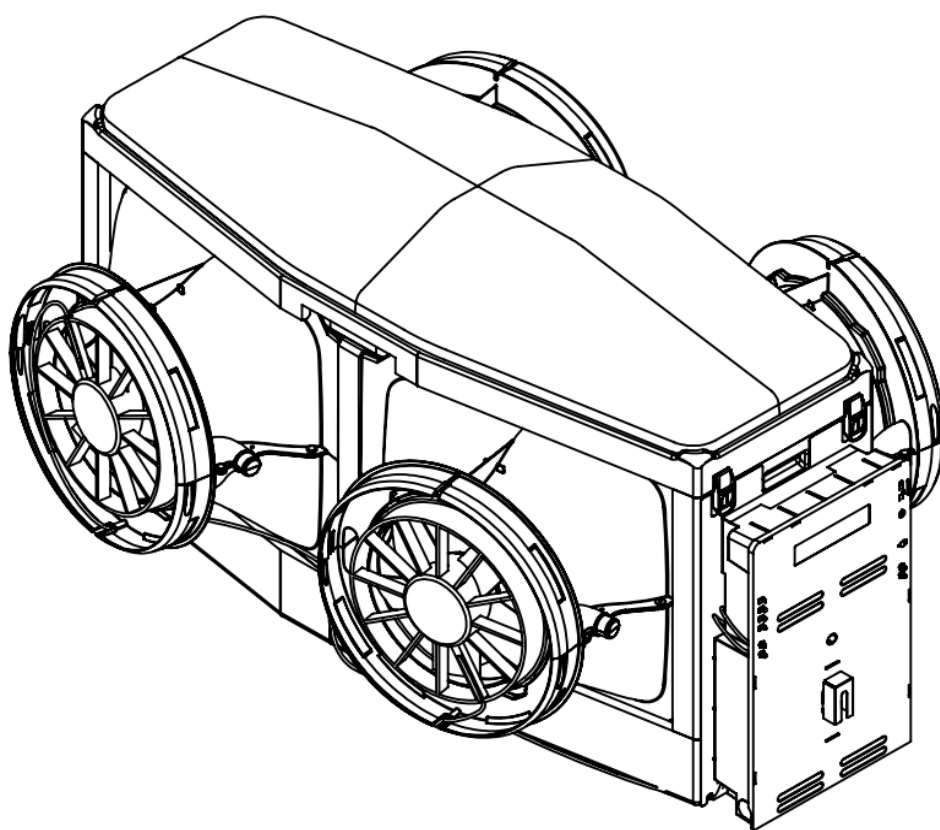


# BRIVIS ICEBERG™ COOLING

Installer's Manual



**PLEASE READ THESE INSTRUCTIONS CAREFULLY BEFORE  
INSTALLING AND USING THIS PRODUCT**



## Scope

This manual covers the installation and setup of the Brivis Iceberg™ evaporative cooler within the roof space, i.e. between ceiling and roof line.

## Definitions

### Shall

Indicates a mandatory requirement of this manual.

### Should

Indicates a recommended requirement of this manual.



Warning – Important note

Any deviations from these instructions may, at the discretion of Brivis, void the warranty. As a result, the customer and/or installer may be charged a fee for non-product warranty related call outs. Also note that failure to comply with these instructions may preclude Brivis from being able to service the unit.

## Disclaimer

“IMPORTANT NOTICE: This document is a guide only. Laws, regulations and industry standards can vary between States and Territories. Accordingly, this guide shall be read in conjunction with, and subject to, all laws, regulations and industry standards applicable in the State or Territory in which the products are installed. You shall ensure that the installation of the products will comply with those laws, regulations and standards, and that the products recommended to customers are fit for the purpose for which they are intended.”

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# 1. General Guidelines

The Bravis Iceberg™ shall be installed in accordance with these instructions and related regulations, codes, standard, and authorities. These include but may not be limited to:

- AS 3666.1 Air-handling and water systems of buildings – Microbial control
- Bravis "ICEBERG™ SuperSizeGuide"/Bravisize™
- AS 4254 - Ductwork for air-handling systems in buildings
- HB 276 - 2004 – A guide to good practice
- Local Gas and Electricity Authorities
- Local Building Regulations
- Environment Authorities
- Building Code of Australia (BCA)

## 1.1 Unpacking the Cooler

The Bravis Iceberg™ is supplied and transported in one box containing the Evaporator Module, Safety Tray and Fan-Motor Assemblies.

To unpack:

- Carefully remove the outer packaging and any retaining brackets/straps that secure the items to the pallet.

## 1.2 Lifting the Iceberg™ components

Before lifting the Bravis Iceberg™ components onto the roof, ensure the lifting equipment is in good operating condition and capable of lifting the total weight. Be sure there is a clear area to place the components down, which is within reach of the lifting equipment.

## 1.3 Insulation

It is important that ducting should be well insulated. It is mandatory under some building codes to install insulated, fire rated ducting on Evaporative Cooling systems. Check with your local authority.

## 1.4 Installing Ductwork, Bends and Elbows

The duct system should be designed and installed in accordance with the following:

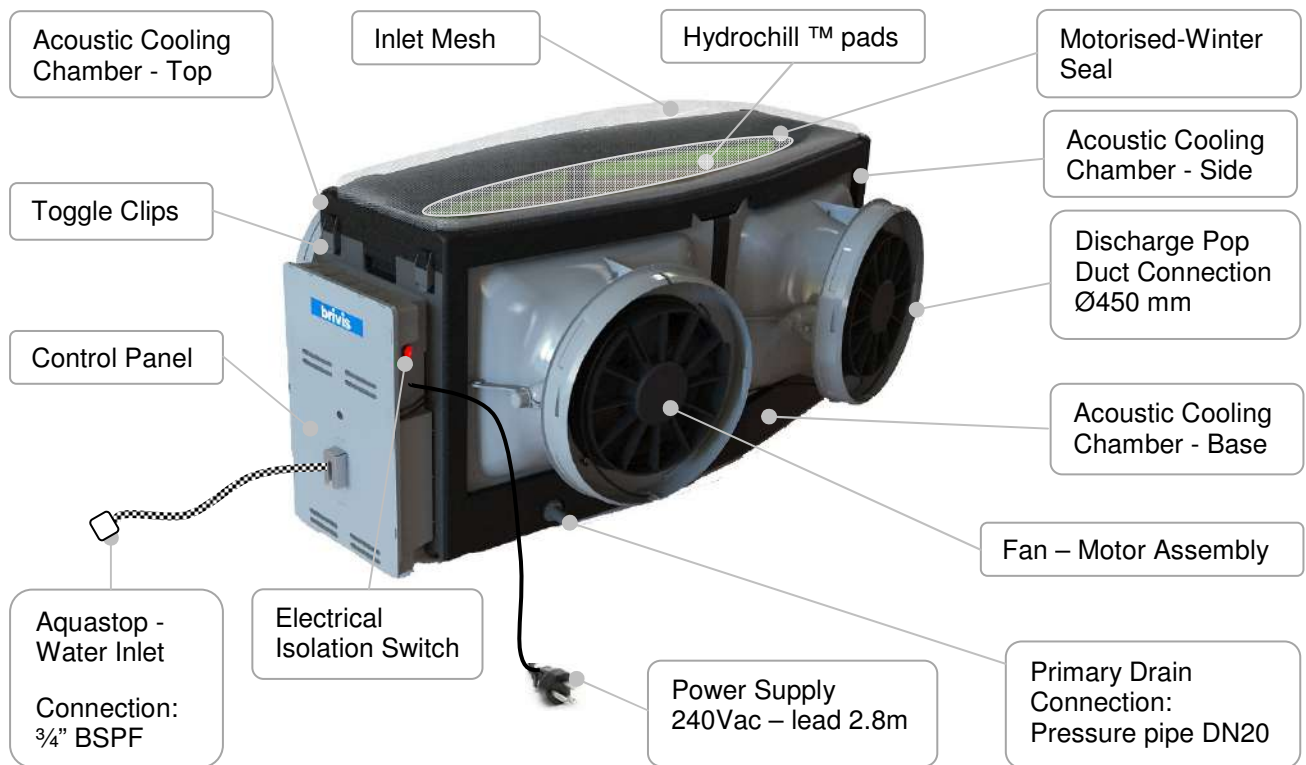
- These installation instructions.
- Standard engineering practices.
- Bravis Iceberg™ SuperSize Guide / Bravisize™ and Installation Guidelines.
- Where square ducting elbows are to be used, install turning vanes within the elbow to aid airflow.
- Use unrestricted ductwork with smooth changes of duct cross section.
- Bends in ducting should have a large radius and branches should have shallow angles.

## 1.5 Dampers

Dampers may be required to balance the air distribution of the duct system.

## 1.6 Brivis Iceberg™ Evaporator Module

Diagram 1.



## 1.7 Brivis Supplied and Field Supplied Items

Table 1.

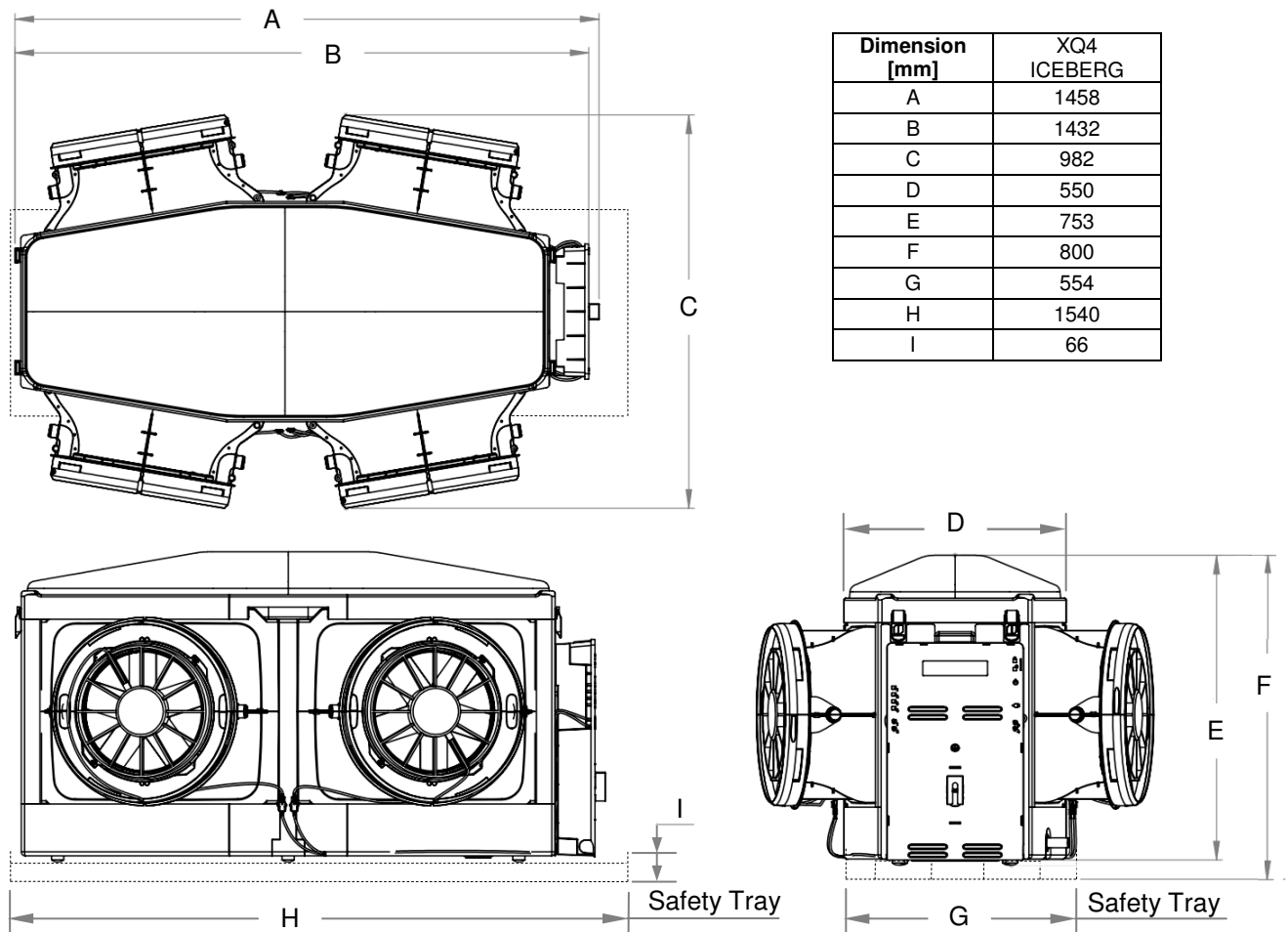
Brivis Supplied	Field Supplied
Evaporator Module	Independent power supply from switchboard to unit
Safety Tray	DN20 pressure pipe for primary drain
Wall control & plug kit (x1) and Loom (20m)	40mm DWV pipe for safety tray drain
Optional	Chipboard for platform
Brivis Icecap™	Flashing for Brivis Icecap™ (if fitted)
Brivis BAL Icecap™	Bi-directional Ball valve + Nipple

Note: An Icecap™ can be supplied upon request to meet air intake requirements. Other equivalent air intake accessories may be field supplied, refer Air Intake section.

## 2. Iceberg™ XQ4 Model Dimensions & Service Clearances

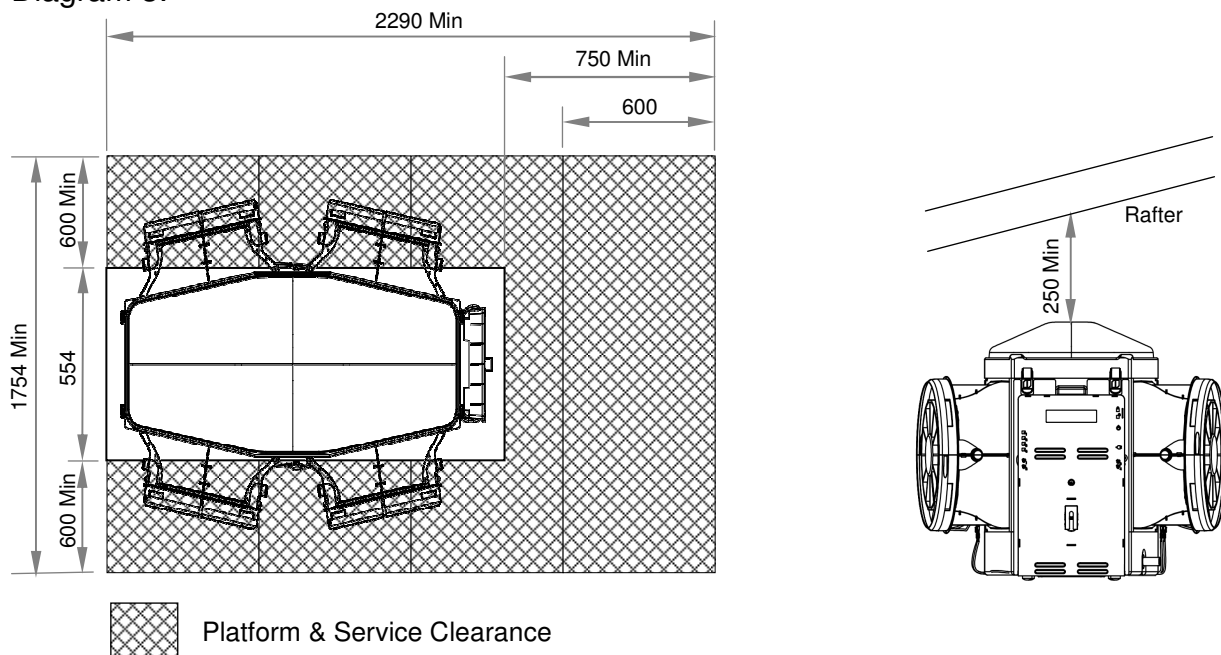
### 2.1 XQ4 Evaporator Module (B062192)

Diagram 2.



### 2.2 XQ4 Platform & Service Clearances

Diagram 3.



### 3. Cooler Service Requirements

#### 3.1 Electrical Power Supply to the Cooler

The Cooler is pre-wired with a 3-pin plug and lead, and should be plugged into a standard 10 Amp - 240 Volt power socket located within the roof cavity, in close proximity to the Evaporator Module. The power socket should be wired back to the meter box on a dedicated power circuit.

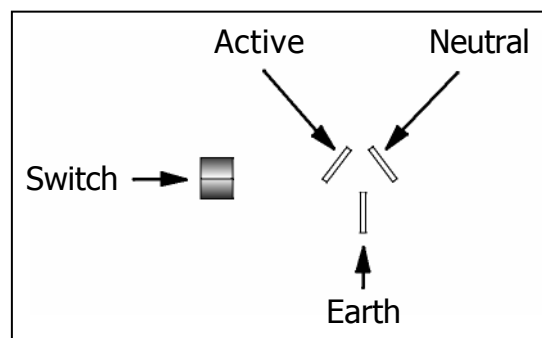
**Note:** A qualified electrician shall install the 240 Volt wiring according to local regulations.

**IMPORTANT:** Switch OFF the power and unplug the Cooler before touching any wiring. If any electrical wiring is damaged, it shall be replaced by the manufacturer, its service agents or an electrically qualified technician, in order to avoid a hazard.

The electricity supply shall be 240 Volt / 50 Hertz, and from an authorised power supplier.

Generators should never be used, as their output may be incompatible with or damage the Cooler's electronic control system.

Diagram 4.



#### 3.2 Water Supply to the Evaporator Module

The Evaporator Module's water system is designed to operate with a water supply pressure between 300 kPa and 1000 kPa. If the supply pressure is excessive, a field-supplied pressure-reducing regulator shall be fitted at the meter. If the pressure is insufficient the Cooler's operation will be compromised. In areas subject to water pipes freezing the primary drain should be insulated to prevent damage to the Cooler.

- Ensure the supply piping has been flushed before connecting it to the Cooler.
- A registered licensed plumber shall install the water supply piping and connection to the Cooler in accordance with the local water supply regulations.
- A bidirectional isolating valve on the water supply line shall be placed and secured in the Safety Tray beside the Evaporator Module so that it does not dislodge. This shall be provided to facilitate isolation of the water or to disconnect the water supply piping when servicing.
- Non-return isolating valves on the water supply are not recommended as they may cause damage or lock up the Cooler's inlet mechanism where high lock-up pressures or freezing water in pipes may occur.
- For the owner's convenience, an additional bidirectional isolating valve may be provided at ground level to isolate the water supply.
- The water supply pipe shall be supported and secured so as not to place strain on the Cooler's water connection fittings or cause water hammer noise.
- Water quality should be checked and filtration fitted where necessary e.g. tank or bore water.
- The connection size to the Evaporator Module is 3/4" BSPF.

## 4. Brivis Iceberg™ Hardware

### 4.1 Evaporator Module

The Evaporator Module is where heat transfer through evaporation takes place and this shall be installed within the roof space. The Evaporator Module contains the Brivis Iceberg™ control system and water distribution system which supplies water to the Hydrochill™ pads. This shall be installed on the Safety Tray supplied by Brivis.

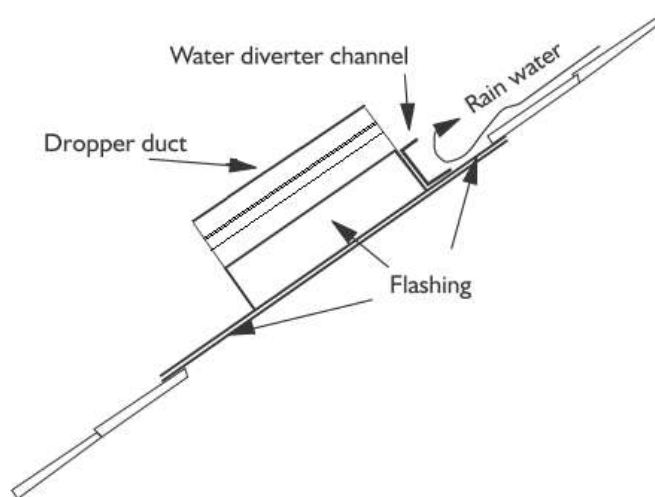
### 4.2 Air Intake - Icecap™

The Brivis Icecap™ is an air intake accessory and is available for BAL and non-BAL installations. It is the installer's responsibility to ensure the minimum air intake open area requirement of 0.5m<sup>2</sup> is met to service the Brivis Iceberg™ Evaporator Module. This may be achieved with the use of roof vents, gable vents, eave vents or the Brivis Icecap™.

### 4.3 Icecap™ Flashing

If you install a Brivis Icecap™ refer to the installation instructions supplied with the Brivis Icecap™ and following guidelines. The Colorbond™ roof flashing (field supplied) shall be fixed and sealed to the dropper duct to prevent water entry into the building. On installations where the Icecap™ is more than 4m downstream from the roof peak, it should be fitted with an additional water-diverting channel on the dropper duct high side that extends beyond the dropper duct sides by at least 50mm (see diagram below).

Diagram 5.



## 5. Evaporator Module Installation

### 5.1 Prior to Installation

Please review your local plumbing regulations as you may need to consider either down pipe, storm water pit or sanitary drain locations when deciding on the position of the Evaporator Module.

### 5.2 Service Light and Access Walkway

- A service light should be installed adjacent to the unit's control access panel inside of the ceiling space.
- The service light switch should be located near the manhole.
- An access walkway should be installed from the man hole to the Evaporator Module and should be free of obstruction to allow access for service and maintenance. If rafter pitch is greater than 700mm a walkway shall be installed to assist with service access.

### 5.3 Evaporator Module location

Inspect the roof space prior to positioning the Evaporator Module and decide on the best orientation for connection of plumbing and service access.

**Note:** A minimum distance of 555 mm is required between adjacent rafters to install the Evaporator Module.



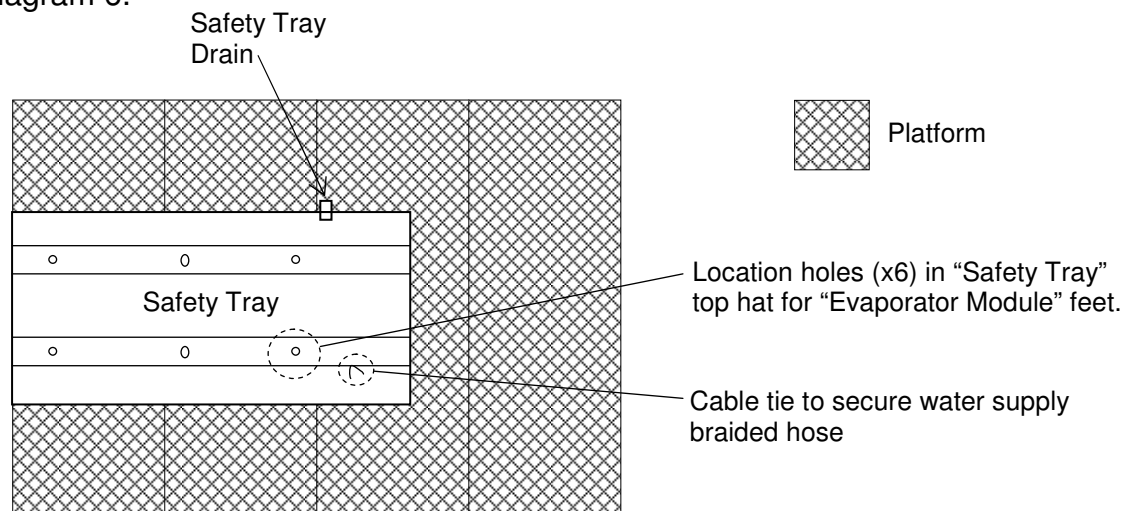
## 5.4 Positioning the Platform and Safety Tray

For servicing, a working platform shall be provided, capable of supporting a tradesman and his tools. Secure the platform to the ceiling joists ensuring the position enables the required service clearances between Safety Tray and the platform edge, refer to Diagram 6.

With the Evaporator Module and Safety Tray on the ground remove the Evaporator Module from the Safety Tray and relocate the Safety Tray to within the roof space. Position the Safety Tray on the boards as shown in Diagram 6, and do not fasten to the platform as puncturing the Safety Tray will damage its functionality.

**Note:** The controls end for the Evaporator Module shall be located at the same end as the Safety Tray Drain. There are location holes in the Safety Tray supporting channels to assist with unit location.

Diagram 6.



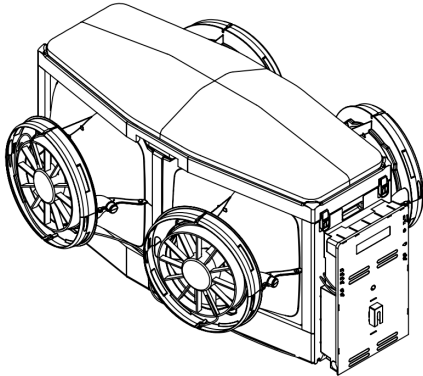
**Note:** The Brivis Iceberg™ may be raised on the safety tray to ensure the primary and secondary drain achieve continuous fall.

## 5.5 Positioning the Evaporator Module

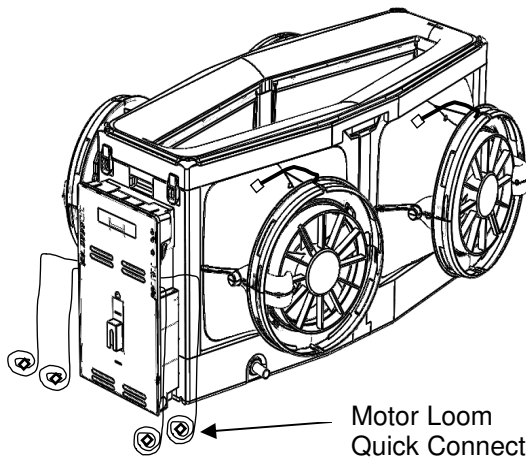
A distance between rafters of 555 mm is required to enable installation of the Evaporator Module. Before lifting and locating to within the roof space the Evaporator Module shall have the fan assemblies removed.

## 5.6 Remove Fan Assemblies

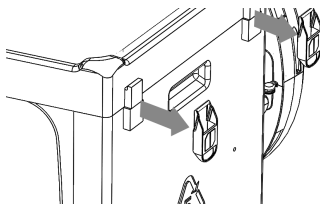
1. Remove Evaporator Module from the box.



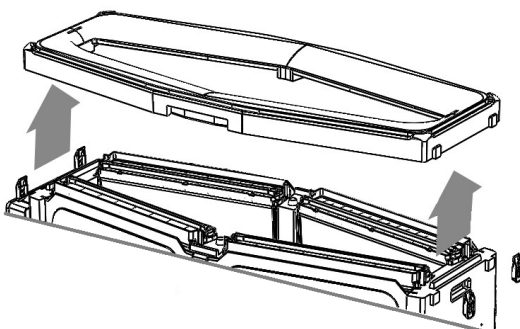
2. Disconnect motor looms at quick connect.



3. Remove the four "Toggle Clips", two each end, connecting "Evaporator Module Top" to the "Evaporator Module Base". Pull from the bottom of the clip and rotate to remove.

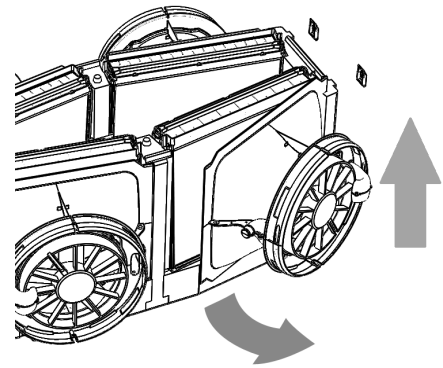


4. Lift "Acoustic Cooling Chamber – Top" vertically to remove and place down ensuring not to damage the "Inlet Mesh".



5. Remove all "Fan Assemblies" from the Evaporator Module:

- 5.1 Lift "Fan Assembly" 40mm vertically and rotate away from centre.



6. Re-assemble the "Acoustic Cooling Chamber – Top", repeat step "4" in reverse.

7. Re-assemble the "Toggle Clips", repeat step "3" in reverse.

8. The "Evaporator Module" is now ready to lift into the roof space. There is a handle at each end of the unit to assist with this. As the "Hydrochill™ pads" are now exposed be careful not to damage during the lift and positioning of the "Evaporator Module".

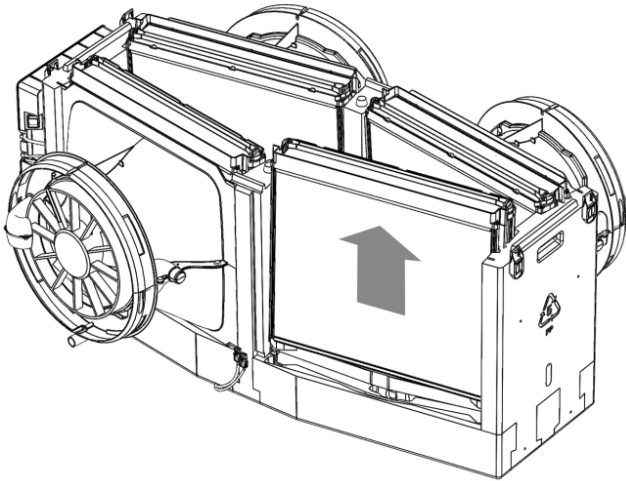
9. With the "Evaporator Module" in position on the "Safety Tray" lift the fan assemblies into the roof space and reassemble. Repeat steps 7 through to 1 in reverse.

## 5.7 Hydrochill™ Pad Removal

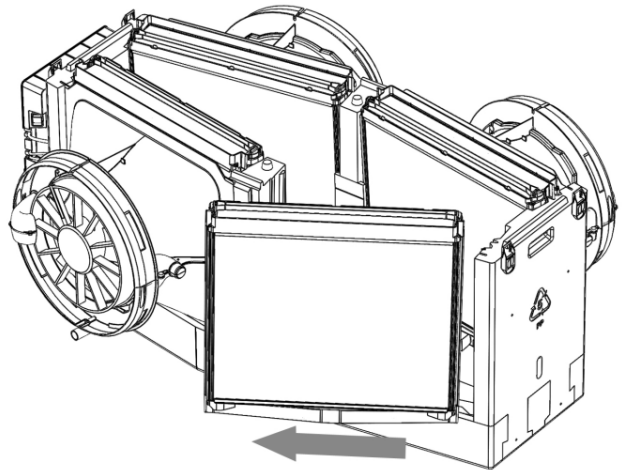
Prior to removing the Hydrochill™ Pads all of the Fan Assemblies must be removed as detailed in section 5.6 up to the end of Step 5.

To remove the Hydrochill™ Pads follow the below procedure:

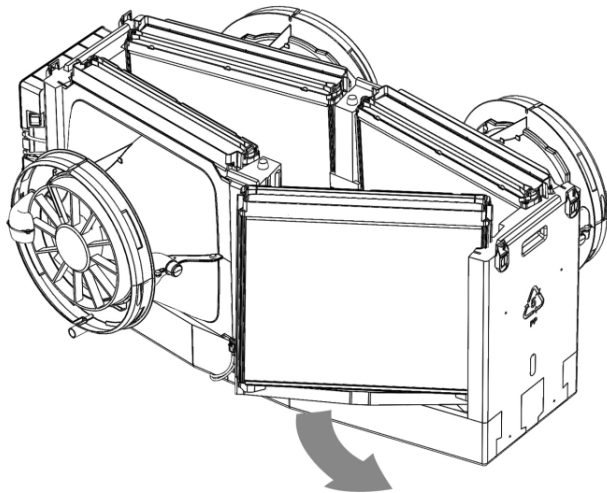
1. Lift the Hydrochill™ Pad up 50mm to dislodge from the water manifold supply spigot at the base of the pad.



3. Remove Hydrochill™ Pad horizontally away from the unit as shown.



2. Rotate the Hydrochill™ Pads away from the centre of the unit. This is typical for all four Hydrochill™ pads.



4. To assemble Hydrochill™ Pads repeat steps 3 through to 1 in reverse.

**Note:** The socket on the Hydrochill™ Pad must seat correctly on the water manifold spigot to ensure water is delivered to each pad equally.

To confirm Hydrochill™ pads are positioned correctly check the following:

- The top of all Hydrochill™ pads when in position are at the same level.
- The **Acoustic Cooling Chamber – Top** mates correctly with the Evaporator Module ends and sides, i.e. no gaps.
- Toggle clips fit correctly.

## 5.8 Evaporator Module – Primary Drain

Brivis recommend the drain outlet be plumbed to a suitable point in order to disperse the waste water away adequately without causing damage or nuisance i.e. no overflowing.

Ensure that all field supplied drainage pipe is rigid (not flexible) and UV stabilised if exposed to the external environment.

Ensure any drain has a continuous fall, the joints and fittings are adequately sealed, and that all penetrations in and out of the roof cavity are correctly sealed against water entry into the building, i.e. shall be compliant with local plumbing regulations.

The drain pipe shall also be properly supported along its entire run, and shall not place strain on the Evaporator Modules outlet fitting or base.

The drain connection size at the Evaporator Module is to suit DN20 pressure pipe.

**Note:** The “**Evaporator Module**” drain and “**Safety Tray**” drain shall not be joined.

## 5.9 Safety Tray – Secondary Drain

The Safety Tray shall be drained independently of the Evaporator Module and be assembled using **40mm DWV** with no reduction in open cross-sectional area. This drain shall be terminated in a position where the end user can see if water is dripping from the outlet. Please instruct the home owner to call their Installer or Brivis Service should they notice water dripping from the Safety Tray drain outlet.

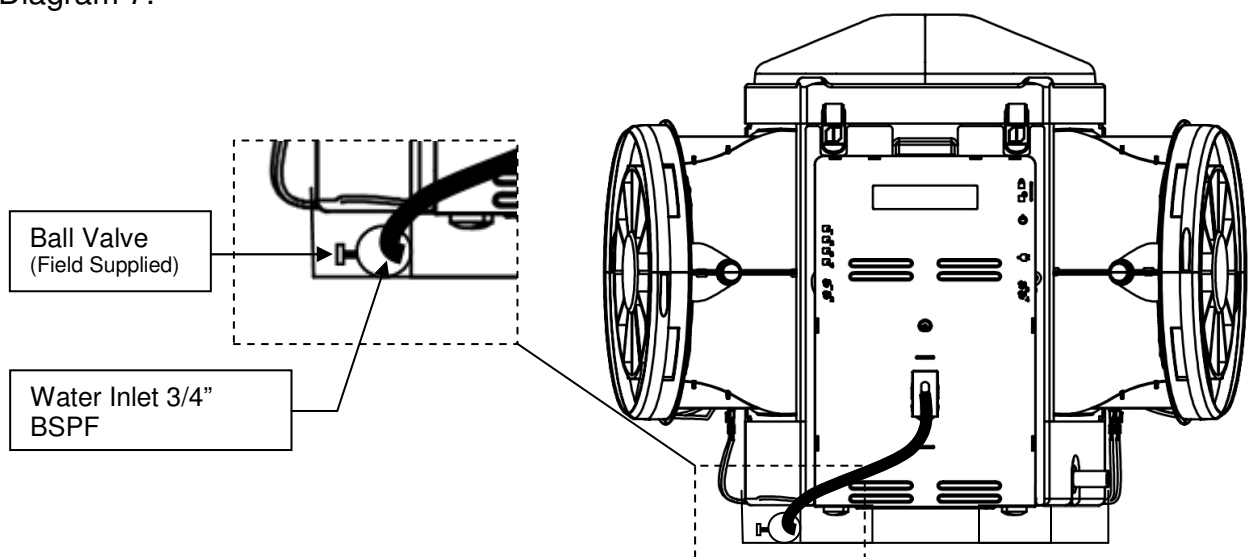
## 5.10 Inlet Connection

The water inlet connection point is on the “**Evaporator Module**” within the roof space. The connection size is 3/4” BSPF and is located on the Aquastop, a device secured to the end of the braided hose. A bi-directional water isolation valve is required at the unit for servicing and it shall be connected directly to the Aquastop. After connection the ball valve shall be secured inside the safety tray, a position and cable tie has been made available for this, refer to Diagram 7.



**Note:** A bi-directional valve shall be secured within the Safety Tray with cable tie provided

Diagram 7.



**Note:** New hose-sets supplied with the appliance are to be used and old hose-sets should not be used.

### 5.11 Trident PLUS Water Management System

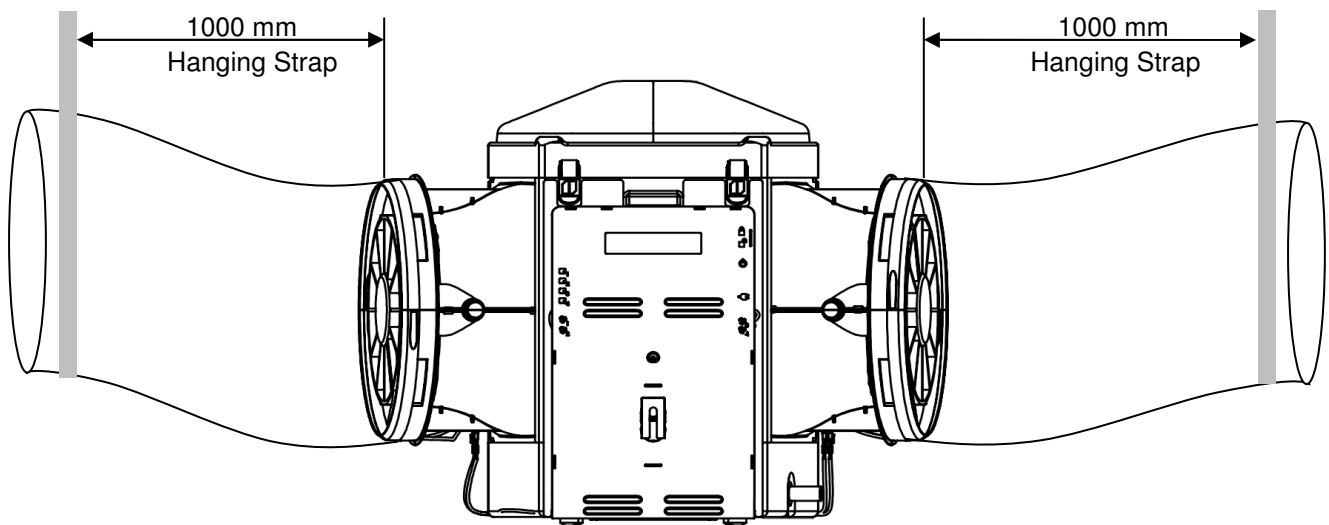
The Brivis Iceberg™ Trident Water Management System has two automated functions:

- An electronic water level sensor that automatically maintains the correct water level within the tank.
- A Brivis AquaSave module that helps maintain water purity during the Brivis Iceberg's operation and therefore does not flush as often.

### 5.12 Connecting Duct Work to the Evaporator Module

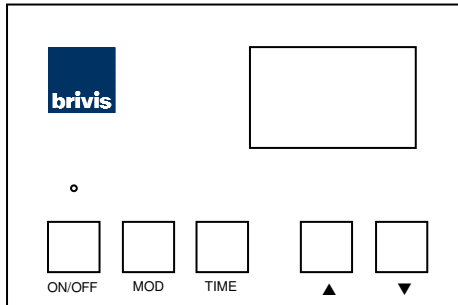
- The ductwork should not inhibit walkway access to existing services, as this may result in an occupational health and safety (OH&S) hazard.
- Refer to AS 4254 for the installation requirements of ductwork in buildings.
- The outlet pop sizes on the Evaporator Module are 18" / 450mm.
- The ductwork shall be hung off the support platform and joists as shown below.
- The minimum recommended duct length shall be no less than 6m and include 2 x 90° turns; one for connection onto the register and the other between the unit and the turn onto the register.

Diagram 8.



## 6. Brivis Wall Control Location and Mounting

### 6.1 Brivis Iceberg™ Wall Control



The Brivis Iceberg™ Evaporator Module comes supplied with a Brivis wall control. The loom is supplied and connected to the Brivis Evaporator Module PCB ready for routing to wall control.

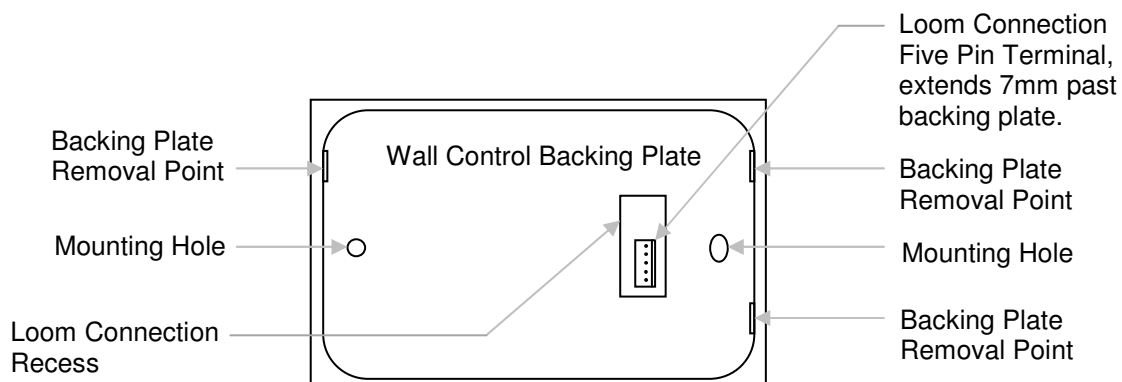
### 6.2 Positioning the Brivis Wall Control

The Controller in Auto mode will constantly monitor the temperature inside the house, switching the Iceberg™ ON and OFF to maintain the target comfort level selected. To do this effectively, the wall control shall be positioned correctly:

- Install the wall control within the area being cooled. It is important that the Wall Control is placed in a position that will provide the most accurate reading of the temperature within the area being cooled.
- Attach to an internal wall. The temperature difference on an external wall can affect the reading, so always mount the wall control on an internal wall. Also keep the hole in the wall for your wiring as small as possible and seal it to prevent draughts from within the wall cavity affecting the temperature sensing.
- The Wall Control should be approximately 1500mm above floor level.
- Avoid hot spots. Keep it as far away as possible from heat sources, e.g. above electrical equipment, direct sunlight and walls backing onto wall-ovens and stoves.
- Avoid cold spots. Ensure that the Wall Control is not affected by draughts coming through doorways, windows and stairwells, and is not placed too close to cooling outlets.
- Avoid dead spots. Do not site it in areas with little or no air circulation, e.g. behind doors, in corners or alcoves.
- Interference from other electrical connections. Ensure the thermostat and wiring loom is kept away from other electrical, data and antenna cables.

### 6.3 Mounting of Wall Control

1. Ensure power is isolated from the Brivis Evaporator Module.
2. Remove "Backing Plate" with a small flat screw driver at one of the three removal points.
3. Using the "Backing Plate" as a template on the plaster wall, mark out the two "Mounting Holes" and "Loom Connection Recess".
4. Cut out the "Loom Connection Recess".
5. Drill 8mm holes in "Mounting Hole" location and fit supplied plaster plugs.
6. Mount backing plate with supplied screws.
7. Pull loom through the plaster cutout and connect the five pin terminal to "Loom Connection" point on fascia back.
8. Mount "Wall Control Fascia" to "Wall Control Backing Plate".



## 7. Brivis Iceberg™ Sequence of Operation

### 7.1 Start Up

On start up a 15 second delay period provides time for the Motorised-WinterSeal to open before any other function begins.

If the Cooler has been OFF for longer than 45 minutes the tank will require refilling. Allow approximately 3-5 minutes depending on the water pressure.

### 7.2 Pre-wet

The Cooler has been pre-programmed to automatically saturate the filter pads when the system is turned ON.

Pre-wet is the process of running the pump and wetting the Hydrochill™ pads without the fan operating, ensuring full pad saturation and optimum cooling potential when the fan starts.

System OFF Time	Pre-Wet Time
<ul style="list-style-type: none"><li>• Less than 2 minutes</li></ul>	<ul style="list-style-type: none"><li>• No Pre-Wet</li></ul>
<ul style="list-style-type: none"><li>• Longer than 2 minutes</li></ul>	<ul style="list-style-type: none"><li>• Pre-Wet 4 minutes</li></ul>
<ul style="list-style-type: none"><li>• Longer than 45 minutes</li></ul>	<ul style="list-style-type: none"><li>• Tank has to be filled, therefore total time including Pre-Wet is 5-7 minutes.</li></ul>

### 7.3 Tank Water Quality and Replenishment during operation

During the Cooler's operation with the pump operating, the Cooler will be evaporating water and automatically refilling itself. The Brivis Iceberg™ will periodically, after a specified number of tank refills, flush out the tank without stopping the Cooler.

### 7.4 Shut-down Times

When the Cooler is turned OFF at the end of use the following will occur:

1. Water supply to the unit will cease.
2. Circulation of water within the unit will cease.
3. The supply air fans will continue to run for up to a further 6 minutes to dry out the Hydrochill™ pads.
4. After 45 minutes of no system operation the shut-down procedure begins with draining of the tank, followed by a wash cycle to clean the tank for approximately one minute.

## 8. Commissioning Checklist

Once installation of the system is complete Brivis recommends you perform an “**Installation Check**” test. This takes approximately five minutes and confirms correct functionality of the Brivis Iceberg™. To initiate the “**Installation Check**” please do the following:

1. Isolate power from the Brivis Iceberg™.
2. Remove the control panel cover and locate the dip switches on the main control board.
3. Change dip switch setting from “**1,0,0,0**” (Run configuration) to “**0,1,0,1**” (Installation Check configuration).
4. Place control panel cover back onto the unit.
5. Turn power back onto the Brivis Iceberg™ and the “**Installation Check**” will start automatically and proceed through the following sequence:
  - a. Motorised-WinterSeal will open.
  - b. Water solenoid will open and tank will begin to fill with water.
  - c. When high level is reached the solenoid will close and drain pump will run for 2 minutes.
  - d. After 2 minutes item ‘b’ will repeat followed by ‘c’.
  - e. If there are no faults with the water supply and primary drain the Motorised-WinterSeal will close.
6. If the Motorised-WinterSeal does not close and the system stops check the following:
  - a. Supply pressure is between 300kPa and 1000kPa.
  - b. There is continuous fall on the primary drain.

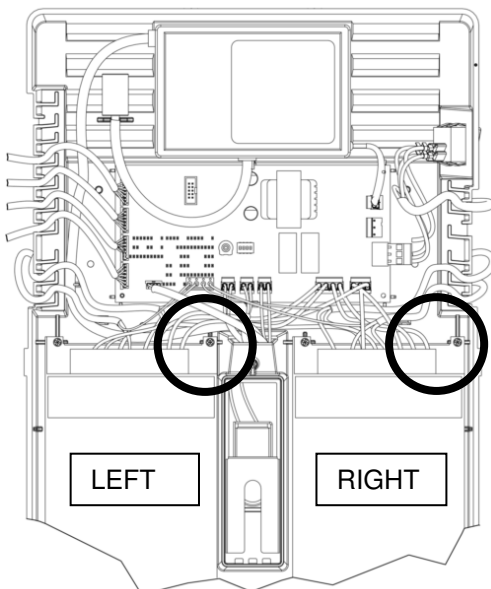
Other commissioning checks to consider include checking:

- The automatic Motorised-WinterSeal is not catching and opens fully.
- The isolating valve on the water supply is turned ON.
- The water tank fills with water and the water inlet valve closes when the tank is full.
- There is no foreign matter in the water tank or fan housing.
- The Hydrochill™ pads are correctly in position.
- The pump operates when turned ON at the Wall Control.
- The fan operates through the entire speed range.
- The water distribution is even with the Hydrochill™ pads in position and the Cooler in operation.
- The “**Acoustic Cooling Chamber – Top**” is secured correctly.
- The water drains completely from the tank and that any external drain piping is not blocked or restricted.
- The Safety Tray drains correctly

### 8.1 Changing Fan Airflow Rate

The Brivis Iceberg™ has four Fan Motors and two power supplies where one power supply services two Fan Motors. The power supply on the **LEFT** side controls the Fan Motors on the left side and the power supply on the **RIGHT** side controls the Fan Motors on the right side. The supply voltage to each Fan Motor from factory is 48VDC. If you would like to change the airflow rate for a minimum of two Fan Motors do the following:

Diagram 9.



1. Isolate power to the unit.
2. Remove the screw retaining the controls cover to the controls enclosure. This is located in the centre of the controls cover.
3. On the top face of the power supply, refer to circles on Diagram 9, there is an L.E.D and behind it is a dial which changes the DC supply to the Fan Motors when turned.
4. **Do not** turn the dial clockwise.
5. Rotate the dial anti-clockwise to reduce the DC power supply to the Fan Motors and the airflow rate for the associated fans.
6. Reassemble the controls cover, turn power to the unit back on and assess the change in airflow rate.



## 8.2 Handover

- Demonstrate system and controls operation to homeowner
- Explain exhaust and ventilation requirements
- Show the secondary drain position and inform what to do should water begin to flow from drain
- Discuss importance of clean air intakes (e.g. Icecap™)
- Warranty registration
- Service Maintenance requirements

## 9. Troubleshooting

**IMPORTANT:** Switch OFF the power and unplug the Cooler before touching any wiring. Care shall be taken to ensure electrical components have been isolated before performing any service work, i.e. water inlet valve. Only an electrically qualified technician should carry out any service to electrical wiring.

### Isolating Switch

The Brivis Iceberg™ has a power-isolating switch to facilitate servicing and is located on the side of the Evaporator Module control panel. Always test for electrical voltage before commencing any work on the cooler.

### 9.1 Fan Motor will not start, check:

- The 10 Amp fuse in the meter box has not blown.
- The Cooler's 3-pin supply plug is correctly located in the power socket.
- For power at the power socket (plug in another appliance and test).
- The isolating switches at the unit and the supply power socket are turned ON.
- The unit is turned ON at the Brivis Wall Control.
- The fans spin freely with adequate tip clearance.
- The quick-connect for the motor loom is not disconnected.
- That all other electrical connections are secure, and if the motor will not start, call Brivis for service.

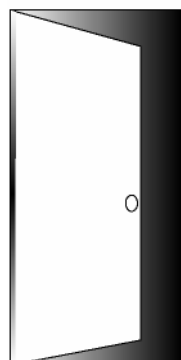
### 9.2 The circulation pump will not start, check:

- The 10 Amp fuse in the meter box has not blown.
- The Cooler's 3-pin supply plug is correctly located in the power socket.
- For power at the power socket (plug in another appliance and test).
- The isolating switches at the unit and the supply power socket are turned ON.
- The unit is turned ON at the Brivis Wall Control.
- The pump impellor is not blocked or obstructed.
- All electrical connections are secure, and if the pump will not start, call Brivis for service.

## 10. Exhaust and Ventilation

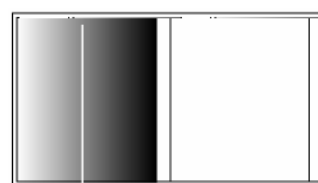
**Note:** Exhaust fans may be required if insufficient free exhaust area exists. If the exhaust fan is the only exhaust or ventilation outlet, then its capacity should be at least equal to the Cooler's air output.

Diagram 10. Door = 1.6m<sup>2</sup>



Hinged Window = 0.3m<sup>2</sup>

Opening Sliding Window = 0.7m<sup>2</sup>



Average ventilation area provided by various openings when fully opened.

**Table 2. Opening required for Brivis Iceberg™.**

Model	Number of average size windows & doors (suggestions only)	Highest Fan Setting	Lowest Fan Setting
XQ4	Three sliding windows or one door & two hinged windows	2.3m <sup>2</sup>	1.4m <sup>2</sup>

**Note:** Ceiling exhaust vents (security relief vents) are not recommended as recirculating air will impair the performance of the Cooler.

## 11. Technical Specifications

Model	Weight		Tank Capacity (litres)	Motor		System Amps	Fan Impeller Blades	Control Loom length	Primary Drain	Safety Drain
	Dry	Wet		Watts /motor	Volts DC /motor					
XQ4	46	62	12	290	48	8	5	20m	DN20 Pressure pipe	40mm DWV

## Notes



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