

# **EcoPower® Hybrid Ventilator**

## *Installation Manual*



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## 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
EcoPower 400	$\geq 0.3\text{m}^2$	0° - 45°
EcoPower 600	$\geq 0.5\text{m}^2$	0° - 45°
EcoPower 900	$\geq 0.9\text{m}^2$	0° - 22.5°

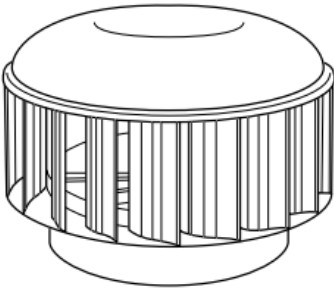
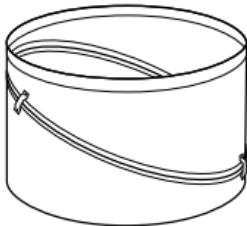
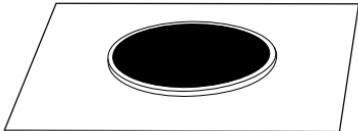
\* performance values based on 5Pa pressure loss across the make-up air opening.

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

**DO NOT PROCEED TO INSTALL THIS PRODUCT IF THE ABOVE REQUIREMENTS ARE UNABLE TO BE MET**

## 2. PACKING LIST – Check Before Commencing

### Included Parts

Ventilator Head	Varipitch	Flashing
		

### Additional Materials Required - Not Supplied

#### a. FASTENERS (Quantity and Type)

Product	Head to Varipitch	Varipitch to Flashing	Flashing to Roof
EP400	6	6	12
EP600	9	9	16
EP900	12	12	26
Fasteners	<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>		

- b. **SUPPLEMENTARY FLASHING** (if required) to provide a minimum of 1 dry pan on each side of the ventilator throat – refer to section 5 for details.
- c. **SPARKGUARD** (if required) for BAL rated applications or to provide protection against the entry of vermin.

### **IMPORTANT Note Regarding Lifting This Product**

Lift the product in its original packaging using a crane or similar equipment to roof mounting location – prior to handling the product.

**Caution:**

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.

## SAFETY AND WARNINGS

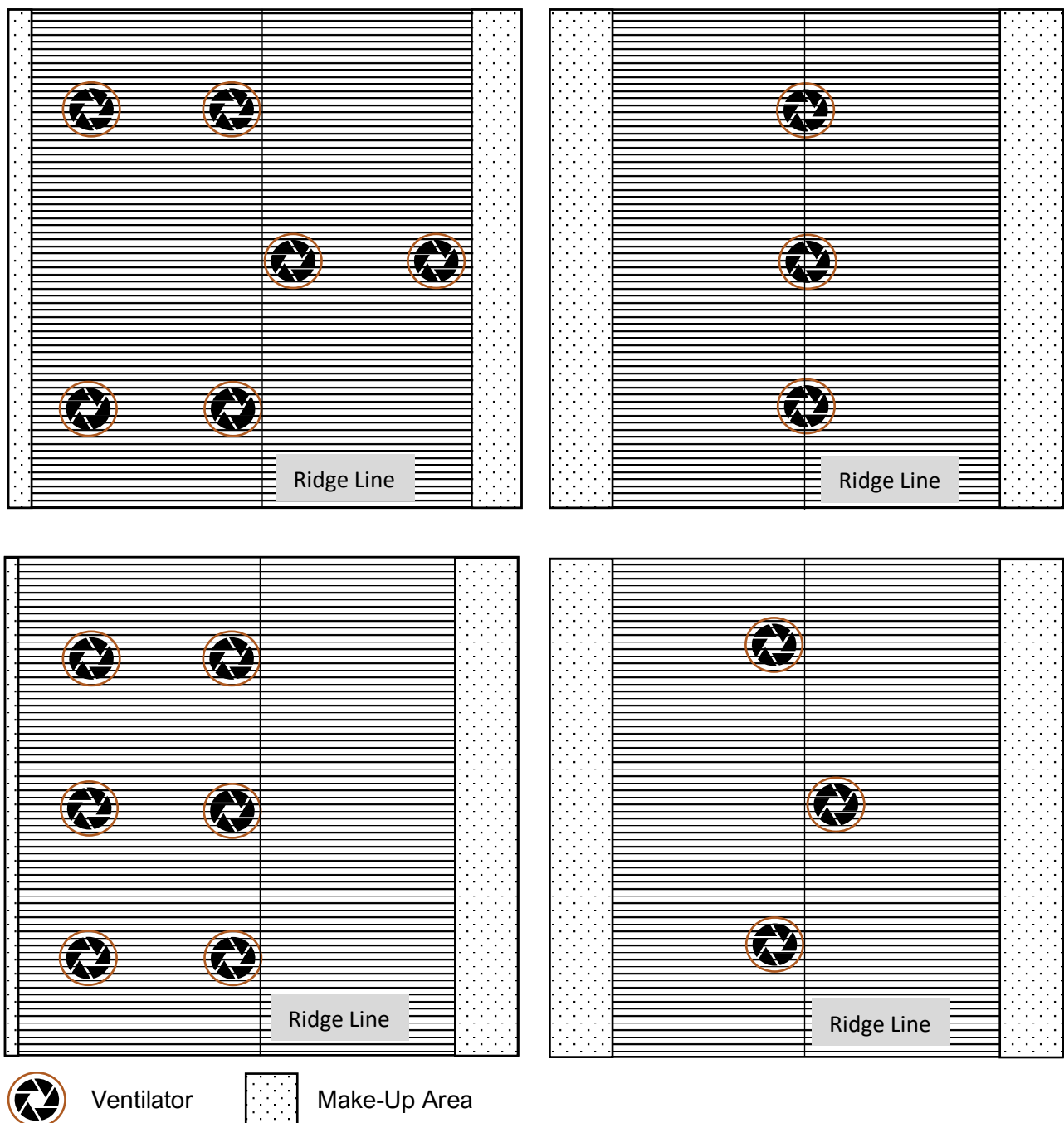
- a. Please read this manual carefully before installing this product and keep it for future reference or provide it to the building owner/maintenance manager.
- b. The installation of this product involves working at heights on a sloping surface and may be dangerous which includes the potential of death, personal injury, or property damage. Please be aware of the following before installing this product.
- c. Follow the state or territory regulator OH&S guidelines for working at height (e.g. Roof work), electrical, working in elevated temperatures (e.g. roof space in summer). For more information on your state's OH&S guidelines for working at heights, please refer to: <https://www.safeworkaustralia.gov.au/heights>
- d. This product must be installed by a qualified installer and all electrical wiring must be undertaken by a qualified electrician.
- e. This hybrid ventilator uses 220V-240V AC power for the electrically powered components and electrical connections must only be undertaken by a qualified electrician.
- f. This hybrid ventilator is supplied with either a Smart Controller or Interface Box - these devices must not be tampered with and the hybrid ventilator must not be operated without either of these devices.
- g. Do not attempt to power up the product when the product is not suitably roof mounted as the turbine will rotate without warning and may create a hazard.
- h. 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.
- i. Damaged parts must be replaced with a genuine replacement part from Bradford Ventilation.

### 3. VENTILATOR POSITIONING & PROVISION FOR MAKE-UP AIR

Bradford Ventilation recommends that ventilators are positioned 4m to 6m away from each other in all directions for effective and efficient performance. Ensure that the ventilators are not sheltered from the wind by surrounding objects, the angle created by the roof ridge or from each other.

Make-up air is required for this hybrid 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 area.

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.

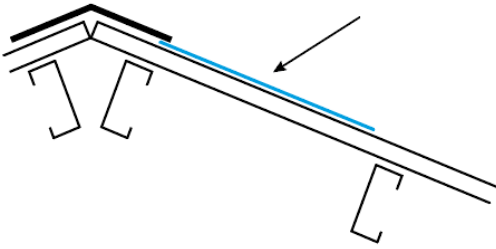


**IMPORTANT:** If insufficient external make-up air is provided, the ventilators will draw make-up air from each other – this will both diminish the effectiveness of the system and increase the risk of the system drawing external water into the building during periods of rain.

#### 4. VENTILATOR INSTALLATION – Ridge Installation

NOTE: Cyclonic application variations to these instructions are set out in Section 6.

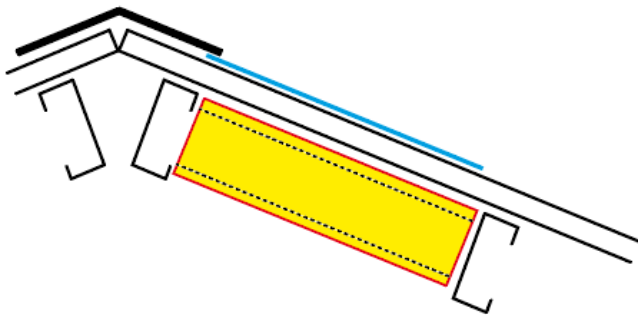
- a. **Set Position:** Place the base flashing under the ridge cap in the required position and adjust position to avoid structural roof members below the roof sheet.



##### Important Note Regarding Roof Structural Support:

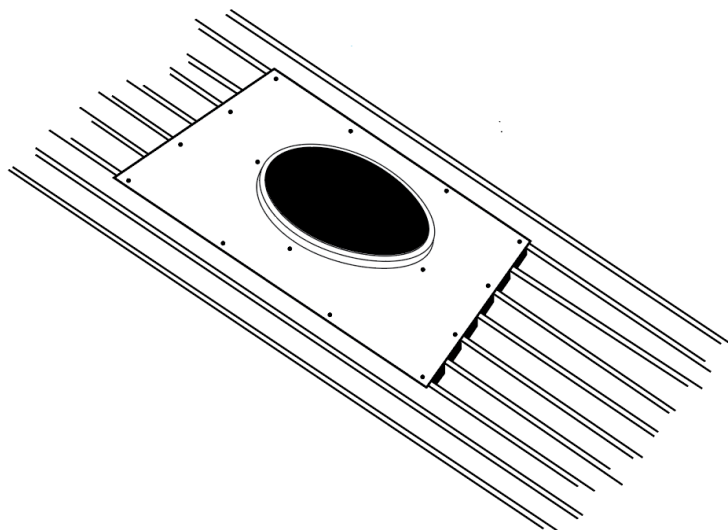
**EP400 & EP600** – If the purlin spacing is larger than 600mm, trimmers are required. Install the trimmers between the purlin on the either side of the opening. Do not cover the openings.

**EP900** – If the purlin spacing is larger than 1000mm, trimmers are required. Install the trimmers between the purlin on the either side of the opening. Do not cover the opening.



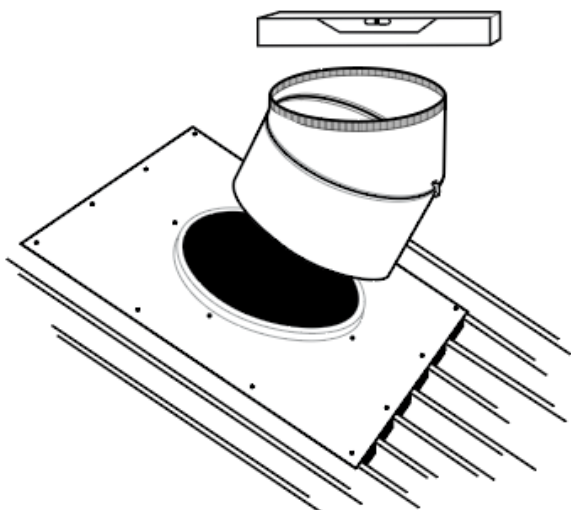
- b. **Mark Hole Position:** Ensure the flashing covers the corrugation or ribs equally on each side of the flashing, then mark a circle on the roof using the hole in the flashing as a template.
- c. **Cut Hole:** Carefully cut the hole, remembering that there may be insulation and other roof members under the roof sheet. Once the hole has been cut, fold up the edge of the corrugations or pans.

- d. **Secure Flashing:** Attach the flashing to the roof (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 suitable sealant to ensure they are weatherproof.

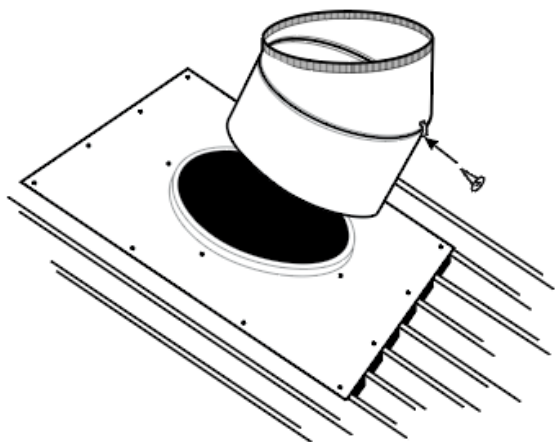


Model	Fasteners to secure Flashing to Roof
EP400	12 (4 near throat)
EP600	16 (4 near throat)
EP900	26 (4 near throat)
<i>Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed</i>	

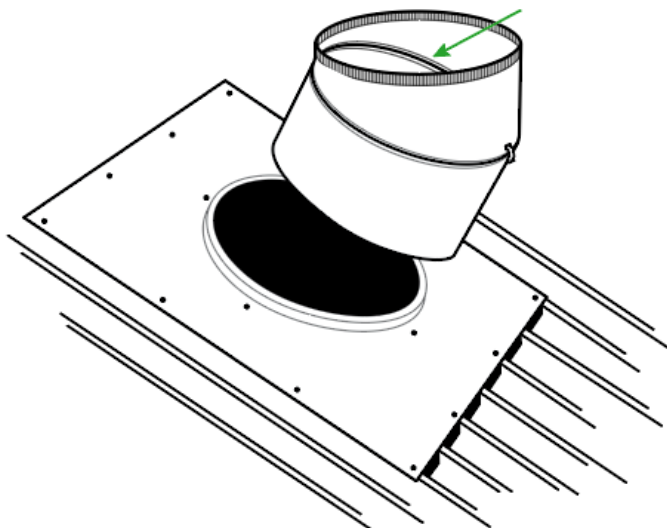
- e. **Assemble the Varipitch:** When a Varipitch throat is being used, place the Varipitch on the flashing and rotate the top and bottom halves until the top of the Varipitch is level (horizontal) - it is recommended that an electronic or spirit level is used to ensure that the top edge of the throat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



**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 the clip between the two halves of the varipitch.

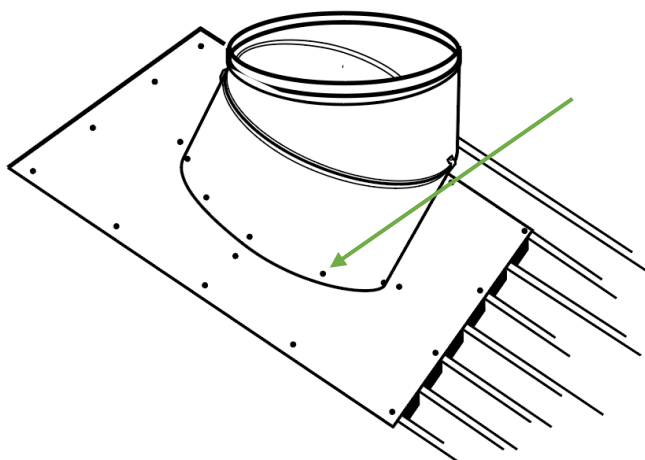


- f. **Weather Sealing:** Seal the Varipitch seam on the inside with a bead of weather-resistant suitable sealant.



NOTE: **DO NOT** apply sealant to the joint between the flashing and Varipitch. This is a natural gutter to release any trapped condensation.

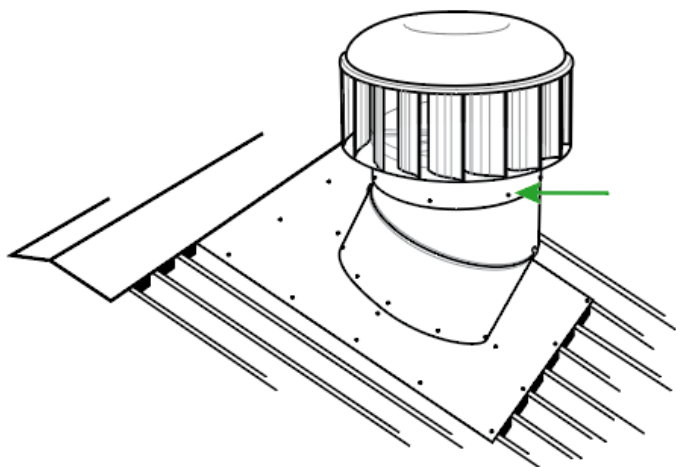
- g. **Secure Varipitch to Flashing:** Secure the varipitch to the flashing using the recommended number of screws shown in the table below – **DO NOT seal** this connection.



Model	Fasteners to secure Varipitch to Flashing
EP400	6
EP600	9
EP900	12
Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed	



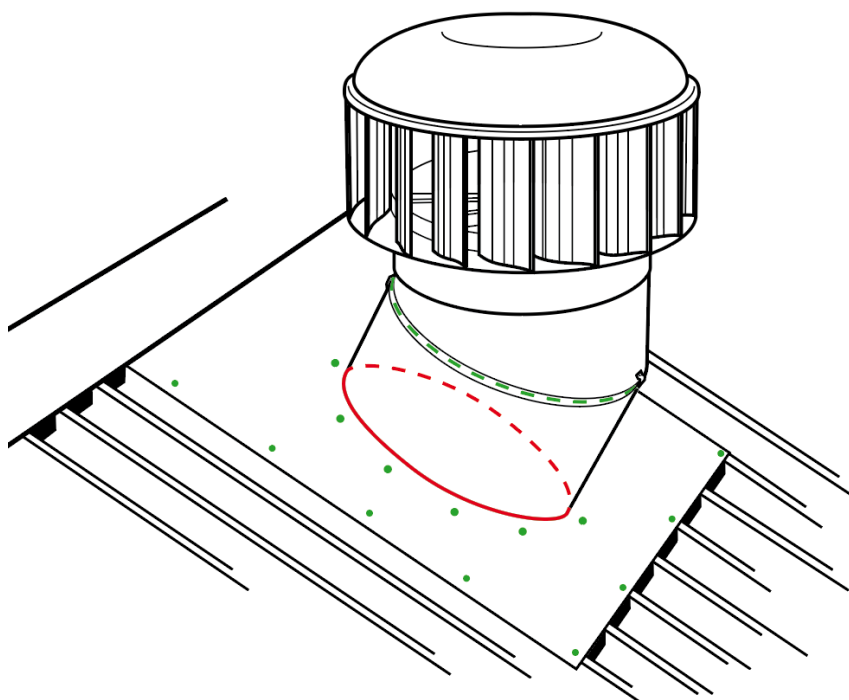
- h. **Assemble Turbine:** Assemble the turbine head to the Varipitch. Re-check if the assembly is level (horizontal) and adjust the turbine by tilting the throat slightly if required. Ensure the knurling (the tapered section of the Varipitch) is fully inside the ventilator throat and secure the ventilator 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
EP400	6
EP600	9
EP900	12
Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed	

- i. Sealing is crucial for this product to ensure no leaking occur during its lifespan. Ensure the following areas are sealed;

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

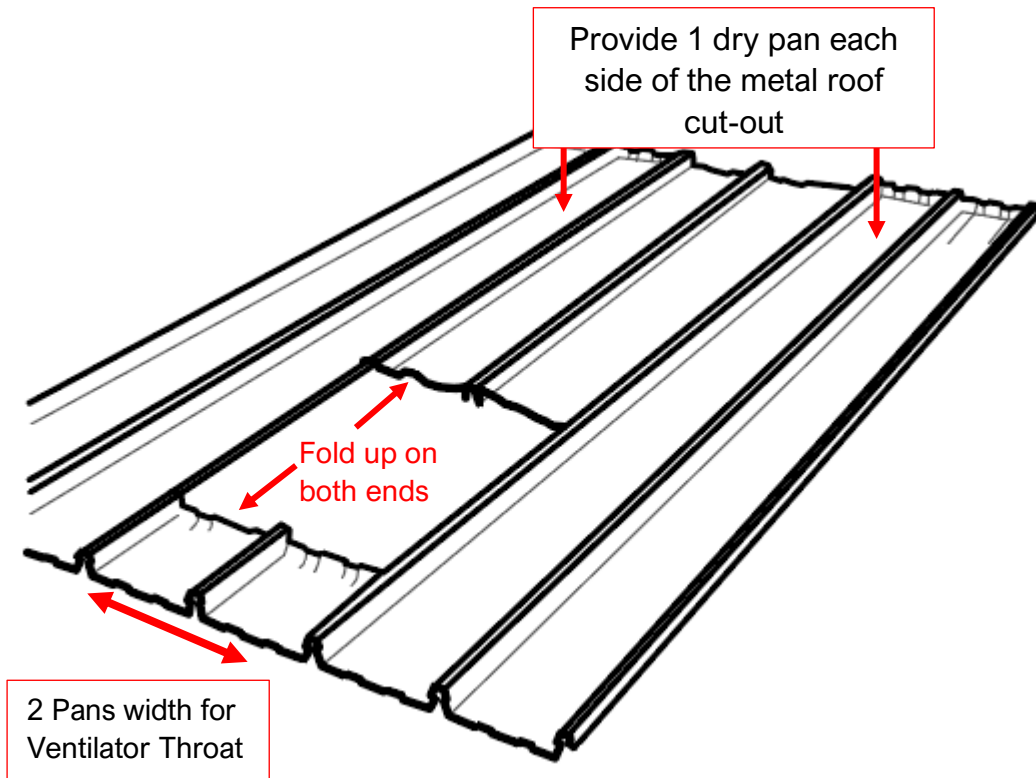


Go to Section 6 for Additional Requirements for Cyclonic Wind Regions

## 5. VENTILATOR INSTALLATION – Away from Ridge Line - Back-Flashing Required

NOTE: Cyclonic application variations to these instructions are set out in Section 6.

- a. **Hole Layout:** It is recommended that 1 dry pan is flashed on each side of the ventilator throat cut-out. If the ventilator diameter is greater than 1 pan width and less than 2 pans width – cut a square hole for 2 pans.



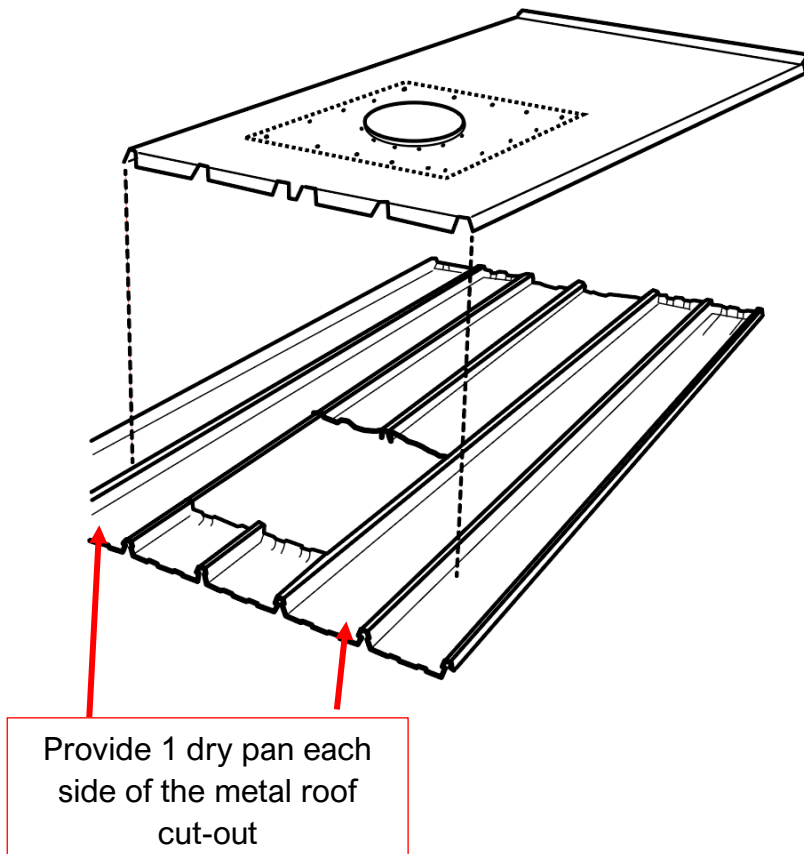
Note :

EP400 & EP600 – If purlin spacing larger than 600mm, trimmers may be required. Install the trimmers between the purlin on the either side of the opening. Do not cover the openings.

EP900 – If purlin spacing larger than 1000mm, trimmers may be required. Install the trimmers between the purlin on the either side of the opening. Do not cover the opening.

- b. Back-Flashing **Assembly:** Ensure that the width of the back-flashing tray is sufficient to cover at least 1 dry pan on each side of the cut-out in the metal roof. Position the flashing in the middle of the tray with 1 dry pan on each side of the flashing cut-out. Mark a circle using the hole in the flashing as a template and cut the hole in the back-flashing tray.

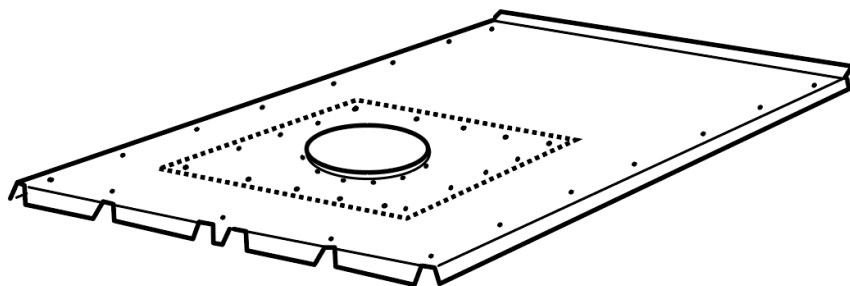
Secure the ventilator's flashing to the back-flashing tray using the recommended number of fasteners shown in the table below:



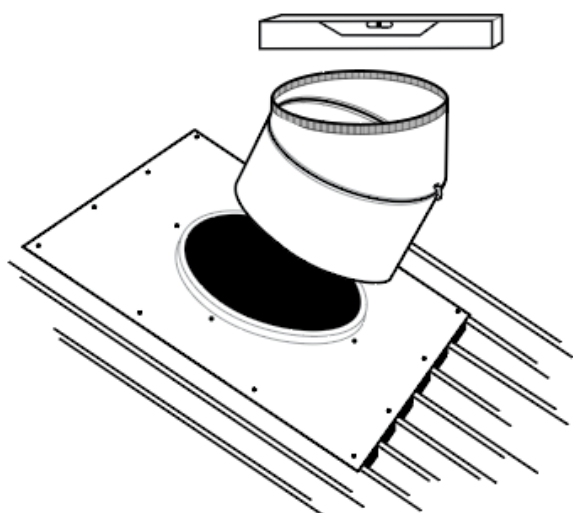
Model	Fasteners to secure Flashing to Roof
EP400	12 (4 near throat)
EP600	16 (4 near throat)
EP900	26 (4 near throat)
Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed	

Note: Always provide 1 dry pan on each side of the ventilator throat to avoid water or rain ingress.

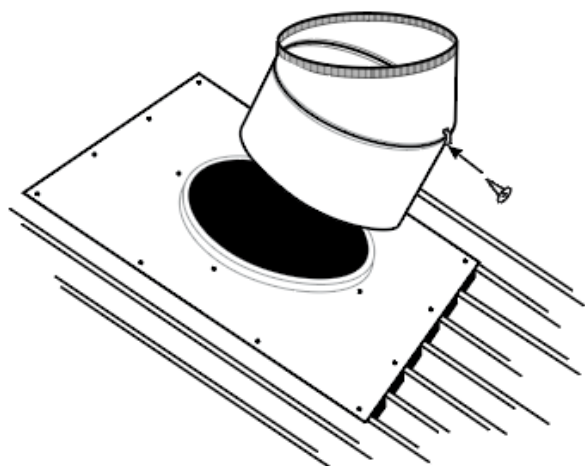
- c. **Assemble Back-Flashing:** Secure the back-flashing tray to the roof using a minimum of one 10G X 16MM Galvanised Self Drilling TEK Screws with Neo **or** 5/32" (4.0mm) Rivets Aluminium/Steel Sealed every 150mm. If trimmers are used ensure the flashing is secured to the trimmers. Seal all fasteners with suitable sealant to ensure they are weatherproof.



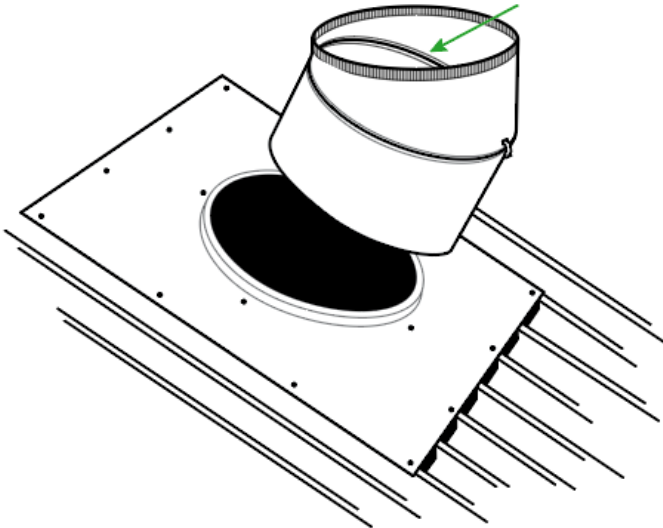
- d. **Assemble the Varipitch:** When a Varipitch throat is being used, place the Varipitch on the flashing and rotate the top and bottom halves until the top of the Varipitch is level (horizontal) - it is recommended that an electronic or spirit level is used to ensure that the top edge of the throat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

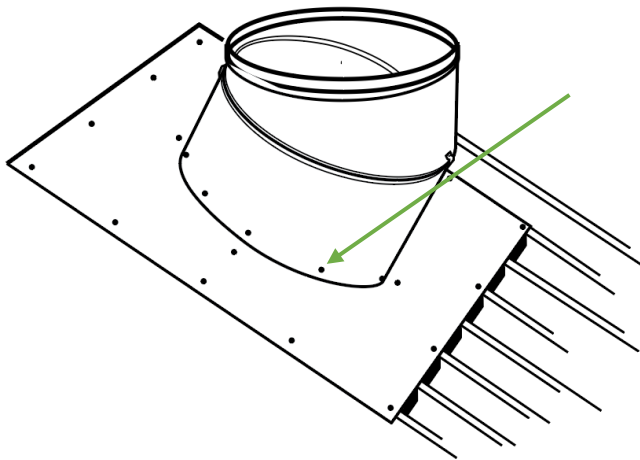


- f. **Weather Sealing:** Seal the Varipitch seam on the inside with a bead of weather-resistant suitable sealant.



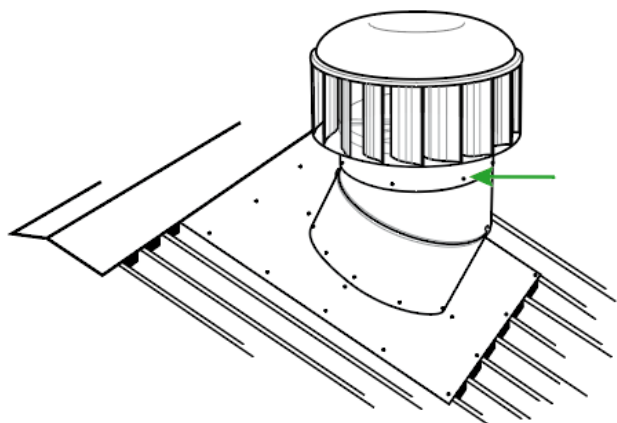
NOTE: **DO NOT** apply sealant to the joint between the flashing and Varipitch. This is a natural gutter to release any trapped condensation.

- j. **Secure Varipitch to Flashing:** 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
EP400	6
EP600	9
EP900	12
Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed	

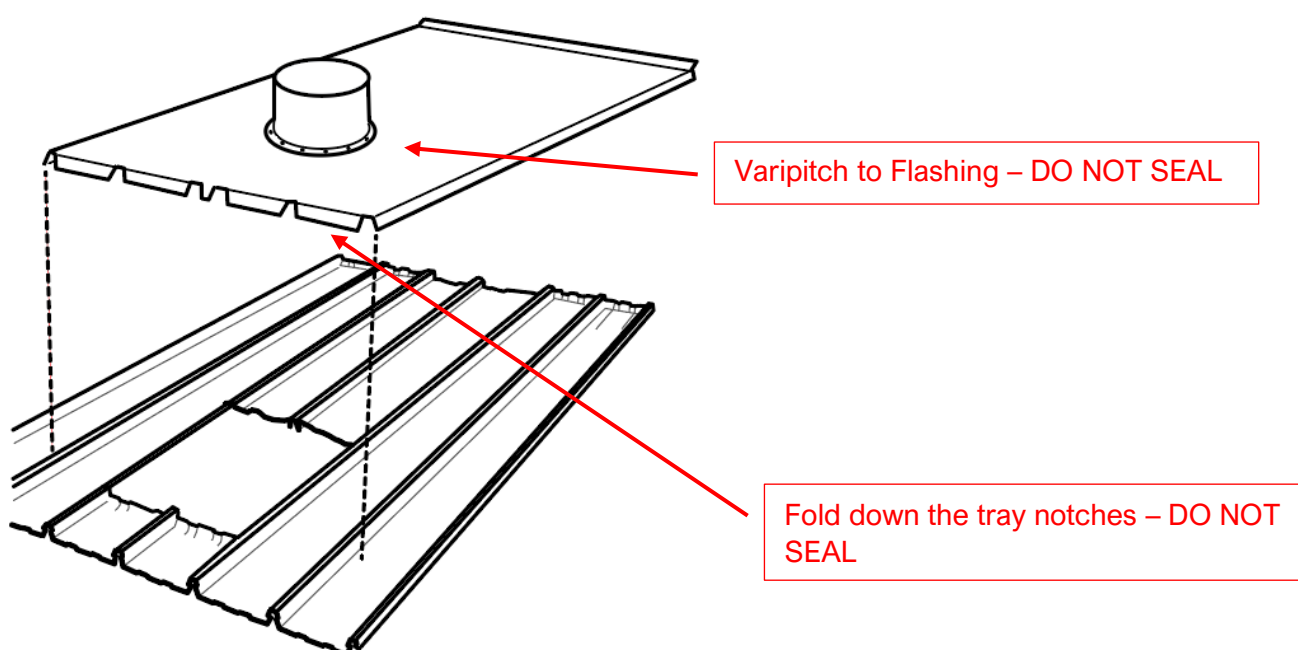
- g. **Assemble Turbine:** Assemble the turbine head to the Varipitch. Re-check if the assembly is level (horizontal) and adjust the turbine by tilting the throat slightly if required. Ensure the knurling (the tapered section of the Varipitch) is fully inside the ventilator throat and secure the ventilator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



Model	Fasteners to secure Turbine to Varipitch
EP400	6
EP600	9
EP900	12
Use 10G X 16MM Galvanised Self Drilling TEK Screws with Neo or 5/32" (4.0mm) Rivets Aluminium/Steel Sealed	

- h. Sealing is crucial for this product to ensure no leaking occur during its lifespan. Ensure the following areas are sealed ;

Location Area	Sealing Requirement
Fasteners	Seal
Flashing	Seal
Varipitch Seam	Seal
Varipitch to Flashing	Do Not Seal
End of the ribs	Seal
Tray	Sealed and fixed to the roofing
Tray Notches	Folded down into pans – do not seal



Go to Section 6 for Additional Requirements for Cyclonic Wind Regions

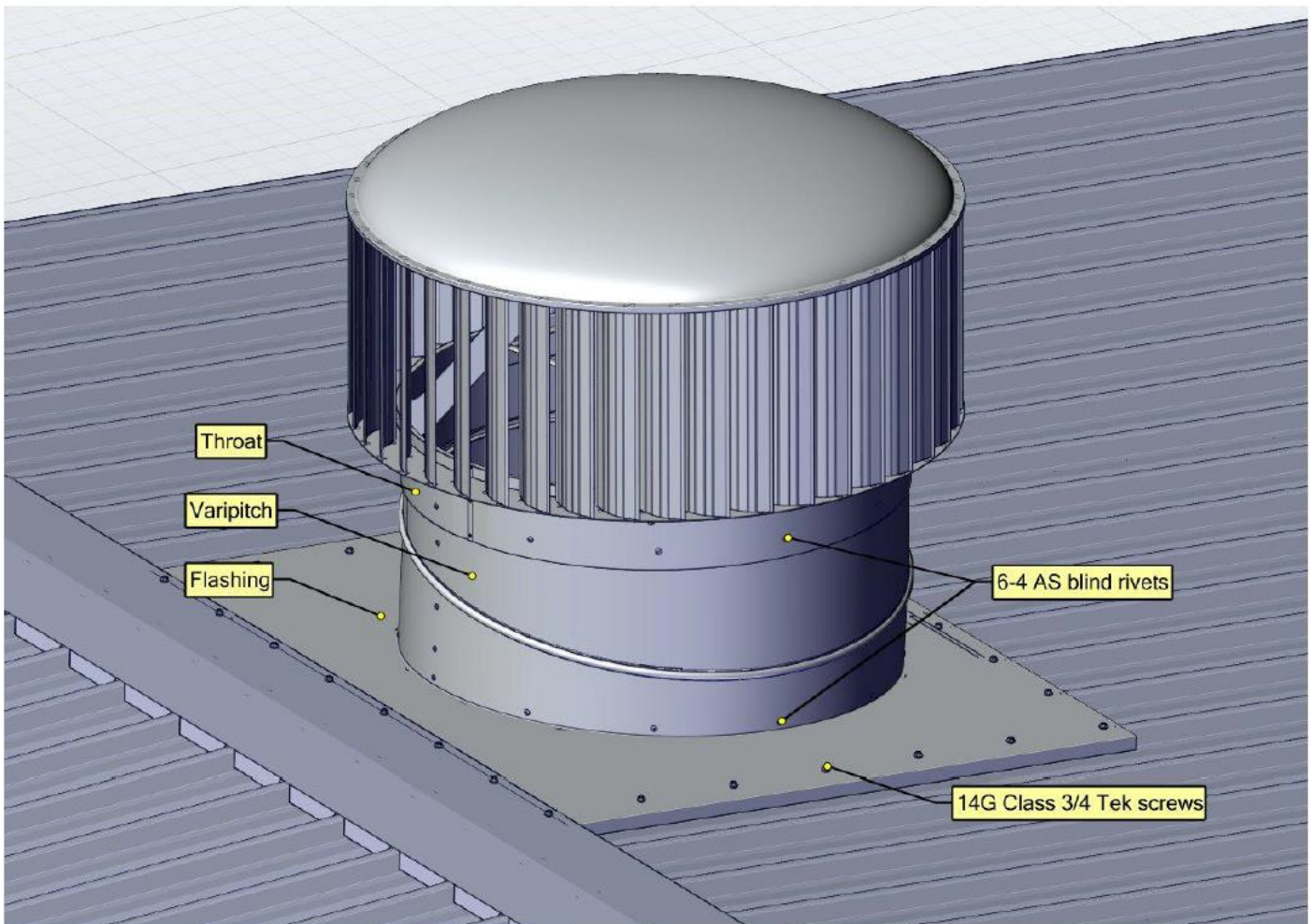


## 6. CYCLONE REGION INSTALLATION – Additional Requirements for Cyclonic Wind Regions

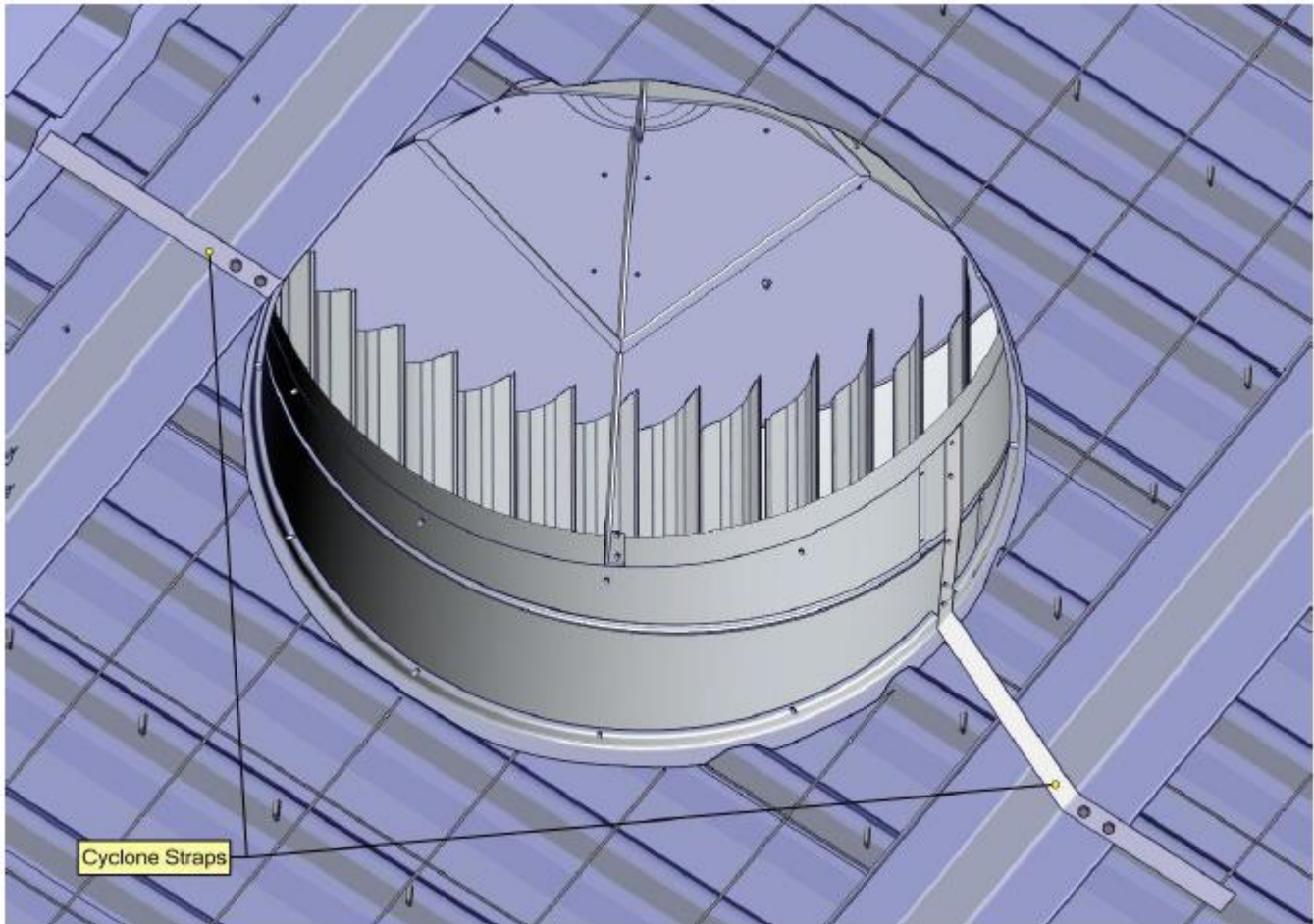
The specific installation instruction variations in this section must be applied to installations in cyclonic regions or where the use of a cyclonic restraint has been designated – replace guidance in Section 6 & 7 with specific information in this Section.

### Fastener Selection

- a. Fix Flashing to roof with 14G Class 3 or 4 Tek screws. Locate 4 close to Varipitch and 26 around the 4 sides of the flashing.
- b. Fix Varipitch to Flashing with 12 x 6-4 AS blind rivets. Seal with suitable sealant if unsealed rivets are used.
- c. Fix Throat to Varipitch with 12 x 6-4 AS blind rivets. Seal with suitable sealant if unsealed rivets are used.



## Cyclone Strap Assembly

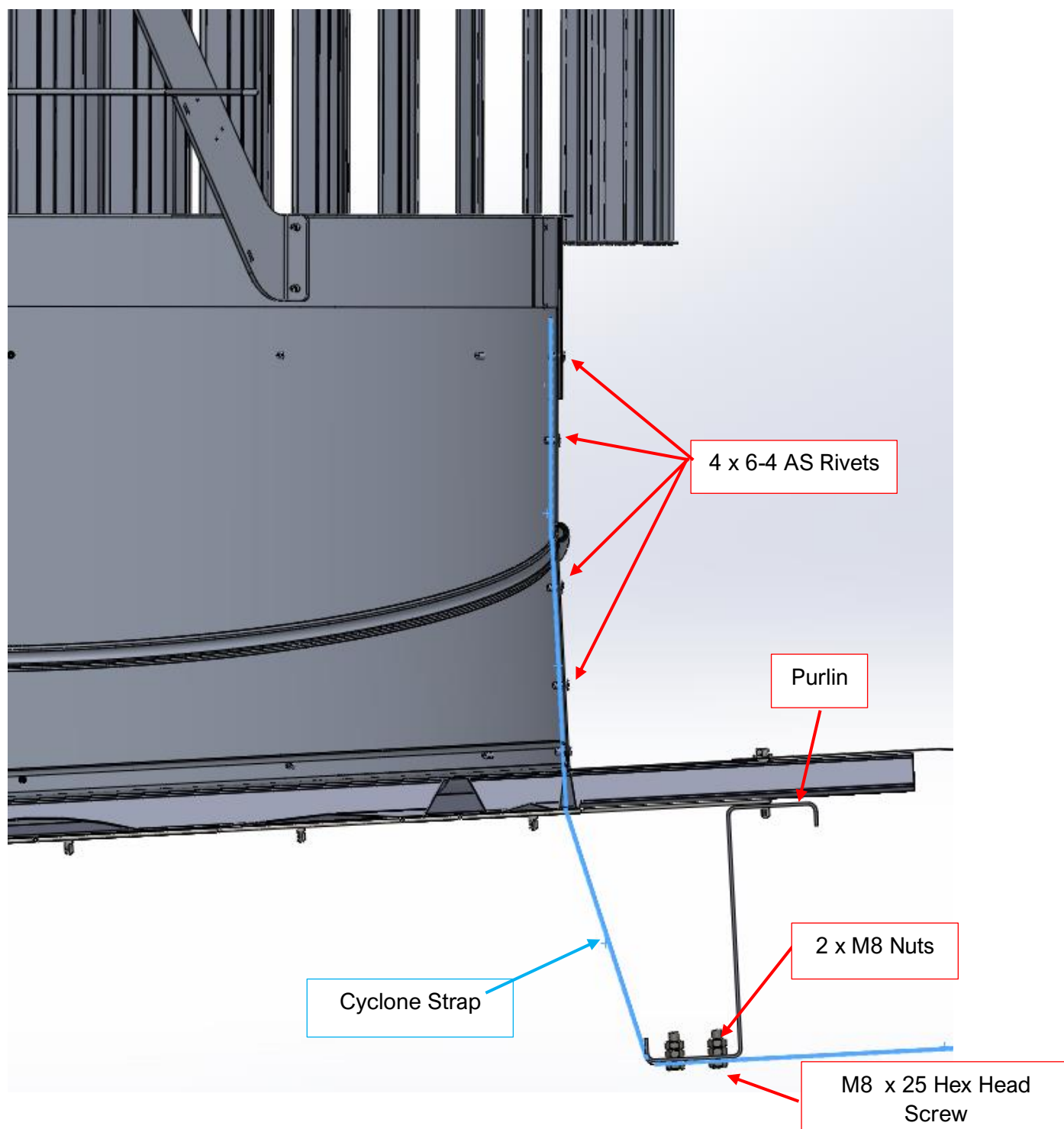


**Note: Safety mesh shall not be removed. The safety mesh has been removed in the above figure to show internal installation of the cyclone strap only.**

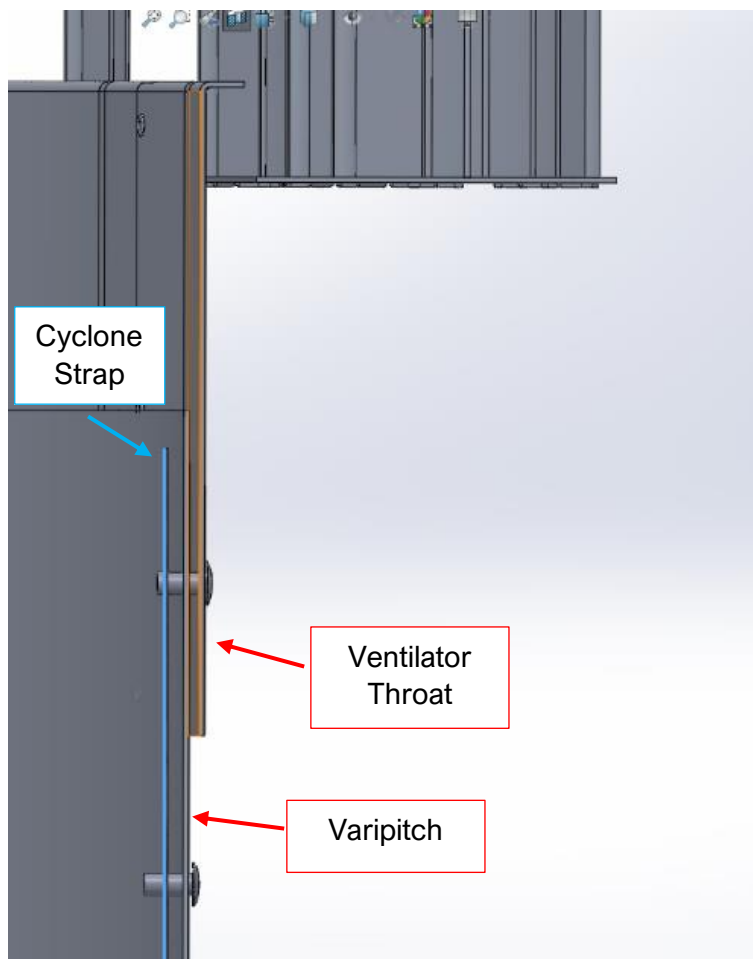
- d. Attach the 30x0.8x950mm long Cyclone Straps to the inside top edge of the Varipitch, down to the underside of a roof purlin as shown above.
- e. Fix both cyclone fixing straps to the inside of the varipitch with at least 4 x 6-4 AS rivets. Two rivets must be located above the varipitch seam with one through the throat, varipitch and strap.
- f. Fix the lower end of the strap to the purlin with M8 hex head screws (minimum class 4.6) and two M8 nuts per screw.



## Cyclone Strap Assembly - Cross Section View 1



## Cyclone Strap Assembly - Cross Section View 2





## 7. 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 products 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.
- Sparkguard (if provided) – ensure this is clear of debris.
- Cyclone Strap (if provided) – check fastener tension.
- Electrical component and connections – check connections for wear or exposure damage.

## 8. TROUBLESHOOTING GUIDE

No	Failure Mode / Potential Cause(s)	Image / Description
1	<p>Water or rain leakage.</p> <p>Varipitch connection not sealed.</p> <p>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 with silicon.</p> <p>ACTION: Seal varipitch connection.</p>	
2	<p>Water or rain leakage.</p> <p>Ventilator throat gutter blocked.</p> <p>Placing silicon 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>ACTION: Remove blockage</p>	

3	<p>Water or rain leakage.</p> <p>Insufficient turndowns along the front edge of the back-flashing due to low roof pitch and driving rain.</p> <p>ACTION: Extend and seal flashing.</p>	
4	<p>Water or rain leakage.</p> <p>No back-flashing provided.</p> <p>ACTION: Extend back-flashing to under sheet above or roof ridge.</p>	
5	<p>Water or rain leakage.</p> <p>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>	
6	<p>CAUTION: Reliance upon flexible sealants.</p> <p>Through expansion and contraction of building components over time, 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>	
7	<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>	
8	<p>Creation of Negative Pressure in a Building Leading to Back-drafting.</p> <p>The demand for make-up air by the ventilators leads to the creation of sufficient negative pressure in the building that vents of a lower height (downslope from ridge) can be forced to rotate in the opposite direction to, in effect, supply air to equalise pressure. This can lead to rain being inadvertently draw into the building when the phenomenon occurs during wet weather.</p> <p>The characteristics of this phenomenon occur when:</p> <ol style="list-style-type: none"> <li>The building is very air-tight and make-up air is not balanced.</li> </ol>	

	<p>b. Vents are located at different levels on the roof with majority adjacent to ridge and lesser number down slope.</p> <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 (<math>\Delta T \times</math> 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>
9	<p>Condensation</p> <p>Ventilators with dampers which are unable to allow the warm humid air escape through the ventilator may be at risk of condensation. This is due to the un-insulated 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 applying insulation to top damper surface to reduce the temperature differential.</p>

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For further technical advice  
call 1300 850 305 or visit [csrbradford.com.au](http://csrbradford.com.au)

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