



INSTALLATION AND OPERATION

AL SERIES EVAPORATIVE COOLER

OR MODELS



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SAFETY

1.0 INTRODUCTION

This Manual is for use with a Seeley International manufactured AIRAAL Evaporative Cooler OR Models. This manual is updated without notification and it is the installer and customers responsibility to ensure the latest version is used. This Manual is intended to assist in the Installation, Commissioning and Service of Seeley International manufactured AIRAAL units and DOES NOT take precedence over any Australian Standards or legislation.

This book should be retained with the unit or made easily accessible to installation and maintenance personnel.

AIRAAL units are evaporative cooler appliances, capable of supplying cooled air and direct air ventilation. AL units are produced in 4 different capacities to suit a wide variety of installation requirements.

1.1 GENERAL SAFETY INFORMATION

THIS EVAPORATIVE COOLER IS TO BE INSTALLED BY AN AUTHORISED PERSON ONLY

- DO NOT** Operate this appliance before reading the manual.
- DO NOT** Place articles on or against this appliance.
- DO NOT** Use or store flammable materials near this appliance.
- DO NOT** Operate this appliance with panels, covers or guards removed.
- DO NOT** Spray aerosols in the vicinity of this appliance while it is in operation.
- DO NOT** Remove markings and or labels from the unit.
- DO NOT** Remove warning labels from the unit.
- DO NOT** Use chlorine tablets

These AIRAAL Evaporative Cooler units must be installed in accordance with these instructions, local plumbing regulations, municipal building codes, electrical wiring regulations, Australian Standards and any other relevant statutory requirements.

Employers and Employees Responsibility	Risk Assessment
The installation and maintenance of evaporative cooling units, particularly at height, has the potential to create Occupational Health and Safety (OH&S) issues for those involved. Installers are advised to ensure they are familiar with relevant State and Federal legislation, such as Acts, Regulations, approved Codes of Practice and Australian Standards, which offer practical guidance on these health and safety issues. Compliance with these regulations will require appropriate work practices, equipment, training and qualification of workers. Seeley International provides the following information as a guide to contractors and employees to assist in minimising risk.	A risk assessment of all hazardous tasks is required under legislation. A risk assessment is an essential element that should be conducted before the commencement of work, to identify and eliminate the risk of falls and other risks, or to minimise these risks by implementing control measures. This does not need to be a complicated process - it is a matter of assessing the job to be done and considering what actions are necessary so the person doing the job does not injure themselves. This should be considered in terms of: <ul style="list-style-type: none">• What are the chances of an incident occurring?• What could the possible consequences be?• What can be done to reduce, or better still, eliminate the risk?

1.1.1 Handling the Unit

AL coolers are provided with lifting external points. The cooler must remain in the upright position at all times.

1.1.2 Positioning the Cooler

The unit should be installed so that it is level. Allow 1200mm clearance around the unit. Air intake to the unit should not be restricted in any manner. Approval should be sought by Seeley for any installation encroaching on these limits. No modifications shall be made to the unit. If the unit is being installed on a sloped roof, a roof stand shall be installed and adequately secured before the AL unit is installed.

1.1.3 Wiring Electrical

Connections must be in accordance with all relevant Australian Standards and applicable State regulations and local legislation.

1.1.4 Drainage

Drainage for the cooler section shall be done in accordance with relevant Australian Standards (AS3500) and statutory requirements and local legislation.

SAFETY

1.1.5 Occupational Health and Safety

Only safe working practices shall be employed when working on the AI Coolers. The process of installing the units shall take into consideration relevant OH&S requirements. These requirements pertain to all aspects of access, installation, operation and maintenance. Persons installing water appliances shall be aware of their responsibilities and qualified in accordance with local OH&S requirements. Precautions shall be taken to avoid any electrical hazards present in the water installation.

1.1.6 Water Supply

Pipework supplying the unit shall be installed by an appropriately qualified person and be fitted with the required isolation valves. Pressure to the unit must be no greater than 1400 kPa. Potable water shall be used.

1.1.7 Commissioning, Recommissioning and Decommissioning

Every AI Evaporative Cooler shall be commissioned according to the instructions in Section 4 of this Manual prior to use to ensure safe start and operation of the unit and shall include checks of safety and operating control.

Following maintenance work on any part of the unit, the affected part of the installation shall be re-commissioned by checking to ensure safe start-up and operation.

After a maintenance shutdown, isolation of the unit or interruption to the water or electrical supply an appropriately qualified person shall conduct start up checks to confirm safe operation.

When a unit is being decommissioned it shall be physically disconnected from the water supply, purged and sealed. Where possible components should be recycled in accordance with government regulations.

1.1.8 Operational Safety

AIRA AL Evaporative Coolers must not be operated until the unit has been commissioned by a qualified person. The unit should not be operated if any safeguards, panels or controls have been removed, damaged or bypassed.

If the unit is not operating as intended turn off the unit at the wall switch and then isolate the power and water supply. The unit should remain isolated until a qualified service technician has inspected the unit and resolved any issues.

1.1.9 Safety Points to Consider

- What is the best and safest access to the roof and/or work areas?
- If a worker is alone, who knows they are there and if they get into difficulty, how can they summon help? (Call someone on the ground? Mobile phone? Etc.)
- Has the roof section or structure been assessed to ensure that it can withstand the load of the appliance and workers.
- Does the worker have appropriate foot wear? (Flat sole jogger type is advisable.)
- Are all power cables / extension leads safe and appropriately rated?
- Are all ladders, tools and equipment suitable in good condition?
- Where ladders are to be used, is there a firm, stable base for them to stand on? Can they be tied or secured in some way at the top? Is the top of the ladder clear of electricity supply cables?
- Is there a roof anchor to attach a harness and lanyard to? If so, instruction should be issued for the use of an approved harness or only suitably trained people used.
- Are all tools and materials being used, prevented from slipping and falling onto a person at ground level? Is the area below the work area suitably protected to prevent persons walking in this area?
- Does the work schedule take into account weather conditions, allowing for work to be suspended in high winds, thunder storms/lightning or other types of weather giving wet, slippery surfaces?
- Is there an on-going safety check system of harnesses, ropes, ladders and access/lifting equipment and where they exist on roofs, anchor points before the commencement of work?
- Is there a system which prevents employees from working on roofs if they are unwell or under the influence of drugs or alcohol?
- Are there any special conditions to consider i.e. excessive roof pitch, limited ground area, fragile roof, electrical power lines?
- Is the person conducting the installation and maintenance appropriately qualified and familiar with local authority and Australian Standards.

SAFETY

1.1.10 Legionnaires Disease

Evaporative air conditioners have not been implicated in any outbreak of Legionnaires disease, although Legionella bacteria have been found in such systems. The water temperature in the evaporative air cooler section is normally at about 18°C at which temperature the Legionella bacteria (if present) will remain dormant and cannot multiply.

The following maintenance schedule is required to be followed in order to comply with the New South Wales Public Health Act 1991 section 46:-

- a. Sumps are to be drained and cleaned at three monthly intervals or more frequently if necessary.
- b. Wetted pads are to be drained and cleaned at three monthly intervals or more frequently if necessary.
- c. Water strainers are to be cleaned at three monthly intervals or more frequently if necessary.
- d. If any air filter is fitted, it is to be cleaned or replaced when necessary.

GENERAL INFORMATION

2.1 UNIT OVERVIEW

AIRAL units are Evaporative Coolers. The standard control system is a standalone wall switch or BMS to control the fan and water pumps. Appendix A provides wiring diagrams.

When the pumps are turned on water is drawn into the unit and dispersed through the evaporative cooler pads. The fan is then turned on drawing air across the damp pads lowering the temperature of the air before being fed into the duct work.

Coolers are supplied with one speed VSD compatible motors or 2 speed motors.

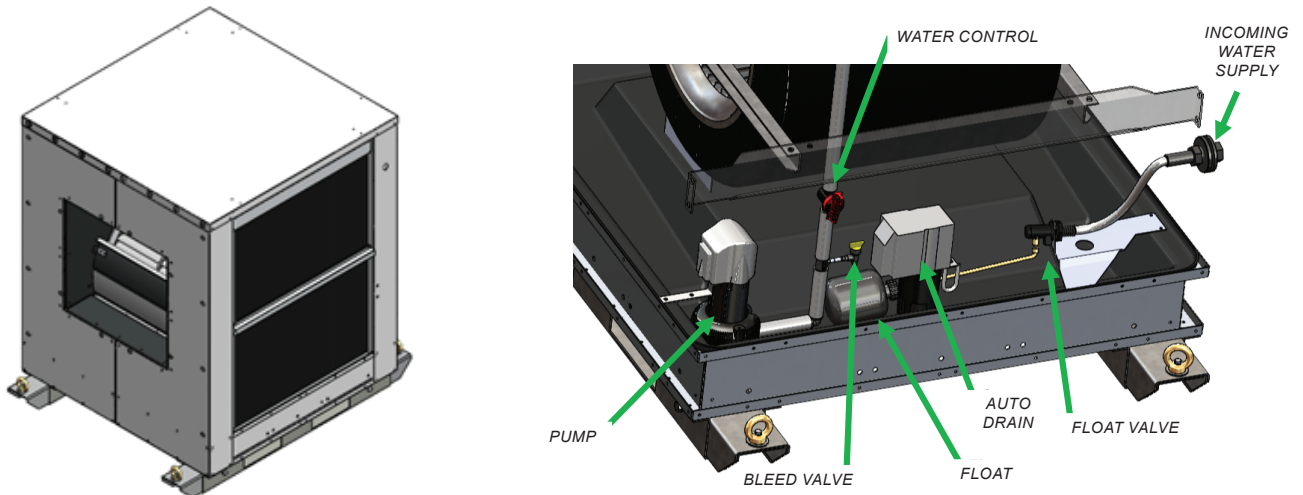


Figure 1: External (left) and Internal (right) components

2.2 EQUIPMENT RECEIPT

Inspect the unit for any damage caused in transit. Any such damage must be immediately reported to the shipper of the goods.

The unit has been factory tested to check for correct operation of all components. If any part is obviously missing or damaged, notify the supplier immediately.

2.3 FACTORY UNIT TEST

All AIRA coolers are given a factory unit test which covers the function test and checks of the safety system including;

- Blower/fan operation
- Electrical wiring

2.4 MODEL DESIGNATION

AIRAL Coolers come in 4 sizes (AL18, AL25, AL30 and AL36) offering a range of airflows. Each unit has a range of pulley kits available which can be purchased to meet the pressure and flow requirements. Units can be specified to have top, side or bottom discharge.

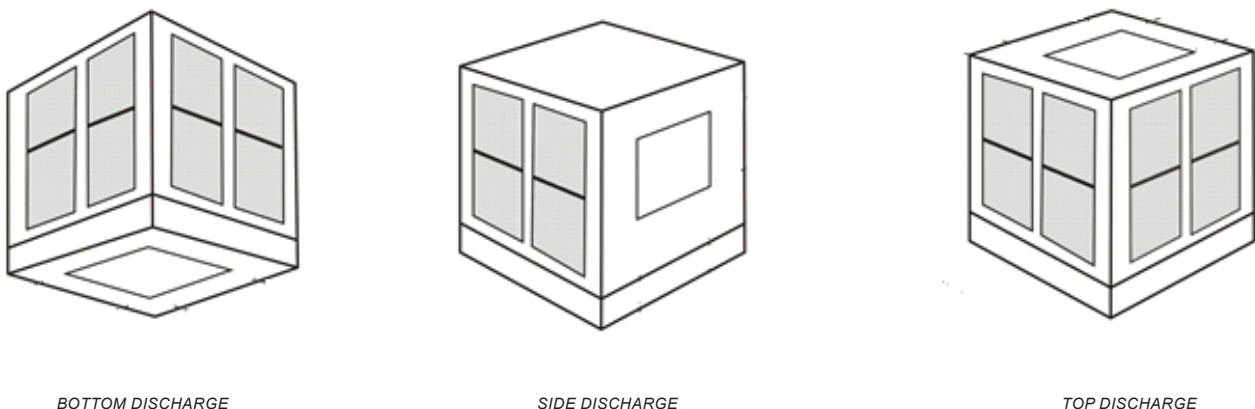


Figure 2: Discharge Options

GENERAL INFORMATION

2.5 TECHNICAL SPECIFICATION

2.5.1 Construction

- The frame is a galvanised steel body and external cabinets are marine grade aluminium.
- Units have Black Magic™ Mini-Cell Chillcel® cooling pads.

2.5.2 Blower

- The standard blower is forward curved and constructed from steel. Units not installed in ductwork are typically optioned with an axial fan due to the low pressure drop.
- Blower housings are powder coated steel as standard.

2.5.3 Fan Motors

- Fan motors are mounted externally to the blower and connect via a set of pulleys.
- All units are available at order with 2 different motor power capacity to meet flow and pressure requirements. Units may be fitted with a larger motor at additional cost. Contact Seeley international for further advice.
- Axial fans are specified for the F configuration and designed to be installed indoors generally as an air curtain.

2.5.4 Pulleys

- Upon order the customer will be given the options of one of three pulley kits to meet their flow and pressure requirements.
- Variations in external pressure drop outside of the standard product range require pulley and belt combinations to be supplied by the customer.
- All pulleys are of steel construction with taper lock mounting.

2.5.5 Electrical Control and Connection

- All units have an electrical starter box housed inside the unit.
- Refer to Appendix A for wiring diagrams.
- Units may be controlled by Wall Switch or BMS.
- Units will require single or 3 phase power depending on required motor size.

2.5.6 Supply Water Specification

Water consumption rates vary with weather conditions but the following can be used as a guide. The evaporative cooler can evaporate around 2.5L of water per hour for every 100L/s of supply air. So a large cooler providing 14,000L/s of air could evaporate $2.5 \times 140 = 350\text{L}$ of water per hour of operation. The water bleed off rate must be added to this in order to calculate the total operating water flow rate.

2.5.7 Relief Area Calculation

Evaporative air coolers always run on 100 % fresh outside air. Always ensure adequate relief is available via open doors and/or windows. Allow approximately 0.4m^2 per 1000L/s of supply air. If 0.5mm fly wire screens are fitted to the relief area, allow 0.8m^2 per 1000L/s for this area. Contact manufacturer if other fly wire thicknesses are installed.

Example:

AL30 – 7.5kW Cooler with 200Pa pressure drop

Air delivery will be approximately 11,890 L/s (refer spec sheet)

If no fly screens are fitted to relief openings:

$$0.4 \text{ m}^2 \times (11890 \text{ L/s} / 1000 \text{ L/s}) = 4.8\text{m}^2 \text{ relief area required}$$

If fly screens are fitted to 70% of the relief openings:

$$[(0.8 \text{ m}^2 \times 70\%) + (0.4 \text{ m}^2 \times 30\%)] (11890 \text{ L/s} / 1000 \text{ L/s}) = 8.1 \text{ m}^2 \text{ relief area required (minimum)}$$

Select relief openings to provide the best pattern of cool air flow throughout the building. Note that relief openings may be ineffective if exposed to high winds. If air exhaust volume is a problem, mechanical exhaust ventilation will be required for as much as 80% of the air delivery of the cooler.

Coolers must not discharge into a closed space but must always be able to relieve from a building.

If Supply air ducts are fitted with adjustable outlet grill blades, the blades should be adjusted to give the best cool air distribution in the area served by the outlet. **Do not close blades too far or air whistle may occur.**

To ensure long life and efficient operation it is essential that the cooler receive an annual service. In extreme environments (e.g. hot dusty areas) more frequent service may be required. Check with the unit installer.

During normal operation of the cooler it is important that the water bleed-off is operating and is not shut off or blocked. This bleed-off will prevent an accumulation of salts and solids in the unit.

GENERAL INFORMATION

2.5.8 Drainage

All AL coolers require adequate drainage to remove water from the unit. It is the installers responsibility to ensure that the drain is adequately sized to accommodate the unit. The local drains shall be sufficient to remove the excess water required to clean out the unit as required.

INSTALLATION INFORMATION

3.0 INSTALLATION INFORMATION

The supplied units are to be installed in accordance to this manual, relevant local standards, acts and regulations. Before installation it is the customers responsibility to ensure that the water and electrical supply required by the unit is available and that the building structure is sufficient to support the load of the operational unit and service and installation personal.

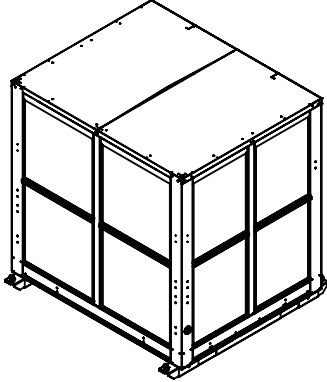
Isolation of the water and electrical supplies to the units shall be accessible and identifiable at all times.

INSTALLATION INFORMATION

3.1 MODEL VARIATIONS AND DIMENSIONS

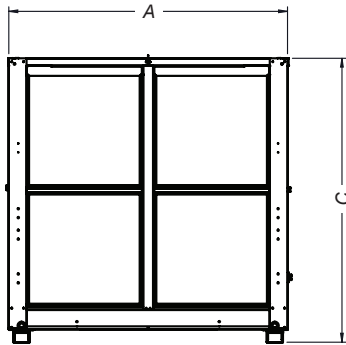
AL SERIES COOLERS

ISOMETRIC (AL18, AL25, AL30)



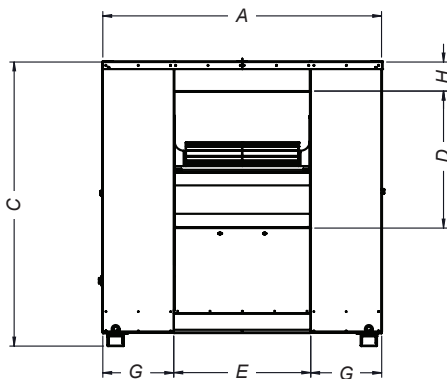
AMI133-A ISO

REAR (AL18, AL25, AL30)



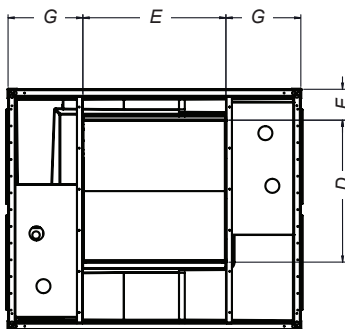
AMI133-A REAR

FRONT (AL18, AL25, AL30)



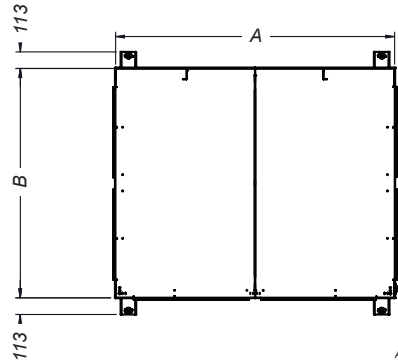
AMI133-A FRONT

BOTTOM (AL30 DOWN DISCHARGE)



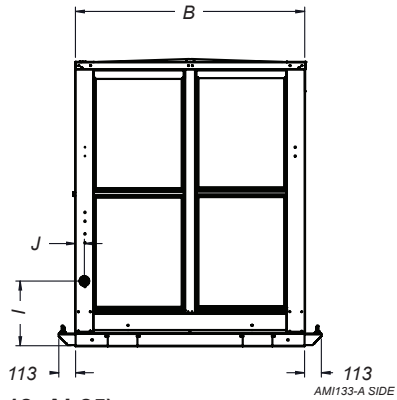
AMI143-A BOTTOM

TOP (AL18, AL25, AL30)



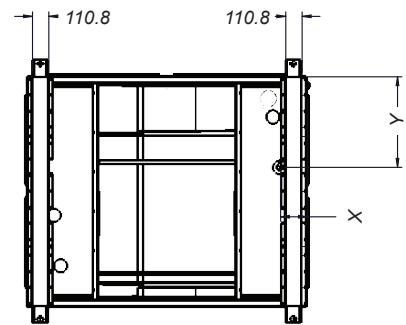
AMI133-A TOP

SIDE (AL18, AL25, AL30)



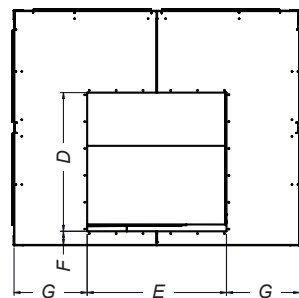
AMI133-A SIDE

BOTTOM (AL18, AL25)



AMI133-A BOTTOM

BOTTOM (AL30 TOP DISCHARGE)



AMI144-A BOTTOM

Dimensions are in mm.

INSTALLATION INFORMATION

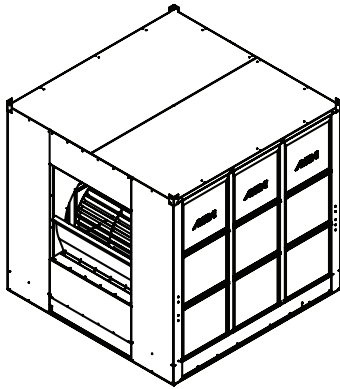
3.1.1 COOLER DIMENSIONS (AL18, AL25, AL30, AL36)

DIM	AL18	AL25	AL30	AL36
A	990	1550	1890	2230
B	990	1550	1550	2240
C	1250	1570	1920	2135
D	500	795	920	1090
E	545	795	920	1090
F	135	195	195	200
G	222	377	483	570
H	270	160	200	395
I	440	440	440	440
J	70	70	70	70

AL SERIES COOLERS

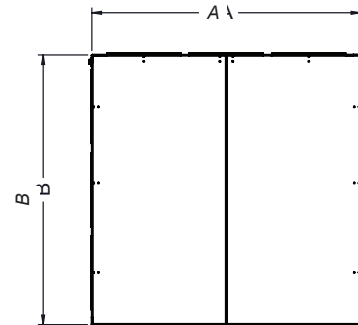
Table 1: AL Series Cooler Dimensions

ISOMETRIC (AL36)



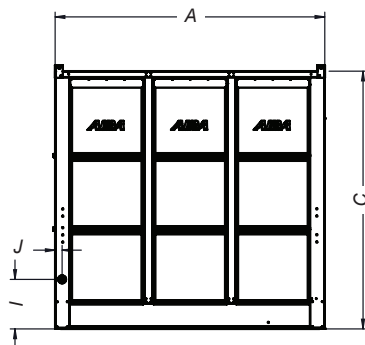
AMI145-A ISO

TOP (AL36)



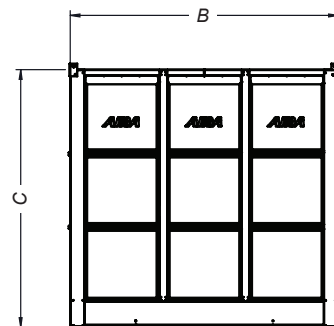
AMI145-A TOP

REAR (AL36)



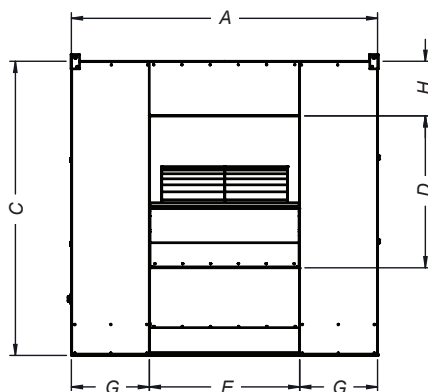
AMI145-A REAR

SIDE (AL36)



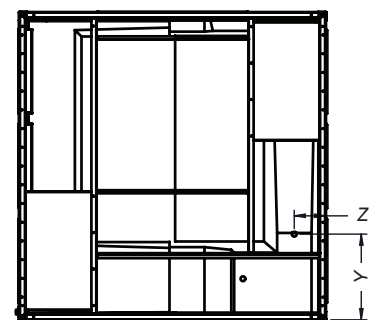
AMI145-A SIDE

FRONT (AL36)



AMI145-A FRONT

BOTTOM (AL36)



AMI145-A BOTTOM

Dimensions are in mm.

INSTALLATION INFORMATION

3.1.2 DRAIN LOCATION DIMENSIONS (AL18, AL25, AL30, AL36)

Model	AL18	AL25	AL30	AL36
X	150	200	240	N/A
Y	500	650	650	650
Z	N/A	N/A	N/A	315

Table 2: Drain Location Dimensions (mm)

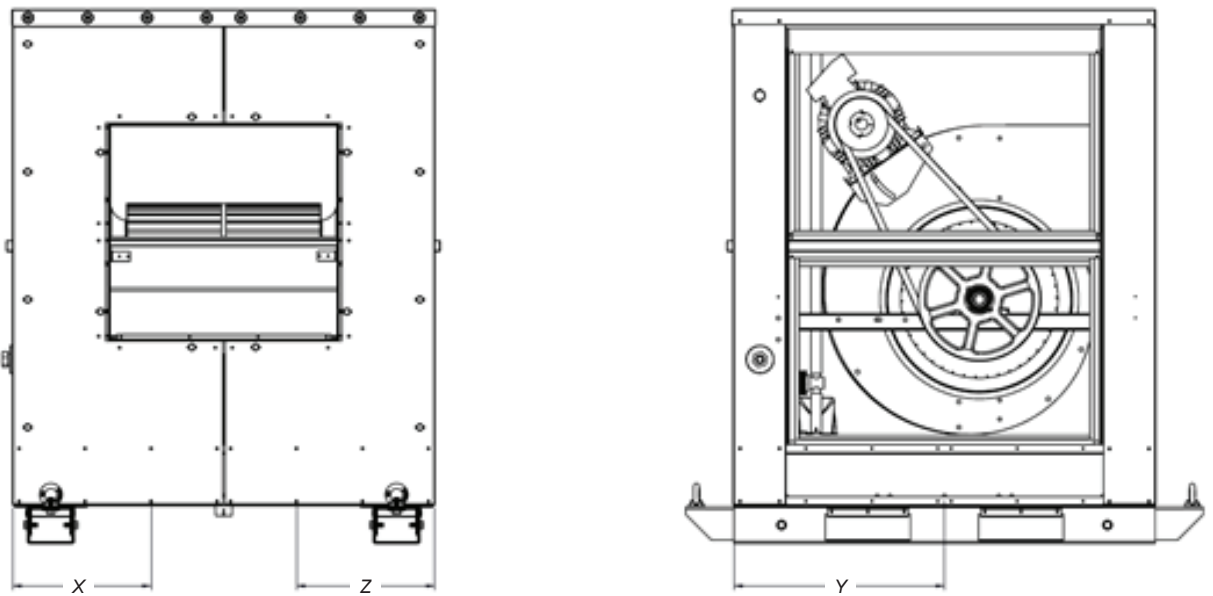


Figure 5: Drain Location

INSTALLATION INFORMATION

3.2 INSTALLATION

The following recommendations are not intended to supplant or take precedence over relevant official regulations. AIRA AL Evaporative Cooler units are designed essentially as a roof top or external ground mount unit.

3.2.1 Location

This equipment is not designed for long and complex air distribution ductwork and as such the unit should be located as close as practicable to the points of air distribution. Depending on large volumes of 100% fresh air, care must be taken to locate the unit clear of kitchen exhausts, heavy vehicle traffic, industrial fume discharge etc. that may allow odour or fume laden air to be drawn into the unit. The prime requisites for the correct location of a unit is an unrestricted supply of clean fresh air.

When selecting a location for the AL Evaporative Cooler unit the following shall be considered.

1. Will the unit be suitably protected from the effects of corrosion and/or dust laden environments and any likelihood of physical damage?
2. Can qualified personnel perform functional adjustments and maintenance on the unit?
3. Does the chosen location prevent a hazard to the building or structure or to the contents of the building?
4. How to minimise the risks associated with storage, use or release of hazardous or flammable substances in the vicinity of the unit?
5. How to minimise risk of harm to persons?
6. Will the noise of the unit operating affect persons nearby? Units should be located so that quiet areas such as bedrooms, living rooms, meetings rooms etc. are not affected for both the premises that the unit is being installed and adjoining properties.
7. A structural engineer is to be engaged to prove that the supporting structure is suitable for a fully laden unit.
8. Ensure any skylights within 3m of the units have adequate fall protection installed.

INSTALLATION INFORMATION

3.2.2 Clearance Around Unit

1200mm is the recommended clearance around all sides for service access.

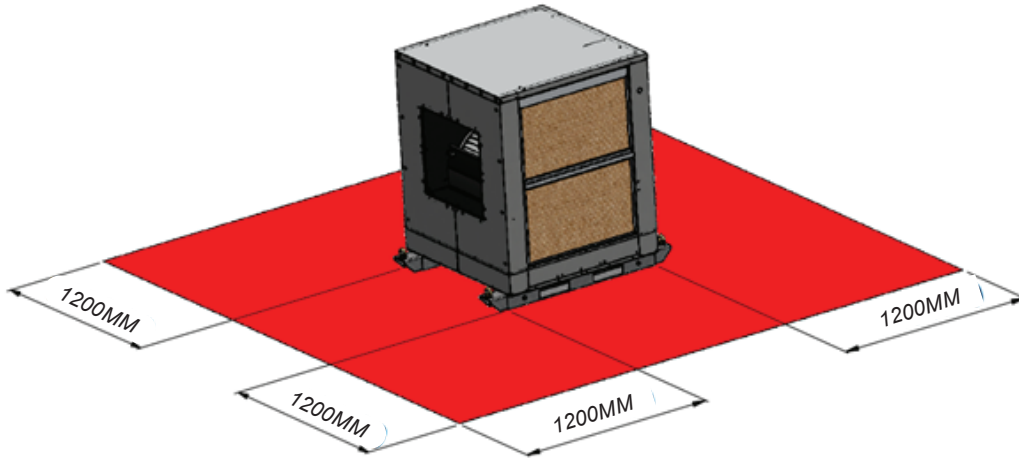


Figure 6: Service Clearance around Unit

3.2.3 Plant Room

It is **not** recommended to install an AL Evaporative Cooler in an enclosed plant room. Doing so may introduce negative pressure into the plant room and allow for harmful gases and fumes to be pulled into the building creating a risk to the building occupants. If a cooler is placed in a plant room a suitably qualified engineer must be consulted to ensure that enough clean airflow is entering the plant room.

If the unit is installed in an external plant room a suitably qualified engineer should be engaged to ensure that other plant that may generate harmful gases and fumes are located at a distance such that the gases and fumes will not be drawn into the building.

3.2.4 Roof Stands

If a roof stand was supplied with the unit it is to be installed in accordance with manual AM011. If the customer chooses to use a 3rd party support structure they must be adequately and professionally designed by a structural engineer to support the operating weight of the unit.

Roof stands shall be installed so that the unit sits level. Figure 7: Typical Roof Stand depicts a typical roof stand used across the AIRA range. Refer to AM011 for Roof stand installation, commissioning, and maintenance.

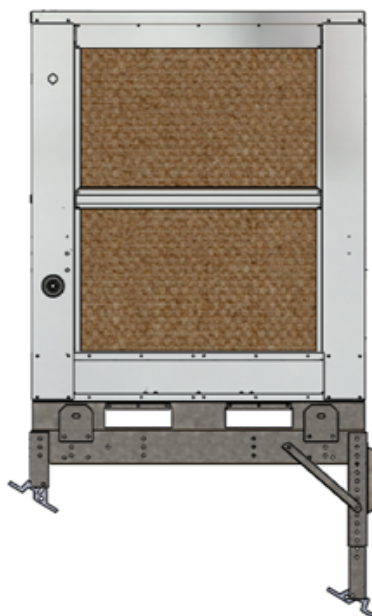


Figure 7: Typical Roof Stand

INSTALLATION INFORMATION

3.2.5 Weight and Location

For roof mounting, the building's roof must be adequately designed to support the unit weight and any service personnel. If in doubt a suitably qualified Civil or Structural Engineer should be engaged to conduct an assessment. The below figures and tables list the corner weights of the units with and without blower.

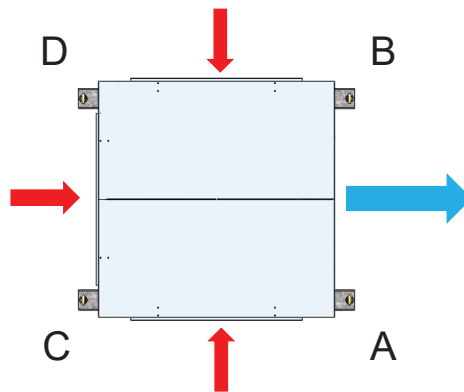


Figure 8: Unit Corner Weights

MODEL	A	B	C	D
AL18	37kg	28kg	27kg	36k
AL25	78kg	71kg	90kg	67kg
AL30	115kg	63kg	84kg	115kg
AL36	140kg	196.5kg	212kg	93kg

Table 3: Unit Corner Weights

3.2.6 Lifting

Units are to be lifted by the points specified and designed to lift only the specific units' dry weight. These lifting points are suitable for either Crane or Helicopter lift with suitable spreader bars. The unit cabinet is lightweight aluminium and at no point should the lifting slings or spreader bar contact the cabinet, failure to comply will permanently damage the case.

Lifting point securing bolts and lifting eyes must be inspected for prior to lifting to ensure all bolts are installed, of correct tensile strength and are correctly tensioned. If any damage is observed, lifting points and/or eyes should be replaced.

Below is a suggested lifting arrangement. Noting that the centre of gravity should be assessed for each unit prior to lifting. By suitably qualified crane operator, rigger and dogmen. Certification of the lifting lug assembly may be obtained by contacting Seeley International.

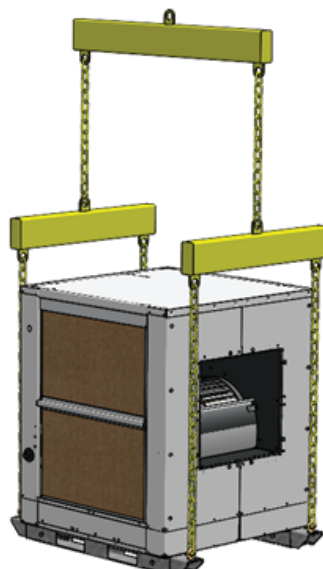


Figure 9: Lifting Example

INSTALLATION INFORMATION

3.2.7 Positioning and Securing

Cabinet units are supplied with under cabinet skids. Units are designed to be supported along the length of the skids. Holes may be drilled into the skids to secure the unit in place. Lifting points at either end of the units are NOT to be used for anything other than lifting the unit into place and may be removed once installation has occurred.

It is the responsibility of the installer to ensure that any platform used to support the unit is suitably designed. A suitably qualified Civil or Structural Engineer must be engaged to conduct an assessment.

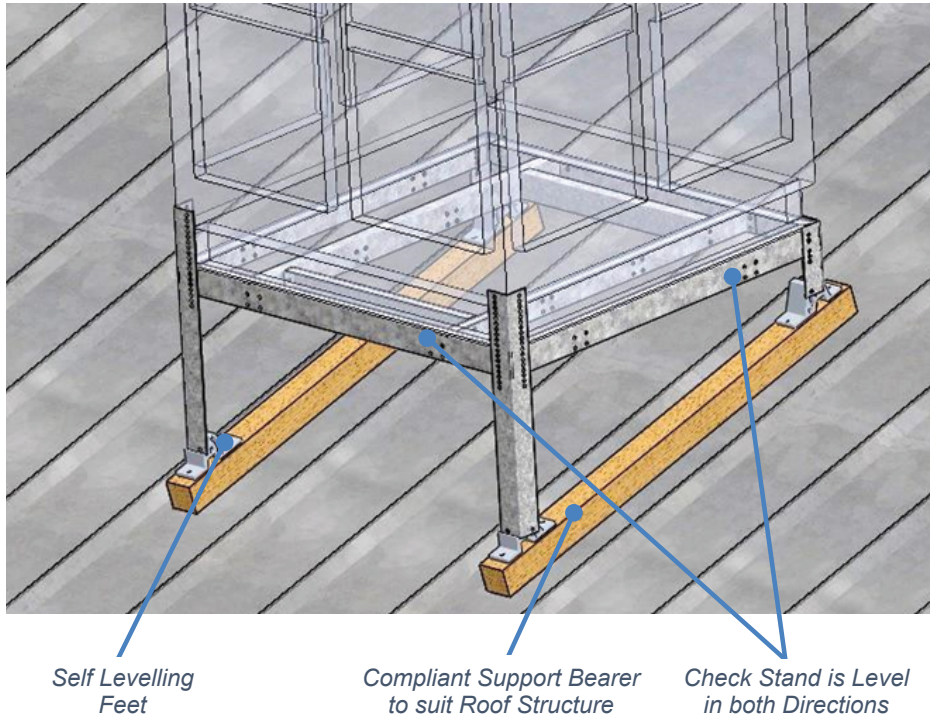


Figure 10: Positioning the unit

3.2.8 Duct Connections

It is the installers responsibility to adequately secure the ductwork to the unit. Typical installations use duct mate screwed to the face of the unit over the blower opening.

Refer to the Model Variants and Dimensions section of the document for specific unit details. Units are available in top, side or down discharge.



Figure 11: Duct Connections

INSTALLATION INFORMATION

3.3 ELECTRICAL CONNECTIONS

3.3.1 Electrical Supply

All electrical connections are to be as per AS3000. All electrical work shall be performed by a registered electrical contractor. Appendix A: Electrical Information, provides a comprehensive electrical connection guide including wiring configurations for different control setups and wiring diagram package and should be used in conjunction with this manual.

- Electrical circuit breakers must be a minimum of a “ D curve” motor start circuit breaker.
- Electrical circuit breakers must be sized according to the total load requirements.

All AIRA AL Evaporative Coolers are supplied with an electrical isolation switch which is to be installed by a qualified tradesperson in a location compliant with Australian Standards and Regulations. A hole saw will be required to create a cut out to install a gland in the desired power entry location. The hole shall be cut in a location such that the cable will not be within the water and can be adequately secured to the inside of the unit.

3.3.2 User Control Configuration Options

There are 2 primary control options for AIRA AI Evaporative Cooler units, Wall switch and BMS. Units are specified with either a wall switch or capability to be wired for BMS interface. The wall switch is the standard option with BMS available upon request. The wall switch should be installed in a secure location that is easily accessible for authorised personnel to control the operation of the unit. It is the customers responsibility to provide wiring back to the unit.



Figure 12: Wall Switch

ON/OFF	PROVIDES POWER TO THE UNIT
SPEED HIGH/LOW	CHANGES FAN SPEED IF UNIT HAS A 2 SPEED MOTOR
COOL	TURNS ON WATER PUMP INSIDE UNIT

INSTALLATION INFORMATION

3.4 WATER CONNECTIONS

3.4.1 Water Supply

The supply pipe should be suitably sized to meet the specified flow and pressure. A ¼ turn ball isolating valve must be installed on the supply pipe near the unit for ease of maintenance. Do not use duo or non-return (check) valves of any kind including stop taps with jumper washers.

NOTE: Non-return type valves can have an effect on the operation of the water solenoid valves. They may lock up and damage can be caused.

1. Fit water supply isolation close to the unit to assist in routine servicing.
2. Before connecting the supply pipe, flush it clear of any swarf or debris that may cause the float valve to stick and leak.

NOTE: In areas where water pipes freeze, provisions will be needed to drain the water piping to prevent damage.

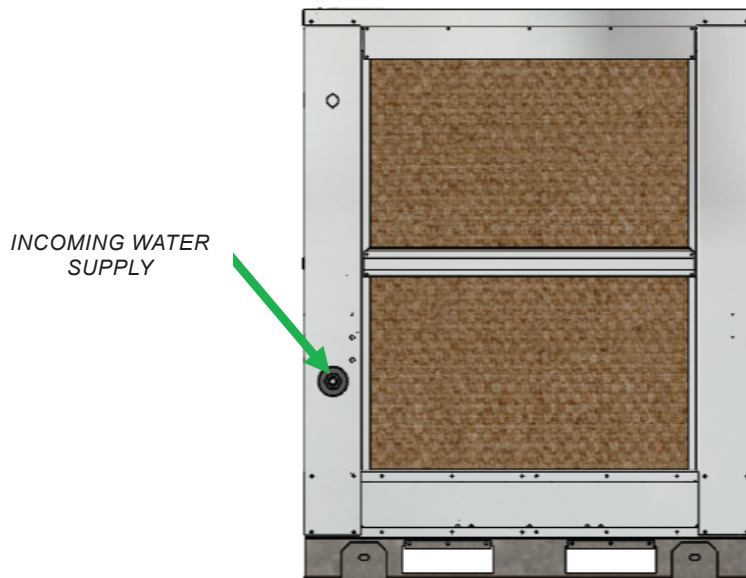


Figure 13: Incoming Water Supply Location

3.4.2 Water Setup

AL Evaporative Cooler units come with internal water components pre-plumbed. Once the unit is in position the water supply to the unit and drainage from the unit will need to be connected.

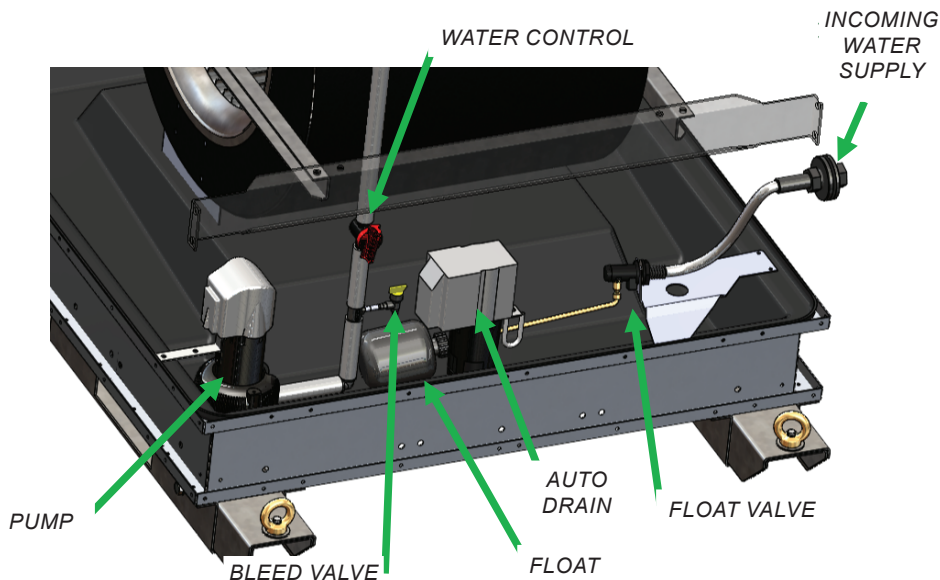


Figure 14: Drain Configuration

INSTALLATION INFORMATION

3.4.3 Drain

The combination drain/overflow pipe outlet must be connected to a drainpipe with sufficient capacity to take the discharge of water from the reservoir. The pipe must connect to a suitable drain or gutter. Drain must be lower than base of pad assembly.

Note: Refer to local regulations to ensure discharge of drain / overflow water is in accordance with statutory requirements.

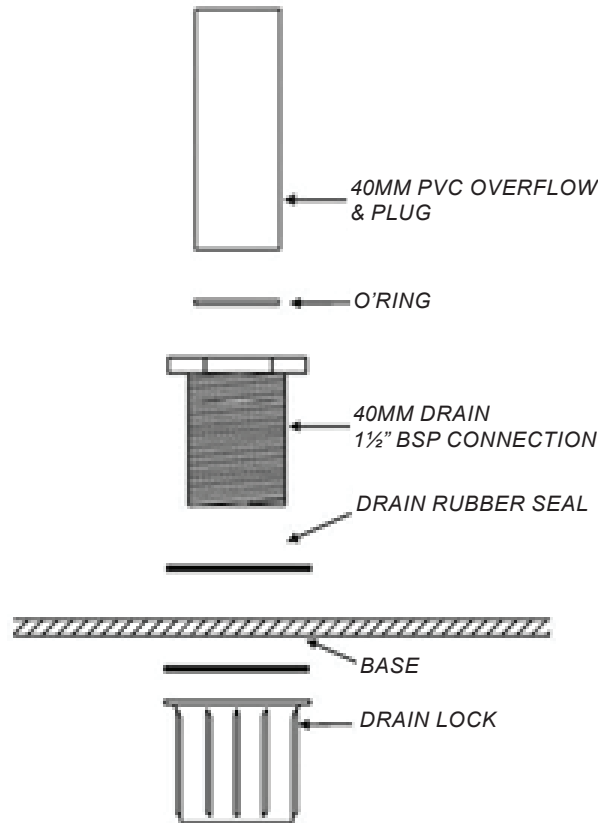


Figure 14: Drain Configuration

3.4.4 Automatic Drain Valve

An optional automatic dump valve (Auto Drain Kit Installation. AL12-36 DST) is available. The valve either replaces the Drain or can be installed in addition. The ADV is designed to empty the sump at the end of a cooling operation. There are multiple configuration options what are explained in detail within the ADV manual. The ADV manual shall be used to ensure correct installation and operation.

The Auto Drain Kit is supplied with a solenoid to control water flow into the unit. Where a solenoid is installed a back flow prevention device and/or check valve must not be installed.

If an Auto Drain is installed the wiring for the pump control is different to a standard unit. Refer to Appendix A

3.4.5 Bleed off Valve

To reduce the accumulation of salts and minerals in the re circulated water it is essential to bleed a certain amount of water to waste, Increased flow of makeup water reduces the salt content. The bleed rate will vary with the water supply quality, but initially should be set to Table 8: Bleed Off Rate. The bleed line from the flow delivery line inside the unit, must be suspended through the overflow pipe or into the optional automatic drain valve.

INSTALLATION INFORMATION

3.4.6 Cooling Pads

All units have removable cooling pads that provide access to the internal components of the cooler.

The following steps can be used to remove cooling pads.

1. Confirm that the unit is not operating and that the power is isolated. Do not remove pads whilst the unit is operational.
2. Lift pad vertically using the handle on the pad frame assembly shown in Figure 15: Cooling Pads
3. Angle the bottom of the pad and pull out of the unit bottom first

The following steps can be used to install cooling pads.

1. Confirm that the unit is not operating and that the power is isolated. Do not remove pads whilst the unit is operational.
2. Place the pad frame assemblies top first into the unit framework.
3. Lift the pad using the handle and align the bottom of the pad with the corresponding slot in the unit framework.
4. Carefully lower the pad frame assembly and confirm that it is held in position by the unit frame.

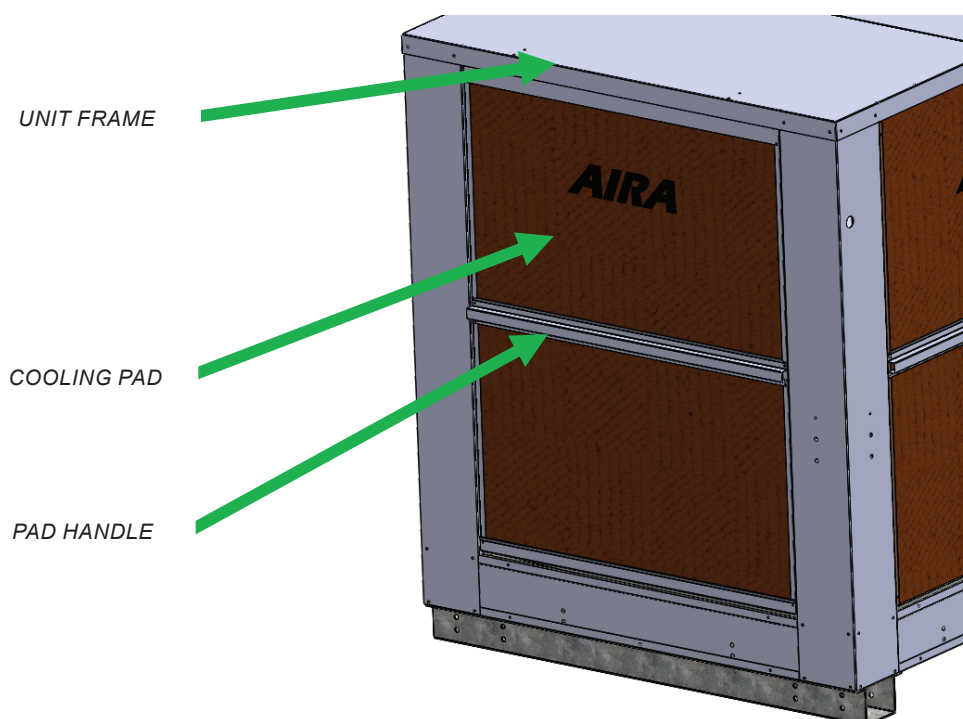


Figure 15: Cooling Pads

COMMISSIONING INFORMATION

4.0 COMMISSIONING

Prior to commencement ensure Main Isolator Switch is OFF and correct electrical Lock Out Tag Out (LOTO) procedures are followed. **Failure to do so may result in Injury or Death.**

A commissioning report template is available in Appendix D of this document. AS5601.1 Appendix O provides additional guidelines for commissioning.

4.1 Unit Details

1. Record unit details on the Commissioning Sheet including Model Number and Serial number which can be found on the control box.
2. A copy of the commissioning document should be kept inside the document pocket.

4.2 General Installation Check

1. Confirm that safe access is available to unit. If the unit is located on a roof, ensure that a certified anchoring system is installed and that the appropriate harness is available for use during commissioning.
2. Confirm the casing is in good condition and free from damage.
3. Check that the unit is sufficiently secured and level. If located on a roof stand, ensure that the roof stand is installed as per the designing engineers' specifications.
4. Check that ductwork from the unit is correctly installed and secured by a qualified person.
5. Check that all pads are in position and free of foreign material.

4.3 Electrical Checks

4.3.1 Electrical Installation Checks

1. Turn OFF main isolator and follow LOTO procedures. **Failure to do so may result in Injury or Death.**
2. The electrical connections are to be completed by a licensed and experienced person.
3. Check that the isolator is fitted and operational. If the isolator is damaged the unit must not be commissioned or operated until the issue is resolved.
4. Check that all wiring is secure and terminated. All cable protection is in good condition.
5. Check that the single/3 phase power is connected to the unit. Test supply connection and record voltage.
6. Confirm that the wall switch is connected and operational.

4.3.2 Blower Box Checks

1. Check the fan motor is securely fitted and aligned. The motor should be sitting level. Confirm that the motor platform is properly secured and tighten if necessary.
2. Check that pulleys are correctly aligned. Confirm horizontal and vertical angularity as well as axial offset are not present. Confirm that all taper locks are secured.

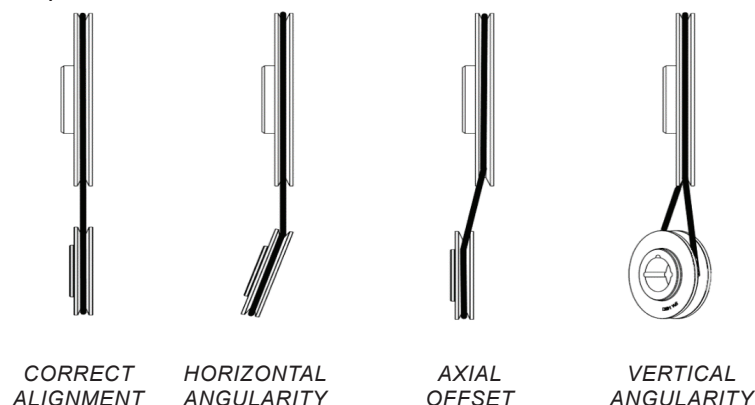


Figure 16: Pulley Alignment

3. Check that the belts are correctly fitted and tensioned. Refer to manufacturer's literature for tensioning methodology and tension requirements. As a general rule for tensioning belts, a deflection of 1.6 – 1.8 mm per 100 mm of belt span is required. The belt span is measured from the centre of the motor pulley to the centre of the fan pulley. (E.g. A belt with a span of 800mm should have a maximum belt deflection of 12.8-14.4mm.)

COMMISSIONING INFORMATION

4. Confirm the fan direction. If the fan is spinning in reverse, check the wiring diagram to ensure that the motor is wired in correctly. Fan direction is to be checked on high and low settings.

COMMISSIONING INFORMATION

4.4 WATER CHECKS

4.4.1 Incoming Water Supply Checks

1. Turn OFF main isolator and follow LOTO procedures. **Failure to do so may result in Injury or Death.**
2. The water connections are to be completed by a licensed and experienced person.
3. Confirm that the base tray is free of debris and clean.
4. Confirm that the drain pipework is connected and sealed.
5. Confirm that incoming water lines were flushed prior to de-isolating ball valve for unit water supply.
6. Check the incoming pressure to the unit is at least 220kPa and not exceeding 1400kPa.
7. Confirm that there is sufficient flow to the unit so that all pumps can operate at 100% demand.

4.4.2 Internal Water Checks

1. Open the ball valve controlling supply to the unit.
2. Allow the reservoir to fill to 5mm below the overflow line and confirm that the float valve shuts off the incoming supply.
3. Allow for the reservoir to remain full for a minimum of 30 minutes periodically checking for leaks.
4. By pushing the ball float down confirm that the overflow/drain works.
5. If an automatic drain valve has been provided activate the solenoid to test functionality. Refer to Auto Drain Valve manual for instructions.

4.5 START UP PROCEDURE

1. Turn blower by hand and check that all moving parts run freely. **CAUTION: Do not put fingers through the blades at any point.**
2. Turn off power isolating switch and remove pad assemblies from the cooler.
3. Check fan/motor belt deflection and adjust if necessary
4. If necessary, wash out reservoir.
5. Check operation of isolation switch.
6. Check and set water distribution by adjusting the water restrictor in the hose from the cooler's water pump to the distribution pipe. Set to ½ open initially with adjustment of the saturation of the cooling pads outlined in 4.6 Setting Pad Saturation.
7. Measuring the flow rate from the water bleed. Using Table 4: Bleed Off Rate adjust the bleed valve to fill 1L in the time shown according to the air flow rate and hardness of the water.

Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off.

BLEED OFF RATE SETTING IN SECONDS (INTERPOLATE FOR OTHER AIR QUANTITIES)							
Air Quantity l/s	2300	3600	5200	10000	14000	18000	Water Quality
Time Seconds/L	240	200	120	80	60	45	Soft 40-100 mg/L
Time Seconds/L	120	100	60	40	30	22	Average 100-400 mg/L
Time Seconds/L	60	50	30	20	15	11	Hard 400+ mg/L

Table 4: Bleed Off Rate

8. Check and ensure sufficient air relief is available via operable windows and/or doors in the cooled area. Required relief calculations as per 2.5.7 Relief Area Calculation.
9. Check that sufficient relief area is provided for a full load current check. Load test motor with a Tong-test or clip-on ammeter. If the motor amps are over the rating plate adjust pulley ratio or increase duct pressure drop to reduce amps to equal to or below ratings as shown on fan motor compliance plate. Pulley ratio change is the responsibility of the installer.
10. Run pump for five minutes to ensure the pads are saturated with water. Run fan on high for five minutes. Shut down unit and isolate power following LOTO procedures. Remove pads and check that fan motor, pump motor, fan etc. are not being splashed with water.
11. Check belt tensions and pulley alignment and adjust if necessary. Check to ensure that the blower wheel has not shifted. If unsure please contact a Seeley International service agent.
12. Ensure that a maintenance schedule is prepared in accordance with suppliers' recommendations and requirements of local authorities.

COMMISSIONING INFORMATION

4.6 SETTING PAD SATURATION

1. Locate the water adjuster/taps. Depending on the cooler model there could be up to four pumps installed in the unit. The discharge line from each pump line will have a dedicated adjuster/tap.
2. If the unit is new, then the pump flow rate adjuster/tap will likely be found to be in the ½ open position.
3. The evaporative unit must be installed, plumbed and float levelled as per Seeley International instructions. The airflow rate should be adjusted to meet specifications.
4. Pre-set each of the adjuster/taps to the ½ open position and fit all pad frames into place.
5. Start the unit fan on high speed and turn on the pumps. All pad frames should now be fitted such that water is flowing to each pad but is not subject to draw-off or carryover around the pad frames. Always check for signs of splashing on interior unit components.
6. The filter pads on the operating unit must now be observed. Check the outside of the unit for signs that the pads are becoming damp. It may take a few minutes for dampness to appear.
7. After 10 minutes check the running unit again. Take note of any pads that still have dry sections. Stop the unit, remove the filter pad/s that provides access to the respective adjuster/tap and open the flow adjuster/tap slightly for any pad(s) that were found to be dry. Never adjust the water flow rate with the unit running.
8. If a pad has been found to be very wet, and in danger of flooding, then close the corresponding adjuster/tap a small amount and re-test.
9. Continue these procedures until all the pads are just damp and no flooding is visible on the pads. Stop the unit and check for signs of water draw-off or carry-over inside the unit (ie. water droplets on pulleys, motor, bearings, scroll, impeller etc.) If carry-over has occurred then adjust (reduce) the water flow to the respective pad(s) and restart the unit.
10. The aim is to have all the pads suitably damp but not flooded.
11. Continue this procedure until suitable wetting has been achieved.

Notes:

- a). The filter pad evaporation rate changes with entering air (ambient) conditions. The water flow rate should be set with this in mind and may have to be readjusted later due to seasonal weather changes.
- b). When performing scheduled maintenance it is recommended that the flow rate for each pump should be checked.
- c). The electrical current flow to the fan motor should be verified to ensure that it falls within the rating specified on the fan motor nameplate
- d). Excessive airflow can cause water carryover by increasing the pad's face velocity. Airflow should remain within the maximums specified for the unit.
- e). Filter pads with obstructed or blocked passages are more prone to water carryover. Blocked pads may have to be replaced if the blockage cannot be cleaned out. Otherwise, the water flow/airflow may be temporarily reduced to compensate. This will result in reduced capacity.
- f). As pads age they can accumulate unmovable dirt and accumulations. This may reduce the water flow rate the pad is able to handle without producing water carryover.
- g). Whenever the unit's water bleed rate has been adjusted the water flow to the pads should be rechecked.

Avoid Flooded Pads!

If the water flow rate to the filter pads is too high water draw-off or carryover will occur, often resulting in unit damage and premature component failures. In some cases water droplets can be sucked into the blower/fan wheel scroll and blown down the attached dropper or duct system.

When commissioning or servicing the unit look for tell-tale signs of flooded pads such as water washed bearings, rust on the dropper/plenum, water stains on the sides of the blower housing, fan scroll, and on the dropper/plenum. Over time water carryover will result in premature bearing failures, excessive corrosion, and damage to electrical components in the unit.

Damage due to water carryover is not covered by warranty.

4.7 COMMISSIONING RESULTS

All commissioning results should be recorded with a copy to be stored in the control box for reference during maintenance.

OPERATING INSTRUCTIONS

5.1 STARTUP SINGLE SPEED – WALL SWITCH UNITS TO PROVIDE COOL AIR

1. Switch the AIR switch to ON.
2. Switch the COOL switch to ON.
3. Switch the Wall Switch SPEED switch to HI.

5.2 STARTUP SINGLE SPEED - WALL SWITCH UNITS TO PROVIDE VENTILATION

1. Switch the AIR ON/OFF switch to ON.
2. Switch the COOL switch to OFF.
3. Switch the SPEED HI/LO switch to HI

5.3 SHUTDOWN SINGLE SPEED - WALL SWITCH UNITS PROVIDING COOL AIR

1. Switch the AIR ON/OFF switch to OFF.
2. Switch the COOL switch to OFF.

5.4 SHUTDOWN SINGLE SPEED - WALL SWITCH UNITS PROVIDING VENTILATION

1. Switch the AIR ON/OFF switch to OFF.

5.5 STARTUP DUAL SPEED – WALL SWITCH UNITS TO PROVIDE COOL AIR

1. Switch the AIR ON/OFF switch to ON.
2. Switch the SPEED HI/LO switch to desired speed.
3. Switch the COOL switch to ON.

5.6 STARTUP DUAL SPEED – WALL SWITCH UNITS TO PROVIDE VENTILATION

1. Switch the AIR ON/OFF switch to ON.
2. Switch the SPEED HI/LO switch to desired speed
3. Switch the COOL ON/OFF switch to OFF

5.7 SHUTDOWN DUAL SPEED – WALL SWITCH UNITS PROVIDING COOL AIR

1. Switch the AIR ON/OFF switch to OFF.
2. Switch the COOL switch to OFF.

5.8 SHUTDOWN DUAL SPEED – WALL SWITCH UNITS PROVIDING VENTILATION

1. Switch the AIR ON/OFF switch to OFF.

5.9 BMS STARTUP AND SHUTDOWN

It is the responsibility of the BMS installer to provide instruction and training on the operation of the interface.

Note:

1. BMS wiring should be done in accordance with Appendix A: Electrical Information. No changes should be made to the internal control box wiring.

OPERATING INSTRUCTIONS

5.10 OPERATIONAL FLOWCHART

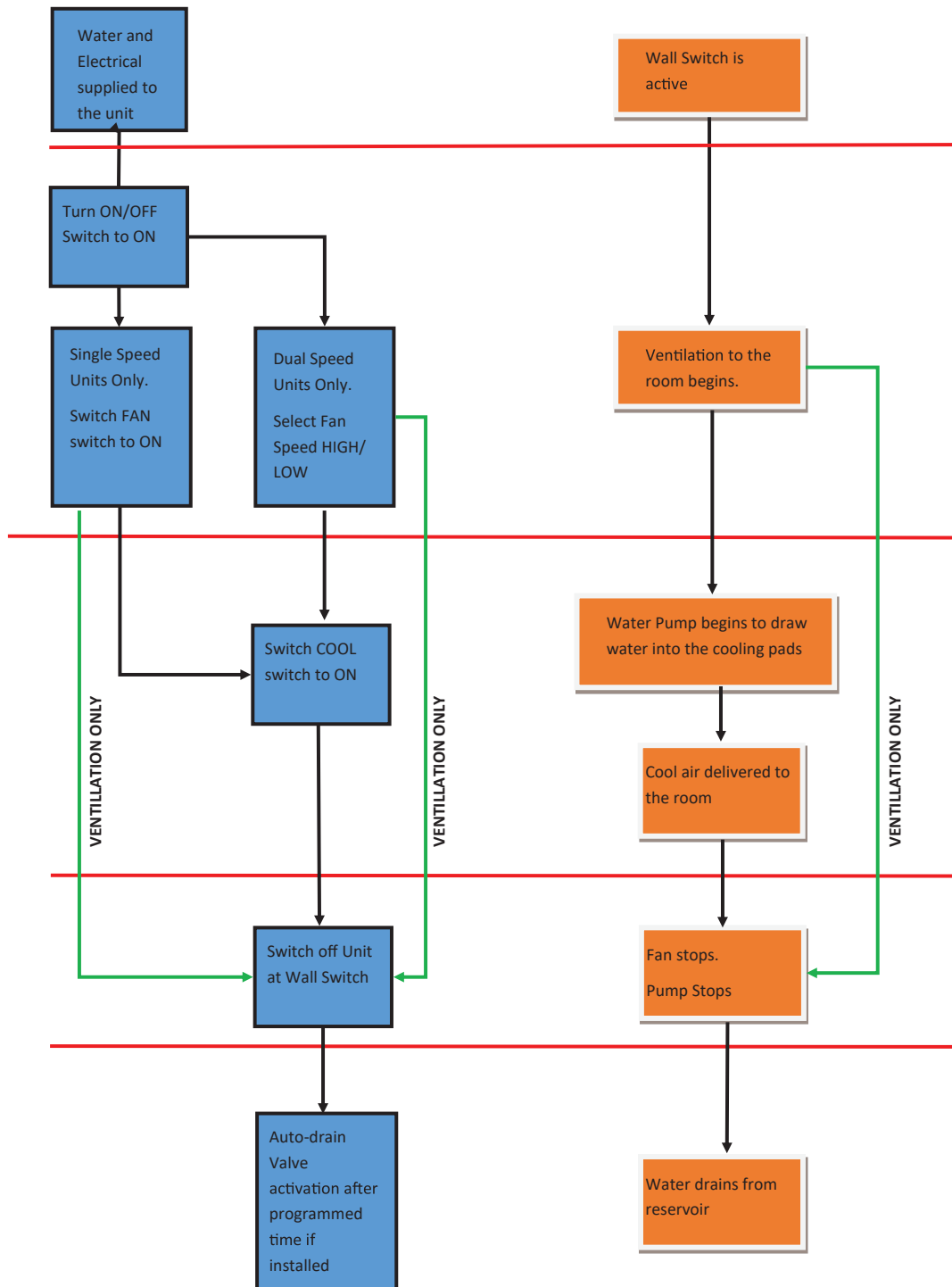


Figure 17: Operational Flow Chart

MAINTENANCE



6.0 SERVICE AND MAINTENANCE

WARNING! Aira AL units require electrical and plumbing trades to service all aspects of the unit. Servicing should be carried out by a qualified Seeley International Service Technician, appointed Aira service agent or appropriately qualified trades persons. If unsure about any servicing or maintenance aspect of the unit, immediately stop work and contact Seeley International for assistance.

Aira units are often manufactured to exact customer specifications. When ordering spare parts, the unit serial number must be used to ensure the correct components are supplied.

When working on the heat exchanger section care must be taken to ensure all parts have sufficiently cooled before commencing any service or maintenance activities.

Appropriate PPE should always be worn which includes but is not limited to safety glasses, hearing protection and gloves. Additional site requirements may require additional PPE, especially when working on roof tops or in commercial/industrial facilities.

Any maintenance required by Australian Standards shall be carried out at required intervals.

Table 5: Inspection and Service of Major Components is the minimum recommended inspection and service schedule. A detailed service schedule and Maintenance checklist can be found in Appendix C. Appendix C also contains a monthly checklist for the owner

Component	Minimum Inspection and Service Schedule
Belts	Quarterly visual inspection/ 6 monthly thorough inspection
Pulleys	Quarterly visual inspection/ 6 monthly thorough inspection
Motor	In accordance with manufactures specifications
Cooler Maintenance	Every 3 Months

Table 5: Inspection and Service of Major Components

6.1 COOLER MAINTENANCE

6.1.1 Cooler Maintenance

THIS SECTION DETERMINES THE LIFE SPAN OF THE COOLER

1. Turn off electric power supply following LOTO procedures. Isolate the water supply to the unit.
2. Remove pad assemblies as per 3.5.6 Cooling Pads
3. Check condition of Pads – use a hose to clean dirt off pads. Do not use excess water pressure as this may make holes in the pads. If pads are to be replaced obtain replacement pads from the manufacturer. Replacement pads are made to order.
4. Drain the unit via the drain or auto drain valve if installed and clean out the internal tray of the unit ensuring all foreign debris is being removed. De-isolate the water supply to the unit and confirm that the float valve stops flow at the required level. **DO NOT** add any biocides to the water tray after filling.
5. Check condition and tension of fan belt/s. Adjust and/or replace as necessary.
6. Re-grease fan shaft bearings.
7. Check pump operation and that bleed-off is operating correctly and not blocked.
8. Refit pad frames and start up unit in accordance with operating instructions.
9. De-isolate the electrical power and run the unit to confirm that pads are sufficiently saturated. Adjust if necessary.

MAINTENANCE

10. LEGIONNAIRES DISEASE: Evaporative air conditioners have not been implicated in any outbreak of Legionnaires disease, although Legionella bacteria have been found in such systems. The water temperature in the evaporative air cooler section is normally at about 18°C at which temperature the Legionella bacteria (if present) will remain dormant and cannot multiply.

The following maintenance schedule is required to be followed in order to comply with the New South Wales Public Health Act 1991 section 46:-

- a). Sumps are to be drained and cleaned at three monthly intervals or more frequently if necessary.
- b). Wetted pads are to be drained and cleaned at three monthly intervals or more frequently if necessary.
- c). Water strainers are to be cleaned at three monthly intervals or more frequently if necessary.
- d). If any air filter is fitted, it is to be cleaned or replaced when necessary.

6.2 MAJOR SERVICE/COMPONENT REPLACEMENT PROCESS

6.2.1 Electrical Components

6.2.1.1 Electrical Wiring

The electrical wiring of the unit should be visually inspected every 6 months and pre-season to ensure that it is free from damage. If visible damage is noted, all damaged wiring should be replaced with reference to the wiring diagrams found in Appendix X.

The following are the recommended steps for replacing damaged electrical wiring.

1. Electrically isolate unit
2. Remove control box cover
3. Inspect electrical wiring for damage
4. Remove damaged wiring and replace.
5. Replace control box cover and test unit operation

6.2.1.2 Isolator Fitted and Operational

Check that the isolator is present and free from damage. Isolate unit and confirm that power is not available at the unit.

6.2.1.3 Single or 3 Phase Power Test

A qualified electrician is to test the incoming power supply to the unit. The supply is to be tagged with available voltage and date of test.

6.2.1.4 Fan and Motor (When fitted as part of Appliance)

Motors range in weight from approximately 20 to 270Kg's. Generally the larger the unit the larger the motor. Refer to technical data sheet or contact Seeley International with the units serial number to identify which motor you have. The use of a lifting apparatus and/or several service personnel may be required for heavier motors.

Tools Required: Metric open end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar, ½" Socket set, metric hex key set, nylon hammer

1. Electrically isolate unit.
2. Disconnect Blower motor.
3. Loosen motor platform and jacking bolts if fitted.
4. Slacken and remove drive belt/s.
5. Extend motor platform fully to gain access to motor mount bolts.
6. Removed motor mount nuts/bolts (The rear bolts may remain in place).
7. Check motor weight on name plate and use appropriate lifting equipment if necessary.
8. Remove motor.
9. Replace motor in reverse order.
10. To tighten belts, use prybar to assist in lifting motor into place whilst tightening locking bolts. Larger motors will have jacking bolts in the motor platform to hold the weight of the motor. Adjust these to the required length to achieve correct belt tension.

Note:

- a). Bolt tensions should be in accordance with bolt manufacturer's recommendations for the bolt diameter, thread type and material. All mount bolts should be high tensile and a minimum grade of 8.8. Anti-seize should be used on all stainless steel bolts.
- b). Belt Tensioner recommended when replacing/re-installing belts.

MAINTENANCE

6.2.1.5 Belts

Replacement of drive belts needs to be conducted routinely. The frequency of replacement will be determined by hours of operation, operational environment and previous maintenance schedule. Belts should be visually inspected monthly with a thorough inspection every 3rd month.

Tools Required: Metric open-end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar and ½" Socket set.

The following are the recommended steps to replace the drive belts. Before works commence ensure all spare parts ordered match that of the unit they are replacing. Aira units are often custom specified for each application and may have components which differ from the standard product offering.

1. Electrically isolate unit.
2. Remove Blower Box access panels.
3. Loosen motor platform bolts.
4. Slacken and remove drive belt/s.
5. Check Pulleys for excess wear, replace if necessary.
6. Replace Belt/s. For multiple drive belt units ensure that they are a matched set. Belts from different suppliers and different batch lots will differ in length.

6.2.1.6 Pulleys

Pulleys are manufactured from steel or aluminium and will generally require replacement less than the drive belts. Any wear on the pulleys will shorten the drive belt life, therefore should be replaced if there are any signs of wear.

Tools Required: Metric open end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar, ½" Socket set, metric hex key set, nylon hammer.

1. Electrically isolate unit
2. Remove Blower Box access panels
3. Loosen motor platform to scroll nuts
4. Slacken and remove drive belt/s
5. Remove Pulley/s from Taperlock bush. A taper lock bush is used to secure the pulleys to the drive shaft. If unsure on how to remove the taper lock bushes refer to the Fenner brand bush guide. Alternately contact Seeley International for Service assistance.
6. Remove Taperlock bush from shaft, may require gentle tapping with nylon hammer.
7. Remove Pulley/s.
8. To reinstall pulley complete operation in reverse.

Note:

- a). The same diameter and belt designation must be used to ensure correct operation. Failure to do so will result in poor unit performance. It may also cause the drive motor to overamp.
- b). Bolt tensions should be in accordance with bolt manufacturer's recommendations for the bolt diameter, thread type and material. All mount bolts should be high tensile and a minimum grade of 8.8. Anti-seize should be used on all stainless steel bolts.
- c). Belt Tensioner recommended when replacing/reinstalling belts.
- d). This is ONLY applicable to units with a Seeley supplied blower box. 3rd Party blowers will have their own maintenance schedule.

6.2.1.7 Fan Direction

Check that the fan is blowing in the right direction. If the fan is running in reverse change check the wiring diagram and swap the power to the motor.

MAINTENANCE

6.2.2 Water Components

6.2.2.1 Water Controls

Confirm that the incoming water supply isolation valve is operational. If the isolation valve is in a location accessible by the public ensure that the valve can be locked open and closed.

6.2.2.2 Water Connection Visual Inspection

The incoming water supply is to be visually inspected for damage and leaks. If visual damage is evident the supply is to be isolated and location of the leak to be identified and fixed.

6.2.2.3 Water Isolation Fitted and in Good Working Condition

The water isolation ball valve is to be examined to make sure that it is present and in good working condition.

6.2.2.4 Water Supply Pressure

The water supply pressure is to be read at the entry to the unit and recorded.

6.2.2.5 Float Valve Operation

Check that the float valve allows for water to enter the reservoir and is set so that flow stops when the water level is 5 - 10mm below the overflow. Adjust if necessary.

6.2.2.6 Overflow and Drainage

Push the float valve down allowing excessive water into the reservoir until water flows into the overflow drain. Confirm the drain takes away all excess water.

6.2.2.7 Automatic Drain Valve

Refer to Automatic Drain Manual and confirm operation.

6.2.2.8 Bleed Valve

Confirm that the bleed valve is set to the correct rate. Refer to Table 4: Bleed Off Rate. Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off. If there are white deposits in the pads or tank the bleed rate needs to be increased.

6.2.2.9 Cooling Pads

The cooling pads should be periodically cleaned. Once the pads have been removed from the unit they can be cleaned using a spray nozzle on a garden hose with a moderate pressure. **Do not** use a high-pressure hose. At this time the cooler cabinet should be inspected and cleaned.

Cooling pads should be periodically changed, the frequency being determined by the rapidity with which dirt, alkali and other foreign matter accumulates in the pads to the extent that cooling efficiency is impaired. The need for changing pads will vary with the locality. If in very good condition, pads may be washed to clean away dust etc, but if pads appear aged or badly fouled, then replace. In localities where there is an excess of lime and alkali, the reservoir pan should be cleaned out every 60 days. If the water is all re-circulated this clean out must be done more frequently. This will also remove dirt which has been washed out of the filter pads.

6.2.3 Casing Components

6.2.3.1 Weatherproof Casing Condition

Check the weatherproof casing for signs of damage, corrosion and leaks.

6.2.3.2 Water Carry Over

As pads become blocked the open area decreases consequently increasing air velocity across the pads which leads to excessive water carry over from the pads onto the internal components. The effect can lead to premature bearing failure and corrosion within the unit and ductwork. Pads are to be cleaned and/or replaced and confirm saturation rate of pads.

6.2.3.3 Duct Condition

Visually inspect the ductwork connection into the unit for damage. When the unit is operating inspect the ductwork for leaks where visible.

MAINTENANCE

6.2.3.4 General Installation

Visually inspect the mounting and how the unit is secured to the roof/ground. Ensure that the unit is stable and correctly aligned with the ductwork.

6.2.4.5 Access to Unit

Check that access to the unit is free of obstructions. If the unit is located on a roof and an anchor system and harness are certified and maintained by an appropriately qualified individual.

6.2.4.6 Maintenance Records

Ensure that maintenance records are up to date and stored in a location where they are protected from the weather and other possible causes of damage.

MAINTENANCE

6.3 FAULT FINDING COOLER

FAULT	POSSIBLE CAUSE	REMEDY
Inadequate Cooling	<ol style="list-style-type: none"> 1. Clogged or dirty pads. 2. Dry pads or lack of water while cooler is in operation. 3. Insufficient air discharge openings or inadequate exhaust from area being cooled, causing high humidity. 4. High Humidity. 5. Fan running backwards. 6. Fan running slowly. 	<ol style="list-style-type: none"> 1. Clean or replace pads. 2. Check water distribution system for possible obstruction in tubing. Check pump operation. Check water flow restrictor and level of unit. 3. Make sure there is adequate provision for exhausting air from area being cooled. 4. When outside humidity is high, evaporation rates will be low, thus reducing efficiency of cooler. Turn off 'cool' switch for best results. 5. Rewire motor for correct rotation. 6. Check motor amps. If below the maximum amps (refer to data plate) re-adjust motor pulley to increase speed.
Fan does not start	<ol style="list-style-type: none"> 1. Circuit breaker tripped or fuse blown. 2. Loose electrical connections. 3. Faulty control switch 4. Faulty motor 5. Loose pulley or belt 6. Broken belt 	<ol style="list-style-type: none"> 1. Check circuit breaker for motor start-up and draw suitability. 2. Check and tighten all connections. 3. Replace. 4. Replace and determine reason for fault. 5. Tighten pulleys and belts to manufacturers' specifications. 6. Replace and tighten to correct tension.
Belt slip or excessive belt wear	<ol style="list-style-type: none"> 1. Belt loose. 2. Pulleys not correctly aligned. 3. Wet belt. 	<ol style="list-style-type: none"> 1. Tighten belt to manufacturers' specified tension. 2. Adjust alignment and check with an alignment tool. 3. Stop any water leaking onto belt from pad assembly or distribution system and adjust water restrictions as per commissioning documentation.
Pump fails to start	<ol style="list-style-type: none"> 1. Pump motor faulty. 2. Incorrect wiring of pump and control switch. 3. Loose electrical connection. 4. Pump switch faulty. 	<ol style="list-style-type: none"> 1. Replace Pump 2. Refer to wiring diagrams in Appendix A. 3. Check all connections and tighten as required. 4. Replace switch
Pump runs but water not circulated, or pads are dry	<ol style="list-style-type: none"> 1. Insufficient water in base tray. 2. Pump strainer basket blocked. 3. Blocked water tubes. 	<ol style="list-style-type: none"> 1. Adjust ball valve/float assembly. 2. Remove, clean and replace. 3. Remove, clean and replace.
Water constantly overflowing	<ol style="list-style-type: none"> 1. Float valve incorrectly set 2. Inlet valve not sealing 	<ol style="list-style-type: none"> 1. Adjust float valve 2. Replace Valve
Noisy Air Conditioning	<ol style="list-style-type: none"> 1. Belt "Squelching". 2. Belt "Squealing". 3. Inadequate sized ducts or grilles. 4. Loose Water Connections. 	<ol style="list-style-type: none"> 1. Adjust motor alignment. 2. Tighten belt by adjusting motor platform or tighten belt. 3. Increase grille size. 4. Tighten all connections.
Formation of white deposits in tan and on pads	<ol style="list-style-type: none"> 1. High mineral content in water supply. 	<ol style="list-style-type: none"> 1. Increase the bleed rate.
Unpleasant Odour	<ol style="list-style-type: none"> 1. Intake air located near the source of odour. 2. New pads fitted. 3. Algae in tank. 4. Pad remains wet after shutdown. 5. Break in water distribution system. 	<ol style="list-style-type: none"> 1. Relocate the intake or remove the odour source. 2. Will go after a short time 3. Drain tank and clean thoroughly, fill with new clean water and install new pads. 4. Allow fan to run for further 10 minutes after pump has been shut off. 5. Replace any cracked or broken tubing.
Water being thrown into area being cooled	<ol style="list-style-type: none"> 1. Too much water in the pad. 	<ol style="list-style-type: none"> 1. Ensure filter pads are correctly installed. 2. Replace with new filter pads. 3. Check restrictor tap setting and adjust if required.

Table 6: Fault Finding Coolers

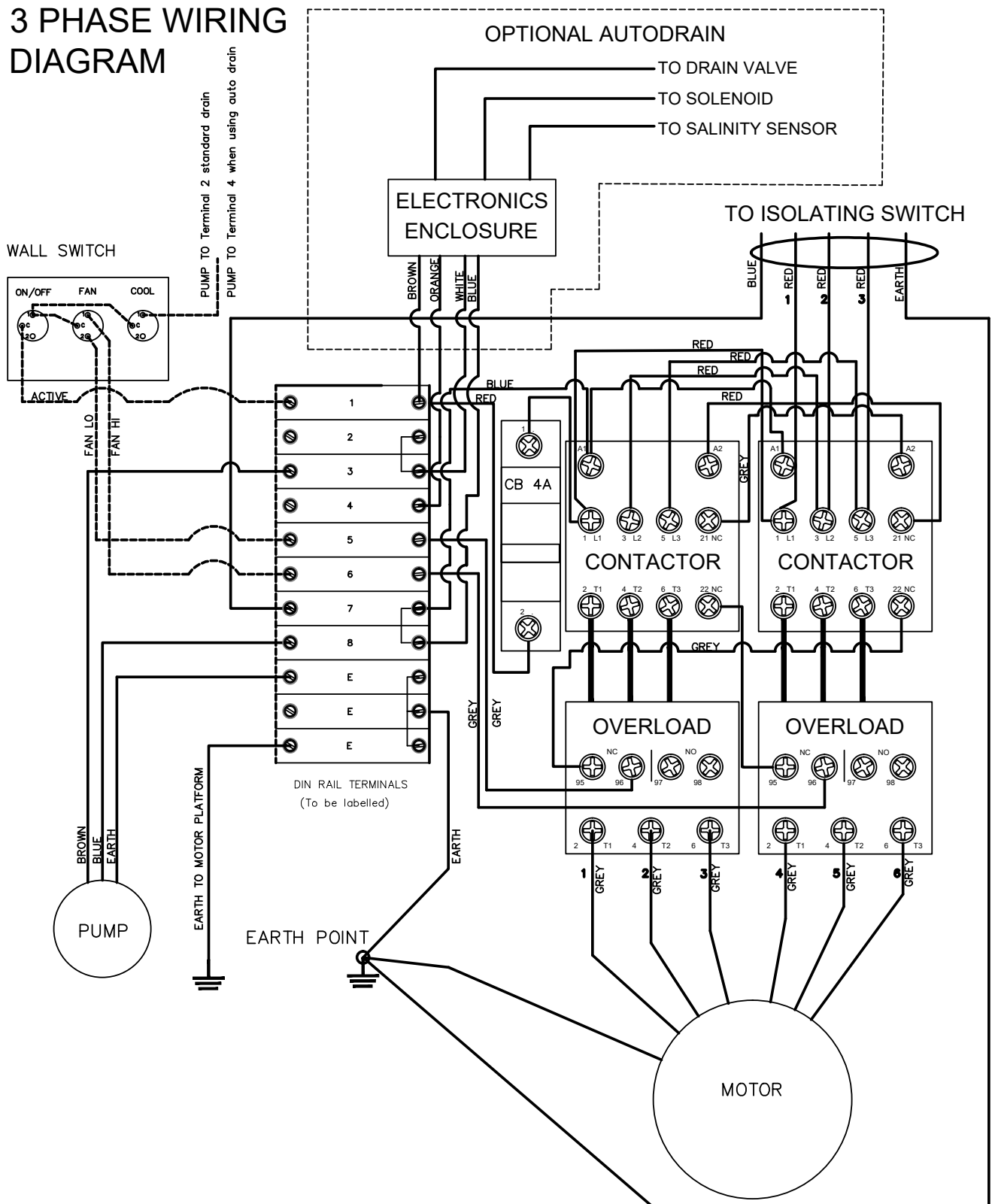
6.4 REPLACEMENT PARTS LIST

Contact Seeley Spare Parts for comprehensive spare parts list, Model and Serial Number will be required.

APPENDIX A: ELECTRICAL INFORMATION

APPENDIX A1 - 3 PHASE WIRING DIAGRAM

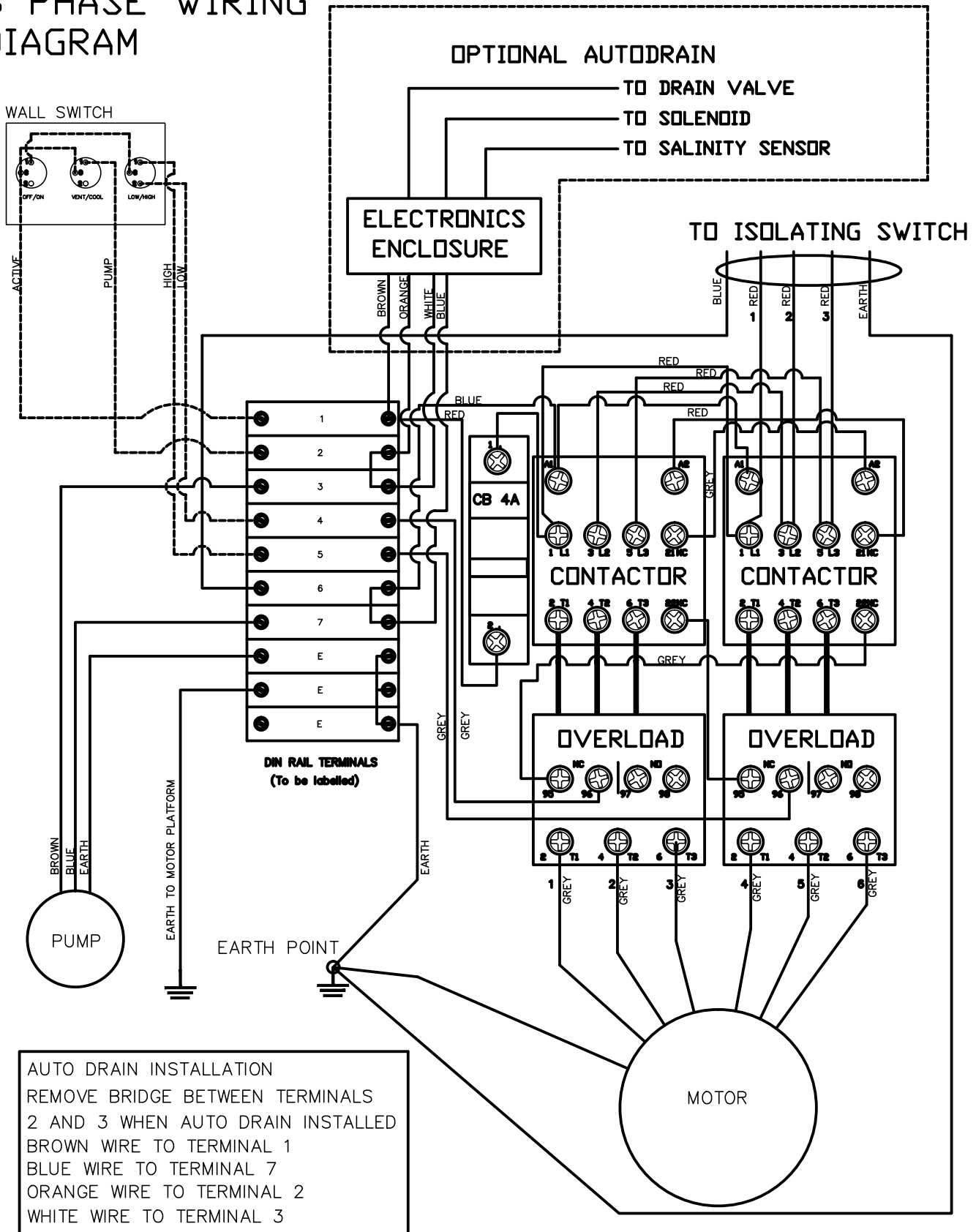
3 PHASE WIRING DIAGRAM



APPENDIX A: ELECTRICAL INFORMATION

APPENDIX A2 - ORIGINAL THREE PHASE COOLER WIRING DIAGRAM

3 PHASE WIRING DIAGRAM



APPENDIX B: COMMISSIONING REPORT

		Pass = ✓ Adjust = A Attention Req. = X
Unit Details	Model Number	
	Serial Number	
	Installer	
	Installation Date	
	Site Address	
	Unit Condition	
General Installation	Access to the Unit	
	Condition of Casing	
	Unit is adequately secured	
	Structural bolts and grub screws tight	
	Roof Stand Installation	
	Duct Work to unit connected	
	Flue Installation	
All pads are in position and free of foreign material		
Electrical Commissioning	Have Electrical connections been completed by a licensed, experienced person	
	Isolator fitted and operating	
	All wiring secure and terminated	
	Single or 3 phase power (test)	
	Fan Motor / Alignment	
	Pulleys/ Alignment	
	Fan Belts properly tensioned	
	Fan direction correct	
Wall Switch/BMS installed		
Water Commissioning	Water Isolation Fitted	
	Water supply flushed	
	Water Connections Free of Damage	
	Incoming Water Pressure between 220kPa and 1400kPa	
	Unit base and reservoir free of debris and clean	
	Flow to unit can meet 100% of pump requirement	
	Water isolation ball valve operation	
	Float Valve correctly set	
	Reservoir checked for leaks	
	Drain and Overflow Operation	
Automatic drain valve operation		
General Operation	Confirm fan can be easily turned by hand	
	Any transport brackets removed	
	Pad Saturation set	
	Bleed Valve set	
	Wall Switch or BMS activates Fan	
	Fan High/Low Operation	
	Pump Operation	
	Motor Amps	A
Secure Location for Results communicated with owner		
Electrical Commissioners Details	Name:	Date:
	License number:	Signature:
Water Commissioners Details	Name:	Date:
	License number:	Signature:

APPENDIX B: COMMISSIONING REPORT

Commissioning Notes:

APPENDIX C: MAINTENANCE

APPENDIX C1: MAINTENANCE SCHEDULE

DESCRIPTION	COMPONENT	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Pre-Season
Electrical	Incoming Electrical Supply	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Electrical Wiring	✓						✓						✓
	Isolator Fitted and Operating	✓						✓						✓
	Single or 3 Phase Power Test	✓						✓						✓
	Fan Motor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Belts & Pulleys Visual Inspection	✓			✓			✓				✓		
	Belts & Pulleys Thorough Inspection	✓						✓						✓
	Fan Obstructions Direction	✓												✓
Water	Incoming Water Supply	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Water Connections Visual Inspection	✓			✓			✓				✓		
	Water Isolation Fitted and in Good Condition	✓			✓			✓				✓		
	Water Supply Pressure	✓			✓			✓				✓		✓
	Float Valve Operation	✓			✓			✓				✓		✓
	Overflow and Drainage	✓			✓			✓				✓		✓
	Automatic Drain Valve	✓			✓			✓				✓		✓
	Bleed Valve	✓			✓			✓				✓		✓
	Pad Saturation	✓			✓			✓				✓		✓
Installation	Weatherproof Casing Condition	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Inside Unit Condition	✓												✓
	Duct Condition	✓												✓
	General Installation	✓			✓			✓				✓		
	Access to Unit	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	Maintenance Records	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Operation	Start Up and Run Sequence	✓						✓						✓
	Control Operations	✓						✓						✓
	Motor Amps High and Low Speed	✓						✓						✓
	Safety Features	✓						✓						✓

APPENDIX C: MAINTENANCE

APPENDIX C2: MONTHLY MAINTENANCE CHECK

Owner Monthly Checklist

Unit Type: _____

Description	Component	Check For	C=Clean R= Replace A= Adjust √= Check
Electrical	Incoming Electrical Supply	Visually inspect incoming electrical supply and isolation for signs of damage.	
Water	Incoming Water Supply	Visually inspect incoming water connection for signs of damage	
Casing	Access to unit	Access to unit is clear of obstructions	
	Weatherproof casing	Case is secure, not damaged and free from corrosion.	
	Maintenance records	Previous maintenance records are in a safe location and any required maintenance items have been actioned	

ONLY A QUALIFIED TECHNICIAN SHALL ADJUST SETTINGS

Checked By: _____

Signature: _____

Date: _____

APPENDIX C: MAINTENANCE

APPENDIX C3: MAINTENANCE CHECKLIST

Maintenance Check List

Unit Type: _____

Date of Maintenance: _____

Description	Component	Check For	C=Clean R= Replace A= Adjust ✓= Check N/A= Not Required
Electrical	Incoming electrical supply	Visually inspect incoming electrical supply and isolation for signs of damage. If any major upgrades have been installed to the site confirm that there is sufficient power for unit operation.	
	Electrical wiring	Check wiring in control box. Replacing any damaged or loose wires.	
	Isolator fitted and operating	Check isolator switch for signs of damage. Confirm that switch isolates unit.	
	Single or 3 phase power test	Test and record incoming voltage to unit.	
	Fan Motor	Refer to manufactures specifications	
	Belts and pulleys visual inspection	Check belts and pulleys for signs of wear and damage. Check for rubber deposits and if belts have a glazed or slick look. Replace if required	
	Belts and pulleys thorough inspection	Check alignment of pulleys. Check tension of belts. Replace if required	
	Fan obstructions and direction	Check fan is clear of any foreign objects. Confirm fan is operating in correct direction	
Fan Bearings	Check greasing of fan bearings and grease as necessary.		
Water	Incoming Water Supply	Visually inspect incoming water connection for signs of damage. Check that the unit isolation valve is in good working condition and easily accessible. If any new water appliances have been installed confirm that there is sufficient water pressure and flow for unit operation.	
	Water connections visual inspection	Visually inspect the water piping to and within the unit.	
	Water isolation fitted and in good condition	Check water isolation valve successfully isolates the unit.	
	Water Supply Pressure	Check incoming supply pressure against unit label	
	Drain Unit	Confirm that drain or auto-drain can remove water from the unit	
	Clean out the unit	All foreign material is cleaned out of the unit. Internal surfaces wiped down.	
	Cooling pads.	Wash the cooling pads with a garden hose spray nozzle. Check for build up of dirt and/or salt. Replace if required.	
	Float Valve Operation	Check that the float valve allows water to flow until the water reaches 5mm below the overflow.	
	Bleed Valve Operation	Check that the bleed valve rate per Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off.	
	Pump Operation	Check that the pump operates when the cooling function is active.	
	Water Distribution Tap Settings	Check that the water distribution tap is set to allow the required flow rate to the pads.	

APPENDIX C: MAINTENANCE

Installation	Access to unit	Access to unit is clear of obstructions. Roof anchor system is compliant and certified if required.	
	Casing	Check that the case is free of damage. Check that all access panels are secure. Check the internal of the cases for signs of water build up. Remove any foreign objects.	
	Internal Condition	Check for signs of water carry over. Check that the internal reservoir is not leaking.	
	General Installation	Check the condition of all fixings securing the unit. If a roof stand is installed check condition of the stand. Confirm that the unit is level. Confirm duct connections.	
	Maintenance records	Check that previous maintenance records are in a safe location and any required maintenance items have been actioned	
Operation	Start up and run sequence	Check that unit operates as expected with no visual, sound or smell abnormalities.	
	Control Operations	Check that thermostat and wall switch/BMS controls operate as expected	
	Motor Amps High and Low Speed	Check motor amps on high and low speeds to ensure the motor is not over-amping.	
	Pad saturation	Check that pads are sufficiently saturated. Under saturation will limit cooling. Over saturation will lead to water carry over.	

Checked By: _____

Signature: _____

Date: _____

APPENDIX D: WARRANTY INFORMATION

HOW TO REGISTER YOUR PRODUCT WARRANTY (Australia and New Zealand only)

Please register your warranty online by visiting seeleyinternational.com

Step 1 - select “**Support**” then “**Register for Warranty**”

Step 2 Enter your product serial number and “**Submit**”

Step 3 Enter the required information and “**Submit**”

Important Note: You need to have the following information to complete your registration:

- your unit model and size
- serial number
- date your system was installed
- name of the dealer you purchased it from

Please complete this section. You will also need to retain your purchase receipt, and proof of any warranty period extension.

Brand: _____

Model: _____

Serial No: _____

Customer Name: _____

Installation Address: _____

Installation Type: Residential / Non Residential / Commercial

Date of installation: _____

Installer / Dealer: _____

As with any product that has moving parts or is subject to wear and tear, it is **VERY IMPORTANT** that you maintain your Cooler / Heater and have it regularly serviced. It is a condition of warranty cover for your Cooler / Heater that you comply with all of the maintenance and service requirements set out in the Owner’s / Operation / Service Manual. Compliance with these requirements will prolong the life of your Cooler / Heater. Further, it is also a condition of warranty cover that each item in the Maintenance Schedule in the Owner’s / Operation / Service Manual is performed with the frequency indicated, by a qualified, licensed technician, and that the Maintenance Schedule is properly filled out (i.e. names, signature, date, and action taken) when the item is completed.

ANY FAILURE TO CARRY OUT THE REQUIRED MAINTENANCE AND SERVICING REQUIREMENTS, AND ANY FAILURE TO PROPERLY FILL OUT THE MAINTENANCE SCHEDULE, WILL VOID YOUR WARRANTY.

APPENDIX D: WARRANTY INFORMATION

WARRANTY TERMS AND INFORMATION (Australia and New Zealand Only)

In this warranty:

We or **us** means Seeley International Pty Ltd (Seeley) ABN 23 054 687 035, and our contact details are set out at the end of this warranty;

You means you, the original end-user purchaser of the Goods;

Supplier means the authorised distributor or retailer of the Goods that sold you the Goods in Australia or New Zealand;

Goods means the product, unit, appliance or equipment which was accompanied by this warranty and purchased in Australia for installation and use only in Australia, or purchased in New Zealand for installation and use only in New Zealand; and

Relevant Warranty Period means the various warranty periods as described in clause 1 and clause 3 below, as appropriate.

For Australian customers: Our Goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Goods repaired or replaced if the Goods fail to be of acceptable quality and the failure does not amount to a major failure.

In addition to any rights and remedies that You may have under the Australian Consumer Law, the Customer Guarantee Act 1993 (New Zealand) or any other law, subject to the terms of this warranty, We provide the following warranty:

1. If during the first one (1) years from the date of purchase, the Goods upon examination prove defective by reason of improper workmanship or material, We will repair or replace, at our option, the Goods or any part thereof without charge for either parts or labour, during normal working hours.
2. The warranty granted under clause 1 applies to all components which form part of the original cooler / heater, but does not cover:
 - a) fair or normal wear and tear;
 - b) damage, loss or claims caused by, resulting from, or arising out of any utilities that service or are connected to the Goods. This includes but it is not limited to electrical surges, and inadequacies, failure, or other problems in or with any electricity, power, or water supply to the Goods;
 - c) after the first year: (i) the replacement, supply, or servicing of consumable items (including without limitation cooler pads, washers, seals, drive belts) and (ii) maintenance adjustments to the cooler / heater; and
 - d) despite clause 2.c. above, air filters;
 - e) installation (including without limitation ductwork, fittings, and other related installation components) which is excluded.
 - f) batteries (including damage caused by leaking or faulty batteries), cracking or breaking of display screens in controllers, physical damage caused by the user or third parties, and accidental breakage.
3. Seeley also warrants the Fan Motor for the first two (2) years from the date of the Goods purchase, if upon examination prove defective by reason of improper workmanship or material, We will repair or replace at our option, the Fan Motor or any part thereof without charge for parts, during normal working hours.
4. During the period to which any expressed warranty applies, all defective part(s) shall be replaced or repaired (at the discretion of Seeley) without charge for either parts or labour, during normal working hours. Should we deem in our absolute discretion to replace the Goods pursuant to clause 1 or clause 3, we may substitute any similar good even if it is not on our current price/equipment list. Further, Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the Goods.
5. We are under no obligation to repair or replace the Goods or Parts under clause 1 and 3 above if (i) the Goods have not been installed and commissioned in accordance with the Installation Manual (ii) the Goods have not been installed and commissioned properly or competently, (iii) the Goods have not been operated, serviced and maintained in accordance with the instructions provided in the Owner's Manual, or (iv) if any such service or maintenance has not been properly or competently performed. It is a condition of warranty cover that each item in the Maintenance Schedule in the Owner's / Operation / Service Manual (if it was published with such a Schedule) is performed with the frequency indicated, by a qualified, licensed technician, and that the Maintenance Schedule is properly filled out (ie names, signature, date, and action taken) when the item is completed. Any failure to carry out the required maintenance and servicing requirements, and any failure to properly fill out a Maintenance Schedule in the Manual, will void your warranty. The addition of any third party device, (except where it is required by the installation instructions and complies with those instructions), or the removal or alteration of any Seeley component, or damage due to misuse of the unit, or faulty installation or commissioning, will void this warranty.
6. As far as the law permits, We will not be liable for any consequential loss suffered through, or resulting from, the non-operation, or ineffective operation of the cooler / heater. The warranties granted under clause 1 and clause 3 do not cover damage to the cooler / heater or other loss resulting from acts of God.
7. No other person, company or corporation is authorised to offer, or give on our behalf, any other warranty. The benefits conferred are in favour of You and any person deriving title to the cooler / heater whilst in its original place of installation. Nothing in this warranty shall be construed as affecting any rights You may have under all the relevant laws, or Commonwealth or State Legislation which give You rights which cannot be modified or excluded by agreement.

APPENDIX D: WARRANTY INFORMATION

8. In order to claim under the warranties granted under clause 1 or clause 3 You must:
- a) either:
 - contact us within the Relevant Warranty Period on Australia 1300 650 644, New Zealand 0800 589 151; or
 - log a warranty claim on our website (website address below) within the Relevant Warranty Period; and
 - b) make available for inspection by the service agent who will come to the location of the Goods or send to us at the address below within the Relevant Warranty Period: (i) the legible and unmodified original proof of purchase, which clearly indicates the name and address of the original retailer, the date and place of purchase, the product name or other product serial number, (ii) all of your records of all service and maintenance carried out to the Goods, plus the Maintenance Schedule in the Owner's Manual (if it was published with such a Schedule), (iii) a copy of the completed Warranty Information section above, and (iv) if an extended warranty period was provided by Seeley International for the Goods, then the relevant document provided by Seeley International confirming that extended warranty period. If you choose to send the documents described in (i) to (iv) to Seeley International, then they must be accompanied by a covering letter which states your name and address and daytime telephone number, the address at which the Goods are installed, and the model and serial number of the Goods.
9. The warranty granted in clause 1 and clause 3 covers the costs of parts and labour but you will be responsible for:
- a) the cost of travel incurred for a Seeley International service agent to get to and from the location of the Goods if the location of the Goods is either: (i) outside the metropolitan areas of the capital cities; or (ii) more than 35 kilometres from an authorised Seeley International branch or service representative; and
 - b) any costs for additional labour or equipment associated with gaining acceptable and safe service access to the Goods installed in restricted, high or unsafe locations, and/ or the removal and replacement of any barrier, walls, roofs, fences etc; and
 - c) any costs incurred by the Seeley International service agent in gaining access to the Goods which is necessary to comply with any safety or workplace safety requirements and/or any other relevant regulations. For the avoidance of doubt, the reference to any costs incurred also includes the cost of any necessary site inductions.
10. We are not responsible in any way for any failure and/or inadequate performance of the Goods which arises from or is connected to the use in the Goods of non-genuine spare parts. Seeley International strongly recommends that only spare parts supplied or approved by it are used in the Goods.
11. The employees and Executive of Seeley International are not responsible for the installation of the Goods and expressly disclaim all liability resulting from incorrect installations or installations that do not conform to local electrical codes, local plumbing codes, Occupational Health and Safety requirements, and by laws which are legislated or in effect at the time of installation.
12. This warranty is only valid and enforceable in Australia or New Zealand.

Note: It is important that the safety and privacy of our service technicians is protected at all times. Accordingly, We and our Seeley International service agents reserve the right to refuse service if (i) safety and accessibility to the unit cannot be guaranteed or (ii) the owner of the unit, occupant of the site where the Goods are located, or any other third party seeks to take photographs, or make a video or audio recording, of the service technician(s) while they are on the site or carrying out service to the unit. If a service technician attends the site but subsequently leaves for any of these reasons then a service charge will be made for the call which charge shall be a debt immediately due and payable by the person or entity that has made the claim under this Warranty. If a service call reveals no warranty fault found with the Goods, a charge will be made for the call.

Our liability under this warranty is limited to the extent permitted by law. That is, to the extent that it is fair and reasonable, if the Goods are not of a kind ordinarily acquired for personal, domestic or household use or consumption, your remedies associated with any failure or defect of the Product will be limited to:

- a) the replacement of the Goods or the supply of equivalent goods;
 - b) the repair of the Goods;
 - c) the payment of the cost of replacing the Goods or of acquiring equivalent goods; or
 - d) the payment of the cost of having the Goods repaired
- and subject to the terms and conditions included in this warranty.

SERVICE DEPARTMENT

Seeley International Pty Ltd
112 O'Sullivan Beach Road
Lonsdale, South Australia 5160
Customer Service Centre 08 8328 3844
Website: www.seeleyinternational.com

APPENDIX D: WARRANTY INFORMATION

FOR SERVICE

To book a Service on your Seeley International product:

Visit www.seeleyinternational.com the select **“Support”** and **“Find Agent / Book Service”** then enter the required information. or Phone Australia 1300 650 644 or New Zealand 0800 589 151 to be directed to your closest authorised Service Agent.

PRIVACY NOTICE

Seeley International Pty Ltd ABN 23 054 687 035 will use the personal information you provide us with to provide warranty support for the product you have purchased and to inform you about other products and services. If you choose not to supply us with the information requested, we may be unable to provide you with warranty support. We may also disclose your information to third parties, such as related entities; retailers, distributors, service agents and contractors who are affiliated with us; or marketing or market research companies. If you would prefer not to receive direct marketing communications from us, please follow the instructions to “unsubscribe” which will be included in the direct marketing communications we send you, or contact our Privacy Officer using the details set out below. While we do not currently transfer personal information to recipients who are outside of Australia or New Zealand or store personal information outside of Australia, if we transfer your information to third parties who do so, we will take reasonable steps to ensure that the overseas recipients do not breach the Australian Privacy Principles or if you are a New Zealand customer, the New Zealand Privacy Principles. By registering your warranty, you consent to having your personal information used in this way. Please read our Privacy Policy on our website www.seeleyinternational.com for further explanation of how we collect, use, hold and disclose personal information, and how you may access and seek correction of your information. It also sets out how you may complain about a breach of the Australian Privacy Principles, or if you are a New Zealand customer, a breach of the New Zealand Privacy Principles, and how we will deal with your complaint. You may contact us at: Privacy Officer, Seeley International Pty Ltd, 112 O’Sullivan Beach Road, Lonsdale, South Australia 5160.

APPENDIX E: RELEASE INFORMATION

Ver	Date	Amendment	Author	Approved
1.0	01-06-2017	Initial Release	T. Zahtila	
1.1	13-12-2018	Updated Format Updated General Information Added Installation Information Added Commissioning Information Updated Operating Instructions Added Unit Maintenance Information Added Appendix A Added Appendix B Added Appendix D	R. Aisbett	C. Arnel
1.2	3-4-2019	Updated Operating Instructions	R. Aisbett	C. Arnel
1.3	07-06-20	Updated Gas Rates to reflect AGA report R18080103	C. Arnel	C. Arnel
1.4	25-03-21	Updated to include LPG SD40 as Type A	C. Arnel	C. Arnel
1.5	14-04-21	Updated Format Updated Safety Information Updated Installation Updated Commissioning Updated Unit Maintenance Information Updated Appendices	D.Wall	C.Arnel
1.6	22/02/22	Updated Commissioning Section	D.Wall	C.Arnel
1.7	03/11/22	Update controls and wiring diagrams	D.Wall	C.Arnel
1.8	04/02/23	Update wiring diagram for Auto Drain Install	D.Wall	C.Arnel
1.9	20/09/23	Update rear page	D.Wall	M.Gay
1.10	26/02/24	Updated warranty information	D.Wall	M.Gay



Warranty Service

Australia: 1300 650 644
New Zealand: 0800 589 151

Seeley International Technical Support

Australia: 1300 650 399
New Zealand: 0800 589 152

For all other regions, contact your local distributor.
seeleyinternational.com

Online Support Portal (AUS/NZ)

Scan or Click QR



It is the policy of Seeley International to introduce continuous product improvement.
Accordingly, specifications are subject to change without notice.
Please consult with your dealer to confirm the specifications of the model selected.