

# Breezway Louver Windows

DESIGN MANUAL

HAWAII USA

*breezway*<sup>®</sup>

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## Hawaii Product Performance Warranty

Altair® Louvers are designed to meet and exceed the requirements of AAMA/WDMA/CSA 101/I.S.2/A440-05 and A440-08.

The following table outlines the maximum variations that Breezway® North America will warrant per Design Pressure (DP). Exceeding these constraints will void this Warranty. The limitations have been generated through AAMA (American Architectural Manufacturer's

Association) test results. The design constraints below apply to Altair Strip Hardware within the ios® Window System or the Makani™ Window System.

For commercial applications, please consult Breezway with your specific project requirements, so we can correctly apply the relevant performance warranty constraints.

## Breezway Window System Performance Warranty Constraints

	R25		R35		R45	
	25psf DP (100MPH Wind Velocity) 37.5psf STP (123MPH Wind Velocity) 3.75psf Water Resistance		35psf DP (118MPH Wind Velocity) 52.5psf STP (145MPH Wind Velocity) 5.25psf Water Resistance		45psf DP (135MPH Wind Velocity) 67.5psf STP (160MPH Wind Velocity) 6.75psf Water Resistance	
	Max Bay Width	Max Height	Max Bay Width	Max Height	Max Bay Width	Max Height
<b>ios® Window Systems<sup>3</sup></b>						
6" Altair tempered glass <sup>1</sup> blade	37"	17 blade 96–5/16"	31–1/2"	17 blade 96–5/16"	32–1/4" <sup>5</sup>	12 blade 68–3/4" <sup>4,5</sup>
6" Altair float glass <sup>1</sup> or aluminum blade	37"	17 blade 96–5/16"	31–1/2"	17 blade 96–5/16"	NA	NA
6" Altair wood blade	37–25/32"	17 blade 96–5/16"	32–9/32"	17 blade 96–5/16"	NA	NA
4" Altair tempered glass <sup>1</sup> blade	37"	26 blade 94–23/32"	31–1/2" <sup>2</sup>	26 blade 94–23/32" <sup>2</sup>	32–1/4" <sup>5</sup>	15 blade 55–3/4" <sup>4,5</sup>
4" Altair float glass <sup>1</sup> or aluminum blade	37"	26 blade 94–23/32"	31–1/2" <sup>2</sup>	26 blade 94–23/32" <sup>2</sup>	NA	NA
4" Altair wood blade	37–25/32"	26 blade 94–23/32"	32–9/32" <sup>2</sup>	26 blade 94–23/32" <sup>2</sup>	NA	NA
<b>Makani™ Single Bay Window Systems</b>						
6" Altair float glass <sup>1</sup> , tempered glass <sup>1</sup> or aluminum blade	36"	20 blade 112–13/16"	31–1/4"	20 blade 112–13/16"		
6" Altair wood blade	36–3/4"	20 blade 112–13/16"	32"	20 blade 112–13/16"		
4" Altair float glass <sup>1</sup> , tempered glass <sup>1</sup> or aluminum blade	36"	31 blade 112–13/32"	31–1/4"	31 blade 112–13/32"		
4" Altair wood blade	36–3/4"	31 blade 112–13/32"	32"	31 blade 112–13/32"		
<b>Makani™ Multiple Bay Window Systems</b>						
6" Altair float glass <sup>1</sup> , tempered glass <sup>1</sup> or aluminum blade	36"	11 blade 66–7/8"	31–1/4"	10 blade 59"		
6" Altair wood blade	36–3/4"	11 blade 66–7/8"	32"	10 blade 59"		
4" Altair float glass <sup>1</sup> , tempered glass <sup>1</sup> or aluminum blade	36"	18 blade 66–7/8"	31–1/4"	15 blade 59"		
4" Altair wood blade	36–3/4"	18 blade 66–7/8"	32"	15 blade 59"		

### NOTES:

Altair Louvers with 4" glass blades tested to AAMA/WDMA/CSA 101/I.S.2/A440-08, achieve an air leakage of 0.65cfm at 1.6psf.

**DP** = Design Pressure    **STP** = Structural Test Pressure

These results have been generated through AAMA test results and are certified under the relevant AAMA codes. Test reports are available upon request. For constraints on fixed glass, contact Breezway.

- Glass must be straight and flat within 1/100" per ft.
- ios Window System with Inside Screen only.
- Inside screens should not be installed within one mile of the ocean.
- Standard Heights only.
- High upstand sill required.

## Product Warranty

Breezway® North America, Inc. ("Breezway") guarantees to the original commercial purchaser ("Purchaser") of Breezway Altair® and Palmair® Louver Windows ("product") that Breezway will, at Breezway's option, either repair or replace the product that is found to be defective in workmanship or materials during the seven (7)-year warranty period ("Warranty Period") which starts from the date of purchase of the product ("Start Date") and expires seven (7) years after the Start Date, subject to the conditions and exclusions contained in this warranty. The following conditions and exclusions apply:

- a. The product is installed in accordance with the manufacturer's product performance warranty, written installation specification and with all relevant building code / AAMA Standards.
- b. The product has been maintained according to industry and Breezway Louver Windows recommendations. Please see the Breezway Care and Maintenance instructions at Breezway's website at [www.breezway.com](http://www.breezway.com)
- c. This warranty does not cover damage or defects in the product relating to misuse, physical abuse, neglect, broken glass, alterations (including, but not limited to, customer-applied finishes), minor imperfections in glass that do not affect the products structural integrity or significantly obscure vision, normal wear and tear (including, but not limited to, discoloration), acts of nature (including, but not limited to, fire, hurricane, flooding), condensation (moisture or ice forming on the surface of the glass or frame) or damage as a result of condensation (except where such condensation or damage is caused by failure of the product), improper storage, improper handling, improper installation or failure to properly care for and maintain the product.
- d. Manufacturing standards and tolerances are not deemed defects, nor are industry variations in color of aluminium, plastic and wood componentry.
- e. Breezway accepts no responsibility for glass breakage (except for faulty workmanship or materials). Toughened and float glass is guaranteed against defects and degradation for a period of three (3) years starting from the Start Date.
- f. Moving parts, which wear out as part of normal use, are guaranteed for seven (7) years starting from the Start Date. All electrical components are guaranteed for a period of one (1) year starting from the Start Date. Screen products are warranted for three (3) years starting from the Start Date.
- g. This warranty is limited to the repair or replacement of the faulty product at the company's discretion, but does not extend to the installation or refinishing of a replacement product. Breezway reserves the right to modify or discontinue any product. For the repair or replacement of a modified or discontinued product, Breezway will have the right to substitute the current product and components of equal quality and as similar in appearance as possible. Breezway will not be obligated to replace a discontinued product and component for which no similar alternatives are available. If Breezway determines that repair or replacement is not commercially practical or cannot be timely made, then Breezway will refund the purchase price.
- h. Only repairs carried out by Breezway personnel or authorised agents are covered by this warranty.
- i. Claims under this warranty should be made within one month of the defect arising in the product. Copies of documentation showing the purchase date of the product and this warranty should be included with your written claim and forwarded to your builder or window dealer. Please sign, date and keep this warranty in your files.
- j. There is no liability for defects or damage caused by the effects of air pollution, mildew, exposure to harmful chemicals or normal weathering caused by exposure to the elements. Normal weathering is defined as exposure to sunlight and extremes of weather and atmosphere that will cause any colored surface to gradually fade, chalk or accumulate dirt or stains. The severity of any conditions depends on the cleanliness of the air in the area and many other local influences over which Breezway has no control. Breezway shall have sole discretion to determine whether the product has experienced normal weathering.

**DISCLAIMER OF WARRANTY:** The foregoing remedies are the exclusive remedies for breach of warranty. Except for the express warranty contained herein, Breezway extends no other warranties, whether express, implied or statutory, and Breezway expressly disclaims the implied warranty of merchantability and fitness for a particular purpose.

**LIMITATION OF REMEDIES:** In no event will Breezway be liable for incidental, indirect, special or consequential damages, whether based on breach of express or implied warranty, breach of contract, negligence, strict liability or any other legal theory. Such damages include, but are not limited to, lost profits, loss of use, claims of third parties and property damage. This warranty shall be governed by, and construed in accordance with, the laws of the State of Hawaii.

## Louver Care And Maintenance

### Maintaining Aluminum Finishes

Regular maintenance of the surface finish will be necessary to reduce the rate of weathering. The frequency of cleaning will depend on the environmental conditions, but as a guide should be done at 3 monthly intervals, or more frequently in aggressive coastal or industrial environments.

Remove loose deposits with a wet sponge (avoiding scratching by dry dusting first).

Use a mild detergent in clean, warm water and a chamoise to clean louver frames and blades. Avoid excessive amounts of water gaining entry into internal mechanisms through the handle notch. Rinse with clean water.

Do not use any cleaning agents that contain a caustic base, abrasive materials or chemicals that can affect the surface finishes.

To help maintain the lustre of the finish apply and wipe over with 'non-abrasive' car polish.

### Glass Maintenance

For best results glass blades should be regularly cleaned with mild, non-abrasive detergents. Low e glass blades should be installed with the coated side facing to the inside of the building and should only be cleaned with mild, non-abrasive detergents. Abrasive detergents or cleaning tools will visibly damage the low e coating.

### Wood Louver Blade Finishes

Western Red Cedar blades are a natural material and as such will be susceptible to color variations and natural movement. Prior to installation or exposure to weather, all wooden blade surfaces must be finished with a suitable exterior grade sealant. The finish used should be 'non-tacky' or 'abrasion-resistant' to avoid blades sticking together when closed. Dark colors can cause wood movement. The surface sealant should be re-applied to the sealant manufacturer's instructions to avoid weathering of the wood and minimize wood movement. The product warranty will become void if these actions are not adhered to.

### Louver Maintenance

It is recommended that inspection be carried out at the time of installation and then at yearly intervals. This may be required more frequently depending upon the variation of location, and environmental conditions.

#### Inspection and check

1. Inspect all screw fixings for firmness.
2. Where handle connectors are used, inspect all pivot points of linkages, connecting links, pins and split pins and/or clips for wear and secure fixings.
3. Ensure all louver blades operate freely.
4. Ensure that seals are in place and clean.
5. The Powerlouver™ Window should be operated at least once per month.

### Lubrication

All internal louver operating mechanisms are pre-lubricated, prior to assembly, with a clear lubricant where required. Under normal conditions this will be satisfactory for the life of the window.

### Plastic Maintenance

When cleaning plastic components it is recommended to be done by wetting a cloth with a neutral cleaning agent such as a car wash without wax/polymer, or alternatively a mild furniture polish.

Acidic or alkaline cleaning solutions, such as vinegar, detergents and glass cleaners should be avoided.

## Selecting The Right Aluminum Finish

The aluminum components of Altair® Louver windows are available in two different surface finishes: anodized and standard powder coating.

Powder coatings are polyester coatings from leading powder suppliers applied to a thickness of 50µm and anodized finishes are to a thickness of 25µm. Over time, weathering of powder coated surfaces should be expected, resulting in a gradual change in appearance. This will be evident in loss of gloss, chalking, color change and erosion of the powder coatings. Selecting the right finish for the atmospheric conditions of the site and correct maintenance will be critical to the ongoing appearance of the finish.

Note that industry accepted color variation can occur during the aluminum anodizing process.

### Altair® Strip Hardware Standard Finishes

Finish	Colour Code*	Handle & Clips at Standard price
White Powder Coat	RAL9003	White
Almond Powder Coat	Munsell 2.5yr 7.5/1.5	Almond
Clear Anodized 25 micron	—	Misty Gray
Dark Bronze Anodized 25 micron	—	Black

- RAL and Munsell are color space systems, used to describe part colors. These are manufactured to an agreed industry standard color specification.
- These standard colors are for product supplied from our Hawaii Service Centre. Equivalent Non-standard USA finishes are ex-Australia and may have a different finish.
- Strip Hardware with a Pottery finish is only supplied to Milgard.

### ios® Window System and Makani™ Window System Standard Finishes

Finish	Colour Code*	Handle & Clips at Standard price
White Powder Coat	RAL9003	White
Clear Anodized 25 micron	—	Misty Gray
Dark Bronze Anodized 25 micron	—	Black

- RAL and Munsell are color space systems, used to describe part colors. These are manufactured to an agreed industry standard color specification
- These standard colors are for product supplied from our Hawaii Service Centre. Equivalent Non-standard USA finishes are ex-Australia and may have a different finish.

## Energy Efficiency

Breezway Altair® Louver Windows can help to enhance the energy efficiency and comfort of a building by offering:

### Maximum ventilation

With no fixed panes and blades that open almost fully horizontally, Altair Louver Windows welcome fresh, cooling breezes. These cooling breezes reduce the need for power hungry electric air conditioning systems, thereby helping to save our fragile environment.

### Tight Sealing

Altair Louver Windows have an air infiltration rating that is 2 times better than the standard required for jalousie windows. Tight sealing reduces draughts thereby allowing heating and cooling systems to run more efficiently. (Altair louver windows are rated at 0.34 cfm, the AAMA requirement for jalousie windows is 1.2cfm.)

### Choice of Glazing

A variety of energy efficient glazing options is available to meet local requirements. For example, in hot climates tinted glass blades or wood blades reduce the amount of hot sunlight that enters a building. In mixed and heating climates, the improved insulating properties of low e glass blades offer thermal performance comparable to clear double glazing.

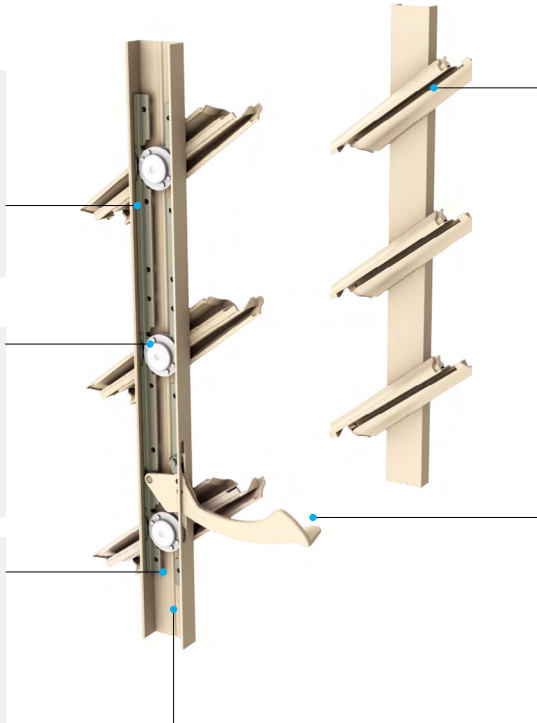
## Altair® Louver Description and Functions

- Worldwide patents approved.

Extruded "T" shaped aluminium operating bars provide a strong, non corrosive, durable and smooth operating mechanism. It also adds extra security as the bars operate to the outside of the channel at all times.

For long and maintenance free use the operating and over centre locking mechanisms are manufactured from non-corrosive material, including all rivets and fasteners.

Injection moulded bearings made of acetal use the living hinge concept to pull the louvre blade against the channel as the window is closed. This results in higher resistance to water and air. Security is now increased by interlocking teeth in the bearing retainer. (Tested to over 40,000 open/close cycles)



The Altair Louvre channel is made from 6060-T5 extruded aluminium.

Clips are manufactured from UV stabilised polypropylene. The clip colour is solid throughout. Primary and secondary drainage channels within the louvre clips direct the flow of any water to the outside of the building. Colour matching is available for Breezway Standard Colour range.

The handle is made entirely from a UV stabilised acetal. This makes it not only non corrosive, but ideal for commercial areas, as it will spring back to position, even when bent severely. For other handle options see the Altair Handles section. Colour matching is available for Breezway Standard Colour range.

## Altair® Louver Systems

Altair Louvers are available in either the fully integrated Louver Window System or a Strip Hardware System for other frames.



**Louver Window System -**  
Altair® Louvers in a Breezway ios® Frame (Inside screen model shown)



**Louver Strip Hardware System -** Altair® Louvers in other Framing System

**Altair® Louver Left**  
hand Side

**Altair® Louver Right**  
hand Side


Handles can be on either the left or right hand sides.

### ios® Altair® Louver Window System

ios Window Systems are custom designed for Altair Louvers and can be screened internally and externally (inside screen model shown above).



### Altair® Powerlouver™ Window System

Automated louvers are ideal for out of reach installations or for integration with building automation systems. Only available within the Breezway Powerlouver Easyscreen™ Window System (ex-Australia).

#### NOTES:

Altair louvers cannot be used on rake head windows

## Altair® Louver Gallery Features

### Gallery Type Options

- Single Operating Mechanism
- Powerlouver System\*

### “Standard” Inclusions

- Extruded channel with or without screw holes;
- Single operating mechanism with single left hand control handle (viewed from inside);
- Color Matching handles and clips for all finishes, except black handles and clips for Dark Bronze Anodized finishes;
- Standard louver gallery heights.
- Choice of clips to suit 1/4" or 9/16" blades.

\* Not stocked locally. Longer lead times apply.

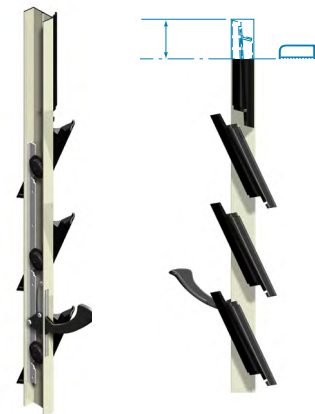
### “Off Standard” Features Available

(No change to manufacturing lead time)

- Top Extended channel to next standard clip size, or cut to length channel for off standard heights;
- Optional handle Low Profile Handle, Ring Handle;
- Inside Screen Handle (Note the operator is an extra charge if ordered as strip hardware.)

## Off Standard Louver Gallery Heights (Extended Channel)

Top extension can be achieved by cutting back to required height.



It is recommended that, wherever possible, Altair Louver Windows should be designed to a standard height. This will reduce the product cost and ensure effective opening of all blades.

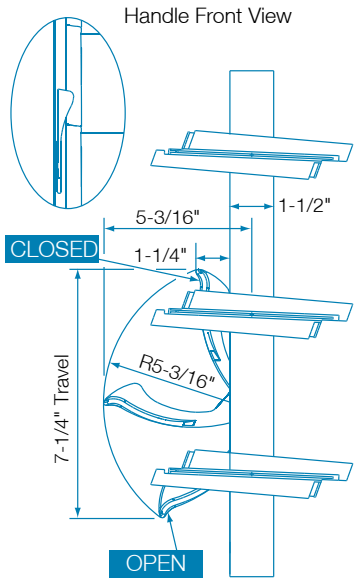
In some circumstances this may not be possible. In these instances the Altair Louver can be ordered with an Extended Channel. The Extended Channel is a continuation of the channel that is cut to size, giving improved appearance and water performance in comparison to an add-on extension piece.

The Louver is supplied with an Extended Channel that can be cut back to the required height. Note that the part to be cut down is located at the top of the gallery. Blades must comply with local requirements.

For example, the louver illustrated is ordered as 3 blade with Extended Channel.

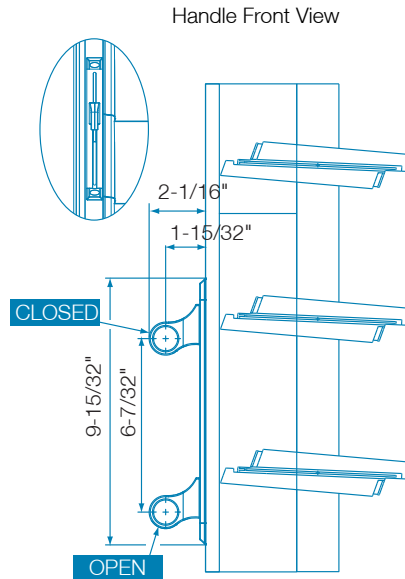


Altair® Louver Handles



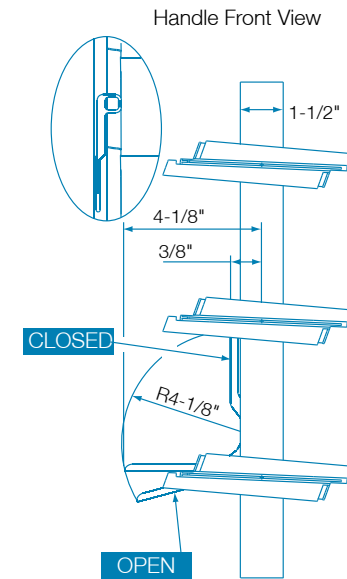
Standard Handle

- Acetal handle
- Ergonomic design for comfortable use



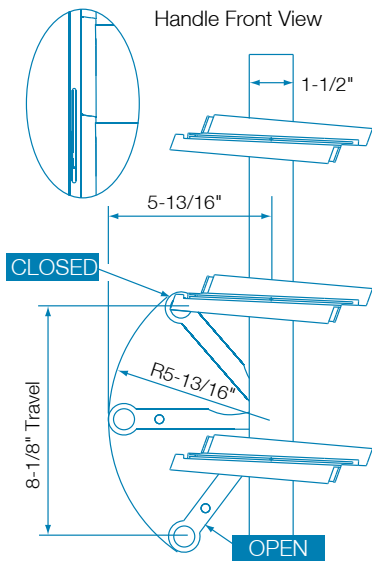
ios® Inside Screen Slide Handle

- Acetal handle
- For manual operation with inside screen ios Window System only
- Should not be operated using a pole



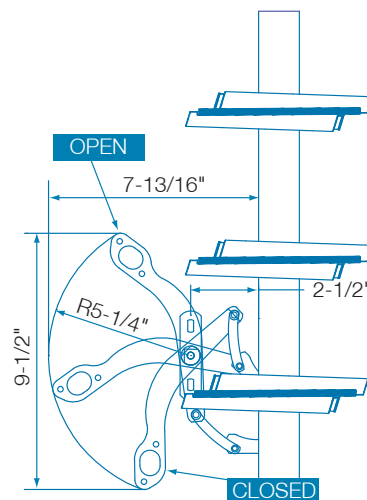
Low Profile Handle

- Stainless steel handle
- Substitute for Standard Handle when inserting into bi-folding & sliding door panels



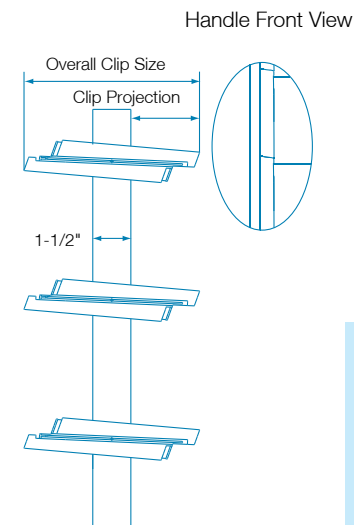
Ring Handle (A13)

- Stainless steel handle for manual operation with optional Breezway Telescopic Pole when installed out of reach



Altair Inside Screen Handle

- Aluminum handle
- For manual operation when screens are positioned to the inside of the louvers
- Strip hardware only



Powerlover™ Gallery

- Concealed motors and connectors for use with Easyscreen™ Powerlover Window Systems only.

**6" clips:**  
Overall clip size = 7"  
Clip projection = 2-11/16"

**4" clips:**  
Overall clip size = 5-1/16"  
Clip projection = 1-3/4"

## Altair® 6" Louver Standard Handle Positions

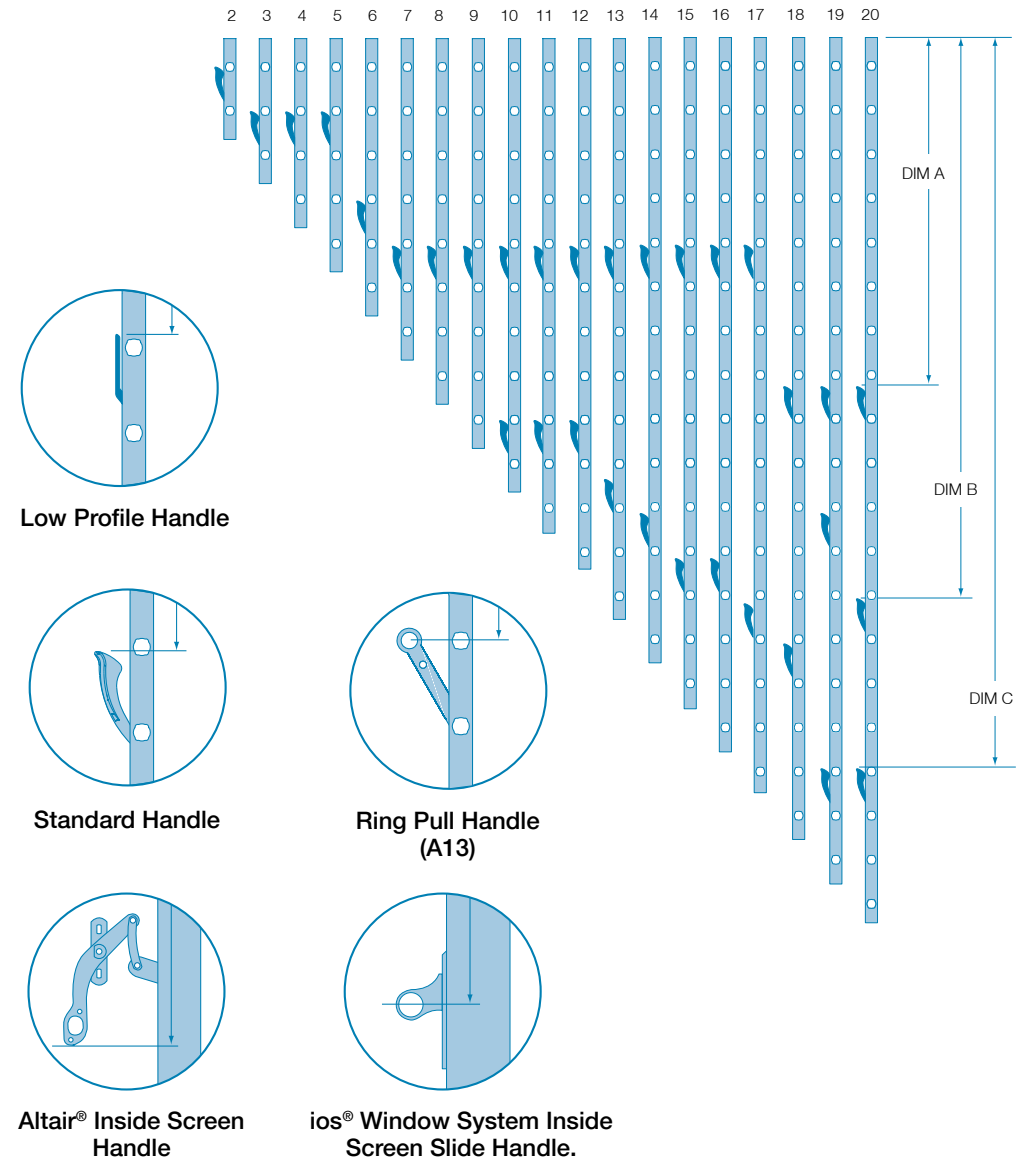
### Formulas for Other Handle Positions

Low Profile Handle Position	= Standard Handle Position – 1/8"
Ring Handle Position	= Standard Handle Position + 11/16"
Slide Handle Position	= Standard Handle Position + 1/8"
Altair Inside Screen Handle Position	= Standard Handle Position + 9-1/4"

No. of Blades	Banks of Blades Controlled from Head Downwards	Channel Length	Dim A	Dim B	Dim C
2	2	12–19/32"	2–7/8"		
3	3	18–1/8"	8–3/8"		
4	4	23–5/8"	8–3/8"		
5	5	29–1/8"	8–3/8"		
6	6	34–21/32"	19–13/32"		
7	7	40–5/32"	24–29/32"		
8	8	45–21/32"	24–29/32"		
9	9	51–3/16"	24–29/32"		
10	7 3	56–11/16"	24–29/32"	46–31/32"	
11	7 4	62–7/32"	24–29/32"	46–31/32"	
12	7 5	67–23/32"	24–29/32"	46–31/32"	
13	8 5	73–7/32"	24–29/32"	52–15/32"	
14	9 5	78–3/4"	24–29/32"	57"	
15	7 8	84–1/4"	24–29/32"	63–1/2"	
16	7 9	89–3/4"	24–29/32"	69"	
17	8 9	95–9/32"	24–29/32"	69"	
18	9 9	100–13/16"	41–13/32"	74–1/2"	
19	9 4 6	106–5/316"	41–13/32"	57–15/16"	91–1/4"
20	9 6 5	111–13/16"	41–13/32"	68–31/32"	91–1/4"

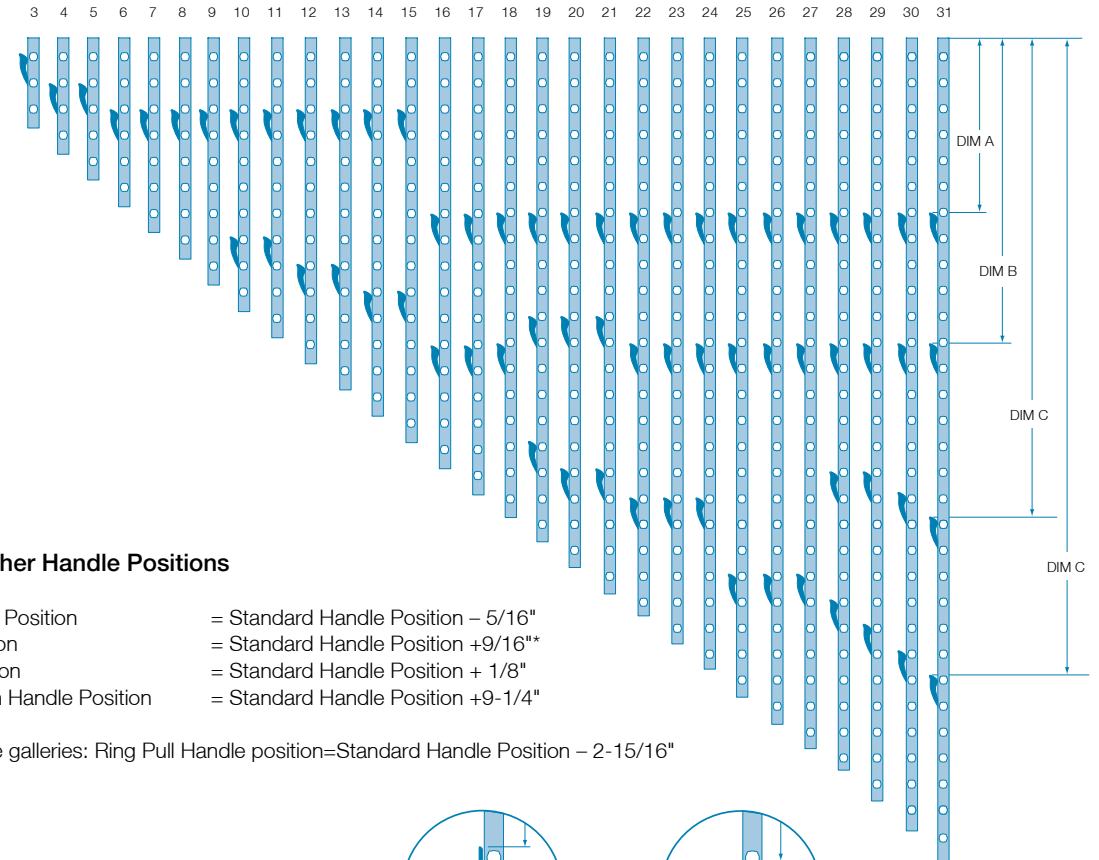
### NOTES:

- Additional handles can be specified or relocated to another position. Each handle can operate a maximum of nine clips including at least one clip directly below the handle.
- Fixed blades are not counted as additional blades when calculating handle positions. So both a standard height 5 blade gallery and a 5 blade gallery with a top extension (5 operating blades and a fixed top blade) would have the handle positioned between the 3rd and 4th blades when counting from the bottom of the gallery.
- All handle position formulas are for windows in the closed position (all handles except the Altair Inside Screen Handle are in the up position when the window is closed).



## Altair® 4" Louver Standard Handle Positions

No. of Blades	Banks of Blades Controlled from Head Downwards	Channel Length	Dim A	Dim B	Dim C	Dim C
3	3	12-3/16"	3-9/16"			
4	4	15-3/4"	7-1/16"			
5	5	19-5/16"	7-1/16"			
6	6	22-13/16"	10-5/8"			
7	7	26-3/8"	10-5/8"			
8	8	29-15/16"	10-5/8"			
9	9	33-7/16"	10-5/8"			
10	6 4	37"	10-5/8"	28-3/8"		
11	6 5	40-9/16"	10-5/8"	28-3/8"		
12	6 6	44-1/8"	10-5/8"	31-7/8"		
13	6 7	47-5/8"	10-5/8"	31-7/8"		
14	7 7	51-3/16"	10-5/8"	35-7/16"		
15	7 8	54-3/4"	10-5/8"	35-7/16"		
16	9 7	58-1/4"	24-13/16"	42-1/2"		
17	9 8	61-13/16"	24-13/16"	42-1/2"		
18	9 9	65-3/8"	24-13/16"	42-1/2"		
19	9 5 5	68-7/8"	24-3/4"	38-7/8"	56-5/8"	
20	9 5 6	72-7/16"	24-3/4"	38-7/8"	60-3/16"	
21	9 5 7	76"	24-3/4"	38-7/8"	60-3/16"	
22	9 6 7	79-1/2"	24-3/4"	42-7/16"	63-11/16"	
23	9 6 8	83-1/16"	24-3/4"	42-7/16"	63-11/16"	
24	9 6 9	86-5/8"	24-3/4"	42-7/16"	63-11/16"	
25	9 9 7	90-3/16"	24-3/4"	42-7/16"	74-5/16"	
26	9 9 8	93-11/16"	24-3/4"	42-7/16"	74-5/16"	
27	9 9 9	97-1/4"	24-3/4"	42-7/16"	74-5/16"	
28	9 6 4 9	100-13/16"	24-3/4"	42-7/16"	60-3/16"	77-7/8"
29	9 6 5 9	104-5/16"	24-3/4"	42-7/16"	60-3/16"	81-7/16"
30	9 7 5 9	107-7/8"	24-3/4"	42-7/16"	63-11/16"	84-15/16"
31	9 7 6 9	111-7/16"	24-3/4"	42-7/16"	67-1/4"	88-1/2"



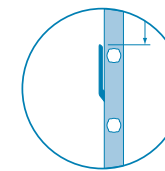
### Formulas for Other Handle Positions

Low Profile Handle Position	= Standard Handle Position - 5/16"
Ring Handle Position	= Standard Handle Position + 9/16"
Slide Handle Position	= Standard Handle Position + 1/8"
Altair Inside Screen Handle Position	= Standard Handle Position + 9-1/4"

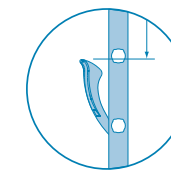
\* For 3 and 4 blade galleries: Ring Pull Handle position=Standard Handle Position - 2-15/16"

### NOTES:

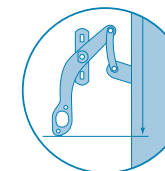
- Fixed blades are not counted as additional blades when calculating handle positions. So both a standard height 5 blade gallery and a 5 blade gallery with a top extension (5 operating blades and a top fixed blade) would have the handle positioned between the 3rd and 4th blades when counting from the bottom of the gallery.
- All handle position formulas are for windows in the closed position (all handles except the Altair Inside Screen Handle are in the up position when the window is closed).



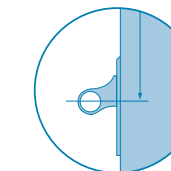
Low Profile Handle



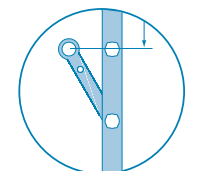
Standard Handle



Altair® Inside Screen Handle



ios® Window System Inside Screen Slide Handle.

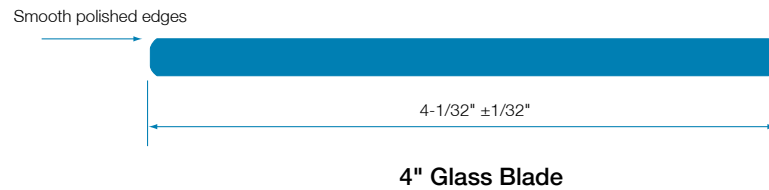
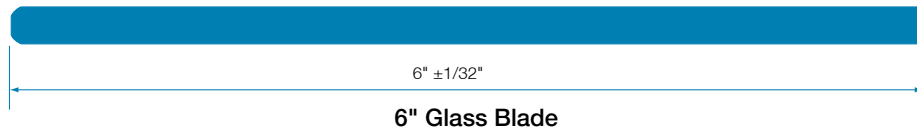


Ring Pull Handle (A13)

**Glass Blades**

**Wide Choice**

- Clear glass for maximum light and for crisp, clear views.
- Clear obscure, grey obscure, bronze obscure, satinlite and satina acid etched finishes for privacy.
- Gray and bronze tinted glass for reduced glare, energy control and to slow the rate of fading of furniture and furnishings.
- Low e coated for enhanced energy efficiency. (Low e coatings are microscopically thin coatings, invisible to the naked eye, that improve the insulation of the glass).



**Extruded Aluminum Blades**

**Architectural Feature**

- Aluminum blades create strong lines and bring a sharp modernity to a room.
- Aluminum blades can be used to create privacy while still allowing ventilation.

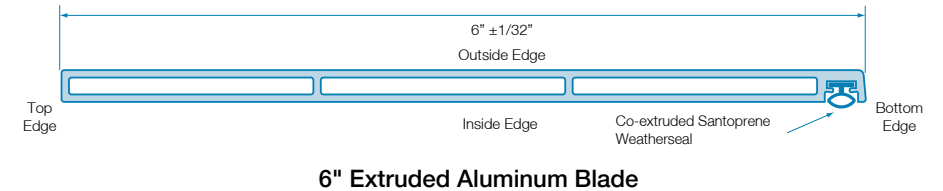
**Wide Choice Of Colors**

- Extruded Hollow Blades are available in a white powdercoat finish, in clear anodized or dark bronze 25µm anodized finishes.

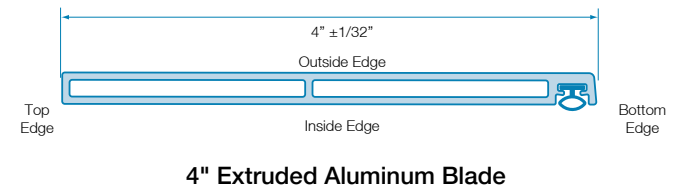
**Refined Design**

- The design of Breezway aluminium blades is being refined to feature low profile weatherseals and a clean design at the top of the blade for a minimalist, modern aesthetic.

Refined Design



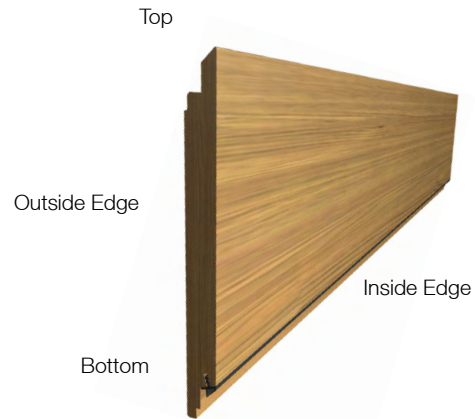
Refined Design



## Wood Blades

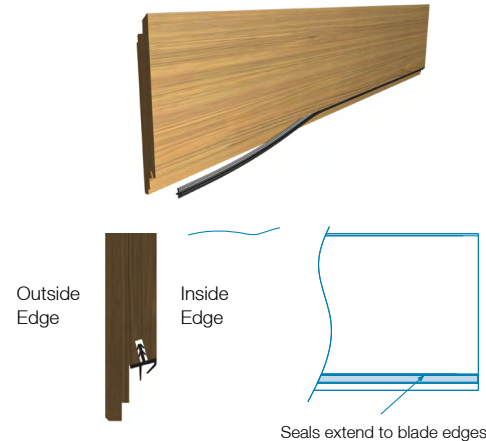
### Specifications

- Sustainable harvested Western Red Cedar
- Straight cut to suit 9/16" clips



### Privacy and Shade

- Solid wood blades provide privacy.
- Wood blades give excellent energy efficiency in warm climates.



## Finishing & Installation

Western Red Cedar blades are a natural material and as such will be susceptible to color variations and natural movement. Prior to installation or exposure to weather, all wood blade surfaces must be finished with a suitable exterior grade finish.

The finish used should be 'non-tacky' or 'abrasion resistant' to avoid blades sticking together when closed.

Dark colors can cause wood movement. The surface sealant should be re-applied to the sealant manufacturers instructions, to avoid weathering of the wood and minimise wood movement. The product warranty will become void if these actions are not adhered to.

Fit the seal by ensuring that it is in the correct orientation and is pushed firmly into the rebate as shown.

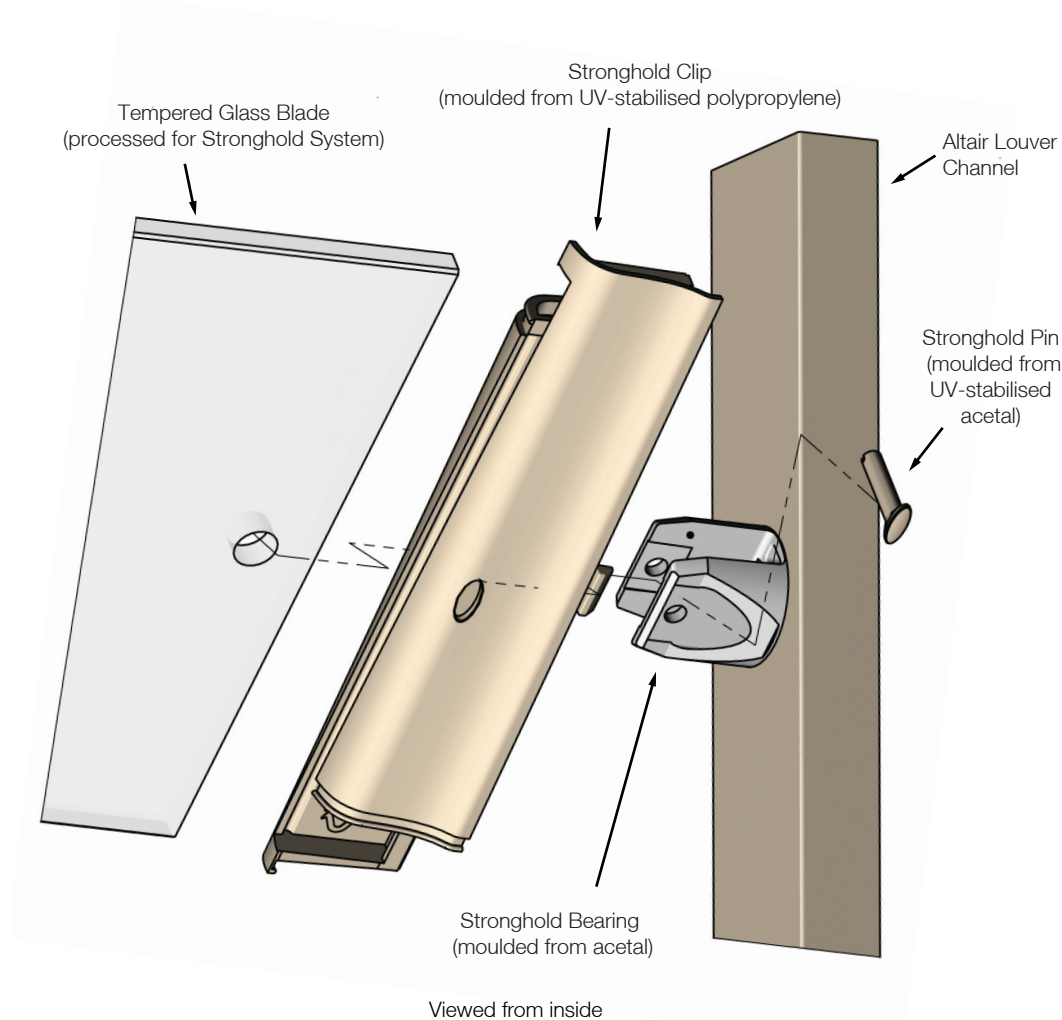
Trim the seal at the edge of the blade to ensure that the louver assembly conforms to the specified water rating. When installing the wood blades into the clips, care must be taken not to split the ends of the wood. Slide the blade slowly into the top of both sides of the open clips.

Flex one side and then the other in sequence while easing the blade into place.

To help the blades to ease into the clips, spray the ends of the blades with clean water. When installed correctly the clip will flex back and firmly hold the wood blade. Ensure the seal is sitting correctly and not twisted once installed. To remove straight cut blades use a paint scraper or butter knife to flex the plastic blade retainer out of the way.

**Maintenance:** The surface finish of the wood requires re-application as per the manufacturer's specifications, to prevent discoloration and damage to the blades.

Altair® Louvers with the Stronghold™ System



**Patented Blade Retention System**

Blades are retained in Stronghold Clips by a pin that passes through the clips, bearing and blade. Once installed, the pins cannot be removed without tools and the blades are prevented from being removed from the clips. Pins are visible on the inside/underside of the clips.

**High Rise Applications**

Breezway Altair Stronghold Louvers are fit for purpose for installation more than 30 feet above ground level. As the entire glazed area can be opened to allow airflow they can be used to maximise natural ventilation and cooling in multi level applications.

**Blade Options**

Processed and tempered glass and processed aluminium blades can be used in the Stronghold System. The Altair Stronghold System is available for use with both 6" and 4" high blades.

**NOTES:**  
 Louver blades are mechanically retained within the clips by the Stronghold System. Patented design.

## Altair® Stronghold™ Louver Clips

Altair Stronghold Clips are visually similar to Altair Clips but do have some dimensional differences. The pin is located on the inside face of the Altair Stronghold Clip when the window is closed and on the underside of the clip when the window is open. The pin is not visible from the outside of the window.

Altair 6" Clip



Altair Stronghold 6" Clip

Altair 4" Clip



Altair Stronghold 4" Clip

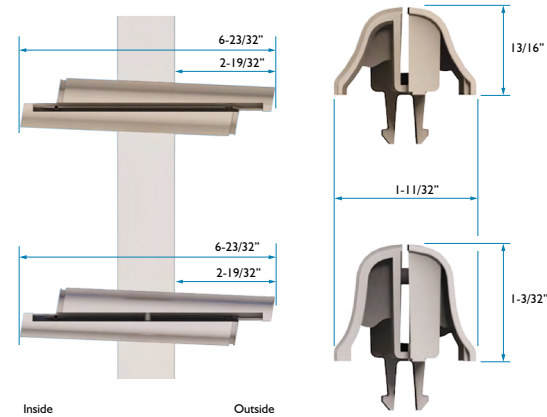
## Clip Dimensions

Altair Stronghold Clips match the overall clip size of standard Altair Clips so project the same distance beyond the channel when the window is in the open position.

In order to provide space for the pin, Altair Stronghold Clips require greater coverage of the blades. As a result Altair Stronghold Clips have a greater height than Altair Clips.

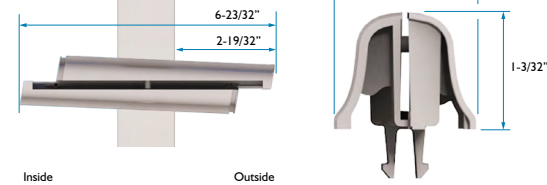
### Altair 6" Clip

Overall clip size = 6-23/32"  
Clip projection = 2-19/32"



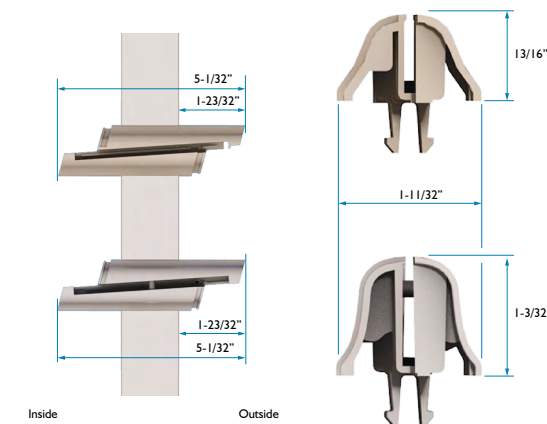
### Altair Stronghold 6" Clip

Overall clip size = 6-23/32"  
Clip projection = 2-19/32"



### Altair 4" Clip

Overall clip size = 5-1/32"  
Clip projection = 1-23/32"



### Altair Stronghold 4" Clip

Overall clip size = 5-1/32"  
Clip projection = 1-23/32"

## Blade Type Compatibility with the Stronghold® System

	6" High	4" High
Annealed glass	N	N
Tempered glass	Y	Y
Aluminium	Y	Y
Straight cut wood	N	N

## Window Sizes

### Standard Heights

The standard heights of Breezway® Window Systems with Altair® Stronghold™ Louvers are identical to the standard heights of Breezway Window Systems with regular Altair Louvers.

### Window Size Constraints

The Altair Product Performance Warranty size constraints for Ultimate Limit State Pressure, Serviceability Limit State Pressure and Water Pass must be adhered to in order to ensure compliance with AAMA/WDMA/CSA 101/1.S.2/A440-05 and A440-08.

## Maintenance

The Breezway Louver Care and Maintenance recommendations must be adhered to.

If blades need to be removed from an Altair Stronghold Louver Window or if broken blades need to be replaced, the pins must be removed. The removal process requires tools and will destroy the pins so new pins will be required when blades are re-installed.

## Powerlouver™ Compatibility

Altair Stronghold Clips are fully compatible with the Powerlouver Systems and have no impact on minimum and maximum Powerlouver Window sizes.

## Compliance With Balustrading Requirements

The Stronghold System is a window, not a balustrade system and has therefore not been tested to balustrade requirements.

The Stronghold System has completed static load, swing bag and sphere tests. Test reports are available from the Breezway website.

It is the responsibility of the building designer to specify systems and products that meet the barrier and balustrade requirements for a building.



## Altair® Louver Window Systems



**ios® Window System with inside screen**

### Frame

ios Window Systems are made from 6060-T5 extruded aluminum for excellent strength, durability and corrosion resistance. Handle and clip colors are matched to the window system.

### Snap On System

Altair Louvers clip neatly against the frame, with no visible gallery screws.

### Integrated Screen Housing

The Breezway® ios Surround Frame includes an integrated insect and security screen housing that allows easy fitting of screens to the frame. Screens can be installed from within the building and are positioned so that they will not interfere with the operation of the louver blades.



**ios® Window System with outside screen**

### High Performance

Breezway Window Systems are purpose designed louver window systems. All frames are produced to conform to AAMA/WDM/CSA 101/1.5.2/A440-05 and A440-08. See our Product Performance Warranty for ratings information.

For frame widths over 13' 1-1/2", surround frames can be milled together.

### NOTES:

Easyscreen™ Powerlouver™ Window Systems are available but are not stocked locally.

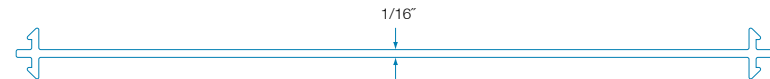
## ios® Window System

Combinations of louver windows and picture windows are possible within the Breezway ios Window System.

- Horizontal combination louver picture windows are contained within a single frame with the louvers and the picture windows separated with mullions.
- Vertical combination louver picture windows are created by mulling individual frames together. (Size limitations apply)

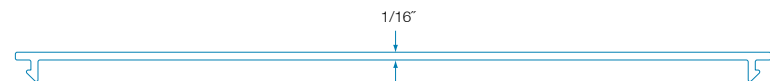


### Horizontal Picture Window Combinations



### Mulling Plate

ios (5-1/8") Mulling Plate  
(1/16" extra height or width)



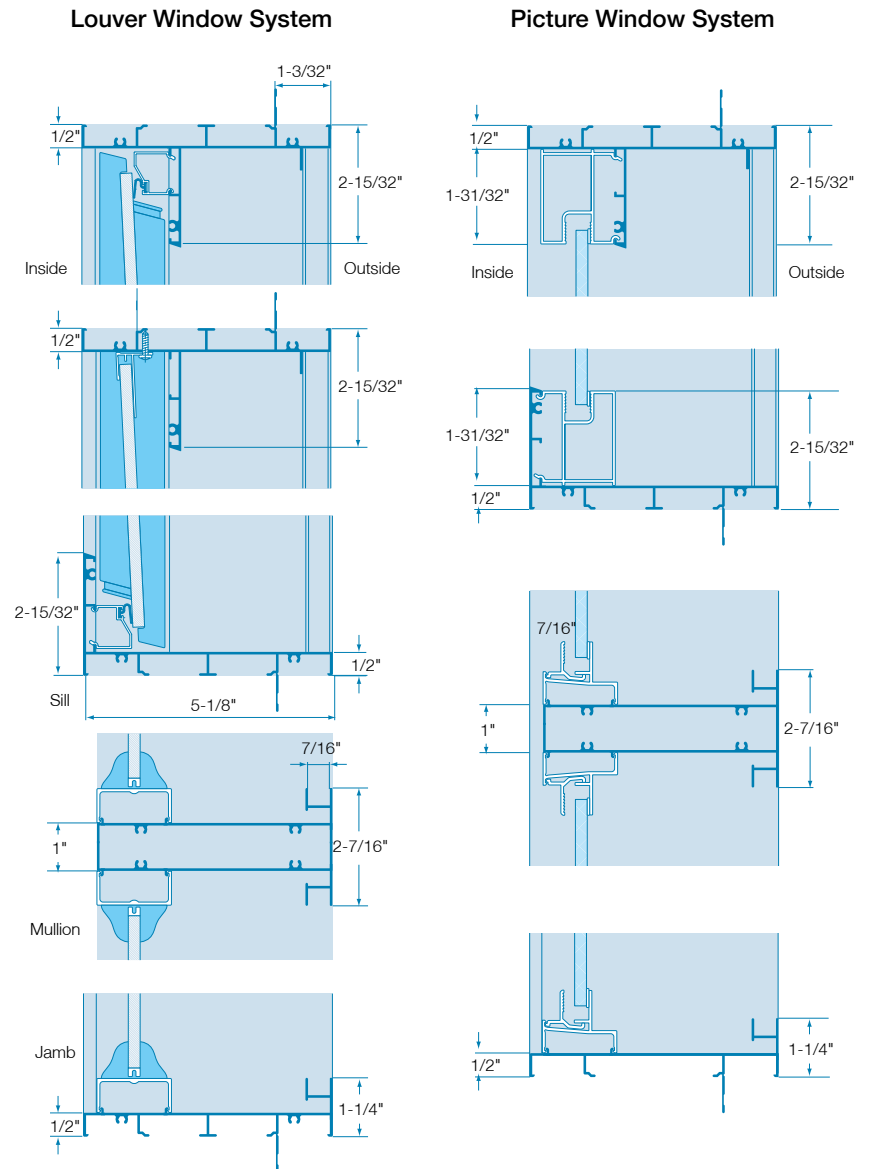
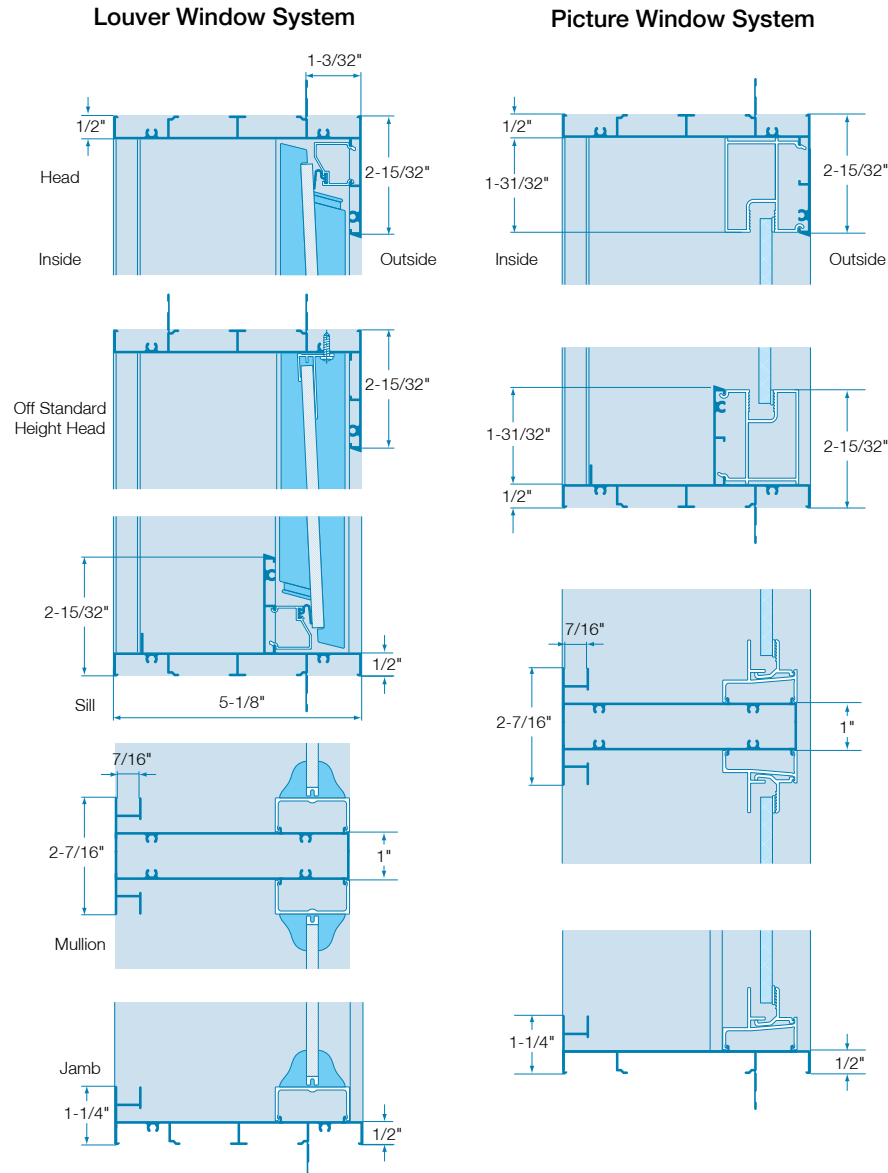
### Cover Plate

When the ios Window System extends beyond the building frame, a cover plate can be used to trim the assembly.

ios (5-1/8") Cover Plate  
(1/16" extra height or width)

ios® (5-1/8") Window System Inside Screen, Glazing to Outside of Frame

ios® (5-1/8") Window System Outside Screen, Glazing to Inside of Frame



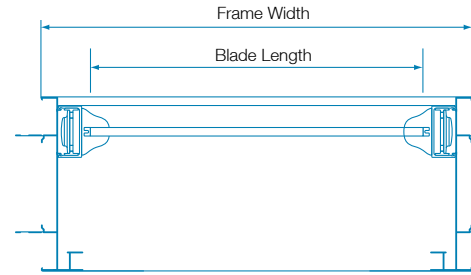
## Standard Heights

ios® Window System with 4" Strips		ios® Window System with 6" Strips	
No. of Blades	Standard Height	No. of Blades	Standard Height
3	13-7/32"	2	13-5/8"
4	16-25/32"	3	19-1/8"
5	20-5/16"	4	24-21/32"
6	23-27/32"	5	30-5/32"
7	27-13/32"	6	35-21/32"
8	30-15/16"	7	41-3/16"
9	34-7/16"	8	46-11/16"
10	38-1/32"	9	52-7/32"
11	41-9/16"	10	57-23/32"
12	45-1/8"	11	63-7/32"
13	48-21/32"	12	68-3/4"
14	52-7/32"	13	74-1/4"
15	55-3/4"	14	79-3/4"
16	59-9/32"	15	85-9/32"
17	62-27/32"	16	90-25/32"
18	66-3/8"	17	96-5/16"
19	69-29/32"	18	101-13/16"
20	73-15/32"	19	107-5/16"
21	77"	20	112-27/32"
22	80-9/16"		
23	84-3/32"		
24	87-5/8"		
25	91-3/16"		
26	94-23/32"		
27	98-9/32"		
28	101-13/16"		
29	105-11/32"		
30	108-29/32"		
31	112-7/16"		

### NOTES:

- Off Standard Heights that are more than 3/16" greater than or less than a Standard Height will have a top fixed blade to achieve the specified height. Off Standard heights that are within 3/16" of a Standard Height will not have a fixed top blade.

## ios® Blade Formulas



### Blade Cut Length ios Window

#### Glass and Aluminum:

Blade Length = frame width less 3-1/32"

#### Stronghold Glass and Aluminum:

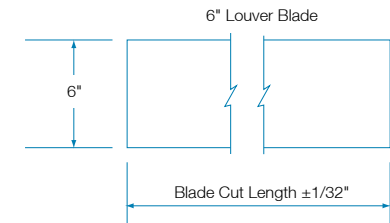
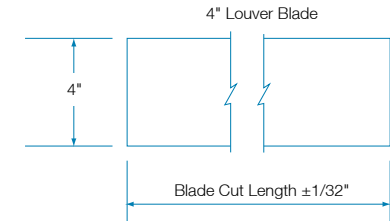
Blade Length = frame width less 2-7/8"

#### Straight Cut Wood blades:

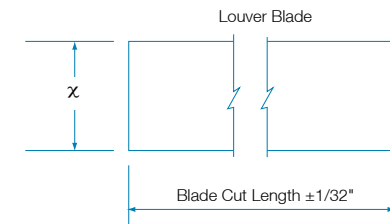
Blade Length = frame width less 3-13/16"

### NOTES:

Laminated glass is not recommended for external use due to the risk of delamination.



### Standard Louver Blade Dimensions



### Extension Blade Dimensions

#### Glass & Aluminum blades:

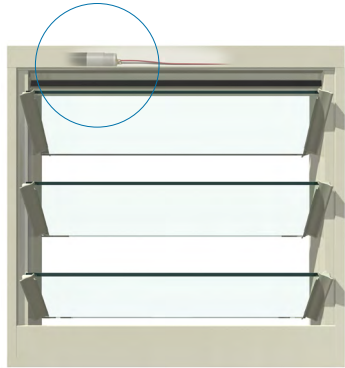
X = Channel extension +13/16"

#### Wood blades:

X = Channel extension +15/16"

For allowable length of blades refer to Breezway Louver Windows's PRODUCT PERFORMANCE WARRANTY.

## Altair® Powerlouver™ System



The Powerlouver Window motor is neatly concealed within the Easyscreen™ Frame.

### Automated Windows

Automated windows allow integration of passive ventilation into automated climate control systems and also offer an easy way to operate windows that are high up and out of reach.

### Integrated Motor and Gearbox

The Breezway Altair Powerlouver Window incorporates a motor and gearbox concealed within the head of the Window Frame resulting in an automated louver window with no visible motors, rods or arms.

### Turnkey Solution

Breezway Altair Powerlouver Windows are easy to specify, order and install as all required components are available from a single supplier, Powerlouver Windows are installed using the same techniques as regular windows and the low voltage power does not require special trades on the building site.

### Variety of Control Options

Control is possible via wall switches, remote control systems or integration into building management systems.

### Frame Options

Altair Powerlouver Windows are only available within the Breezway Easyscreen Surround Frame.

### Height Restrictions

Altair Powerlouver Windows are height restricted to a maximum of 18 blades.

## Powerlouver™ System Operating Condition

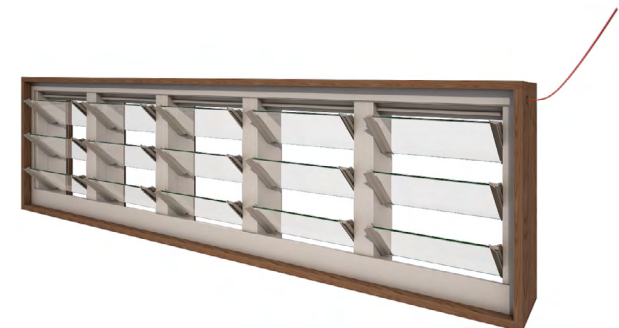
Tests Passed	
Cyclical open / closed	30,000 cycles
Salt mist	1,000 hours
Extreme humidity	90% humidity at 95 °F
Extreme heat	140 °F
Extreme cold	30 °F
Electromagnetic Compatibility	Complies with the requirements of EN61000-6-3 and AS/NZS 4251.1

## Powerlouver™ System Opening Configurations

Breezway™ Altair® Powerlouver™ Window Opening Configurations		
No. of Blades	Motors per bay	Banks of Blades Controlled from Head Downwards
2	1	2
3	1	3
4	1	4
5	1	5
6	1	6
7	1	7
8	1	8
9	1	9
10	2	5 5
11	2	5 6
12	2	6 6
13	2	6 7
14	2	7 7
15	2	7 8
16	2	8 8
17	2	8 9
18	2	9 9

Powerlouver Windows that are 2-9 blades high contain one motor per bay and are wired such that the entire window opens and closes simultaneously.

Powerlouver Windows that are 10-18 blades high contain 2 motors per bay, one motor drives the blades in the top half of the bay and the other motor drives the blades in the bottom half of the bay. 10-18 Blade high Powerlouver Windows are wired such that the blades in the top halves of all the bays form a bank that opens and closes simultaneously and the blades in the bottom halves of all the bays form a second bank that opens and closes simultaneously. The top and bottom banks can be operated independently of each other.



## Powerlouver™ System Electrical Requirements & Wiring

- Operating voltage: 24V DC
- Maximum allowed voltage: 29V DC
- Maximum constant current: 0.25A per motor
- Maximum startup current: 0.4A per motor
- Opening time: Approx 14 seconds
- Working temperature: 30 - 140 degrees fahrenheit

### NOTES:

In extreme cold conditions the windows will not operate if there is excessive ice build up or if the louver blades are frozen together.

### Maximum Constant Current Requirements

Powerlouver Window Type	Motors per bay	Maximum Constant Current Required	Maximum Instantaneous Start Up Current Required
2-9 Blades High	1	0.25 amps per bay	0.4 amps per bay
10-18 Blades High	2	0.5 amps per bay	0.8 amps per bay

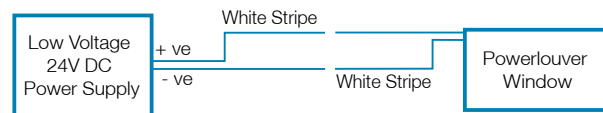
### Battery Backup

The Powerlouver Window has no integrated battery back up. If the power supply fails the window cannot be operated. If battery back up is required, systems are readily available and can be integrated by qualified suppliers.

To **close** the Powerlouver Window:



To **open** the Powerlouver Window:



The direction in which the Powerlouver Window moves is determined by the polarity of the low voltage current supplied. Once the Powerlouver Window has fully opened or fully closed, an electronic circuit stops power being delivered to the motors to prevent the motor being damaged should power be supplied continuously.

## Breezway Transformers

Breezway supplies transformers (as an optional extra) that have been specified to meet the particular requirements of Powerlouver Windows.

- 240V AC current transformed to 2.9 amp, 24V DC constant current, suitable for powering up to 6 Powerlouver Motors.
- Able to provide sufficient instantaneous startup current for up to 6 Powerlouver Motors.
- Built-in overload protection to prevent accidental short circuits from damaging the transformer.

It is not recommended that Breezway transformers be junctioned or wired in parallel. If more than 2.9 Amps is required, a larger transformer should be sourced from others.

It is recommended that transformers are located in a position that enables easy power cycling.

## Controlling Powerlouver™ System

Control options include:

- Breezway Powerlouver Appvivate® Control Units, which allow control via a touch sensitive wall plate, remote control via a smartphone application, or automatic operation in response to temperature or timer events.
- Building management systems, which allow control along with other automated building products and automatic operation in response to various sensors and inputs.

## Powerlouver™ Apptivate® Control Unit

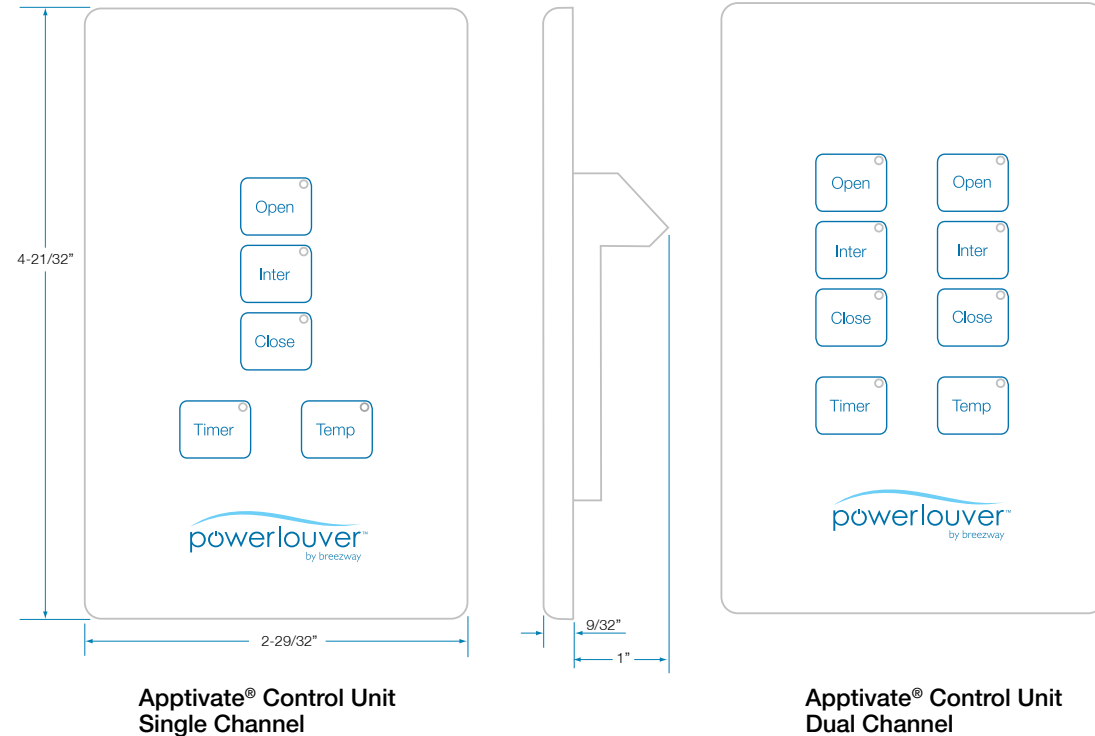
The Powerlouver Apptivate Control Unit is a plastic, touch-sensitive wall switch.

### Features include:

- White, standard sized wall switch.
- Single channel and dual channel models.
- Control of up to 6 Powerlouver Motors per channel.
- Fully open, fully close or open to an intermediate (half-open) position at a single touch.
- Precise control of opening angle by touching and then releasing when the window is in the desired position, or by touching another button to stop the window in the desired position.
- Automatic operation in response to an in-built temperature sensor.
- Bluetooth® module to allow control by and communication with compatible smartphones and tablets.

### Additional features accessible through the Powerlouver™ App:

- Remote control.
- Automatic operation in response to an in-built temperature sensor.
- Automatic operation in response to pre-set timers.
- 'Night mode' which adjusts the brightness of LED lights overnight to minimise potential sleep disruptions.



## Powerlouver™ App

The Apptivate® Control Unit includes a Bluetooth® Smart™ modules which allows wireless communication between a compatible device running the Powerlouver App and the Apptivate Control Unit.

### Remote control

The Powerlouver app enables:

- Remote opening and closing of each Apptivate Control Unit. The range of the Bluetooth signal is approximately 10m - 20m. (The range will be maximised by maintaining a clear line of sight between the device running the Powerlouver App and the Apptivate Control Unit.)
- Naming of Apptivate Control Units, and channels of Apptivate Control Units for easy identification.
- An indication of the open/close position of the Powerlouver Windows connected to each Apptivate Control Unit.

### Compatible devices.

Compatible devices will have Bluetooth® Smart™ modules installed and have an iOS or Android operating system. Devices include:

Apple products running iOS 7 or newer:

- iPhone 4s and newer
- iPad 3 and newer
- iPad Mini and newer
- iPod Touch 5

Devices running Android 4.3 and newer, including:

- Samsung Galaxy Range
- HTC One, MAX
- Sony Experia Range
- Droid RAZR, Ultra, Maxx, Mini
- Google Nexus 4, Nexus 5, Nexus 7 and Nexus 10

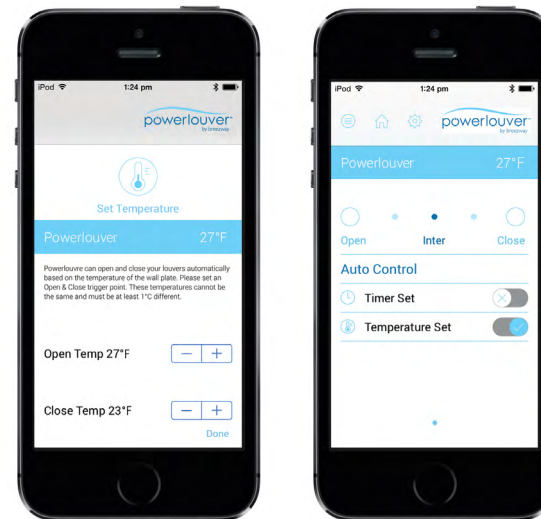
### Security.

Establishing associations between the Powerlouver App and Apptivate Control Units requires:

- Close physical proximity between the Powerlouver App and the Apptivate Control Unit, and
- An access code (defined by the first Powerlouver App to be associated to the Apptivate Control Unit).

If the Access Code is forgotten, a factory reset button can be activated by snapping off the front cover plate of the Apptivate Control Unit and pushing a paperclip through a small hole to hold a button down for a brief period. Security will be maximised by positioning the Apptivate Control Unit in a location that restricts unauthorised access.

If restricting access to the Apptivate Control Unit is not practical then users can seal the hole to block access to the factory reset button from the front panel necessitating the unscrewing of the Apptivate Control Unit from the wall in order to carry out a factory reset.



### Automatic operation in response to temperature.

Temperatures can be set at which the Apptivate Control Unit will:

- Automatically open the windows to naturally cool the room, or
- Automatically close the windows to retain warmth within the room.

Automatic response to temperature can be enabled or disabled:

- Remotely from the Powerlouver App, or
- Directly on the Apptivate Control Unit.

### NOTES:

- As the temperature sensor will be located within the wall cavity it may be susceptible to environmental conditions so the temperature readings will be indicative of the air temperature within the room, but will not exactly reflect the air temperature within the room.
- When responding to temperatures both channels of Dual Channel Apptivate Control Units will respond simultaneously to the temperature sensor.

## Automatic operation in response to timers.

Timer events (time of day and day of week) can be set to:

- Open the windows
- Move the window to an intermediate position
- Close the windows
- Begin responding automatically to temperatures.

This allows the windows to be set to operate in anticipation of the building occupant's daily routine. For example, opening before employees arrive to pre-cool the building, or responding to temperatures from when a homeowner goes to bed so that the windows close when the temperature drops in the early hours of the morning.

Timer events can be enabled or disabled:

- Remotely from the Powerlouver™ App, or
- Directly on the Apptivate® Control Unit.

This allows timer events to easily be disabled as the homeowner leaves the house or enabled as they arrive home.

## Control of multiple Apptivate® Control Units.

Up to 6 Apptivate Control Units can be associated to each Powerlouver App allowing building occupants to control windows around their home from their Powerlouver App.

For ease of identification:

- Each of the Apptivate Control Units can be given a customised name.
- Each of the channels of a Dual Channel Apptivate Control Unit can be given a customised name.
- The Powerlouver App will indicate any Apptivate Control Units which are out of range, or with which a Bluetooth® Smart connection cannot be made.

For maximum control and ease of use, all the Apptivate Control Units associated to a Powerlouver App can be operated simultaneously or independantly.

### NOTES:

- When responding to timer events both channels of Dual Channel Apptivate Control Units will respond simultaneously.

## Control by multiple Powerlouver™ Apps.

Associations can be established between multiple Powerlouver Apps and each Apptivate Control Unit, to allow all family members to control the windows from their smartphones.

### NOTES:

- Only one Powerlouver App will be able to maintain an active Bluetooth® Smart connection with an Apptivate Control Unit at any given time.

For example: Both John and Mary's Powerlouver Apps are associated to the Apptivate Control Unit operating the Powerlouver Windows in their living room. If John opens the windows using his Powerlouver App, Mary will not be able to close the windows using her Powerlouver App until John minimises the Powerlouver App on his smartphone or his smartphone enters 'sleep' mode.



## Apptivate® Control Unit Standard Wiring

Powerlouver™ Motors and Apptivate Control Units require 24v DC power. For ease of wiring the Apptivate Control Unit senses the polarity of the current provided from the transformer and automatically adjusts accordingly.

Up to 6 Powerlouver Motors can be wired in parallel to each Apptivate Control Unit motor group.

It is recommended that transformers are located in a position that enables easy power cycling.

## Building Management System Compatibility

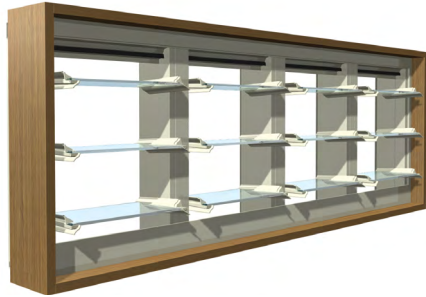
The Altair® Powerlouver Window System has been reviewed for compatibility by the leading suppliers of building management systems. When considering integration into a building management system, the following should be considered:

- Breezway does not supply the various sensors which could be used to instigate opening or closing of the windows (eg temperature or rain sensors).
- Transformer requirements may differ from the requirements of Powerlouver Windows controlled by Apptivate Control Units.
- The Powerlouver Window System does not include an inbuilt electronic mechanism to inform the building management system of its current open or close position.
- Powerlouver Motors include limit switches which prevent the motors from continuing to attempt to open or close the window once the window is fully open or fully closed, thereby preventing damage to the motors and electronics.

Apptivate Control Units are not compatible with building management systems.



## Easyscreen™ Powerlouver™ Window Sizes

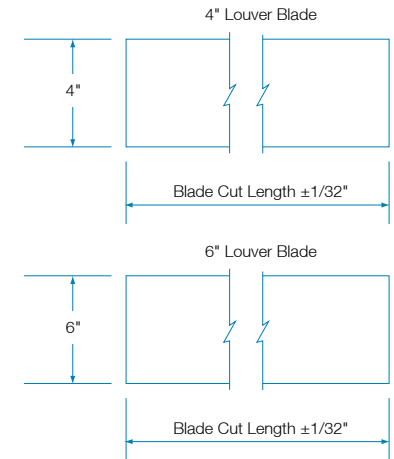
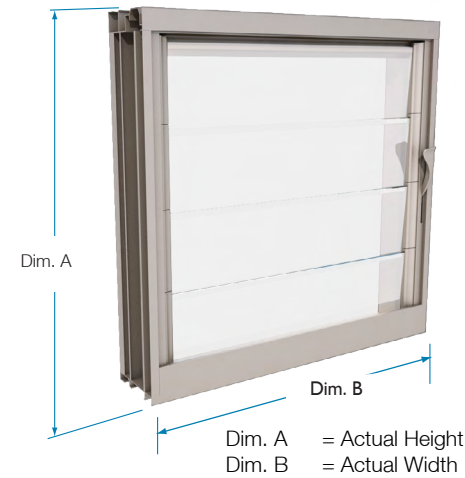


### Four Powerlouver™ Window bays within a single Easyscreen™ Frame

- Maximum width = 157-1/2"  
(Frames over these dimensions will need to be coupled on site or at a window dealer's factory)
- Minimum width = 15-3/4" per bay
- Standard heights only.
- Up to 6 galleries (bays) can be included in a single surround frame.
- Combination louver and picture windows are available.
- Screens to outside only.
- Off-Standard Frame Heights between 4/16" and 1-10/16" greater than a Standard Height are unavailable for 6" Powerlouver in the Easyscreen Frame.
- Off-Standard Frame Heights between 1/16" and 3/16" below a Standard Height are unavailable for 4" Powerlouver in the Easyscreen Frame.
- Off-Standard Frame Heights between 4/16" and 1-12/16" greater than a Standard Height are unavailable for 4" Powerlouver in the Easyscreen Frame.

Blade Count	Altair® Powerlouver in Easyscreen Frame	
	6" Gallery	4" Gallery
2	14-19/32"	NA
3	20-1/8"	14-7/32"
4	25-5/8"	17-3/4"
5	31-5/32"	21-5/16"
6	36-21/32"	24-27/32"
7	42-5/32"	28-3/8"
8	47-11/16"	31-15/16"
9	53-6/32"	35-15/32"
10	58-11/16"	39-1/32"
11	64-7/32"	42-9/16"
12	69-23/32"	46-3/32"
13	75-1/4"	49-21/32"
14	80-3/4"	53-3/16"
15	86-1/4"	56-23/32"
16	91-25/32"	60-9/32"
17	97-5/16"	63-13/16"
18	102-13/16"	67-3/8"

## Easyscreen™ Powerlouver™ Window System Blade Formulas



### Blade Cut Length Easyscreen Powerlouvre Window

#### Glass and Aluminum:

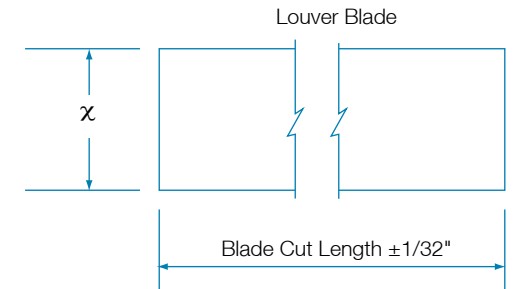
Blade Length = frame width less 3-4/16"

#### Stronghold Glass and Aluminum:

Blade Length = frame width less 3-1/6"

#### Straight Cut Wood blades:

Blade Length = frame width less 4"



### Extension Blade Dimensions

#### Glass & Aluminum blades:

**X** = Channel extension +8/16"

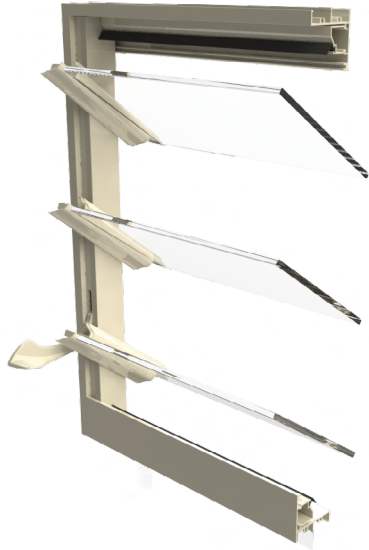
#### Wood blades:

**X** = Channel extension +11/16"

### NOTES:

Laminated glass is not recommended for external use due to the risk of delamination.

**Makani™ Window System**



**Altair® Makani™ Window System**

**Custom designed for Altair Louvers**

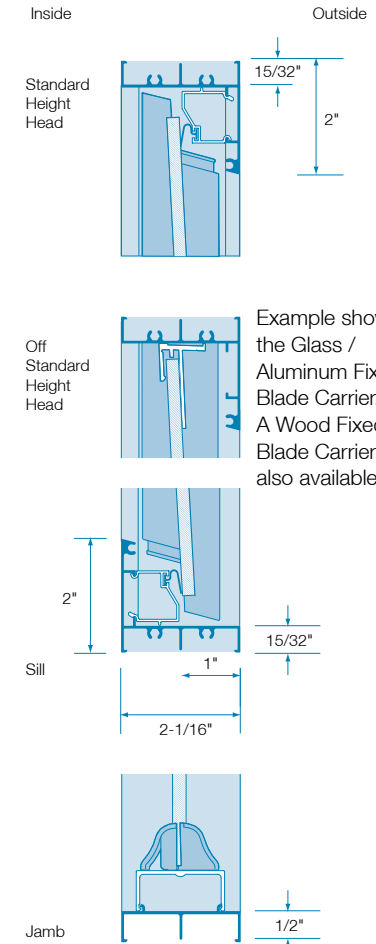
Altair Louver strip hardware neatly clips into the frame with no visible gallery screws.

**Durable**

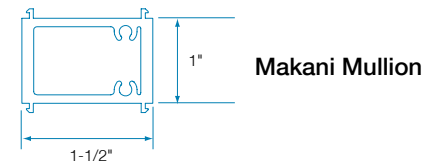
Constructed entirely of non-corrosive materials including 6060-T5 aluminum, stainless steel and industrial strength acetal and polypropylene plastics.

**Strong**

Structural components of the window system are manufactured from 6060-T5 aluminum alloy.



**Makani Louver Window System**



## Standard Heights

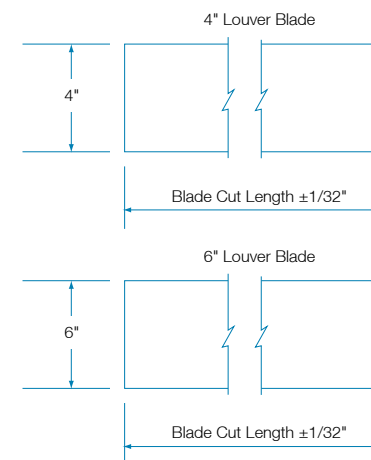
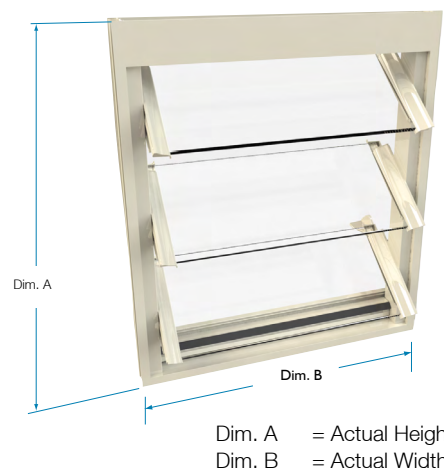
Makani™ Window System with 6" Galleries	
No. of Blades	Standard Height
2	13–19/32"
3	19–3/32"
4	24–19/32"
5	30–1/8"
6	35–5/8"
7	41–5/32"
8	46–5/8"
9	52–5/32"
10	57–11/16"
11	63–3/16"
12	68–11/16"
13	74–7/32"
14	79–23/32"
15	85–7/32"
16	90–3/4"
17	96–1/4"
18	101–25/32"
19	107–9/32"
20	112–25/32"

Makani™ Window System with 4" Galleries	
No. of Blades	Standard Height
-	-
3	13–3/16"
4	16–23/32"
5	20–9/32"
6	23–13/16"
7	27–3/8"
8	30–29/32"
9	34–7/16"
10	38"
11	41–17/32"
12	45–3/32"
13	48–5/8"
14	52–5/32"
15	55–23/32"
16	59–1/4"
17	62–25/32"
18	66–11/32"
19	69–7/8"
20	73–7/16"
21	76–31/32"
22	80–1/2"
23	84–1/16"
24	87–19/32"
25	91–5/32"
26	94–11/16"
27	98–7/32"
28	101–25/32"
29	105–5/16"
30	108–27/32"
31	112–13/32"

### NOTES:

- Off-standard heights that are not within 3/16" of a standard height have a fixed blade at the top to achieve the specific height.
- Refer to the product performance warranty on possible height restrictions for different blade types and bay widths.
- Standard sizes will save money and improve lead times.

## Makani™ Window System Blade Formulas



### Blade Cut Length Makani Window

#### Glass and Aluminum:

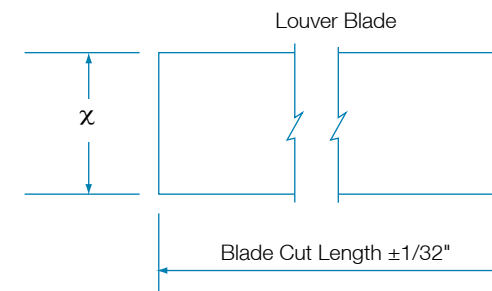
Blade Length = frame width less 3-1/32"

#### Stronghold Glass and Aluminum:

Blade Length = frame width less 2-7/8"

#### Straight Cut Wood blades:

Blade Length = frame width less 3-13/16"



### Extension Blade Dimensions

#### Glass & Aluminum blades:

$\chi$  = Channel extension +23/32"

#### Wood blades:

$\chi$  = Channel extension +7/8"

### NOTES:

Laminated glass is not recommended for external use due to the risk of delamination.

## Breezway Window System Checklist (ios<sup>®</sup>, Powerlouver<sup>™</sup> in Easyscreen<sup>™</sup> and Makani<sup>™</sup>)

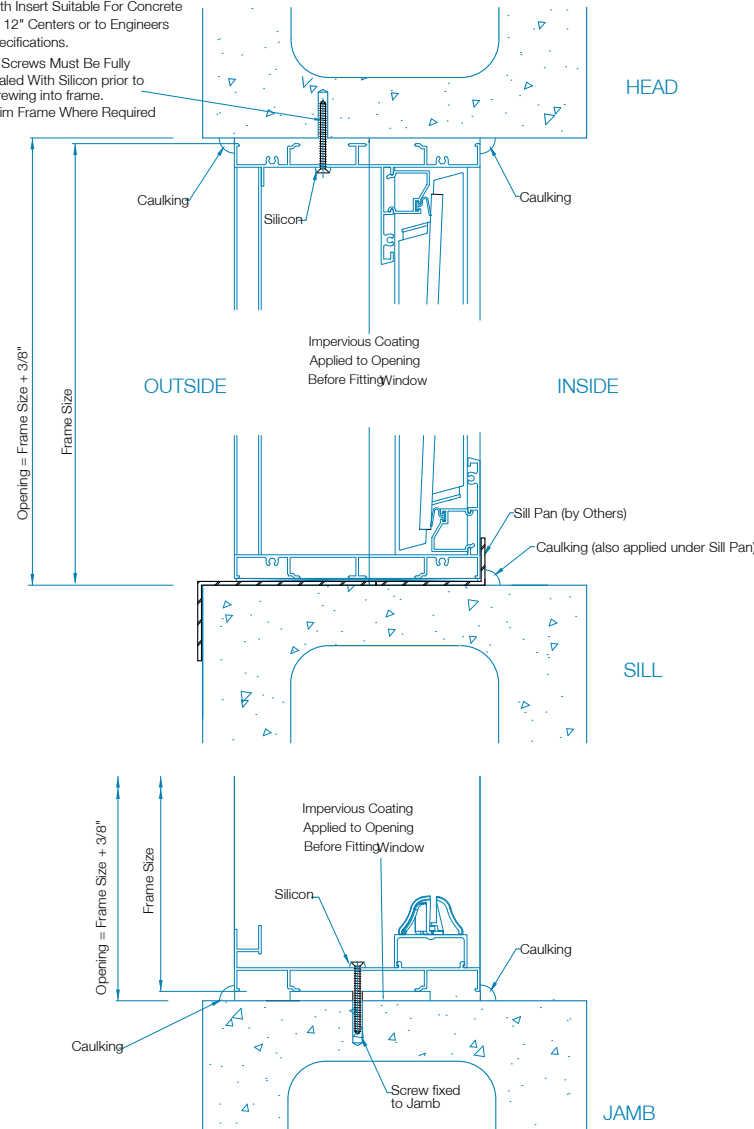
REQUIRED INFORMATION Viewed from inside	OPTIONAL INFORMATION
--	----------------------

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Design Pressure</li> <li>• Inside or outside screen</li> <li>• Left or Right Handed</li> <li>• Manual or Automated</li> <li>• Frame Size</li> <li>• Clip Size</li> <li>• Height &amp; Width</li> <li>• Number of Bays</li> <li>• Bay type: Louver or picture window</li> <li>• Frame Color</li> <li>• Gallery Color</li> <li>• Clip &amp; Handle Color</li> <li>• Handle Type</li> <li>• Blade Type</li> </ul> | <ul style="list-style-type: none"> <li>• Variable Handle Position/Additional Handles</li> <li>• Offset Mullions</li> <li>• Couplers &amp; Cover Plates</li> <li>• Bay Configuration</li> </ul> |
| <ul style="list-style-type: none"> <li>• For Altair Powerlouver Windows handle specifications are not required.</li> <li>• Manually operated Easyscreen Window Systems are no longer available in Hawaii. As the Easyscreen Window System is the only Breezway Window System compatible with the Powerlouver Window, Easyscreen Powerlouver Window Systems continue to be available.</li> </ul>   |  |

Concrete Block Wall Building-In Details

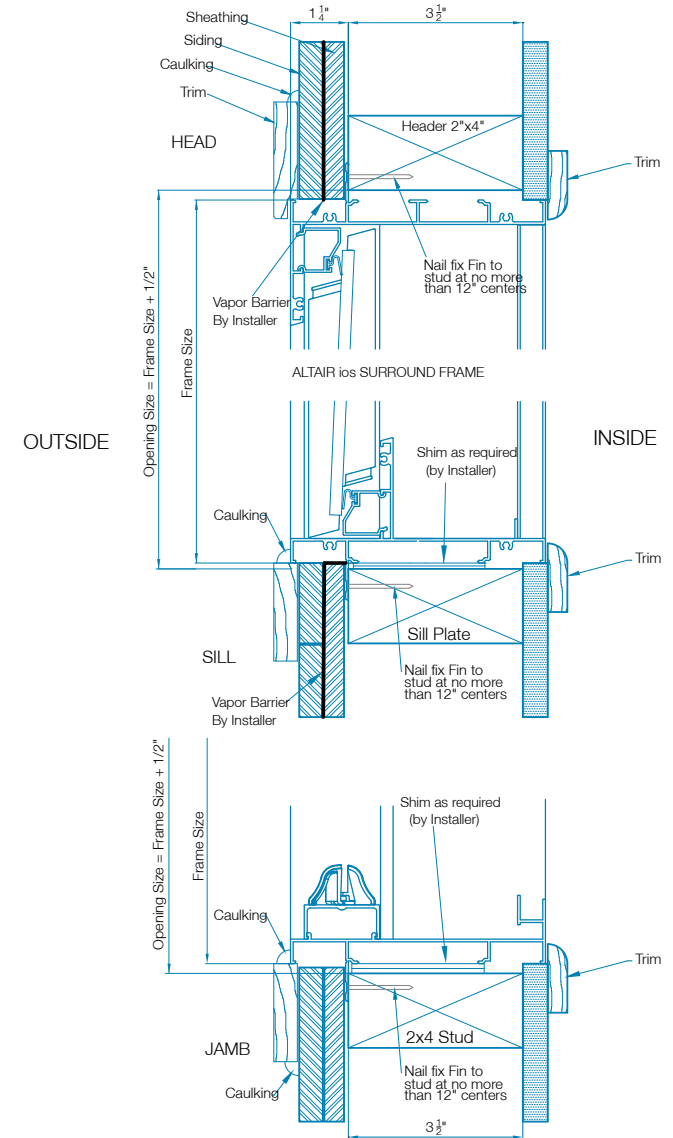
Indicative installation only. Actual installation to be determined by installer based on site conditions and local building laws.

3/16 x 1 1/2" Long Stainless Steel Countersunk Head Screws With Insert Suitable For Concrete on 12" Centers or to Engineers specifications.  
All Screws Must Be Fully Sealed With Silicon prior to screwing into frame. Shim Frame Where Required



2 X 4 Studs Building-In Details

Indicative installation only. Actual installation to be determined by installer based on site conditions and local building laws.



## Altair® Louvers For Other Frames

In strip hardware form, Breezway Altair louver window galleries can be used in most regular wood, aluminum and uPVC window frames. In such instances, Altair strip hardware is simply screwed or clipped into place within the window frame.

If installed in a frame that is square, and according to Breezway's installation instructions, the Altair performance warranty is not affected in any way.

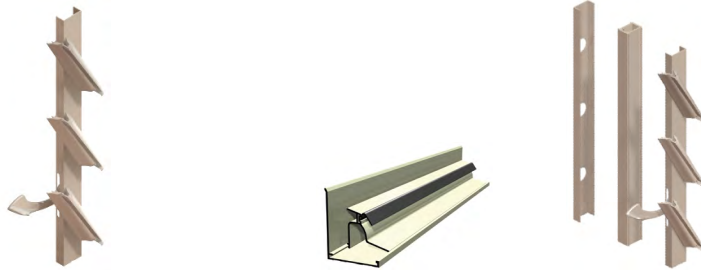
## Altair® Proprietary Frames

Many leading window fabricators, realizing the value of Altair louvers, have committed to maintaining compatibility between their proprietary frames and Breezway Altair louver strip hardware.

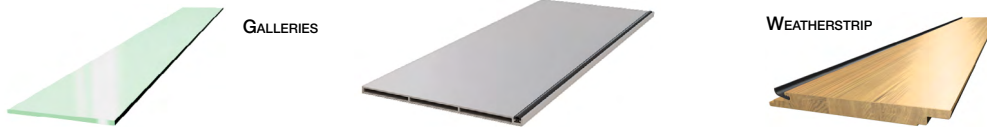
As window frame fabricators do make periodic improvements to their frames, please refer to each fabricators' website for the latest information on their proprietary framing system.

Fabricators	Altair Compatible Frame	Website address for latest frame information	Manufacturer Phone Numbers	Location
Milgard Windows	Tuscany™ vinyl frame	<a href="http://www.milgard.com">www.milgard.com</a>	1800 562 8444	U.S.A.
Coastal Windows	Coastal Jalousie vinyl frame	<a href="http://www.coastalwindows.com">www.coastalwindows.com</a>	808 676 0529	Hawaii
Ply Gem	Pro Vinyl Series	<a href="http://www.plygem.com">www.plygem.com</a>	888 975 9436	U.S.A.

Altair® Louver Strip Hardware System

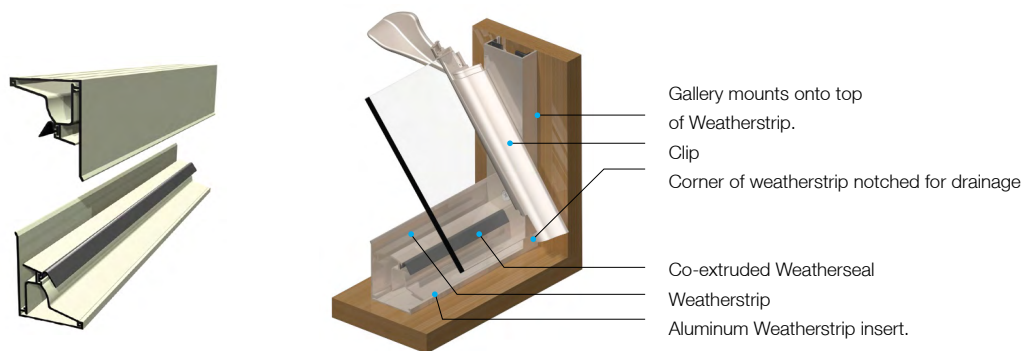


Gallery	Weatherstrip	1-1/2" x 1" Box Mullion
Available in 4" and 6" heights with clips to suit 1/4" thick glass and aluminum blades or clips to suit 9/16" thick straight cut wood blades.	Standard Weatherstrip and Insert	Medium Duty 1-1/2"x1" Box Mullion. Louver Galleries simply clip to Mullion



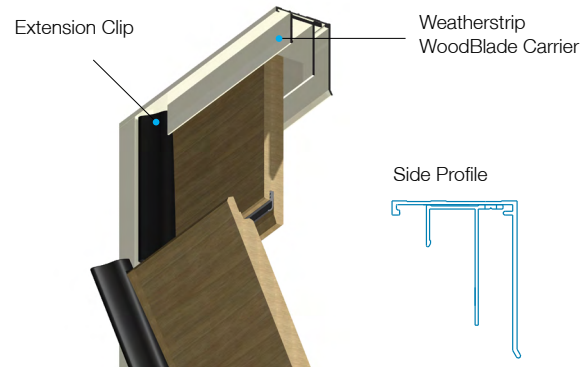
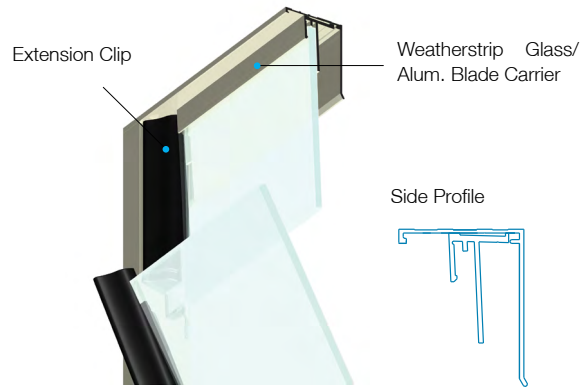
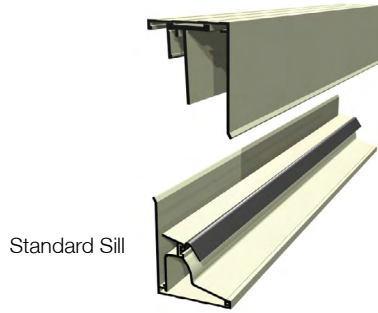
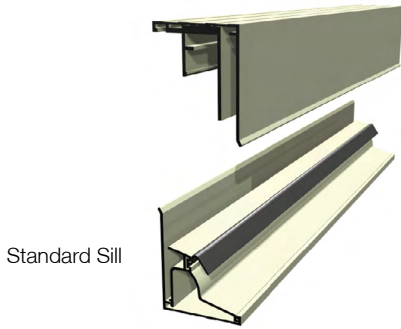
Glass Blade	Aluminum Blade	Wood Blade
1/4" thick Glass Blade	1/4" thick Hollow Extruded Aluminum Blade	9/16" thick straight cut Wood Blades

Altair® Standard Height Louver Weatherstrip



- The same Weatherstrip is used on both the head and sill for standard glass, aluminum and wood louvers.
- Weatherstrip, complete with seal, must be used top and bottom to gain manufacturer's performance warranty.
- Weatherstrips to head and sill add 3/16" to overall gallery height.
- The Altair Weatherstrip does not require notching to accommodate the Altair Gallery.
- Off Standard Height Galleries that are within 3/16" of a Standard Height Gallery will not have a top fixed blade and will therefore require Standard Height Weatherstrip sets.

Altair® Off Standard Height Louver Weatherstrip



Off Standard Height Head for Glass or Aluminum Blades

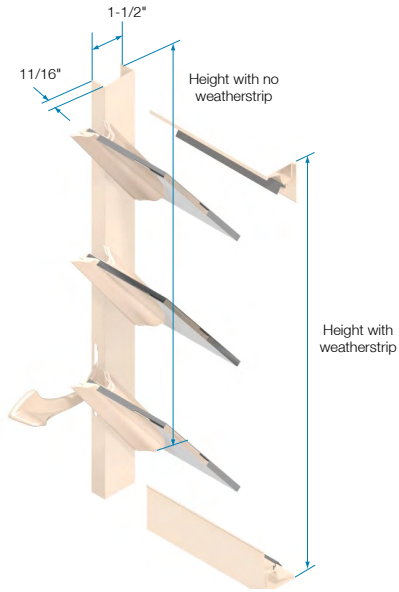
- Off Standard Height Galleries that are within 3/16"mm of a Standard Height Gallery will not have a top fixed blade and will therefore require Standard Height Weatherstrip sets.
- Off Standard Height Galleries that are more than 3/16"mm greater than or less than a Standard Height Gallery will have a top fixed blade and will therefore require Off Standard Height Weatherstrip sets.

Off Standard Height Head for Wood Blades

Standard Heights

Heights for 4" Blade Louver Gallery			
No. of Blades	Height No W'strip	Height With W'strip	Blades Controlled in Banks from Head Down
3	12-3/16"	12-19/32"	3
4	15-3/4"	16-5/32"	4
5	19-9/32"	19-11/16"	5
6	22-27/32"	23-7/32"	6
7	26-3/8"	26-25/32"	7
8	29-29/32"	30-5/16"	8
9	33-15/32"	33-27/32"	9
10	37"	37-13/32"	6 4
11	40-9/16"	40-15/16"	6 5
12	44-3/32"	44-1/2"	6 6
13	47-5/8"	48-1/32"	6 7
14	51-3/16"	51-9/16"	7 7
15	54-23/32"	55-1/8"	7 8
16	58-9/32"	58-21/32"	9 7
17	61-13/16"	62-7/32"	9 8
18	65-11/32"	65-3/4"	9 9
19	68-29/32"	69-9/32"	9 5 5
20	72-7/16"	72-27/32"	9 5 6
21	75-31/32"	76-3/8"	9 5 7
22	79-17/32"	79-29/32"	9 6 7
23	83-1/16"	83-15/32"	9 6 8
24	86-5/8"	87"	9 6 9
25	90-5/32"	90-9/16"	9 9 7
26	93-11/16"	94-3/32"	9 9 8
27	97-1/4"	97-5/8"	9 9 9
28	100-13/16"	101-3/16"	9 6 4 9
29	104-5/16"	104-3/4"	9 6 5 9
30	107-7/8"	108-1/4"	9 7 5 9

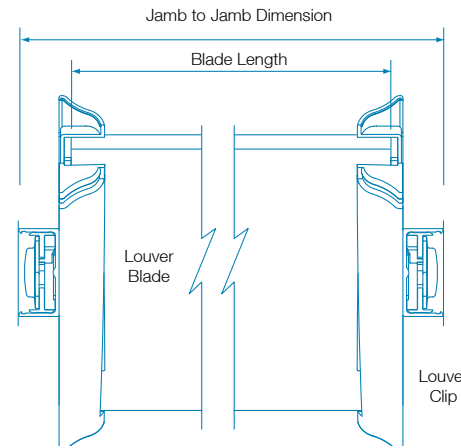




Heights for 6" Blade Louver Gallery

No. of Blades	Height No W/strip	Height With W/strip	Blades Controlled in Banks from Head Down
2	12-19/32"	13"	2
3	18-1/8"	18-1/2"	3
4	23-5/8"	24-1/32"	4
5	29-1/8"	29-17/32"	5
6	34-21/32"	35-1/32"	6
7	40-5/32"	40-9/16"	7
8	45-21/32"	46-1/16"	8
9	51-3/16"	51-9/16"	9
10	56-11/16"	57-3/32"	7 3
11	62-7/32"	62-19/32"	7 4
12	67-23/32"	68-1/8"	7 5
13	73-7/32"	73-5/8"	8 5
14	78-3/4"	79-1/8"	9 5
15	84-1/4"	84-21/32"	7 8
16	89-3/4"	90-5/32"	7 9
17	95-9/32"	95-21/32"	8 9
18	100-13/16"	101-3/16"	9 9
19	106-5/16"	106-11/16"	9 4 6
20	111-13/16"	112-3/16"	9 6 5

### Altair® Strip Hardware Blade Formulas



#### Blade Cut Length Strip Hardware

##### Glass, aluminum:

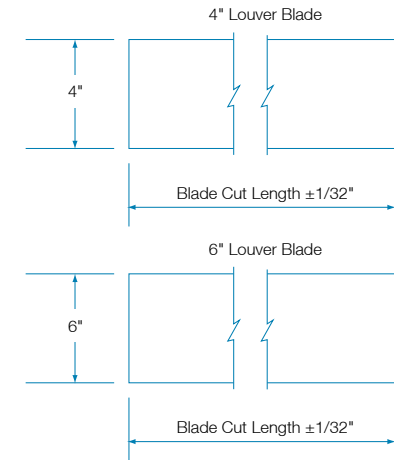
Blade Length = jamb to jamb less 2-1/16"

##### Stronghold glass & aluminum blades:

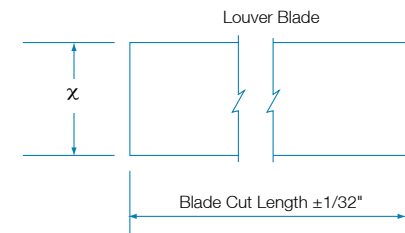
Blade Length = jamb to jamb less 1-7/8"

##### Wood blades:

Blade Length = jamb to jamb less 2-27/32"



#### Standard Louver Blade Dimensions



#### Extension Blade Dimensions

##### Glass & Aluminum blades:

X = Channel extension +13/16"

##### Wood blades:

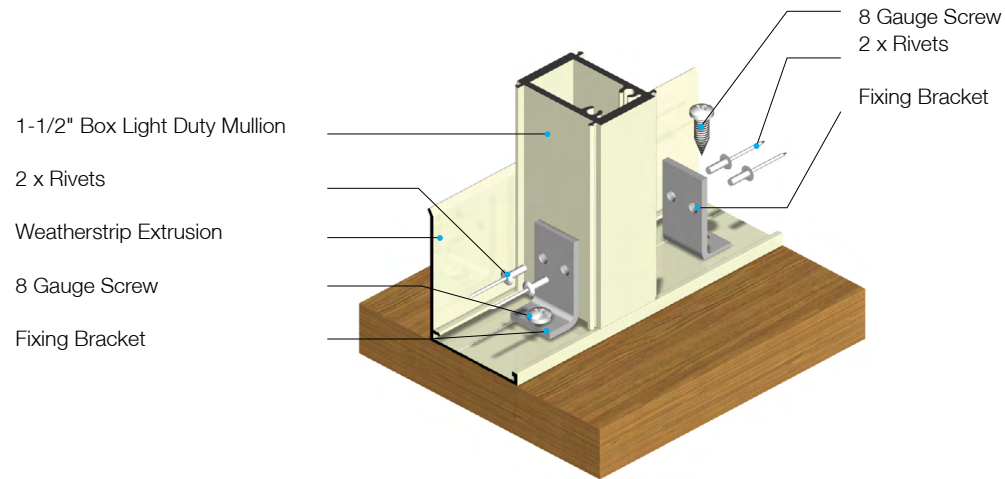
X = Channel extension +23/32"

#### NOTES:

Laminated glass is not recommended for external use due to the risk of de-lamination.

For allowable length of blades refer to Breezway Louver Windows's PRODUCT PERFORMANCE WARRANTY.

Fixing Brackets For Altair® Mullions



Bracket Details for Medium Duty Mullion

Altair® Louvers For Other Frames Checklist

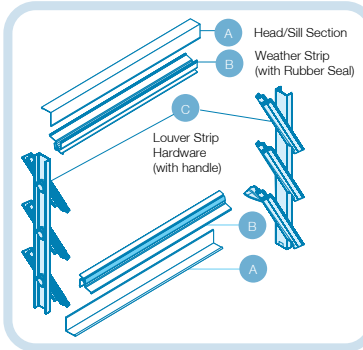
Required Information	Optional Information
----------------------	----------------------

- Gallery Clip Size
- Gallery Height
- Gallery Colors
- Left or Right Handed Control
- Handle Type
- Blade Length & Type
- Weather strip for head & sill

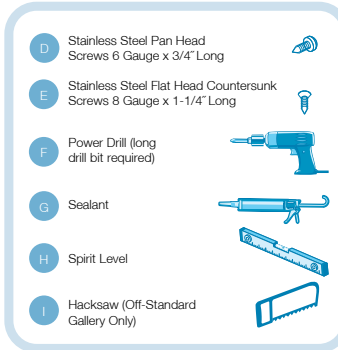
- Screw Holes

Installation Instructions

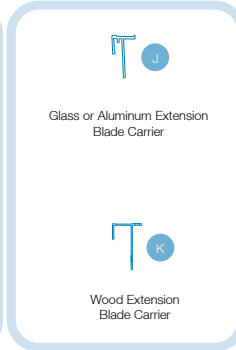
Standard Height Strip Hardware



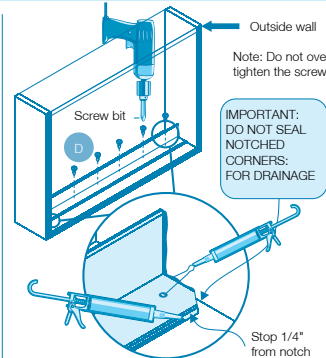
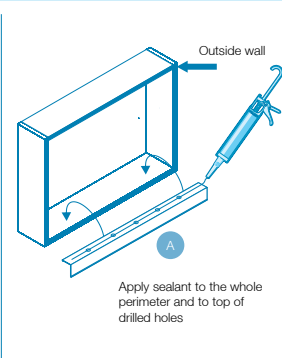
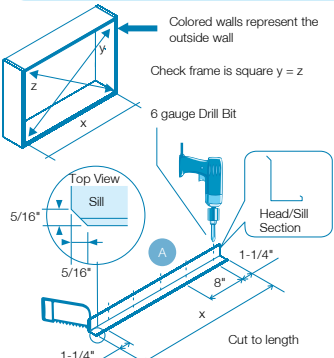
Fixings



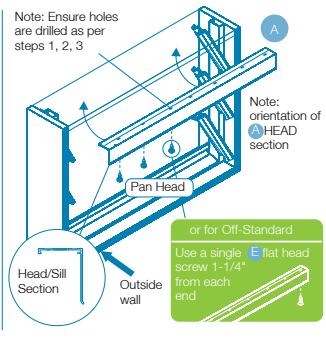
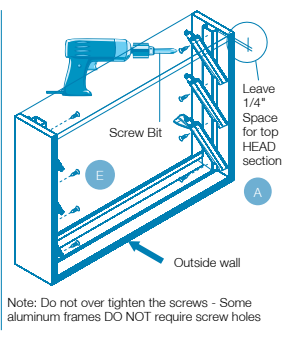
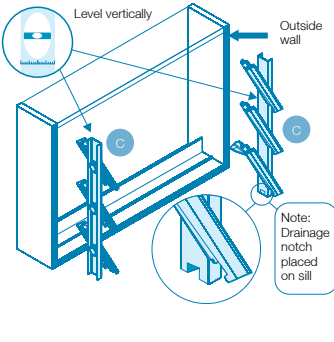
Off-Standard Height



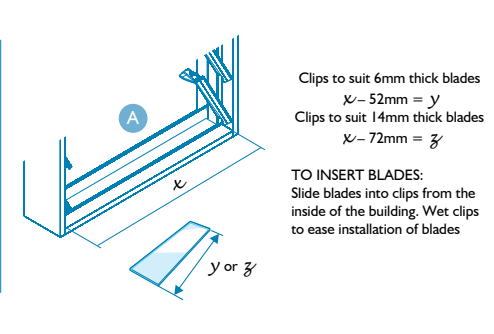
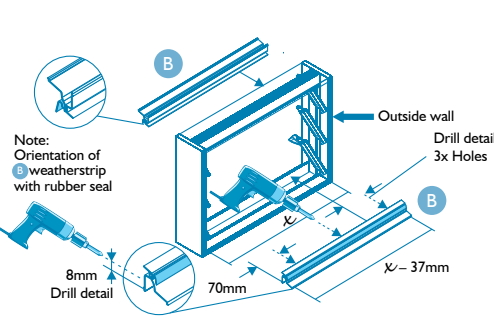
- 1 Check frame to be plumb, square and true, drill holes in sill
- 2 Apply sealant to sill
- 3 Attach sill



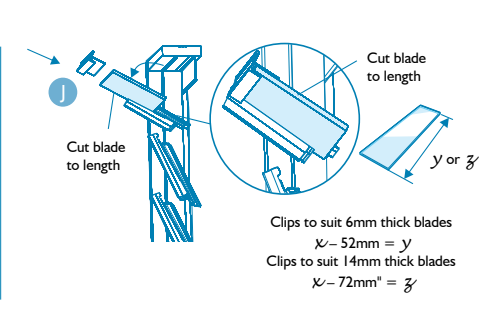
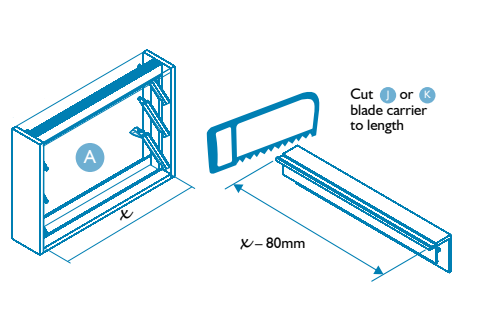
- 4 Insert louver galleries
- 5 Attach louver galleries
- 6 Insert and attach head section



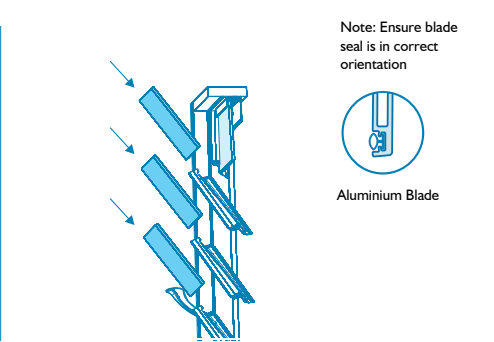
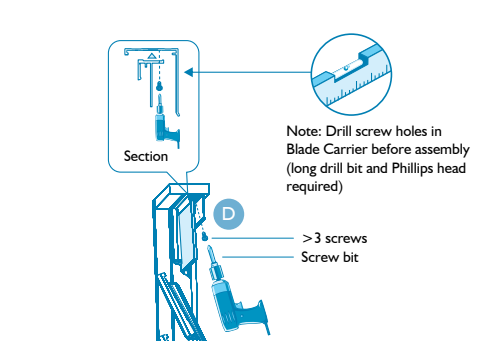
- 7 Check galleries to be true and plumb (Standard Height Only)
- 8 Calculation of blade width (Standard Height Only)



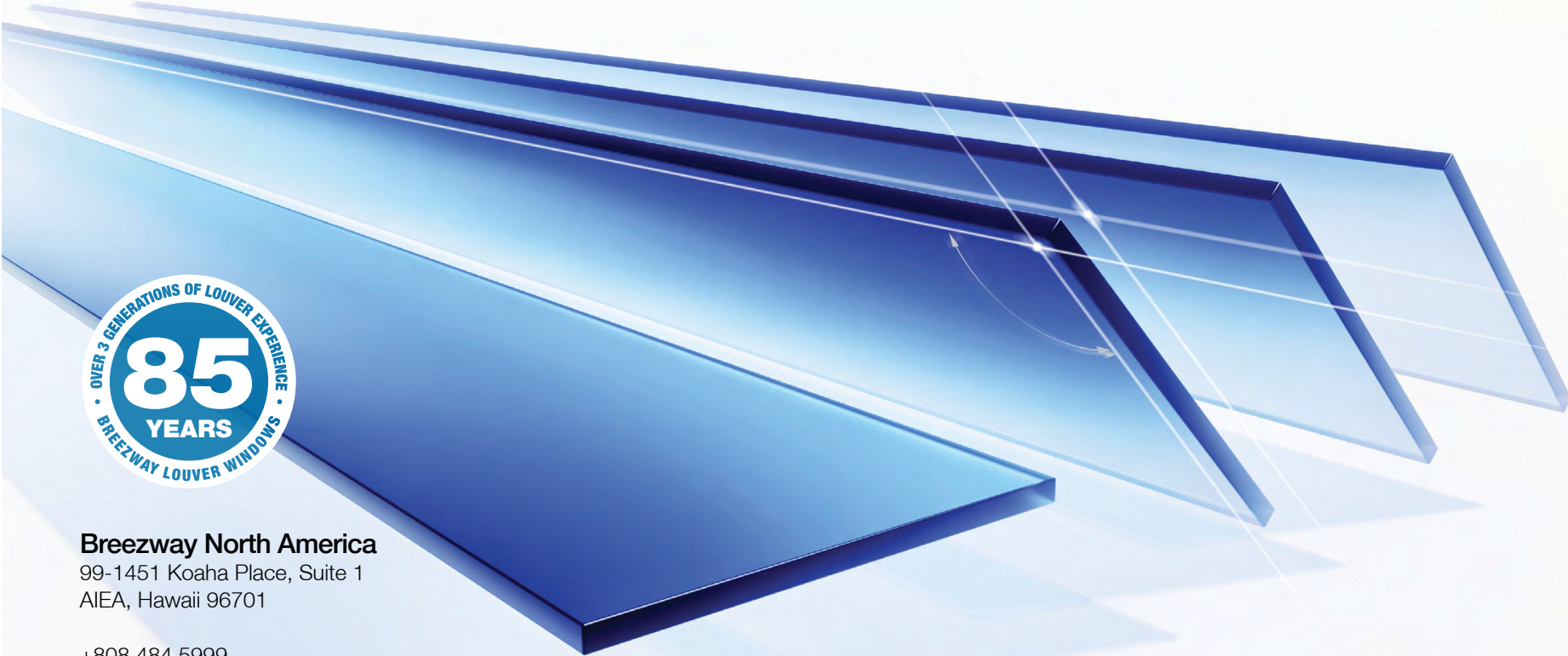
- 7a Cut blade carrier to length (Off-Standard Height Only)
- 8a Assemble blade carrier and blade into galleries (Off-Standard Height Only)



- 8b Rotate blade and attach (Off-Standard Height Only)
- 9 Insert blades and close louvres (Off-Standard Height Only)



# Life's better with Natural Ventilation



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