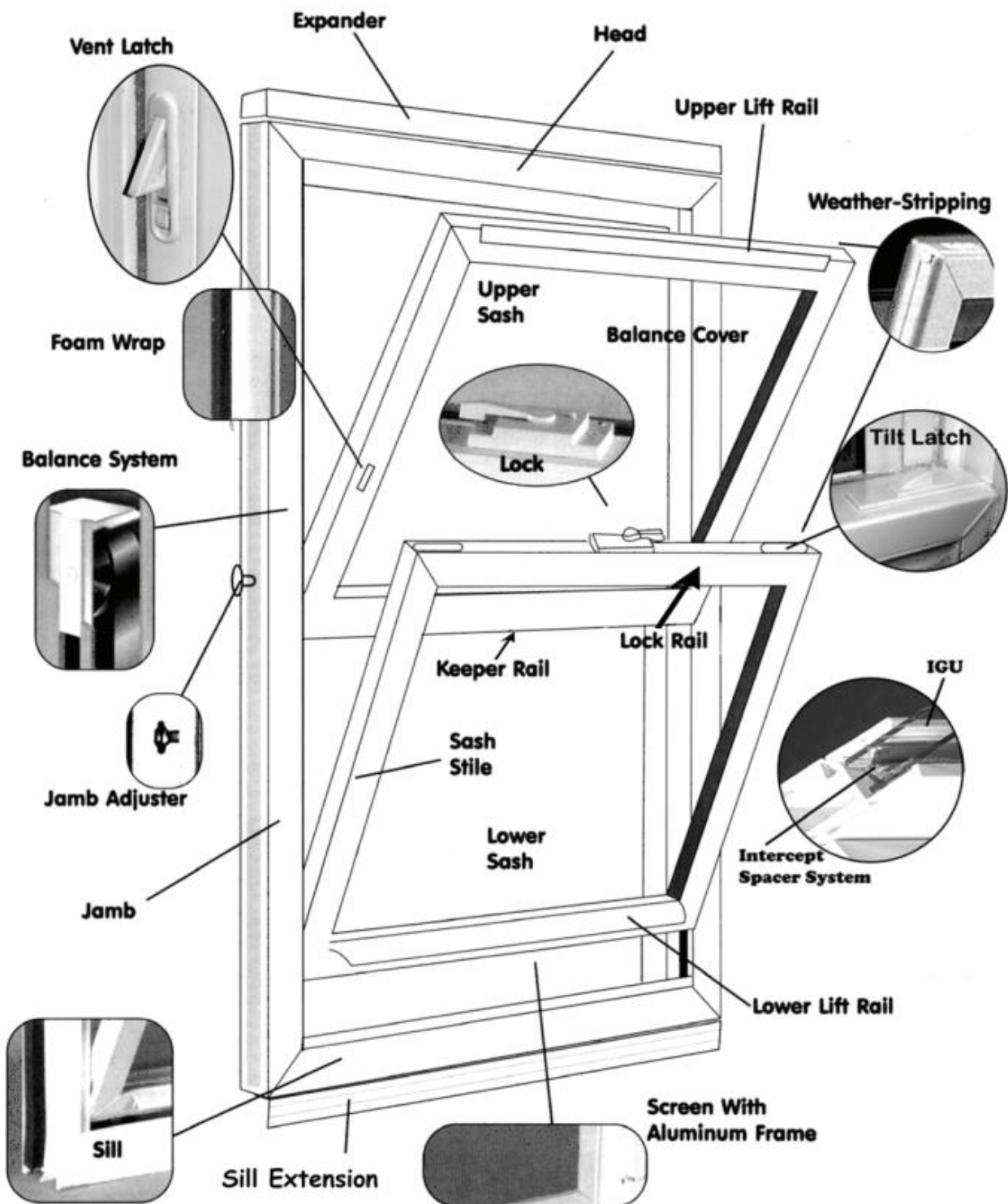




Operation & Maintenance of Vinyl Windows



INDUSTRY NOMENCLATURE



WINDOW TYPES

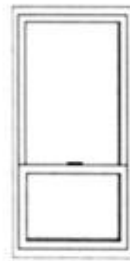
Window diagrams below are outside-looking in, unless indicated otherwise



Single Hung



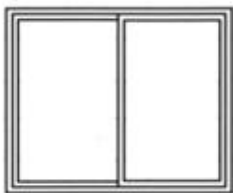
Double Hung



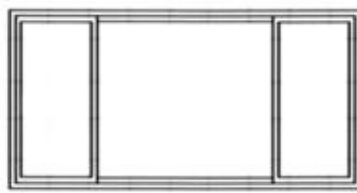
Oriel



Cottage



2 Panel Slider



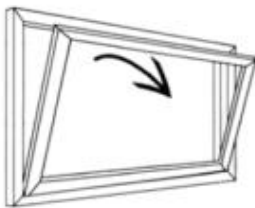
3 Panel Slider



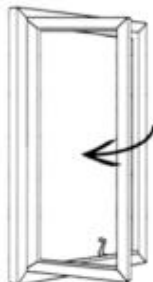
Picture Window



Deadlites
Sash Only

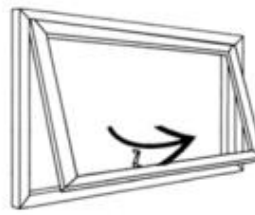


Hopper

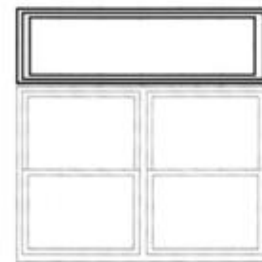


Casement

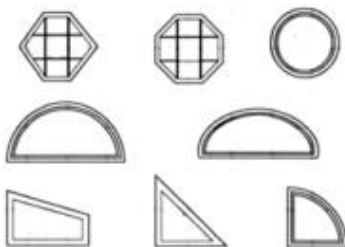
(outside view)



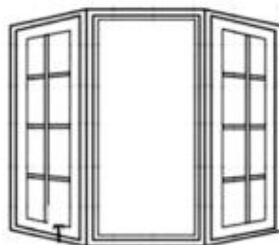
Awning



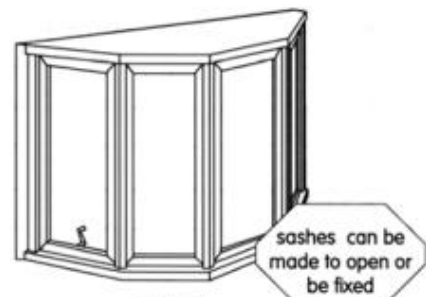
Transoms



Architectural Shapes



Bay



Bow

sashes can be
made to open or
be fixed

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INTRODUCTION

Congratulations, and thank you for your selection of a Crystal Windows & Door Systems Ltd. Product. All our products have been engineered and manufactured to the highest standards. Our products are backed by a limited warranty but have been rigorously tested by certified third-party laboratories to ensure that they perform as designed for many years after.

To keep your vinyl windows and doors operating in the best condition possible, we recommend periodic maintenance and proper care.

In this manual, you will find:

- The normal operation of your window and door components
- How to clean your windows, doors, and screens
- Troubleshooting any problems that may arise

NORMAL OPERATION OF WINDOWS AND DOORS

This section goes over the following topics:

- A description of each window or door type.
- How to open and close your window or door product.
- How to lock and unlock your window or door product.
- How to tilt or remove window sashes for cleaning and maintenance.
- How to adjust hardware to ensure your window or door product opens and closes properly.

Vertical Hung Windows

i. Normal Opening and Closing Operation

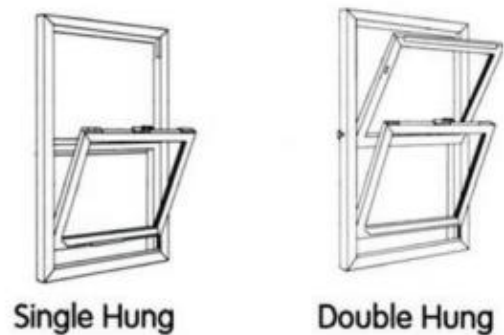
Vertical Hung windows feature operating sashes sliding in a vertical direction along the jambs. Double Hung windows have an operable upper and lower sash.

To open and close the lower sash:

- Ensure that the window is unlocked before opening or closing.
- Lift the sash upwards using the lower lift rail to open.
- Slide the sash downwards to close.

To open and close the upper sash:

- Slide the sash downwards using the upper lift rail.
- Lift the sash upwards to close



ii. **Sash Lock Operation**

Sash locks prevent the window from opening when both sashes are closed. Each lock consists of a sash lock cam on the lower sash and a sash lock keeper on the upper sash. Windows can have one or multiple locks depending on the sash width.

To unlock the sash locks:

- Flip all sash lock cams to the right. The window is now unlocked.

To lock the sash locks:

- Close all sashes to align the sash lock cams and keepers.
- Flip all sash lock cams to the left to engage with the keepers. The window is now locked.



Locked



Unlocked

iii. Tilt Operation

The operable sashes of vertically hung windows can be tilted inwards to provide access to clean the exterior glass surface.

Each operable sash connects to the frame through tilt latches at the top rail and pivot bars at the lower rail. Tilt latches engage with the jambs on both sides. Pivot bars engage with pivot lock shoes, which are connected to balances inside both jambs.

To tilt the lower sash:

- Lift the sash a few inches above the sill.
- Unlatch the tilt latches by pushing both latches towards the center.
- Tilt the sash inwards while keeping the pivot lock shoes at the same height. Tilting the sash unevenly left or right can damage the tilt mechanisms.

To tilt the upper sash:

- Make sure the lower sash is tilted first and remains tilted.
- Lower the upper sash a few inches below the head.
- Unlatch the tilt latches by pushing both latches towards the center.
- Tilt the sash inwards like the lower sash



Tilt Latch on the Upper Sash

To put back the sash, tilt it upwards until both tilt latches snap back into the jambs. You should hear an audible click on both sides. The upper sash must be tilted back before the lower sash.

iv. Removal and Reinstallation of Sashes

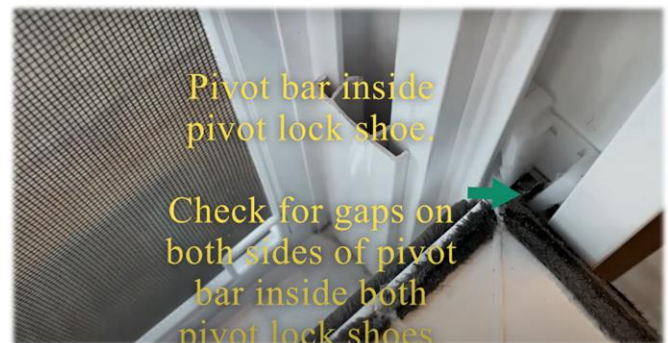
NOTE: The lower sash must be removed before the upper sash. After removal, the upper sash must be reinstalled before the lower sash.

To remove a sash:

- Unlatch the tilt latches on the upper rail and tilt the sash slightly.
 - o For the lower sash, raise it up a few inches above the sill.
 - o For the upper sash, lower the sash a few inches below the head.
- Tilt it down until horizontal, keeping both pivot shoes at the same level.
- Lift one pivot bar out of its pivot shoe and then lift the other end out.

To reinstall a sash:

- Grasp the removed sash by its sides. Reinstall the last side that was removed first.
- Angle the sash to slide the pivot bar into its pivot shoe. The sash should be in the same tilted position it was removed in.
- Align the other pivot bar with its pivot lock shoe and bring it down.
- Tilt the sash back into the frame, making sure both tilt latches snap back into the jambs.



Horizontal Sliding Windows

i. Normal Opening and Closing Operation

Horizontal sliding windows are available in 2-lite or 3-lite configurations with different combinations of operable and fixed sashes.

To open an operable sash:

- Unlock the sash lock and pull sideways using the sash pull.

To close an operable sash:

- Slide the sash back towards the jamb or adjacent sash to close.

ii. Sash Lock Operation

Sash locks prevent the window from opening when both sashes are closed. Each lock consists of a sash lock cam on the operable sash and a sash lock keeper on the adjacent sash. Horizontal sliding windows can have one or multiple locks depending on the sash height.

To unlock the sash locks:

- Turn all the sash locks 180 degrees from their locked position. The sash is now unlocked.

To lock the sash locks:

- Close both sashes to align the lock cams with the keepers.
- Flip all sash lock cams back 180 degrees. Ensure that the lock cams engage their sash lock keepers. The window is now locked.



iii. Operable Sash Removal

For some series, operable sashes may be removed for cleaning and maintenance.

- Interior sash must be removed before the exterior sash during removal.
- Exterior sash must be reinstalled before the interior sash during reinstallation.

To remove an operable sash:

- Open the sash by a few inches.
- Grasp the left and right sash stiles to lift the sash out of the bottom track and further up into the top track.
- Angle the bottom of the sash inwards out of the frame.
- Pull the sash downward to remove it from the top track. The sash is now removed.
- Place the sash on a soft, secure surface away from foot traffic.

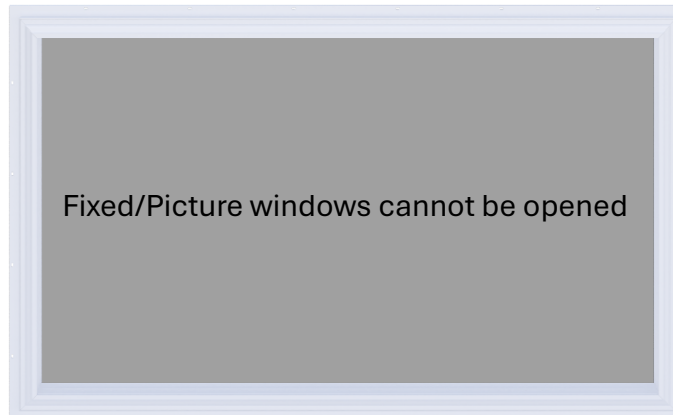


To reinstall an operable sash:

- Reinstall the sash at the same position it was removed in.
- Grasp the sash with its left and right stiles.
- Angle the top of the sash towards the outside and insert it deep into the top track.
- Angle the bottom of the sash towards the window frame and align it with the bottom track.
- Lower the sash carefully. Slide the window side to side to ensure it was properly reinstalled.



Fixed/Picture Windows



Casement Windows

i. Normal Opening and Closing Operation (non-Crank)

Casement windows are hinged either on the left or right. Based on the window series, the vents open either inwards or outwards (in-swing or out-swing).

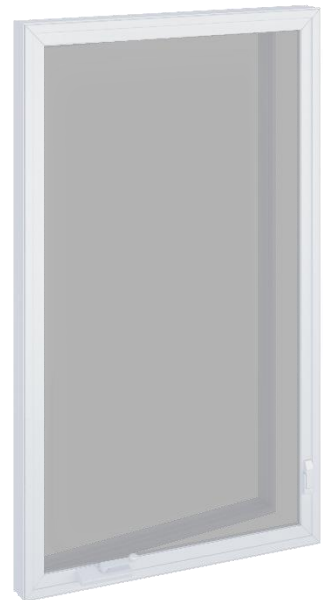
Lock handles are used to lock and unlock the window vent. The lock handle is located either on the vent or frame, depending on the window series. Some windows are available with special locks that can only be opened with a key or special tool.

To open a casement window:

- Unlock the lock handle.
- Push or pull the vent open using the vent lock handle or vent pull rail.

To close a casement window:

- Make sure the lock handle is unlocked.
- Push or pull the vent to closed using the vent lock handle or vent pull rail.
- Once the vent is closed, lock the window using the lock handle.



A crank operator is available for outswing casement windows. It allows users to open and close the vent without physically pushing and pulling the vent. This option provides ADA-compatible accessibility to allow easier opening and closing operation.

ii. **Lock Handle Types and Operation**

a. Frame Lock Handle

A frame lock handle operates a sliding lock along the frame that engages the locking points along the vent.

To unlock the vent:

- The frame lock handle points downward in the locked position.
- To unlock, flip the lock handle up as far as it goes.

To lock the vent:

- Close the vent completely.
- Flip the lock handle down all the way and check if the vent is secured by pushing or pulling on it.



b. Vent Lock Handle

A vent lock handle operates a sliding lock along the side of the vent that engages multiple locking points along the jamb.

To unlock the vent:

- The vent lock handle points downward in the locked position.
- Turn the handle 90 degrees pointing toward the center of the vent.

To lock the vent:

- Close the vent completely.
- Turn the lock handle to point downwards and check if the vent is secured by pushing or pulling on it.

iii. Crank Operator Operation

Crank operators may be installed at the sill frame near the hinge side of outswing casement windows.

To open a window with a crank operator:

- Unlock the window.
- Turn the crank counterclockwise until the vent opens to the desired position.

To close a vent with a crank operator:

- Turn the crank clockwise until the vent is closed completely.
- Lock the window.



Open: Unlock the frame lock and turn the crank counterclockwise



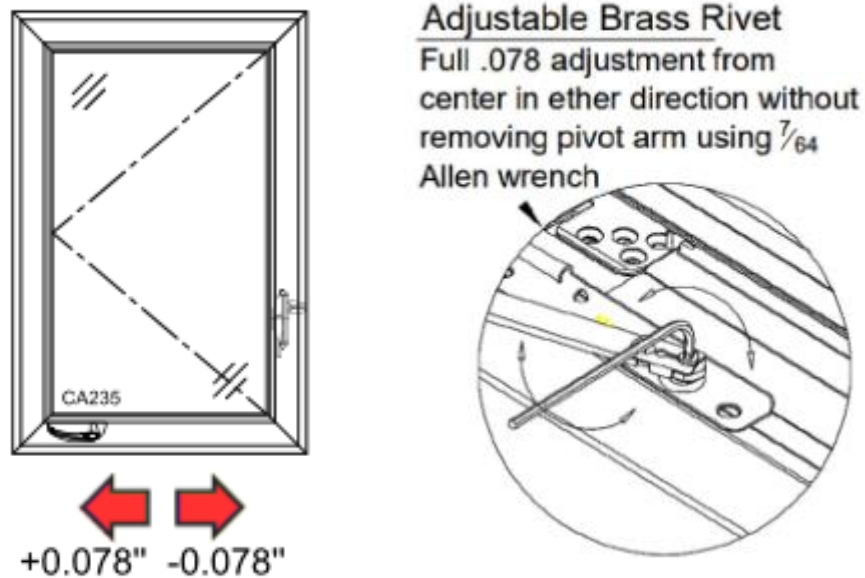
Close: Keep the lock unlocked and turn the crank clockwise



Lock the window by flipping the latch downward

iv. Hinge Adjustment

Option 1: To adjust sash sideways, insert 7/64" Allen key to bottom or top hinge at the keyhole and turn to the desired sash position. This will provide a $-0.078''/+0.078''$ horizontal adjustment.



Option 2: To adjust sash sideways, insert a 7/16" open end wrench to the bottom or top hinge under arm close to twist to the desired sash position. This will provide a $-0.078''/+0.078''$ horizontal adjustment. Do not turn the nut more than a 1/4 turn in either direction.



Projected Windows (Inswing Hopper & Outswing Awning)



i. Normal Opening and Closing Operation (non-Crank)

Projected windows are available as awning or hopper windows. Awning windows open outward and are hinged

near the top while hopper windows open inward and are hinged near the bottom.

Lock handles are used to lock and unlock the window vent. The lock handles are located either on the vent or the frame, depending on the window series.

To open a projected window:

- Unlock the lock handles.
- Push or pull the vent open using the vent lock handle or pull rail.

To close a projected window:

- Make sure the lock handles are unlocked.
- Push or pull the vent to closed using the vent lock handle or vent pull rail.
- Once the vent is closed, lock the window using the lock handles.

A crank operator is available for outswing awning windows. It allows users to open and close the vent without physically pushing and pulling the vent. This option provides ADA-compatible accessibility to allow easier opening and closing operation.

ii. Lock Handle Types and Operation

a. Frame Lock Handle

A frame lock handle operates a sliding lock along the jamb that engages locking points on the vent. Frame lock handles are located on both sides of a projected window vent, and both handles must be unlocked to open the window.

To unlock the vent:

- The frame lock handle points downwards in the locked position.
- To unlock, flip the lock handles up as far as they go.

To lock the vent:

- Close the vent completely.
- Flip the lock handles down all the way and check if the vent is secured by pushing or pulling.



Locked



Unlocked

b. Vent Lock Handles

Vent lock handles operate a sliding lock along the bottom of the vent that engages locking points on the frame. This lock handle is available for hopper windows.

To unlock the vent:

- The vent lock handle point sideways in the locked position.
- To unlock, turn the lock handle 90 degrees pointing up towards the center of the vent.

To lock the vent:

- Close the vent completely.
- Turn the lock handle to point sideways and check if the vent is secured by pushing or pulling on it.



Locked



Unlocked

iii. Crank Operator Operation

Crank operators may be installed at the sill frame near the hinge side of outswing project windows.

To open a window with a crank operator:

- Unlock the window.
- Turn the crank counterclockwise until the vent opens to the desired position.

To close a vent with a crank operator:

- Turn the crank clockwise until the vent is closed completely.
- Lock the window.



Open: Unlock the frame lock and turn the crank counterclockwise



Close: Keep the lock unlocked and turn the crank clockwise

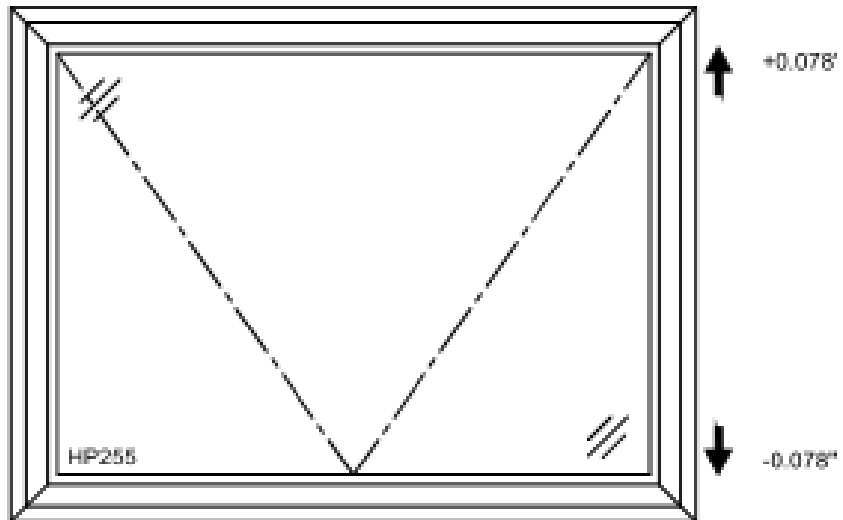
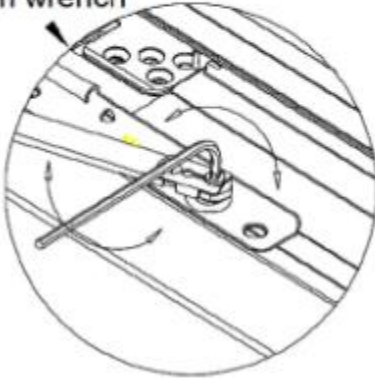


Lock the window by flipping the latches downward

iv. Hinge Adjustment

Option 1: To adjust sash up or down, insert 7/64" Allen key to bottom or top hinge at the keyhole and turn to the desired sash position. This will provide a $-0.078''/+0.078''$ vertical adjustment.

Adjustable Brass Rivet
Full .078 adjustment from center in either direction without removing pivot arm using 7/64 Allen wrench



Option 2: To adjust sash sideways, insert a 7/16" open end wrench to the bottom or top hinge under arm close to twist to the desired sash position. This will provide a $-0.078''/+0.078''$ horizontal adjustment. Do not turn the nut more than a 1/4 turn in either direction.



Sliding Glass Door

i. Normal Opening and Closing Operation

Vinyl sliding glass doors are available in 2, 3, or 4 – panel configurations with different operable and fixed panel positions. In all configurations, there is at least one operable panel.

To open an operable panel:

- Unlock the latch lock. Slide the operable panel open using the pull handle. Use the rail on the meeting stile to assist with sliding the door open.

To close an operable panel:

- Use the pull handle to slide the operable panel back towards the jamb or adjacent fixed panel.



ii. Latch Lock Operation

The latch lock prevents unauthorized access from the outside. The lock lever for the latch lock is located on the pull handle of the operable panel.

To unlock an operable panel:

- Flip the lock lever up to release the lock. The door panel can now slide open.

To lock an operable panel:

- Slide the door closed. Ensure the lock mechanism can latch with the keeper in the jamb or adjacent sash.
- Flip the lock lever down to engage the lock. The door panel is now locked.



Locked (Top)

Unlocked (Bottom)

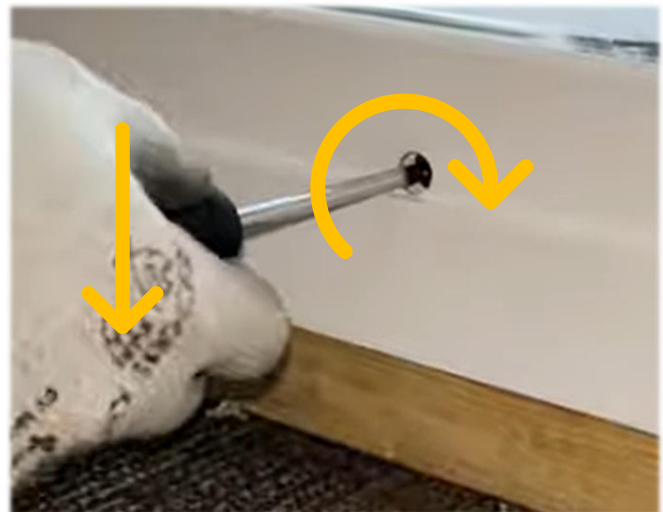
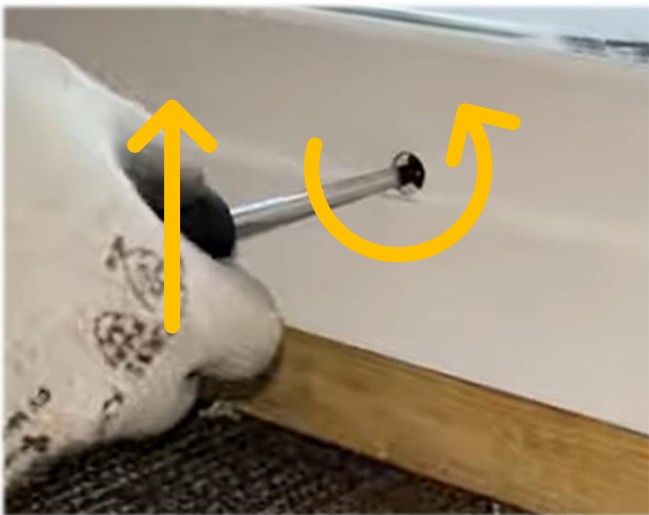


iii. Door Height Adjustments

The height of a sliding glass door can be modified, as necessary, by adjusting the rollers on each end of the operable panel. Each end has a height adjustment screw that determines the height of the door.

To raise and lower the rollers on an operable panel:

- Use a correct-sized screwdriver head to perform the adjustments.
- Remove the caps that hide the adjustment screws at the bottom of the sash.
- Turn the adjustment screw counterclockwise to raise the door.
- Turn the adjustment screw clockwise to lower the door.
- After adjusting the door to a satisfactory height, make sure the door is plumb and level. Look to see if it is vertical along the jamb:
 - o Slide the door until it is almost closed, leaving a slight gap between the door and adjustment jamb/sash.
 - o Measuring the gap at the top, middle, and bottom. If there is a noticeable variation between the top and bottom gap measurements, adjust the height until the same measurements are the same.
- Reinstall the caps at the sill.



NORMAL OPERATION OF WINDOWS AND DOOR SCREENS

Screens allow a window or sliding door to be opened for ventilation while preventing insects and other pests from entering your home.

NOTE: The screens are not designed as a retaining device for children or pets.

Types of Screens

i. Compression Spring Clip Screen

Compression clip screens, half or full, are installed on single/double hung windows and horizontal sliding windows.

They are held in place in the screen frame by compression clips located at the left or top of the screen. Half screens can slide up and down or go side to side to allow access to the outside.



To open a half screen:

- Screens either have pull rails or pull tabs.
- To open the half screen, place your fingers in the pull rail or pull tab and slide it to the desired position.

To close a half screen:

- Place your fingers into the pull rail or pull tab and slide the screen towards the sill or jamb to its closed position.



To remove a compression spring clip screen for vertically hung windows:

- Push/pull the screen to the left, squeezing the compression clips into the frame.
- Angle the screen so the right side pops out of the frame.
- Once both sides are free, bring the screen inside.

To remove a compression spring clip screen for horizontal sliding windows:

- Push/pull the screen up, squeezing the compression clips into the frame.
- Angle the screen so the bottom side pops out of the frame.
- Once the top and bottom are free, bring the screen inside.

Outswing Casement and Awning windows have screens with a similar mechanism and are on the interior. They are full screens not meant to open or close. However, they can be removed by pushing downward from the top and pulling it in.



ii. Plunger Pin

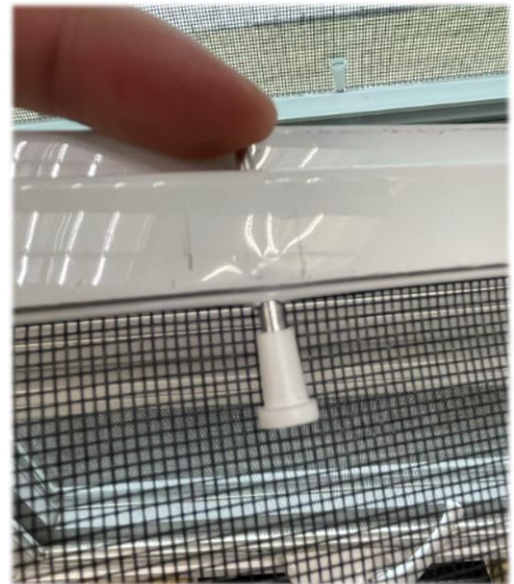
Inswing Hopper windows have screens held in place by a plunger pin on the top and bottom.

To remove a screen with plunger pins:

- Pull on the plunger pins on the bottom and top of the screen frame.
- Take the screen out while maintaining a pulling force on the pins.

To reinstall a screen with plunger pins:

- Pull on the pins and reposition the screen in the window frame.
- Release the pins, making sure they retract back into the window frame to hold it in place.



iii. Sliding Door Screens

Sliding door screens have their own lock so that you can leave your door open and have a deterrent for intruders.

To unlock your door screen:

- From the inside of the screen handle, push the lock tab up, disengaging it from the keeper in the door jamb.

To Lock your door screen:

- Make sure the door is closed to line up the lock latch with the keeper.
- Push the lock tab down and test if it is locked by trying to pull the screen open.



WINDOW LIMITING DEVICES, WINDOW OPENING CONTROL DEVICES, AND WINDOW GUARDS

Window limiting devices are designed to prevent a window from opening more than a predetermined distance. As a safety precaution, window limiting devices are installed with tamperproof screws to prevent removal.

Window Opening Control Devices (WOCDs) are limiting devices that can be fully opened in case of emergency without tools. Like normal limiting devices, WOCDs limit the opening of a window by a predetermined distance. However, they can be released through two separate actions to allow the window to fully open. Closing the window afterwards will automatically re-engage the WOCD.

Window guards are accessories installed on a window opening. They act as a barrier to prevent children or pets from accidentally falling out of a window. Crystal does not manufacture or provide window guard products.

Window Limiting Devices Available by Window Type

i. Vertical Hung Windows

Vent Latches are built into the upper sash stiles and can be used to limit the opening of the lower sash. Thus, you can keep your window open without worrying about intruders coming in, or children/pets climbing out.

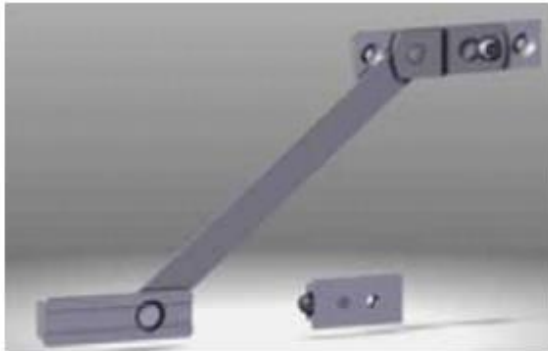
To engage both Vent Latches, flip the notch at the indicated location upwards. Your window can now only open a few inches until you flip both vent latches close.



ii. Horizontal Sliding Windows

Horizontal Sliding Windows can have a WOCD installed to limit opening to 4" maximum. This device is mechanically fastened on the inside sill of your window opening. The WOCD is naturally in the engaged position but can be disengaged by pushing on the red button while sliding the door past the device.

When the window is closed, the WOCD will spring back into the engaged position.



iii. Casement & Projected Windows

Casement and Projected Windows can have limiting arms installed on the frame and vent to keep the sash from opening past a specified angle.



CLEANING AND MAINTENANCE OF WINDOWS AND DOORS

Keeping your Crystal Window or Door product clean helps extend its lifespan. Built up debris and dirt can make it difficult to open and close a window. Please refer to the section below as a guideline as to what to use or avoid when cleaning your window or door.

Cleaning Precautions

CAUTION - Never use the following to clean your vinyl windows:

- Glass cleaners (containing ammonia)
- Liquid grease removers
- Paint removers
- Chlorine bleach
- Abrasive chemicals
- Petroleum-based cleaners or solvents
- Furniture polish
- Razor blades
- Abrasive pads (including melamine foam)



Harsh chemicals can lead to discoloration of your vinyl window sashes and frames and corrode them over time. Glass cleaners not designed for vinyl windows could also cause corrosion.

Mild cleaners such as diluted dish soap or vinegar are safe to use on your windows. Only use glass cleaners that are safe for vinyl windows as necessary for the glass.

CAUTION – Never leave tape on window or door surfaces. These tapes can become permanently attached or leave sticky residue that is difficult to remove without damaging the frame or glass.

4th Surface Coating Special Considerations - You may have chosen to opt for a 4th surface coating to further boost your windows' thermal performance; it is applied onto the innermost surface of the glass unit on your window. It is best to stick to a 10% to 20% vinegar solution as recommended by the glass supplier. Absolutely avoid cleaners containing ammonia or hydrofluoric acid as these will eat away the coating. Also keep any sharp tools away from the glass, including plastic scrapers as it can cause permanent damage.

General Cleaning of Windows and Doors

1. Remove any visible residue from the window/door frames or sashes.
2. Use a vacuum cleaner to pick up loose debris.
3. After vacuuming, use lukewarm water and a soft damp cloth to gently wash the window and door surface and frame. Clean in the horizontal direction first, then in the vertical direction.
4. Frequently rinse out your cloth to prevent dirt from accumulating, which could scratch your window or door surfaces.
5. To remove tough dirt, apply water and soak on the surface. If necessary, apply a diluted dish soap or diluted vinegar solution. Then rinse away with the cloth and lukewarm water.
6. After washing the window or door, dry it with a clean, soft cloth.

TIP – Do not clean sun-heated window or door surfaces. Try cleaning them when shaded or not exposed to sunlight. Streaks appear after cleaning if the water or mild cleaning solution evaporates too fast before it is wiped dry.

i. Exterior Cleaning

In most cases, rain is enough to clean the exterior side of your window. If extra cleaning is required, refer to “Normal Operation of Windows and Doors” section to determine which products have removable sashes, giving you access to the exterior surface.

CAUTION – Always make sure to place the removed sash on a soft, stable surface that is away from foot traffic.

Maintenance of Drainage Systems

Crystal products are designed with water drainage systems that provide a way for water to drain outside after it has entered the window or door sill, usually during a rainstorm. This helps prevent water damage and mold formation from built up water.

Periodically clean window and door sills and check any drainage holes if they are blocked by debris.



Weep drains have a plastic cover that helps keep the hole free of debris. Periodically check to see if it has been blocked by debris.

To clean weep drains:

- Lift the plastic cover.
- Use a soft pipe cleaner or bottle brush and gently clear the drain of any buildup.
- Remove the cleaner from the drain after cleaning.
- Lower the plastic cover and ensure that it can open or close for water to drain freely.



CONDENSATION, HUMIDITY, AND TEMPERATURE

How Condensation Forms on Window and Door Surfaces

Condensation forms when water vapor in the air condenses on a surface with a low enough surface temperature. Warm air can hold more water vapor than cool air, which is why a cold drink sweats out in hot weather; the surface is cold and the air around it can no longer hold the same amount of water.

Windows can be susceptible to condensation forming on its surfaces. The glass on your vinyl windows often feels colder than the frame.

Here is an example of how condensation may form on window surfaces:

Condensation may form on cold winter days. For a single-paned window with no thermal breaks, the window transmits the indoor heat to the cold outdoor air. In turn, the cold outdoor air lowers the surface temperature of the window. Because the warm indoor air is generally more humid than the cold outdoor air, the cold interior surfaces may be below the indoor air's dew point, resulting in condensation forming on the interior window surfaces.

Uncontrolled condensation is undesired because it can damage building construction elements and facilitate the formation of mold and mildew.



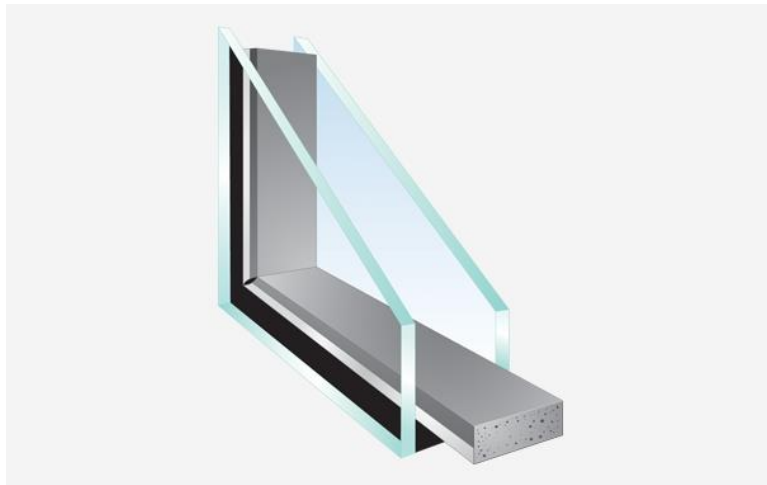
How Crystal Products Reduce Condensation

i. Insulated Glass Units (IGU)

- IGUs can be specified to include Low-E coatings and gas fill (argon and krypton).
- Low-E coatings reflect heat back to the interior to keep the glazing surfaces warm enough to help prevent condensation from forming.
- The gas fill lowers the overall thermal conductivity of the IGU, keeping the interior glazing surfaces warm enough to prevent condensation from forming.

ii. Warm-Edge Stainless Steel and Composite Spacers

- Spacers run along the entire perimeter of an IGU and separate the panes to form a gas cavity between the panes.
- Stainless steel or composite spacers are both significantly less thermally conductive material than traditional aluminum spacers.
- IGUs with aluminum spacers may have condensation forming near the spacers of the interior glazing surface during cold days.
- Spacer upgrades such as Quanex Super Spacer (Left) and Cardinal Endur Spacer (right) both help reduce condensation.



iii. Proper Weather and Air Sealing

- Proper weather sealing and air sealing helps to prevent uncontrolled air drafts.
- During cold days, uncontrolled air drafts may cool the window/door frame, glass or walls adjacent to any air leaks. This provides conditions in which condensation may develop.
- Preventing uncontrolled air drafts helps prevent the formation of condensation.
- Windows and doors should be properly weather-sealed, and air sealed within the unit and around the installation area.

Crystal[®]

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