim piece must be field-installed to cover the gap (See Figure 18). Two case-to-wall support brackets will be provided when anchoring the Ultra Narrow to a wall (See Figure 19 on page 17).

FIGURE 18: Anchoring Ultra Narrow to Another Case



INSTALLATION & OPERATION

FIGURE 19: Anchoring Ultra Narrow to a Wall



Door Leveling

On Crystal™ coolers with same-swing doors, the door-to-door gap should be 3/8". On Crystal™ coolers with French-swing doors, there should be a 7/16" gap between doors at the handle side and a 3/8" at the hinge side. To set the proper gaps, loosen the screws holding the top or bottom door mounting plates, then shift the door.

BOTTOM MOUNTING PLATE

To move the bottom mounting plate, the center locking screw (located behind the bumper) must be loosened.

1. To remove the bumper, use a flathead screwdriver to pry it up from the bottom. Lift the edge, and then slide the screwdriver down the entire length of the bumper to loosen it. Once the bottom edge is disconnected, use a hammer to tap the screwdriver upwards and disengage the bumper from the upper track. Remove the bumper.
2. Loosen the center locking screw by 2 turns, accessed through the hole in the bumper support plate (See Figure 20). This will allow the bottom mounting plate to shift. **Do not remove the center locking screw.**
3. Tap the door's aluminum extrusion with a rubber mallet to shift the door. Once the door is in position, retighten the center locking screw.

TOP MOUNTING PLATE

1. To access the top mounting plate, remove the top trim piece. This will require a Phillips bit and a 1/4" hex screw bit.
2. Loosen all 3 screws that secure the slotted plate by 2 turns (See Figure 21). **Do not remove the screws.**
3. Tap the door's aluminum extrusion with a rubber mallet to shift the door. Once the door is in position, retighten all screws.

FIGURE 20: Center Locking Screw

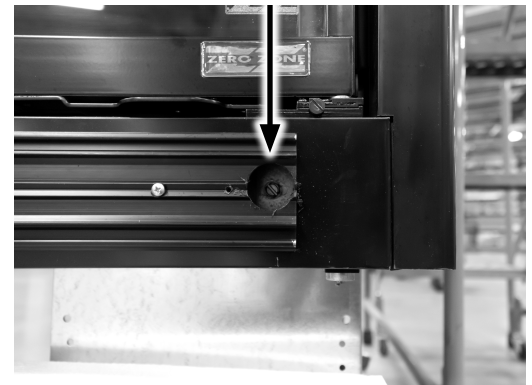
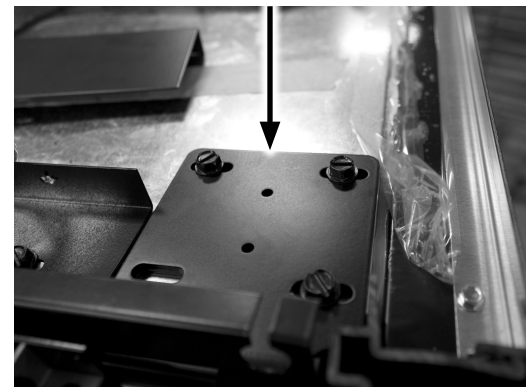


FIGURE 21: Top Mounting Plate



INSTALLATION & OPERATION

Drain

The drain is located at the center of the case in the floor pan. The 1" PVC drain outlet is located at the center front of the case behind the kickplate.

The drain line exits the case in the center. The lateral runs of drain pipe should be installed through the bases (See Figure 22). There is no room in front of the base for the drain pipe because the kickplate installs directly to the front of the bases.

Install the tee to the outlet pipe and a drain trap to the tee. Plug the open end of the tee using the clean-out plug supplied with the drain trap kit. The drain line must be pitched away from the case. The tee, drain trap, and plug are supplied with the case. The drain trap must be level. The drain trap should be primed with water after installation. The drain line must be pitched away from the case enough to ensure proper drainage. Consult your local codes for minimum requirements.

Cases with 1" bases are shipped on wooden skids or pallets. The forward drain section, tee, and "R" trap are shipped loose for field installation.

Condensate Removal System

Zero Zone remote cases can be equipped with a condensate removal system. The system uses a drain pan with pump located behind the kickplate and a condensate evaporation pan mounted on the top of the case.

Condensate water and any liquid spilled in the case will drain into the drain pan. The pump is equipped with a float that turns the pump on when there is a sufficient liquid level. Liquid is pumped through a plastic hose through a check valve and into the condensate evaporation pan. The evaporation pan is equipped with a heater and a float switch to turn on when the heater is submerged in liquid. When the heater is energized, the evaporation pan will be extremely hot and should not be touched. The pump and evaporation pan should be cleaned regularly. Any spilled product, other than water, should be cleaned to prevent odors.

Kickplates

Each case is shipped with a front kickplate. Cases with end panels are shipped with 1 side kickplate per end panel. Cases that join together are shipped with a kickplate splice.

Front and side kickplates are attached to the case bases using Tinnerman clips. Position the front kickplate so the flange is on top and facing outward. The screw (supplied) goes through the kickplate and into the Tinnerman clip (See Figure 23).

There is a natural gap between the top of the kickplate and the underside of the Crystal Merchandiser® that allows airflow of 50 CFM per door. If more airflow is required, contact the factory to order optional louvered kickplates (provides 150 CFM per door).

FIGURE 22: Drain Installation

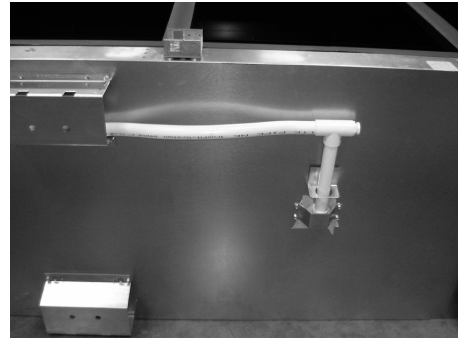
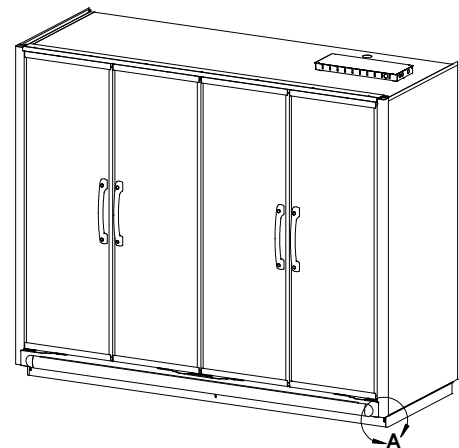
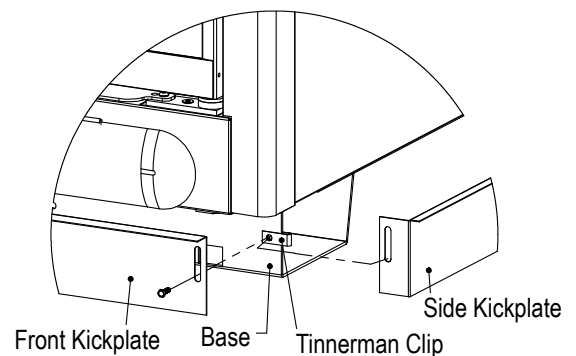


FIGURE 23: Kickplate Installation



1. Install Tinnerman clip at each base.
2. Position side kickplate.
3. Position front kickplate with top flange facing outward.
4. Insert fasteners to secure the front and side kickplates to the Tinnerman clips.



DETAIL A (EXPLODED)

INSTALLATION & OPERATION

Bumper

Cases are supplied with a 3" protective bumper shipped loose on top of each case. Each case has its own bumper assembly, including end caps. The steel bumper support and snap track are factory-installed on the front of the case. The bumper may need trimming before snapping it onto the snap track. **Door leveling must be completed before attaching the bumper (See "Door Leveling" on page 17).**

Top Trim

Top trim is factory-installed, and it hides the door hardware located on the top exterior of the case. Joint splices are shipped loose and must be field-installed at the upper case joints.

Electrical & Light Switch

Cases may have 2 or 3 electrical circuits. Standard cases have 2 electrical circuits: the fan circuit and the lighting circuit. Cases may be purchased with heated doors, which add an additional electric circuit.

The electrical box is mounted on the exterior top right of the case. The box includes the power connection and power supplies for the LED light sticks. The light switch is located on the interior ceiling to the right of the coil cover (See Figure 24).

Black and white wires and wire nuts are supplied, and the wire nut must be connected inside the electrical box. A ground connection should also be connected inside the electrical box. Always refer to the wiring diagram shipped with the case (See Figure 25).

FIGURE 24: Light Switch

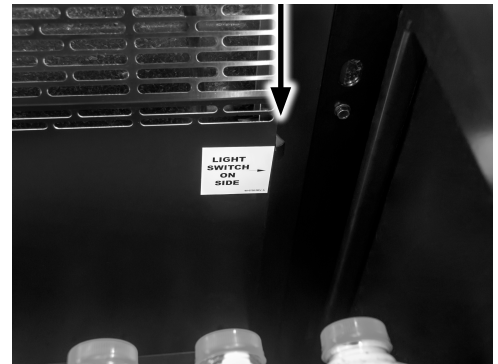
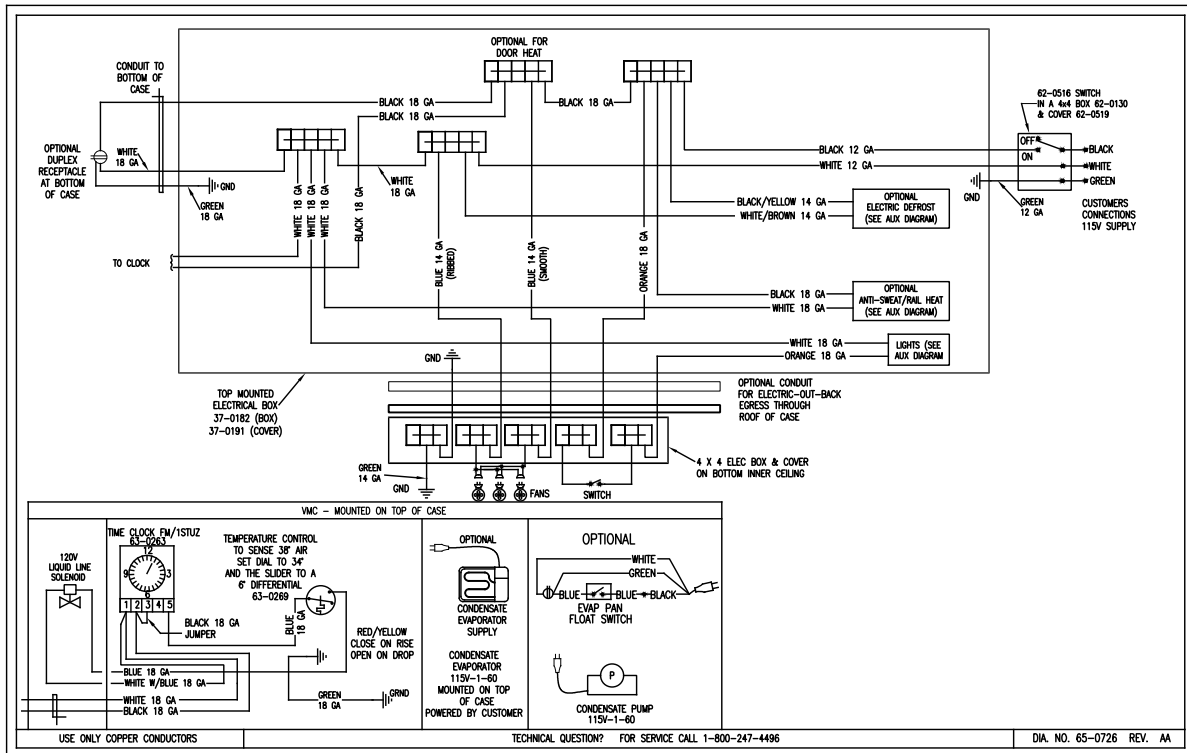


FIGURE 25: Sample Wiring Diagram



INSTALLATION & OPERATION

CoolView® Doors

COOLARC™ DOOR HANDLES

The CoolArc™ door handle is attached to the glass surface of the door by an industrial-grade adhesive.

TORQUE ADJUSTER

The torque adjuster is a spring cartridge that provides tension to automatically close the door. The torque adjuster is located on the bottom of the hinge-side of the door. A square pin inside the torque adjuster fits into a square opening on the door, transferring the spring tension to the door. This means that the square pin must be aligned with the square opening when installing a door.

An adjustment screw on the front can be used to increase tension (turn the screw counter-clockwise) or decrease tension (turn the screw clockwise) so the door closes gently and does not swing open. The screws holding the torque adjuster are secured with removable threadlocker gel; extra force will be required to remove them.

HOLD-OPEN BRACKET

CoolView® doors are self-closing, and closing tension increases as the door opens wider. The hold-open bracket keeps the door open when engaged, which is useful for stocking shelves or case maintenance. To engage the hold-open bracket, open the door to at least 90° until it clicks. Closing the door to about 80° will release tension on the door, and it will self close again.

DOOR GASKET

Upper and lower horizontal magnetized gaskets run the length of each case. The gaskets mate up to steel plates installed at the top and bottom of each door, creating a water-tight seal.

A vertical gasket runs along the hinge-side of each door. The gasket seals against the handle-side of each adjacent door. At the end of each case, another gasket is placed on the handle-side of the door and is used to seal against the side of the case (instead of an adjacent door). French door cases include a sweeper gasket on the handle-side of each door.

REMOVING A DOOR

Note: *The top trim piece must be removed to access the door shoulder bolt. This will require a Phillips bit and a 1/4" hex screw bit.*

1. Remove hold-open, located on the bottom of Crystal™ coolers.
2. Turn door tension screw clockwise until door does not close on its own. This removes tension between the door and torque adjuster.
3. Remove door shoulder bolt and bushing on the top of the hinge-side of the door (**See Figure 26**). Only remove the bolt holding the door; do not remove the bolts attached to the case.
4. Pull the top corner of the door away from the case. **Note:** *The door is heavy. Be prepared to hold the weight of the door.*
5. Lift the door up and clear of the torque adjuster and set down carefully. **Note:** *For safety, do not lift the door by the handle.*

FIGURE 26: Door Shoulder Bolt



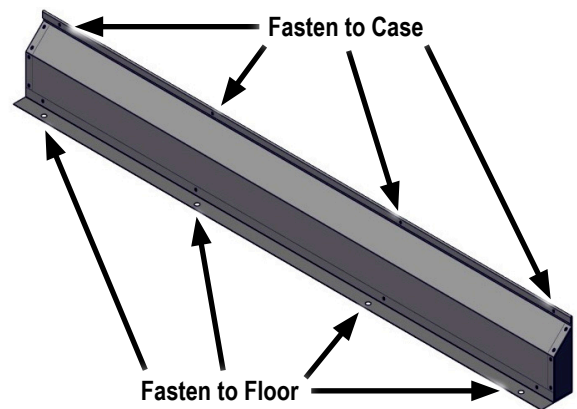
INSTALLATION & OPERATION

Rear Load Cases

Rear Load cases are shipped with the rear sliding doors removed and shipped loose with the case. To maintain proper temperature, the Rear Load case must be positioned in the opening of a walk-in cooler. Before attaching the cases to the walk-in, measure the diagonal opening of the Rear Load case to ensure a square case installation. If the diagonal measurements are not within 1/8", the case must be re-leveled. After the cases are set, install the doors into the opening by inserting the top of the door into the upper track and then sliding the bottom of the door into the lower track.

Rear Load cases may be ordered with an optional insulated close-off for applications where a walk-in cooler does not have a curb along the floor (See Figure 27). After the case is set, the close-off must be installed to the bottom rear of the display case. It protects the display case from potential damage if a pallet of food or beverages is smashed into the back of the display case. It also prevents warm air from entering the walk-in cooler and prevents water from flowing underneath the display case.

FIGURE 27: Rear Load Insulated Close-Off



Mechanical Components

Air is circulated through the display case by fans. The fans are located above the false ceiling panel, and they can be accessed by removing the screws holding the false ceiling panel. Air enters from the top front air grille, and air is discharged down the rear ducts (See Figure 28).

Typically, the expansion valve is located behind the false ceiling panel in the right-most door of each case. After removing the false ceiling panel, you will see a rectangular cover panel. Remove the cover panel to access the expansion valve and suction line Schrader valve (See Figure 28). Alternatively, the expansion valve may be located behind the optional right back duct per customer request. An access cover is provided in the duct (See Figure 29).

Glycol cases typically have a balance valve located in the outlet line on the top of the case. If a stop solenoid is provided, it will also be located in the outlet line on top of the case. Schrader taps are provided inside the case on the right-hand side of the coil for venting and draining the system. An additional tap is provided on top of the case to allow for venting when the system is drained.

FIGURE 28: Fan and Expansion Valve

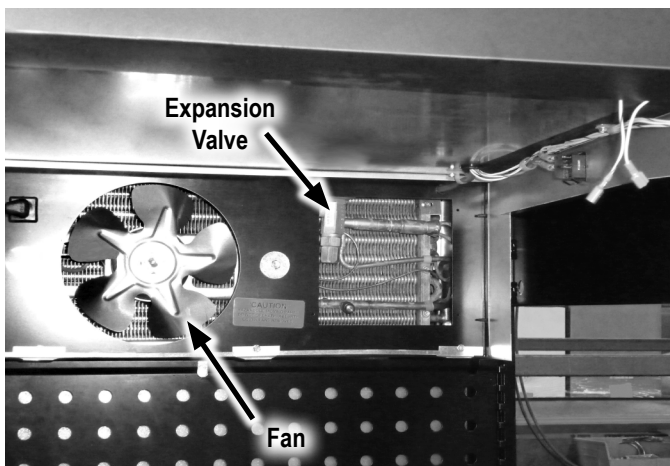
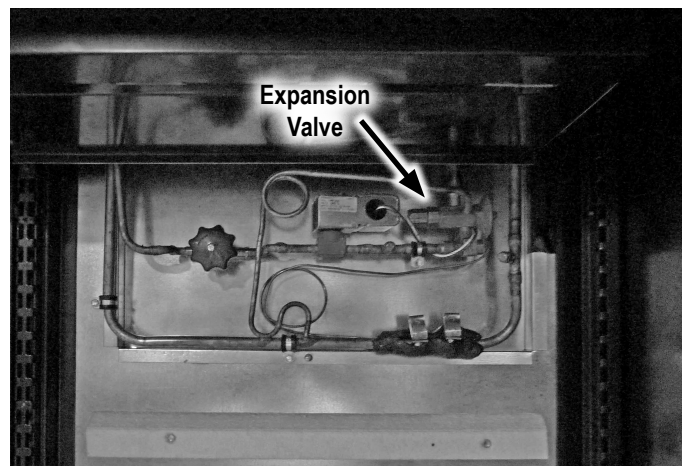


FIGURE 29: Alternate Expansion Valve Location



INSTALLATION & OPERATION

Operation

Refer to the case spec sheet for btuh requirements and electrical requirements. Operate the case at the following settings to maintain product temperature of 41°F or below, per food safety regulations. Refer to the line sizing table ([See Figure 30 on page 23](#)).

CASE OPERATION - TEMPERATURE INTERNAL CONTROL OPTIONS

RACK SYSTEM	CONDENSING UNIT (R-404A MEDIUM TEMP)	RETURN AIR TEMPERATURE	DISCHARGE AIR TEMPERATURE
Evaporator Temp: +28°F	Condensing Unit Cut-In: 74 psig	Return Air Cut-In: +37°F	Discharge Air Cut-In: +34°F
	Condensing Unit Cut-Out: 62 psig	Return Air Cut-Out: +33°F	Discharge Air Cut-In: +30°F

NOTE: Superheat Setting +8°F. Contact Zero Zone if using high-glide refrigerant.

CASE OPERATION - DEFROST SETTINGS

DEFROST SETTINGS		
Off-Cycle	3 Per Day	45 Minute Duration
Electric	2 Per Day	30 Minute Duration

Case Thermometers

The cases are shipped with 2 thermometers. One thermometer is factory-mounted to sense the discharge air stream (rear duct). A second NSF thermometer is shipped loose and should be installed in the warmest product location as required by NSF. Specific field installation instructions are packaged with the NSF thermometer.

Cleaning

Although each Zero Zone display case is thoroughly cleaned before shipping, the cases should be thoroughly cleaned again before start-up and routinely thereafter to maintain a clean appearance. With just a few minutes of cleaning each week, the case will remain in top condition.

1. Do not use high-pressure water or steam to clean the interior or any components.
2. Do not wash fan motors. A damp cloth can be used to wipe the fan motors. Cover the fan motors with a plastic bag when washing the case.
3. Wipe out the case interior using mild detergent and warm water (never an abrasive cleaner).
4. Clean all glass doors, windowed ends, and mirrors using glass cleaner. Cleaning interior glass reduces fogging and increases visibility. Do not use any cleaning products containing silicon for anti-fog.
5. The drain pan can be flushed after removing bottom wire racks. The coil can be cleaned after removing the false ceilings, fans, and fan plenums.
6. If the case is equipped with a condensate pan and pump, the drain should be blocked before washing coils. Water can be removed with a shop vacuum.
7. Coils may be cleaned with a garden hose or pails of water. If the case is equipped with a condensate pan and pump, cases should be cleaned with a minimal amount of water so the evaporator, pump, and drain pans do not get overfilled.
8. The case drain should frequently be cleaned of debris and price tags to prevent clogging. If water is rising, check if the drain is clogged.

INSTALLATION & OPERATION

FIGURE 30: Line Sizing Table (R-404A)

R-404 Line Sizing Tables for Zero Zone RVMC Cooler (+28°F Evaporator Temperature)

Liquid Line Sizing

Up to 50 equivalent feet

90°F Liquid, 2°F Pressure Drop^Δ

For rated Btuh:		
From	To	Liquid Line
0	2,750	3/16"
2,760	8,050	1/4"
8,060	16,600	5/16"
16,610	30,100	3/8
30,110	71,200	1/2

Up to 100 equivalent feet

90°F Liquid, 2°F Pressure Drop^Δ

For rated Btuh:		
From	To	Liquid Line
0	1,870	3/16"
1,880	5,480	1/4"
5,490	11,300	5/16"
11,310	20,600	3/8
20,610	48,800	1/2
48,810	91,700	5/8

Up to 150 equivalent feet

90°F Liquid, 2°F Pressure Drop^Δ

For rated Btuh:		
From	To	Liquid Line
0	1,480	3/16"
1,490	4,360	1/4"
4,370	8,990	5/16"
9,000	16,500	3/8
16,510	39,100	1/2
39,110	73,500	5/8

Up to 200 equivalent feet

90°F Liquid, 2°F Pressure Drop^Δ

For rated Btuh:		
From	To	Liquid Line
0	1,260	3/16"
1,270	3,710	1/4"
3,720	7,660	5/16"
7,670	14,000	3/8
14,010	33,400	1/2
33,410	62,800	5/8

^Δ For 1°F pressure drop, multiply rated Btuh by 1.45 before using the Liquid Line Sizing Table.

[†] Larger liquid line size may be used (such as 3/8), if preferred.

Liquid Correction Factors for Liquid Line Sizing Table - Use Maximum Liquid Temperature

For maximum liquid temperatures other than 90°F, multiply rated Btuh by liquid correction factor before using the Liquid Line Sizing Table

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.98	0.97	0.96	0.97	0.98	1.00	1.04	1.09	1.17

Suction Horizontal Line Sizing

Up to 50 equivalent feet

90°F Liquid, 2°F Pressure Drop[‡]

For rated Btuh:		
From	To	Horizontal
0	1,970	5/16"
1,980	3,580	3/8
3,590	8,460	1/2
8,470	15,900	5/8
15,910	26,300	7/8 [†]
26,310	41,600	7/8
41,610	84,000	1-1/8

Up to 100 equivalent feet

90°F Liquid, 2°F Pressure Drop[‡]

For rated Btuh:		
From	To	Horizontal
0	1,350	5/16"
1,360	2,450	3/8
2,460	5,810	1/2
5,820	10,900	5/8
10,910	18,100	7/8 [†]
18,110	28,700	7/8
28,710	58,000	1-1/8

Up to 150 equivalent feet

90°F Liquid, 2°F Pressure Drop[‡]

For rated Btuh:		
From	To	Horizontal
0	1,080	5/16"
1,090	1,960	3/8
1,970	4,650	1/2
4,660	8,740	5/8
8,750	14,600	7/8 [†]
14,610	23,100	7/8
23,110	46,700	1-1/8
46,710	81,300	1-3/8

Up to 200 equivalent feet

90°F Liquid, 2°F Pressure Drop[‡]

For rated Btuh:		
From	To	Horizontal
0	920	5/16"
930	1,670	3/8
1,680	3,970	1/2
3,980	7,470	5/8
7,480	12,500	7/8 [†]
12,510	19,700	7/8
19,710	40,000	1-1/8
40,010	69,600	1-3/8

[‡] For 1°F pressure drop, multiply rated Btuh by 1.44 before using the Suction Horizontal Line Sizing Table.

^{**} Larger suction horizontal line size may be used, if preferred.

[†] 3/4 horizontal suction line may be used to reduce cost.

Liquid Correction Factors for Suction Horizontal Line Sizing Table - Use Maximum Liquid Temperature

For maximum liquid temperatures other than 90°F, multiply rated Btuh by liquid correction factor before using the Suction Horizontal Line Sizing Table

Maximum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
Liquid Correction Factor:	0.74	0.78	0.82	0.87	0.93	1.00	1.08	1.19	1.32

Suction Vertical Riser Sizing

Maximum Allowable Riser Size For Adequate Oil Return*

70°F Minimum Liquid Temperature, using 0.35 PSI Per 100 Feet (per 2006 ASHRAE Handbook - Refrigeration)

For rated Btuh:		
From	To	Vertical
480	880	5/16
890	2,090	3/8
2,100	3,950	1/2
3,960	6,590	5/8
6,600	10,500	5/8 [†]
10,510	21,300	7/8
21,310	37,300	1-1/8
37,310	59,100	1-3/8

It may be necessary to make adjustments to compensate for special situations which cause the actual Btuh to differ from the rated Btuh of the cases.

All liquid line and suction line sizes are inches, refrigeration O.D.
Subject to change without notice.

* If horizontal line size is smaller than specified vertical riser size, the smaller size may be used for both.

[†] 3/4 suction riser may be used to reduce pressure drop.

Liquid Correction Factors for Suction Vertical Riser Sizing Table - Use Minimum Liquid Temperature

Multiply rated Btuh by liquid correction factor before using the Suction Vertical Riser Sizing Table

Minimum Liquid Temperature:	40°F	50°F	60°F	70°F	80°F	90°F	100°F
Liquid Correction Factor:	0.85	0.89	0.94	1.00	1.07	1.15	1.24

CCR, 5/20/09
ECN# 8261

SP-0612-12, Rev A

INSTALLATION & OPERATION

UNDER CASE FLOOR CLEANING (NSF)

The floor under your Zero Zone display case can be cleaned by following these steps:

1. Remove the fasteners attaching the kickplate to the case. The fasteners are accessed from the front of the unit.
2. With the kickplates removed, remove debris from the floor.
3. Vacuum under the case to remove any dirt, debris, and dust build-up.
4. Mop under the unit using non-abrasive floor cleaner and warm water.
5. When finished mopping, squeegee any remaining water under the unit to the floor drains to speed up the drying process. Replace the kickplates when the floor has dried.

Shelves & Stocking Product

Shelf location may be adjusted in 1" vertical increments in any position for best display advantage. Make sure the shelf brackets are securely seated before placing any product on the shelf. The standard shelves may be tilted down at a 10° angle. Optional shelf assemblies are available that may be tilted at 5°, 10°, or 15° angle.

The case may be stocked with product after it has operated at least 24 hours with correct case temperature and proper control operation. When stocking the shelves, leave a gap between the product and the shelf above, which allows an air curtain on top of the product. Product should not extend beyond the front of the shelves or bottom wire rack.

SHELF TYPE	DEPTH	BRACKET TYPE	LOAD CAPACITY (LBS.)
Solid Shelf, Standard Duty	22"	2-Position (0°/10°)	250/150
		4-Position (0°/5°/10°/15°)	250/250/150/100
	24"	2-Position (0°/10°)	250/150
		4-Position (0°/5°/10°/15°)	250/250/150/100
Solid Shelf, Heavy Duty	22"	2-Position (0°/10°)	350/275
	24"	2-Position (0°/10°)	350/275
Wire Shelf	22"	2-Position (0°/10°)	250/150



For other technical support, please refer to
the Technical Resources page at:

WWW.ZERO-ZONE.COM

or contact the Zero Zone Service Department at:

800-247-4496

All specifications subject to change without notice.

