



Hurricane[®] BAL Installation Instructions

PRINT IN COLOUR



V3 | 12/23

1. SYSTEM PRE-REQUISITES – Check Before Commencing

Before attempting to start the installation, please ensure that the following allowable roof pitch and make-up air requirements can be met.

Product	Make-up air* per ventilator - 100% open, evenly distributed open area	Allowable Roof Pitch
Hurricane BAL 300 - 400	≥ 0.3m ²	up to 45°
Hurricane BAL 450 - 600	≥ 0.5m ²	up to 45°
Hurricane BAL 700 - 900	≥ 0.9m ²	up to 22.5°

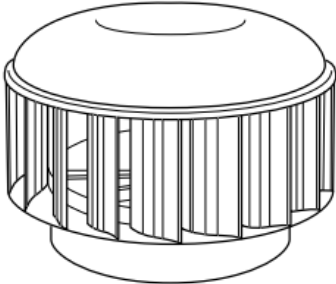
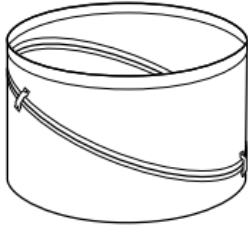
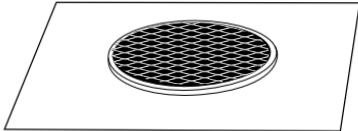
* Performance values are based on a 5Pa pressure loss across the make-up air opening.

Additional make-up air can be provided as per the recommendations in AS1668.2.

DO NOT PROCEED TO INSTALL THIS PRODUCT IF THE ABOVE REQUIREMENTS CANNOT BE MET

2. PACKING LIST – Check Before Commencing

Included Parts

Ventilator Head	Varipitch	Flashing with Integrated Mesh
		

Additional Materials Required - Not Supplied

a. FASTENERS (Quantity and Type)

Product	Head to Varipitch	Varipitch to Flashing	Flashing to Roof
Hurricane BAL 300 - 400	6	6	12
Hurricane BAL 450 - 600	9	9	16
Hurricane BAL 700 - 900	12	12	26
Fasteners	<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>		

b. SUPPLEMENTARY FLASHING required for installation away from the ridge – refer to section 9 for details.

3. IMPORTANT: Note regarding lifting this product

Lift the product in its original packaging using a crane or similar equipment to the roof mounting location, prior to removing the product from its packaging.

Caution During Handling:

The ventilator top surface/dome can be easily scratched or deformed when placed upside down so always place it on a soft/smooth surface such as cardboard or a soft-foam mat.

4. SAFETY WARNINGS

- a. The installation of this product involves working at heights on a sloping surface and may be dangerous, including the potential of death, personal injury, or property damage.
- b. Follow the state or territory regulator OH&S guidelines for working at heights, electrical, working in elevated temperatures (e.g. roof space in summer). For more information on your State OH&S guidelines for working at heights, please refer to: <https://www.safeworkaustralia.gov.au/heights>
- c. All ventilation products must be installed by a qualified installer and all electrical wiring (where applicable) must be undertaken by a qualified electrician.
- d. Due to the size and weight of the turbine, it is recommended that it is always lifted by 2 people or a crane. Refer to the lifting instructions.
- e. Damaged parts must be replaced with a genuine replacement part from CSR Bradford Ventilation.
- f. The turbine head of this product can rotate without warning (even during installation) – always keep body parts away from moving components.
- g. Please read this manual carefully before installing this product and keep it for future reference or provide it to the building owner/maintenance manager.

5. LIMITATIONS

Not suitable for use in cyclonic regions and BAL-FZ zones.

Compliance of this product is dependent upon adherence to this installation guide.

6. PRODUCT SUITABILITY

Always check product suitability & limitations of use prior to selection and purchase - refer to the Product Technical Statement (PTS) available online.

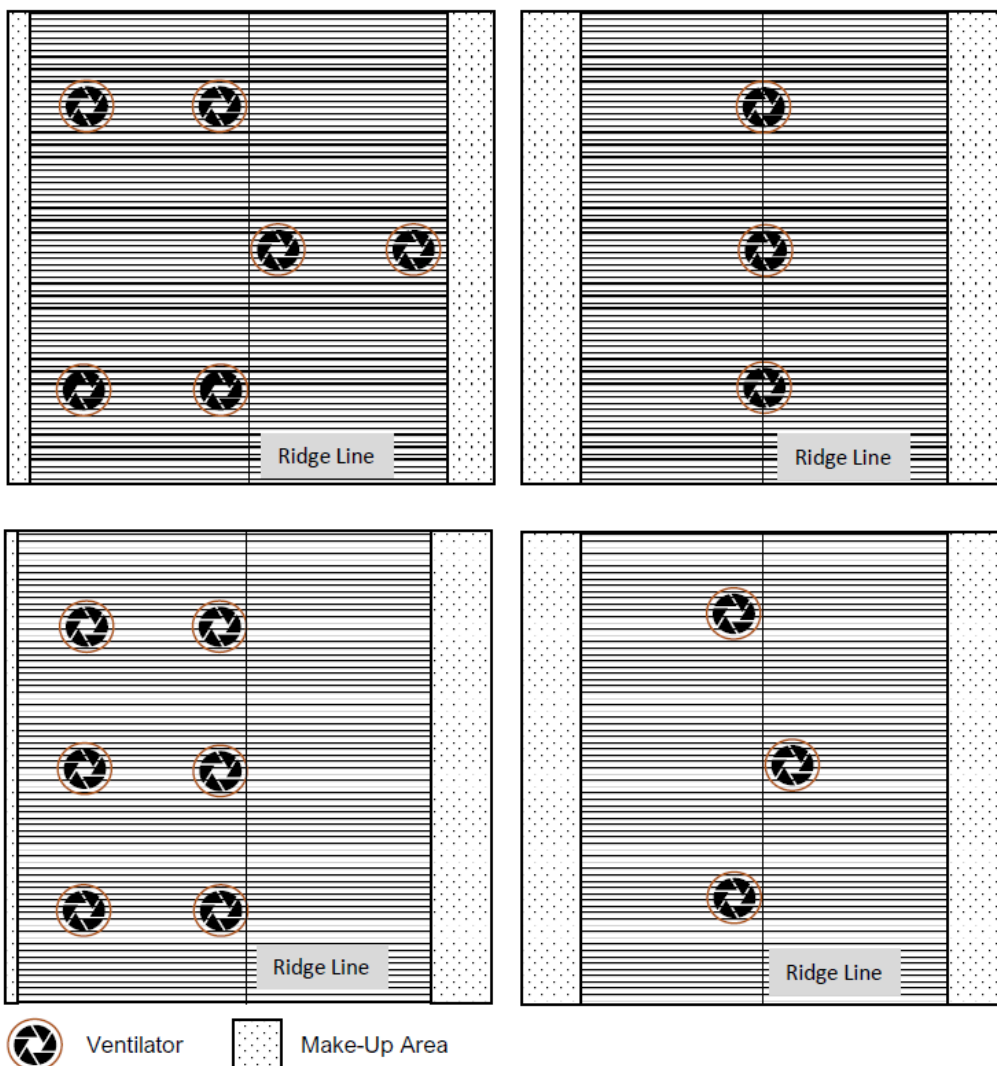


7. VENTILATOR POSITIONING & PROVISION FOR MAKE-UP AIR

CSR Bradford Ventilation recommends that ventilators are positioned 4m to 6m away from each other in all directions for effective and efficient performance. It is also recommended that ventilators of the same size are used together to prevent replacement air from being drawn between ventilators of different sizes. Ensure that the ventilators are not sheltered from the wind by surrounding objects, the shadow angle created by the roof ridge or by each ventilator.

Make-up air is required for the ventilator to replenish the exhausted air. As a general guide, the largest make-up air entry should be positioned on the opposite side of the building to the largest ventilator demand. The make-up air location should be positioned at optimum height to provide efficient sweeping of the floor area with outdoor air.

The illustrations below provide a number of generic ventilator and make-up air layouts but it should be noted that a whole-of-building assessment, as per AS1668.2, should be conducted by a suitably qualified person prior to deciding upon site-specific ventilator and make-up air placement.

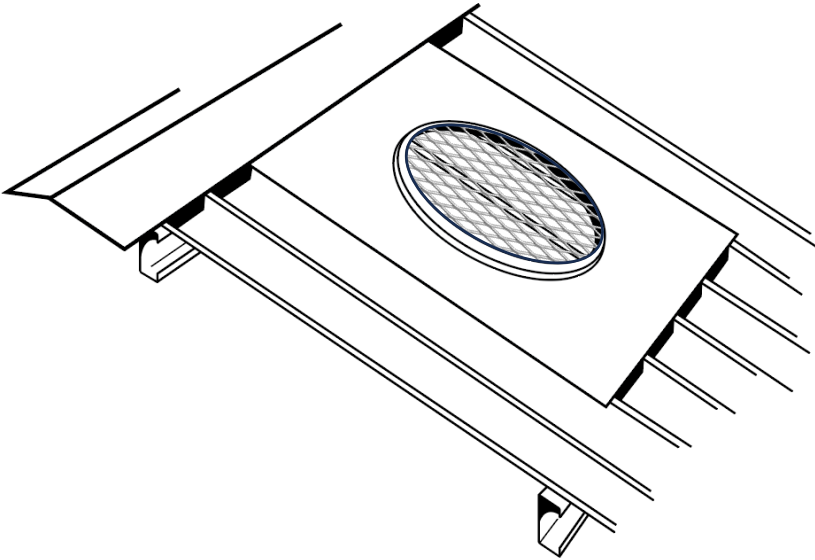


IMPORTANT: If external make-up air is insufficient, the ventilators will draw make-up air from each other – this will both diminish the effectiveness of the system and increase the risk of the system drawing external water into the building during periods of rain. It is also recommended that ventilators of the same size are used together to prevent replacement air from being drawn between ventilators of different sizes.

8. INSTALLATION UNDER THE RIDGE

Note: See Section 9 for installation away from the ridge.

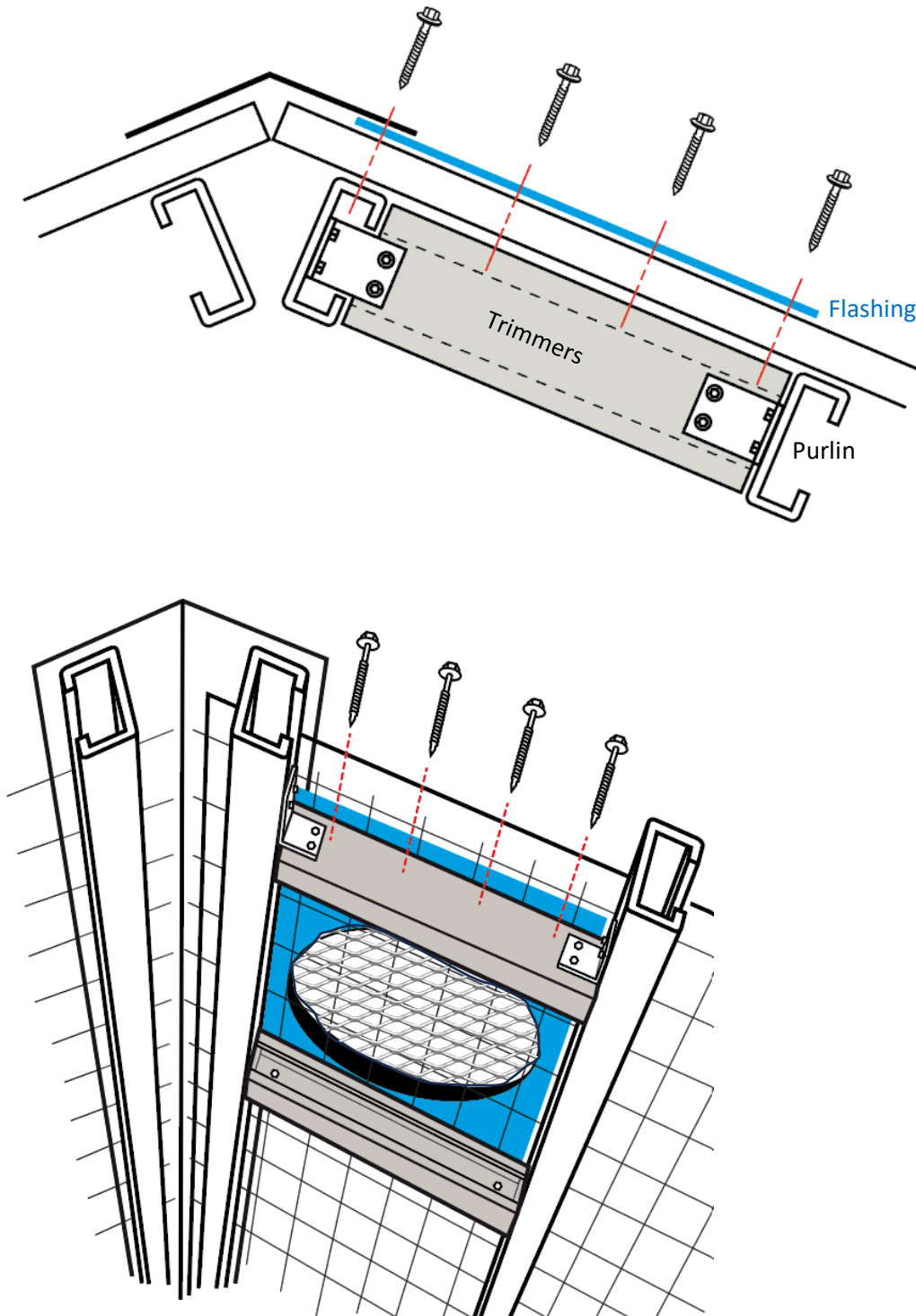
- a. **Set Position:** Remove screws from the ridge cap to allow the ventilator base flashing to be positioned under the ridge cap. Place the base flashing under the ridge cap at the required position and adjust the position to avoid structural roof members below the roof sheet. Ensure the flashing covers the corrugation or ribs equally on each side of the flashing, then mark the size and position of the round (flashing opening diameter) cutout by lifting and marking the roof repeatedly - alternatively use a cardboard template to mark the hole.



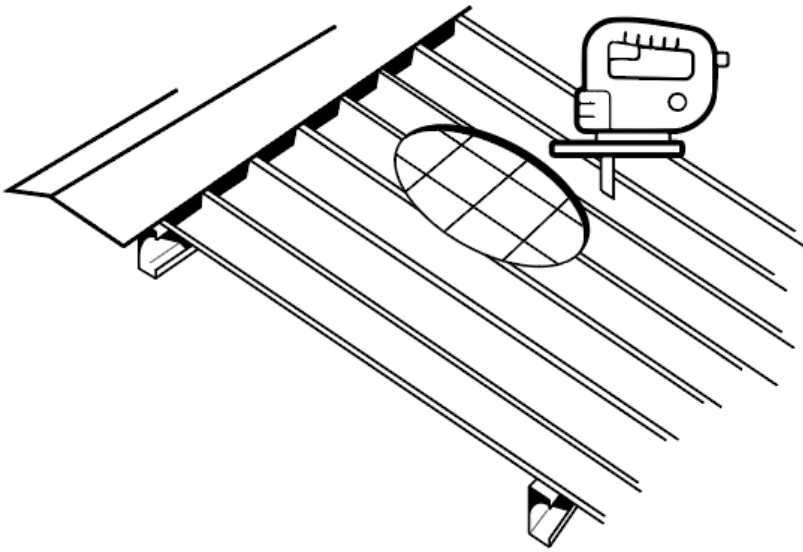
Important Note Regarding Roof Structural Support:

H300 BAL – H600 BAL – If the purlin spacing is larger than 600mm, trimmers are required. Install the trimmers between the purlin on either side of the opening. Do not cover the openings.

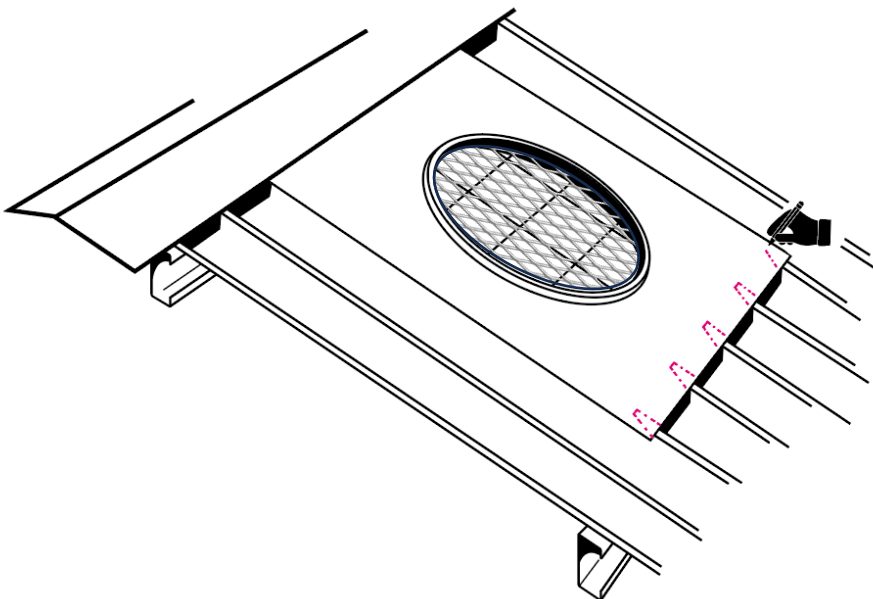
H700 BAL – H900 BAL – If the purlin spacing is larger than 1000mm, trimmers are required. Install the trimmers between the purlin on either side of the opening. Do not cover the opening.



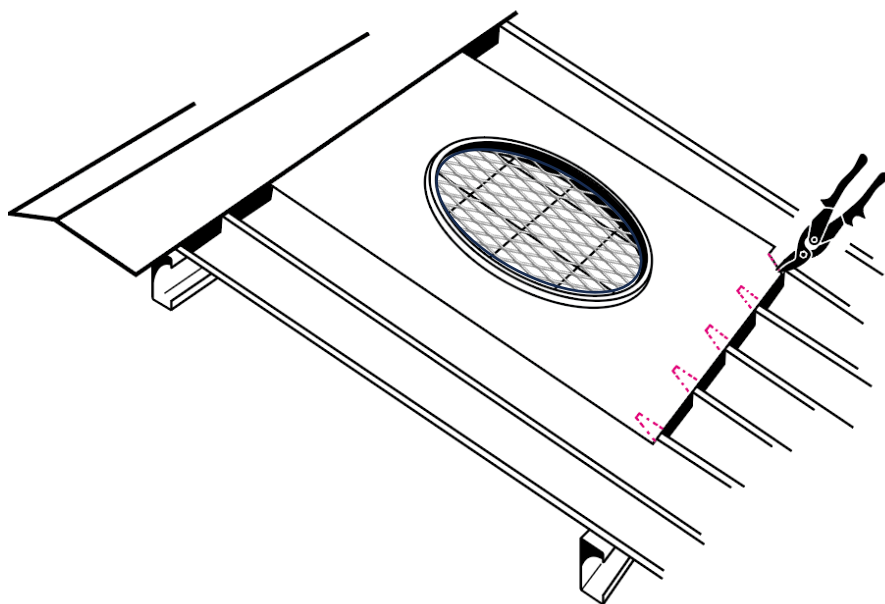
- b. **Cut Hole:** Carefully cut the marked hole, remembering that there may be insulation and other roof members under the roof sheet. Once the hole has been cut, fold up the edge of the corrugations or pans to ensure there are no gaps between roof cladding and flashing. Ensure the roofing safety mesh/net integrity is maintained after the installation.



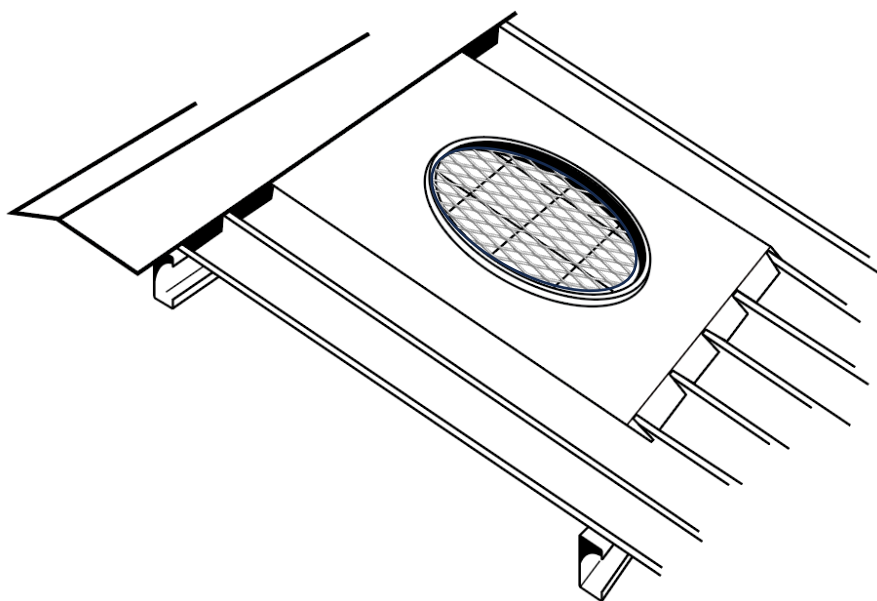
- c. **Secure Flashing:** Attach the flashing under the ridge cap and using a marker draw the profile of the roof corrugation on the bottom edge of the flashing to match the roof profile.



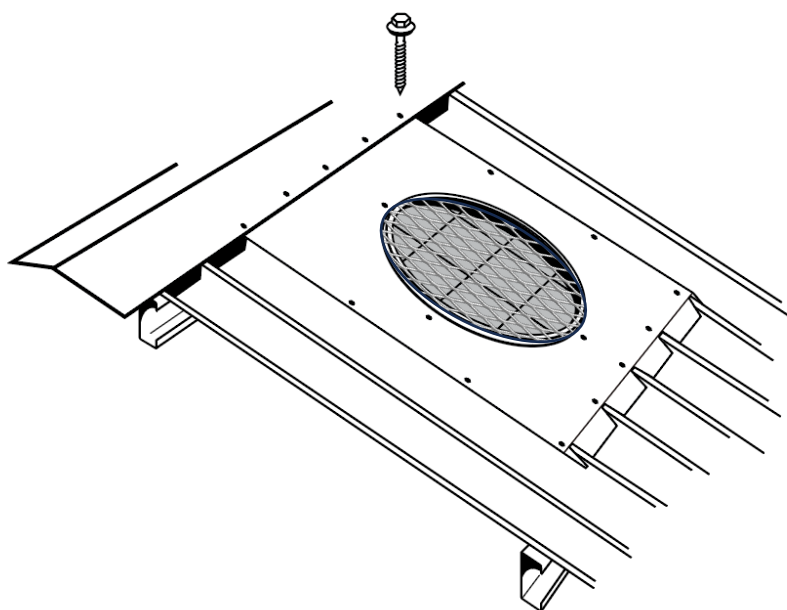
Using a pair of tin snips, cut the bottom edge of the flashing to match the roof profile. It is important to ensure that the flashing accurately matches the profile of the roof cladding with no gaps.



Using a soft rubber hammer, carefully work around the sides and lower edge of the flashing to form it into the corrugations of the metal sheeting profile. Care should be taken when forming the flashing so that the gaps between the roofing material and the flashing are less than 2mm.

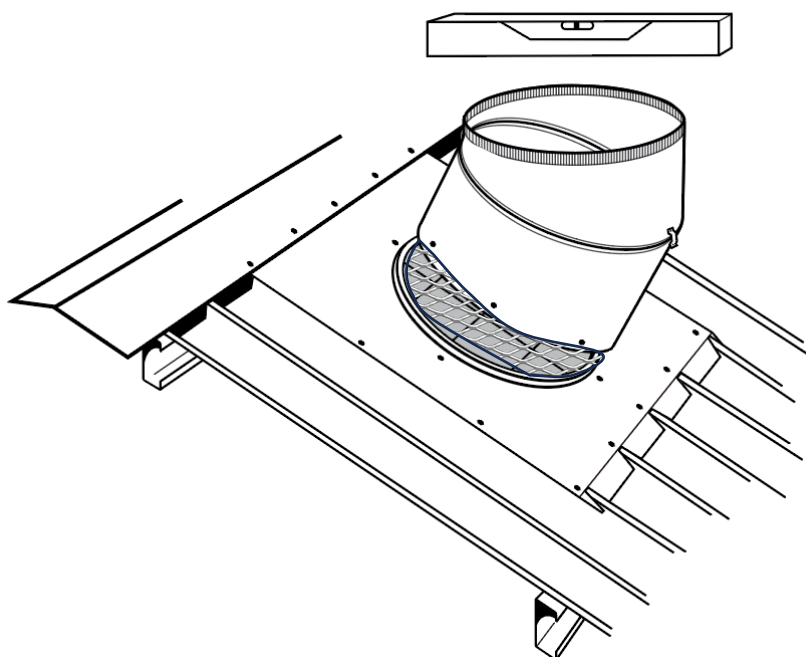


Apply sealant prior to final fixing (refer to the table below for the required number of fasteners). If trimmers are used ensure the flashing is secured to the trimmers. Seal all fasteners with a suitable sealant to ensure they are weatherproof.

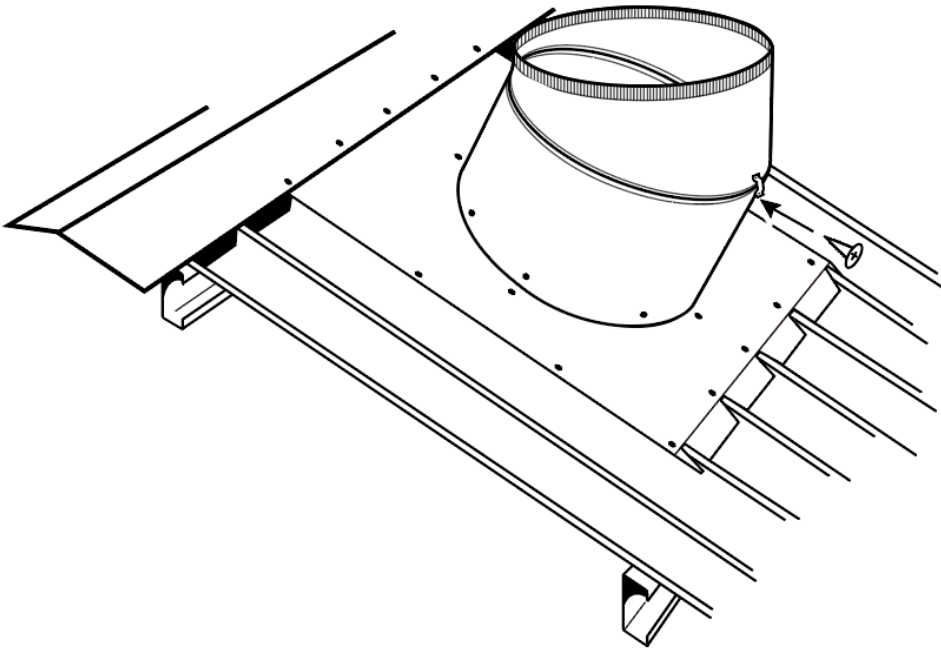


Model	Fasteners to secure flashing to roof
Hurricane BAL 300 – 400	12 (4 near throat)
Hurricane BAL 450 - 600	18 (4 near throat)
Hurricane BAL 700 - 900	26 (4 near throat)
<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

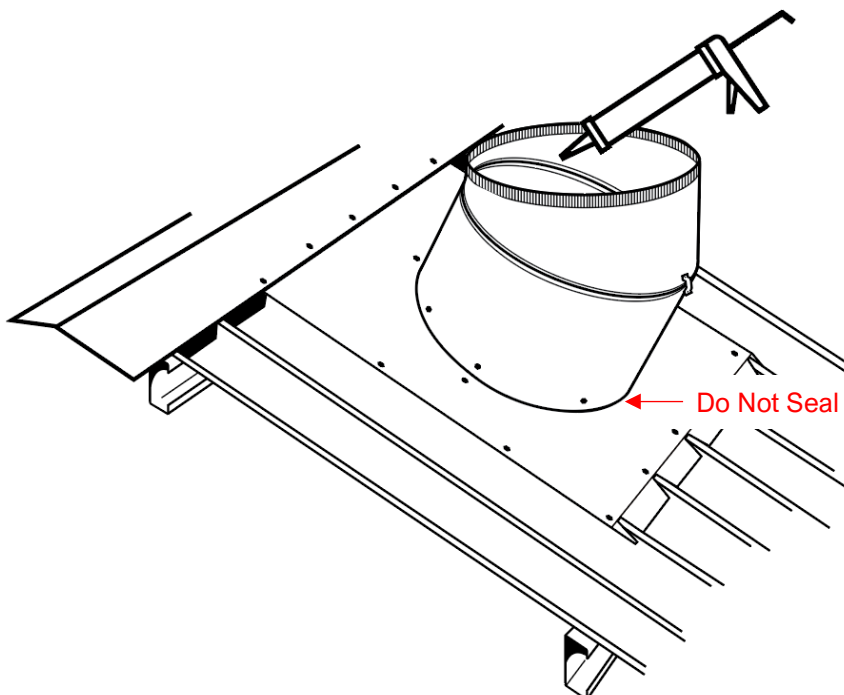
- d. **Assemble the Varipitch:** When a Varipitch throat is being used, position the Varipitch on the flashing and rotate the top and bottom halves until the top of the Varipitch is level (horizontal) - it is recommended that an electronic or spirit level is used to ensure that the top edge of the throat is horizontal in all directions.



- e. **Secure the Varipitch Angle:** With the Varipitch upper throat positioned horizontally, lock it into position using the supplied Varipitch clip. Use either self-tapping screws or blind rivets to secure all the clips between the two halves of the Varipitch.

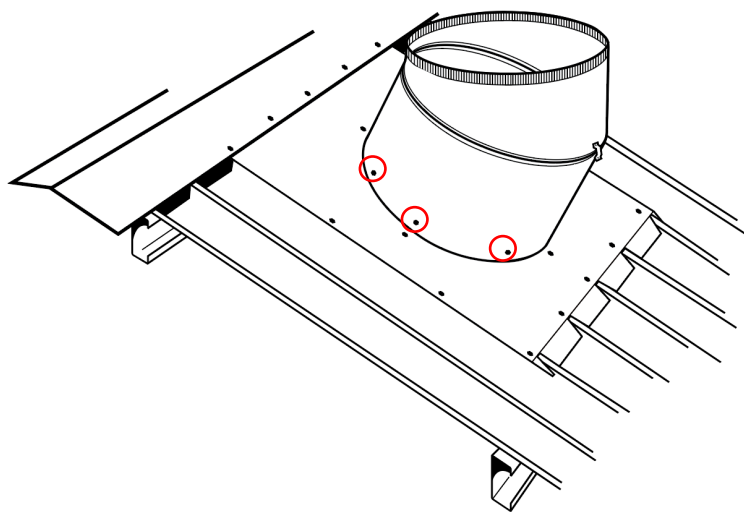


- f. **Weather Sealing:** Apply sealant to all exposed screw heads and seal the Varipitch seam on the inside with a bead of weather-resistant suitable sealant.



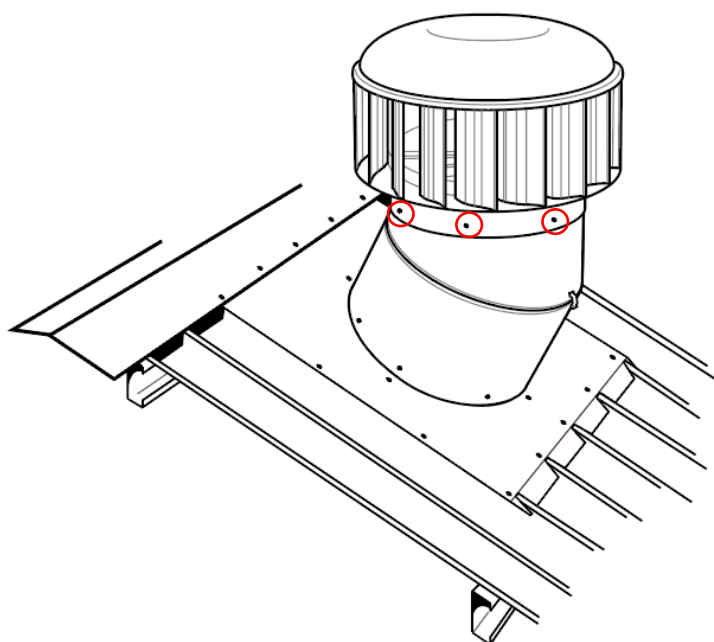
NOTE: DO NOT apply sealant to the joint between the flashing and Varipitch. This is a natural gutter to release any trapped condensation. See details in section (i) below.

- g. **Secure Varipitch to Flashing:** Reposition the Varipitch on the Flashing and check it is horizontal - secure the Varipitch to the flashing using the recommended number of screws shown in the table below – **DO NOT SEAL** this connection.



Model	Fasteners to secure varipitch to flashing
Hurricane BAL 300 – 400	6
Hurricane BAL 450 - 600	9
Hurricane BAL 700 - 900	12
<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

- h. **Assemble Turbine:** Assemble the turbine head to the Varipitch. Re-check if the assembly is level (horizontal). Ensure the knurling (the tapered section of the Varipitch) is fully inside the ventilator throat and secure the ventilator throat by fastening it to the top of the Varipitch with the number of fasteners shown in the table below.

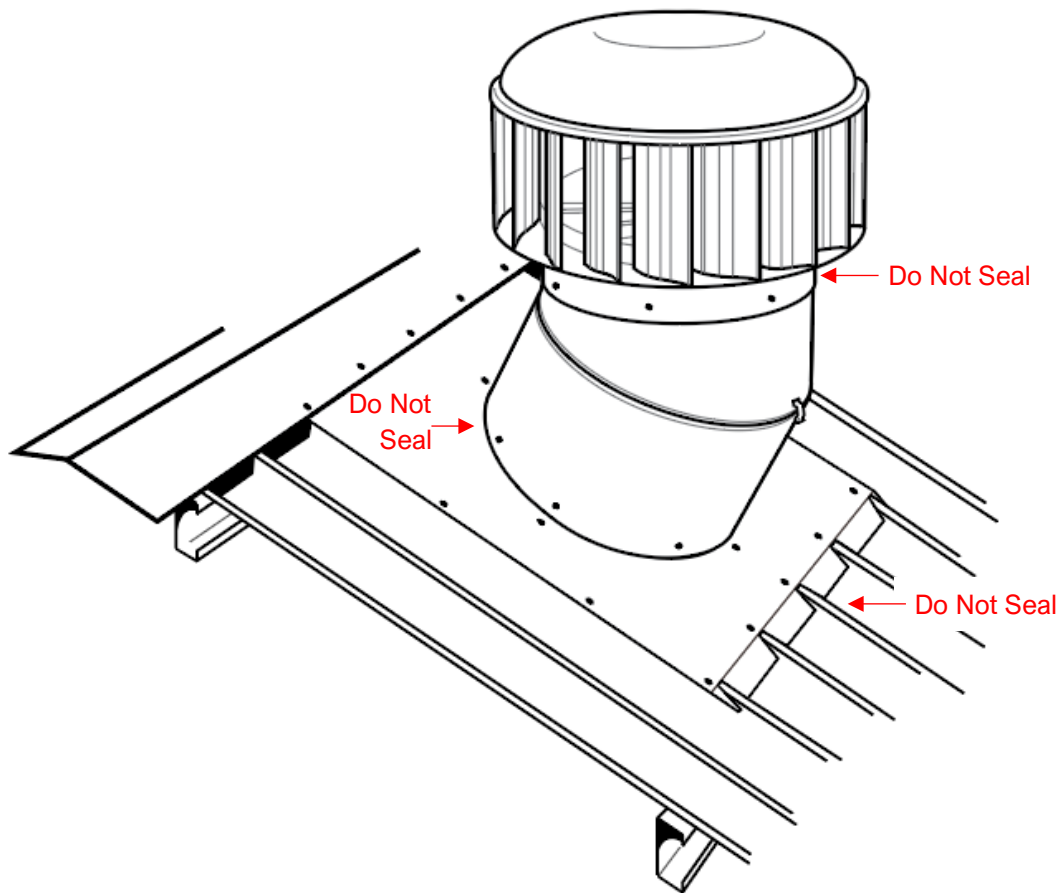


Model	Fasteners to secure turbine to varipitch
Hurricane BAL 300 – 400	6
Hurricane BAL 450 - 600	9
Hurricane BAL 700 - 900	12
<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

NOTE: DO NOT apply sealant to the joint between the turbine and Varipitch. This is a natural gutter to release any trapped condensation. See details in section (i) below.

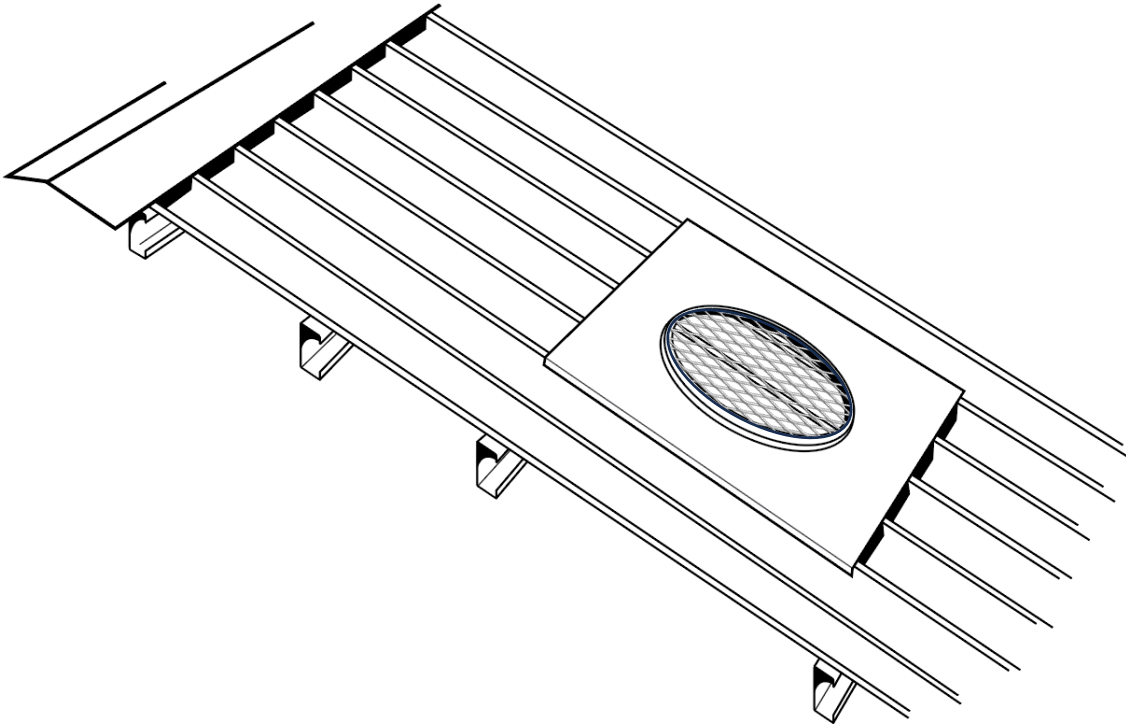
- i. Sealing is crucial for this product but there is also a requirement for drainage. To ensure that only the required areas are sealed, and the drainage path is left open, follow this guide carefully:

Location Area	Sealing Requirement
All fasteners	Seal
Flashing perimeter to roof	Seal
Varipitch seam (inside throat)	Seal
Turbine to varipitch	Do Not Seal
Varipitch to flashing	Do Not Seal
Flashing bottom edge to roof	Do Not Seal



9. INSTALLATION AWAY FROM RIDGE

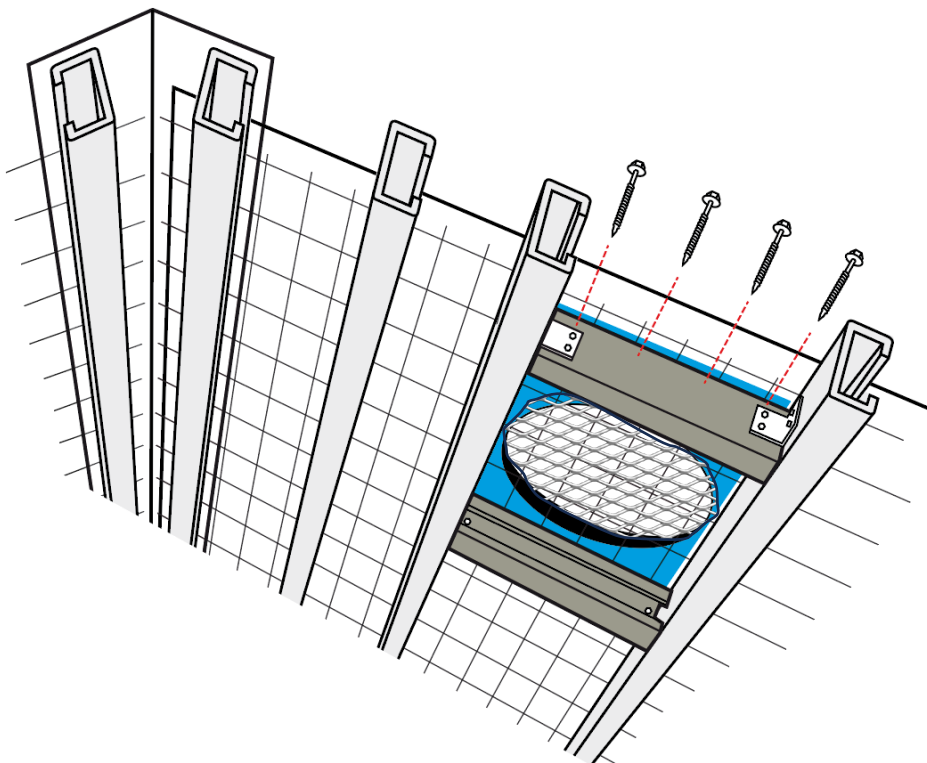
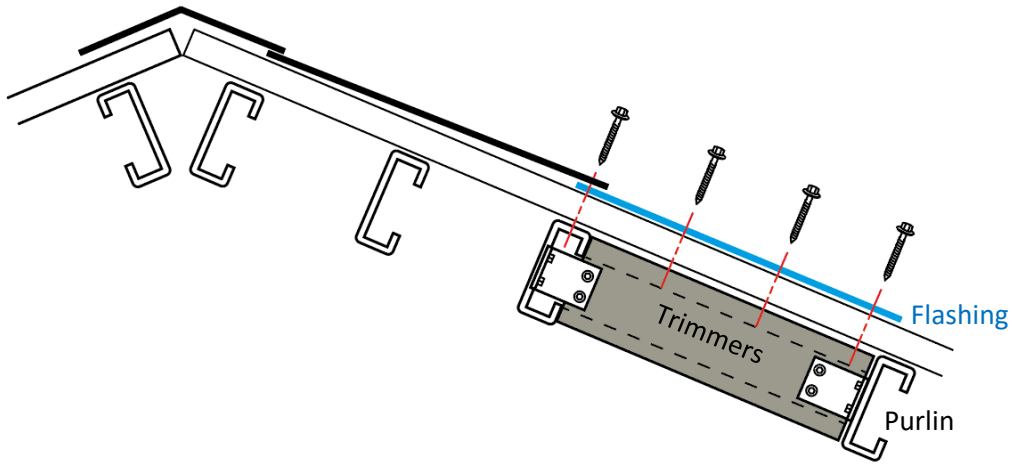
- a. **Set Position:** Place the base flashing at the required position and adjust the position to avoid structural roof members below the roof sheet. Ensure the flashing covers the corrugation or ribs equally on each side of the flashing, then mark the size and position of the round (flashing opening diameter) cutout by lifting and marking the roof repeatedly - alternatively use a cardboard template to mark the hole.



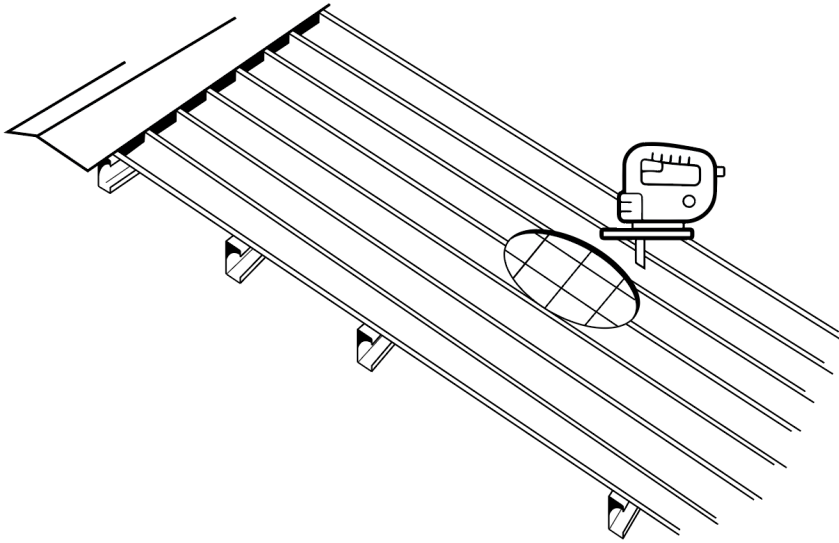
Important Note Regarding Roof Structural Support:

H300 BAL – H600 BAL – If the purlin spacing is larger than 600mm, trimmers are required. Install the trimmers between the purlin on either side of the opening. Do not cover the openings.

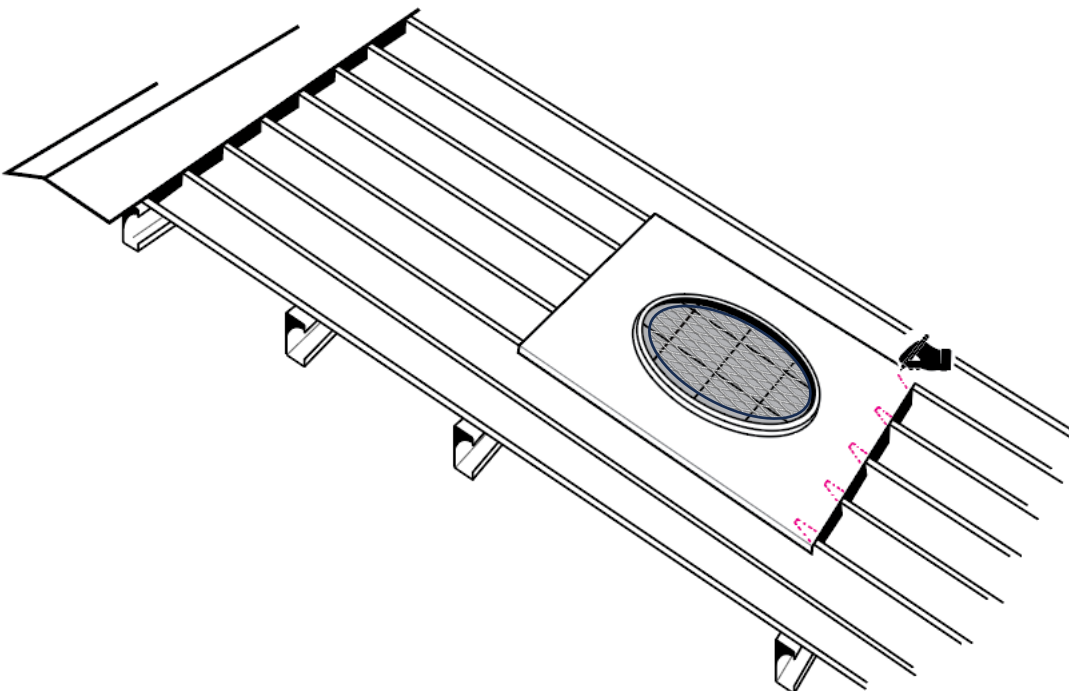
H700 BAL – H900 BAL – If the purlin spacing is larger than 1000mm, trimmers are required. Install the trimmers between the purlin on either side of the opening. Do not cover the opening.



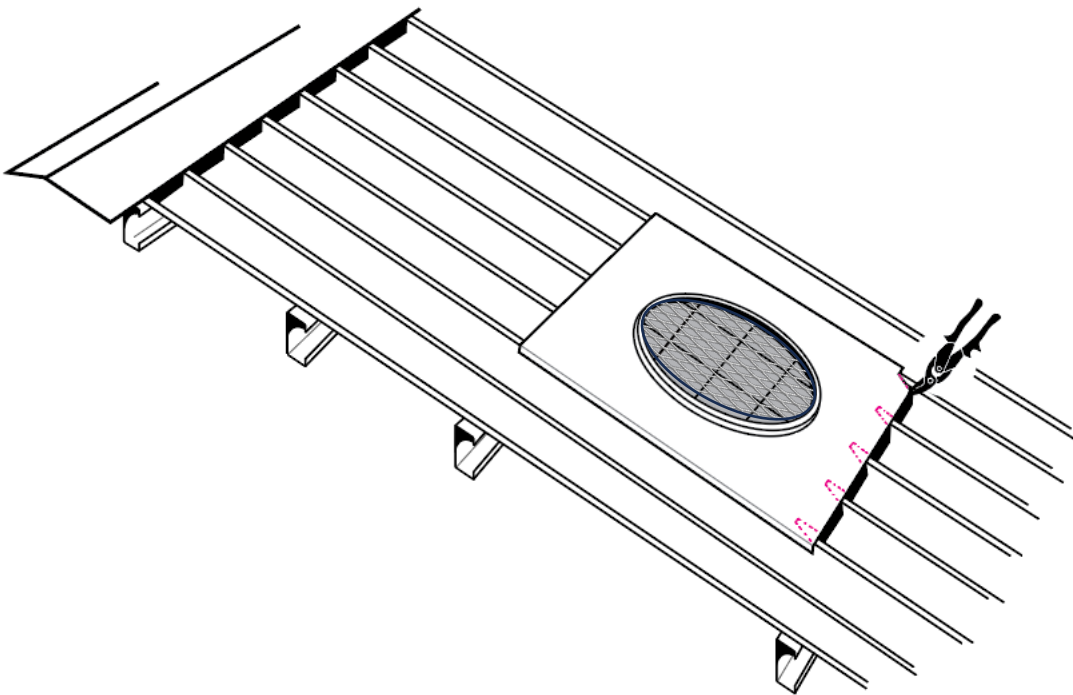
- b. **Cut Hole:** Carefully cut the marked hole, remembering that there may be insulation and other roof members under the roof sheet. Once the hole has been cut, fold up the edge of the corrugations or pans to ensure there are no gaps between roof cladding and flashing. Ensure the roofing safety mesh/net integrity is maintained after the installation.



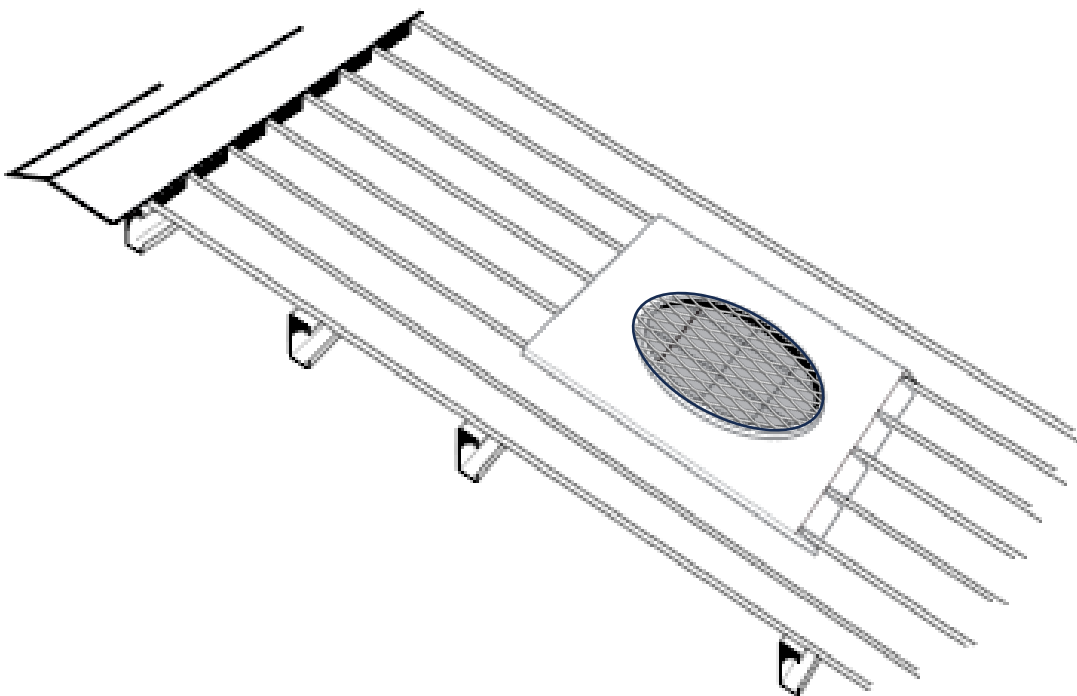
- c. **Secure Flashing:** Attach the flashing over the roof hole and using a marker draw the profile of the roof corrugation on the bottom edge of the flashing to match the roof profile.



Using a pair of tin snips, cut the bottom edge of the flashing to match the roof profile. This will help ensure the lower profile of the roof covered by the flashing.

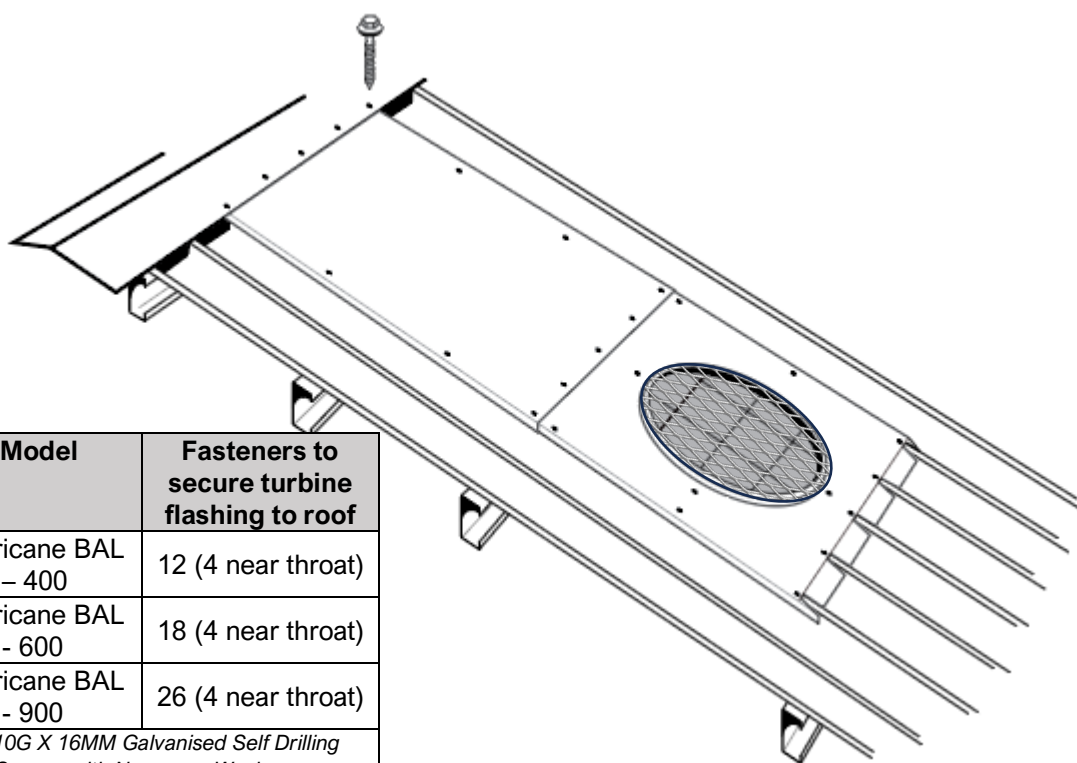
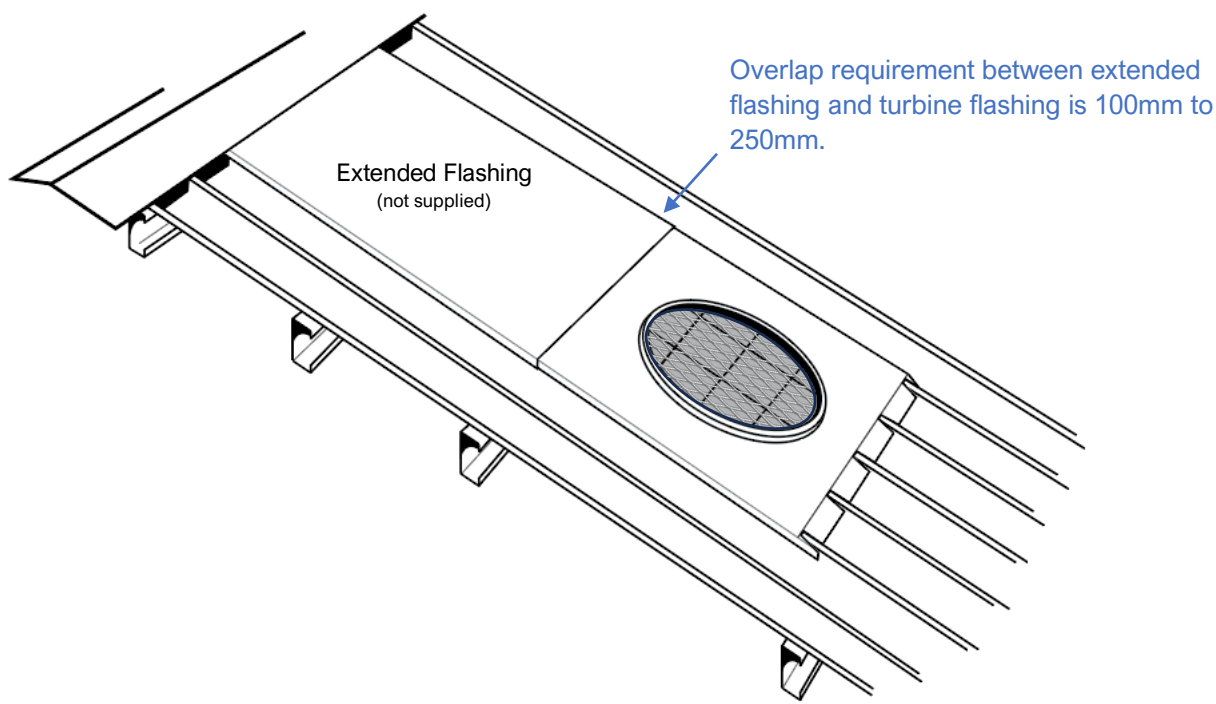


Using a soft rubber hammer, carefully work around the sides and lower edge of the flashing to form it into the corrugations of the metal sheeting profile. Care should be taken when forming the flashing so that the gaps between the roofing material and the flashing are less than 2mm.



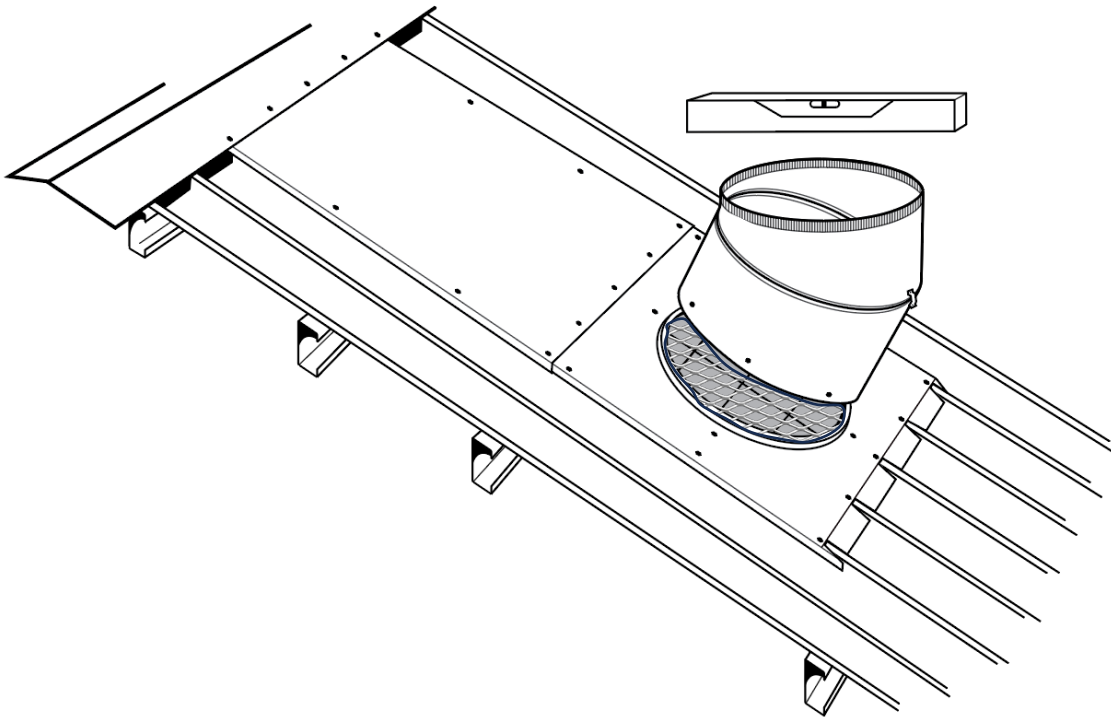
Apply sealant prior to final fixing (refer to the table below for the required number of fasteners). If trimmers are used ensure the flashing is secured to the trimmers. Seal all fasteners with a suitable sealant to ensure they are weatherproof.

Remove screws from the ridge cap to allow the backflashing tray to be positioned under the ridge cap. Slide one end of the backflashing tray under the ridge cap and the bottom end over the flashing - ensure that it overlaps 100 to 250mm..

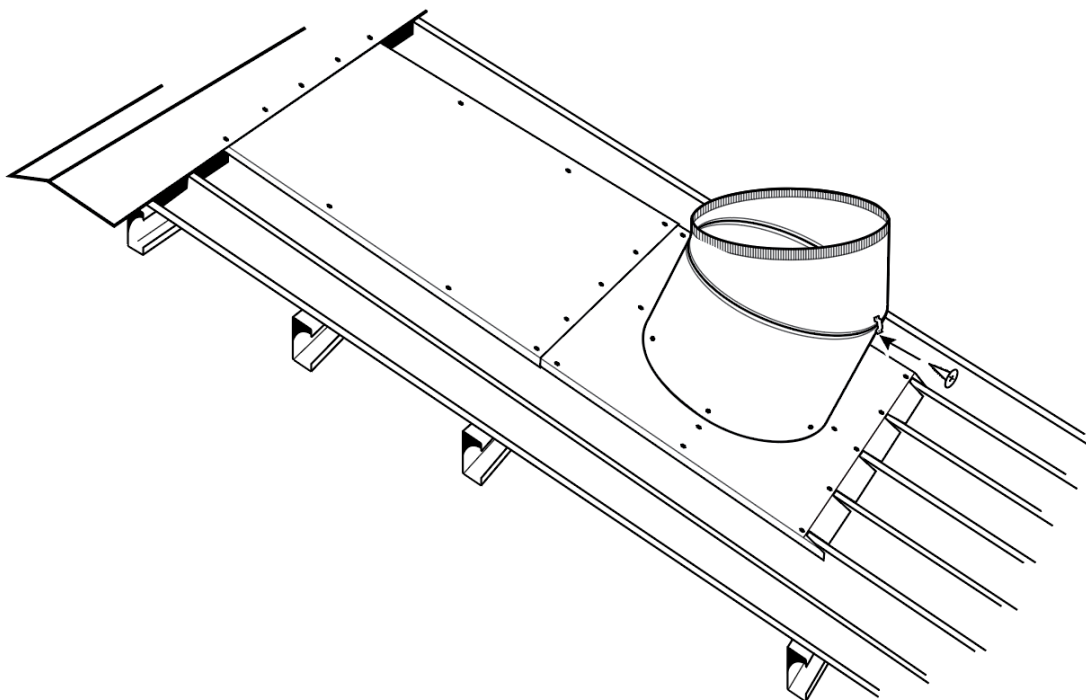


Model	Fasteners to secure turbine flashing to roof
Hurricane BAL 300 - 400	12 (4 near throat)
Hurricane BAL 450 - 600	18 (4 near throat)
Hurricane BAL 700 - 900	26 (4 near throat)
<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

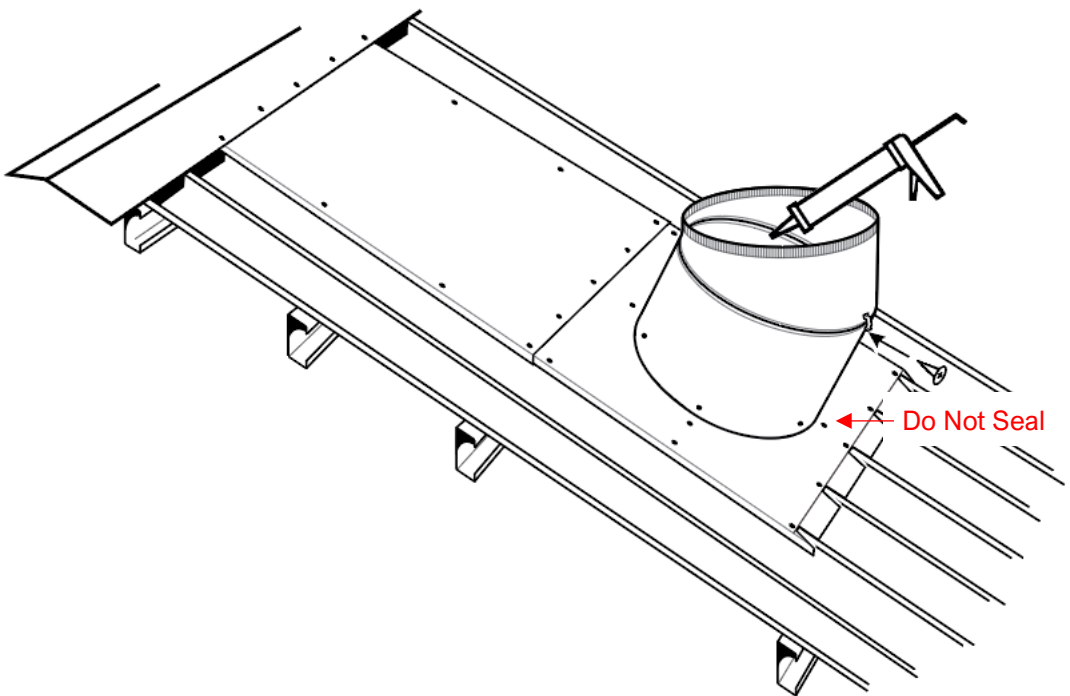
- d. **Assemble the Varipitch:** When a Varipitch throat is being used, position the Varipitch on the flashing and rotate the top and bottom halves until the top of the Varipitch is level (horizontal) - it is recommended that an electronic or spirit level is used to ensure that the top edge of the throat is horizontal in all directions.



- e. **Secure the Varipitch Angle:** With the Varipitch upper throat positioned horizontally, lock it into position using the supplied Varipitch clip. Use either self-tapping screws or blind rivets to secure all the clips between the two halves of the Varipitch.

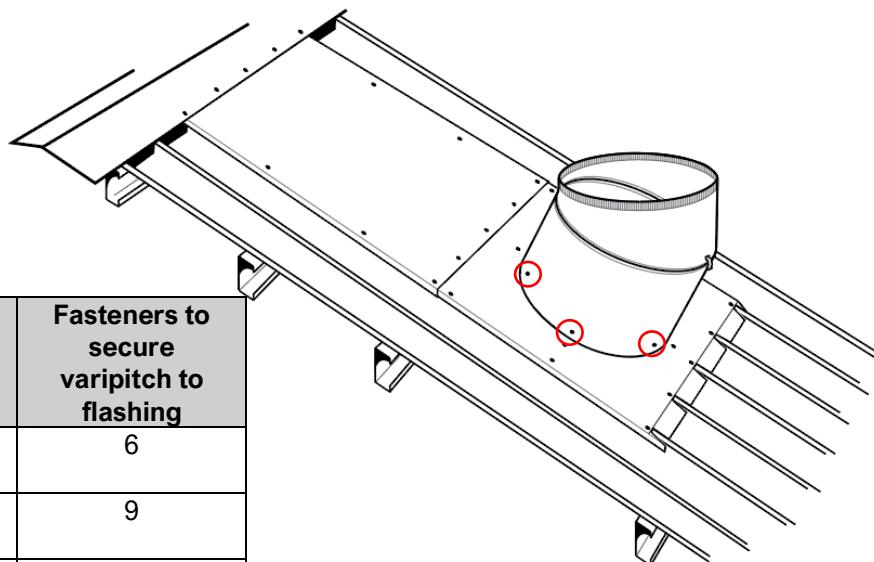


- f. **Weather Sealing:** Seal the Varipitch seam on the inside with a bead of weather-resistant suitable sealant.



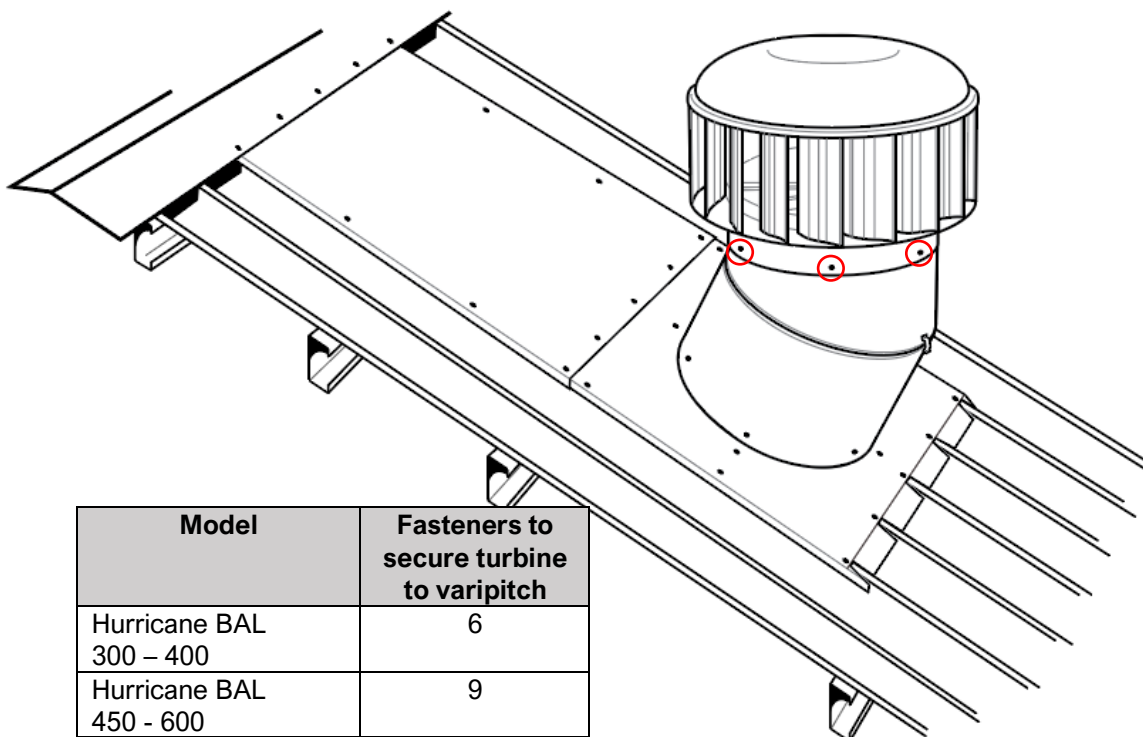
NOTE: DO NOT apply sealant to the joint between the flashing and Varipitch. This is a natural gutter to release any trapped condensation. See details in section (i) below.

- g. **Secure Varipitch to Flashing:** Reposition the Varipitch on the Flashing and check it is horizontal - secure the Varipitch to the flashing using the recommended number of screws shown in the table below – **DO NOT SEAL** this connection.



Model	Fasteners to secure varipitch to flashing
Hurricane BAL 300 – 400	6
Hurricane BAL 450 - 600	9
Hurricane BAL 700 - 900	12
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- h. **Assemble Turbine:** Assemble the turbine head to the Varipitch. Re-check if the assembly is level (horizontal). Ensure the knurling (the tapered section of the Varipitch) is fully inside the ventilator throat and secure the ventilator throat by fastening it to the top of the Varipitch with the number of fasteners shown in the table below.

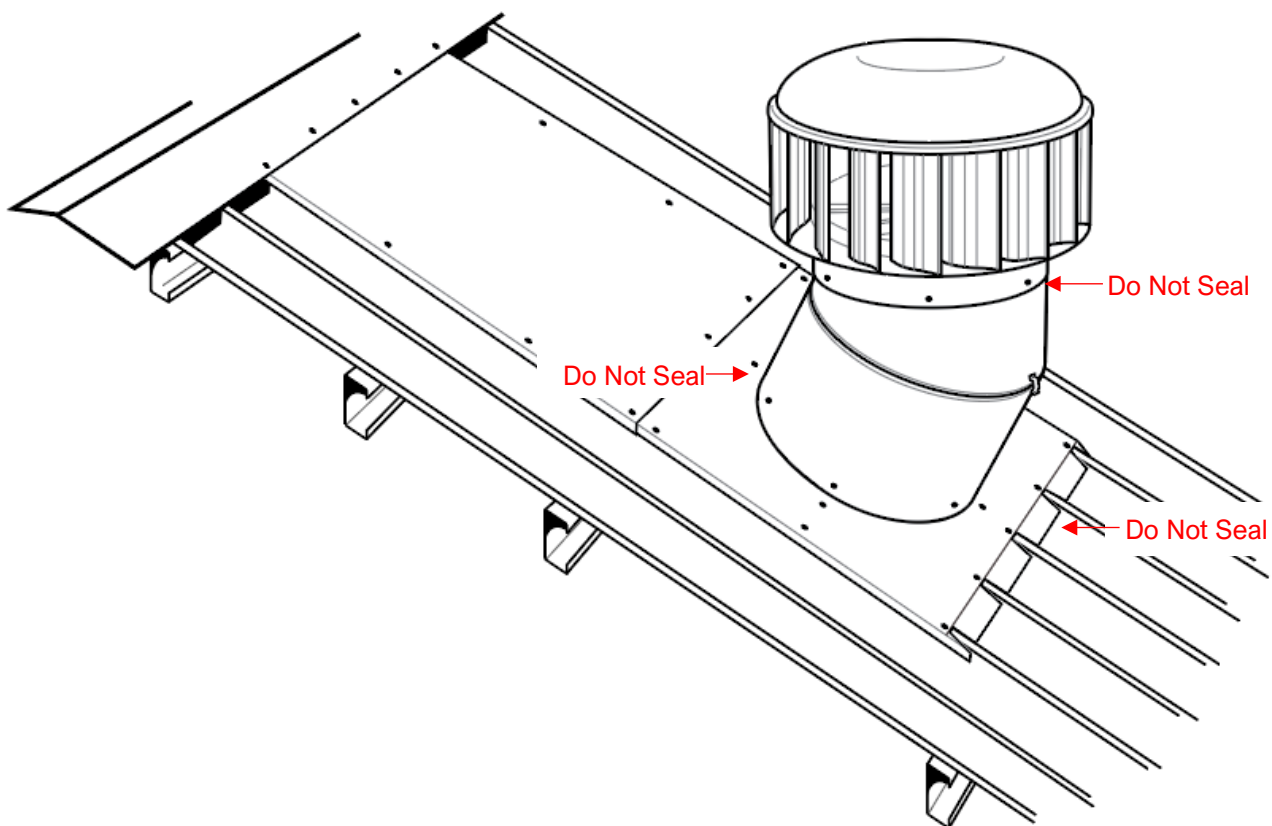


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<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neoprene Washer or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

NOTE: DO NOT apply sealant to the joint between the turbine and Varipitch. This is a natural gutter to release any trapped condensation. See details in section (i) below.

- i. Sealing is crucial for this product to ensure no leaking occurs during its lifespan, but there is also a requirement for drainage. To ensure that only the required areas are sealed and the drainage path is left open, follow this guide carefully:

Location Area	Sealing Requirement
All Fasteners	Seal
Back Flashing perimeter	Seal
Turbine Flashing perimeter to roof	Seal
Varipitch Seam (inside throat)	Seal
Turbine to Varipitch	Do Not Seal
Varipitch to Flashing	Do Not Seal
Flashing bottom edge to roof	Do Not Seal





10. MAINTENANCE




Regular maintenance of this product is essential to ensure its safe and long-term operation. It is the responsibility of the building owner or manager to outline the maintenance program throughout the product's lifespan. The following components should be inspected on a regular basis:

WARNING: Prior to inspecting the ventilator ensure that the power is turned off and that the ventilator head is held in a static position by another person using a gloved hand on the top surface of the turbine (away from the turbine blades) – this should not be undertaken on a windy day when the turbine head cannot be safely slowed.

- Rotating/turbine head – check for excessive movement/contact between components, unusual noise during rotation, listen for noises and assess visual wear & tear.
- Fasteners – check all are in situ and well-sealed.
- Flashing Connections – check joints that are meant to be sealed remain sealed and that those that are meant to be unsealed are clear of obstruction.
- Ember guard (mesh) – ensure this is clear of debris.
- Electrical component and connections – check connections for wear or exposure damage.

11. TROUBLESHOOTING GUIDE

No	Failure Mode / Potential Cause(s)	Image / Description
1	<p>Issue: Water or rain leakage</p> <p>Potential Cause: Varipitch connection not sealed.</p> <p>Action: Seal Varipitch connection with flexible, weatherproof sealant.</p> <p>Additional Information: The photo in the sidebar shows the possible outcome if the Varipitch connection has been slightly separated during angle adjustment or has not been sealed.</p>	
2	<p>Issue: Water or rain leakage</p> <p>Potential Cause: Ventilator throat gutter blocked.</p> <p>Action: Remove blockage – refer drainage diagram in these instructions</p> <p>Additional Information: Placing sealant around the bottom of the vent throat where it contacts the flashing blocks the vent gutter at the base of the throat, preventing the release of internal condensation and mist from the inside of the throat.</p>	

<p>3</p>	<p>Issue: Water or rain leakage</p> <p>Potential Cause: Insufficient turndowns along the front edge of the back-flashing due to low roof pitch and driving rain.</p> <p>Action: Extend turndown or re-flash</p>	
<p>4</p>	<p>Issue: Water or rain leakage</p> <p>Potential Cause: No back-flashing provided</p> <p>Action: Extend back-flashing to under sheet above or roof ridge cap</p>	
<p>5</p>	<p>Issue: Water or rain leakage</p> <p>Potential Cause: Ventilator throat shortened or not used which allows rain 'bounce' to drive water off roof into ventilator</p> <p>Action: Install recommended ventilator throat</p>	
<p>6</p>	<p>Issue: Condensation Drip (after hours) for ventilator with damper.</p> <p>Potential Cause: Inadequate make-up air after hours.</p> <p>Action: Set the damper to an open position to allow air movement during inactive hours where make-up air could not be provided via open windows shutter or louvres.</p>	
<p>7</p>	<p>Reliance upon flexible sealants.</p> <p>Through expansion and contraction of building components over time, flexible sealants such as silicon may develop cavities or cracks which then permit water ingress. It is always recommended that mechanically overlapped seals are created with metal components to provide water protection and that flexible sealants are used to provide secondary protection. While it is recommended that silicon be applied over roofing screws - it is more reliable to use high quality blind rivets or roofing screws with integrated washers.</p>	
<p>8</p>	<p>Failure to Use Ventilator Throat.</p> <p>It is crucial that the ventilators are installed with a Varipitch to ensure the turbine has adequate clearance from the flashing. Failure to comply with this recommendation could lead to rain ingress through the vanes resulting in leakage.</p>	

9	<p>Creation of Negative Pressure in a Building Leading to Back-drafting.</p> <p>The demand for make-up air by ventilators can lead to the creation of sufficient negative pressure in the building that some vents which are working less efficiently can be forced to supply air to the other vents in order to equalise pressure. During wet weather, this can lead to rain being inadvertently drawn into the building via the ventilators and giving the appearance of a leak.</p> <p>The characteristics of this phenomenon occur when:</p> <ol style="list-style-type: none"> a. The building is very air-tight and make-up air is not balanced. b. Vents are located at different levels on the roof with the majority adjacent to the ridge and a lesser number down slope. <p>The ventilators located at the higher levels create pressure and draw air through the ventilators at the lower levels due to greater stack effect ($\Delta T \times$ building height) plus clearer access to wind. This issue can be addressed by installing louvres or low-level static vents to assist in balancing the air pressure.</p>
10	<p>Understanding and Managing Condensation</p> <p>Ventilators with dampers which are unable to allow the warm humid air to escape through the ventilator may be at risk of condensation. This is due to the damper becoming the interface between warm and cool environments, which causes dew point to be reached and condensation to occur on the damper. This may lead to condensation dripping inside the building.</p> <p>Building designers need to consider the condensation risk when selecting products with dampers as there are no preventive measures available to minimise the occurrence other than opening the damper to reduce the temperature differential.</p>