INSTALLATION AND MAINTENANCE MANUAL

Air Change Precise Control Unit (PCU)

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AIR CHANGE

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Air Change PCU

1. INTRODUCTION

SAFETY CONSIDERATIONS

IMPORTANT

DO NOT LEAVE HEAT EXCHANGERS EXPOSED TO DIRECT SUNLIGHT. Prolonged exposure to UV light can cause severe damage to the structure of the heat exchanger, and will void the warranty.

WARNING

Improper installation, service, maintenance or use can cause explosions, fire, electrical shocks or other conditions which may cause personal injury or property damage and will void the warranty. Check with Air Change or your nearest Air Change dealer for any information required on this equipment.

DANGER

Electrical shock can cause personal injury or death. Before performing any work on this equipment, the electrical supply must be turned off at the electrical service box to avoid the possibility of shock, injury or damage to equipment.

Note: There may be more than one power supply circuit.

NOTE TO INSTALLER

- Only trained and qualified personnel should install, repair or service air conditioning equipment. Untrained supervised operatives can perform basic maintenance functions such as cleaning or replacing filters. Service personnel must perform all other operations.
- Installing and servicing air conditioning equipment can be hazardous due to electrical and mechanical components.
- When working on air conditioning equipment, observe precautions in all literature, tags and labels attached to or shipped with unit. Follow all safety codes and guidelines. Wear safety goggles, work gloves and any protective clothing.
- All work must comply with relevant Australian Standard wiring rules and local authority codes. Installers must ensure that all statutory regulations and by-laws have been addressed, and that all relevant codes regarding the handling and recovery of refrigerants have been observed.
- Installers must ensure that the structures built to take the units have been suitably constructed for the purpose, all safety precautions have been applied prior to installation, and all preparation work has been constructed and suitably sized for its purpose.

Inspection and Unpacking

- The unit should be inspected upon delivery for possible external damage incurred during transport. If damage is evident it should be noted on the freight docket and the Air Change sales office contacted. A claim should be lodged with shipping company within three (3) days if shipment is damaged or incomplete.
- If major damage is apparent, do not lift unit on to site without prior approval from Air Change. All units are tested and inspected prior to packing and leave Air Change premises in perfect condition.
- Check unit rating plate to ensure the correct unit matches the job specifications.

Unit Handling

- Do not remove the skids, or any protective crating or packaging, until the unit is at the point of installation. When removing packaging or crating, be careful not to damage, scratch, or dent the unit.
- After the removal of packaging or crating, all removable access panels should be opened to inspect for unit internal damage.

Lifting with a Forklift

- Exercise extreme caution when lifting with a forklift. Do not exceed the height limit of the forklift and never allow fork to lift against the bottom panel of the unit.
- Make careful consideration of the unit's centre of gravity and distribute the weight equally on both forks. Test load to see if the weight is equally distributed. Do this by lifting the unit a few centimetres off the floor and holding it there before lifting any further or before transporting the unit.

Lifting with a Crane

NOTE: All units should be lifted into position using slings.

- Where units have to be lifted into position, installers must check the unit weight is within tolerance of the safe working capacity of the lifting equipment.
- When preparing to move the unit, always determine the unit's centre of gravity in order to equally distribute the weight.
- Spreader bars must be used between slings to prevent crushing the frame or panels. Spreader bars and/or pipe are not supplied with units.
- Spreaders whose length exceeds the largest dimension across the unit should be across the top of the unit.

2. INSTALLATION

Location

General

- The PCU unit is marked with stickers “SA” (Supply Air), and “OA” (Outdoor Air), showing the air path through the unit.
- The Fresh Air supply inlet should be clear of any polluted air from other units, exhaust fans, etc.

Level and Suitable Base

- These units are primarily designed to be fitted on a suitably reinforced support base of sufficient strength to adequately take the full operating weight of the equipment.
- The unit must be mounted on a level base and any slope should not exceed +25 mm over the unit's dimensions to ensure proper condensate drainage.
- On rooftop applications, the unit must sit at least 152 mm above the roof surface. Place the unit above a load bearing wall. Arrange supporting members to adequately support the unit and minimise the transmission of vibration to the building.

Suspending the Unit

- Before suspending the unit, check the supporting beams to be used and verify that it has sufficient load carrying capacity to support the weight of the unit.

Access for Maintenance

- The unit must be mounted so maintenance personnel can gain access to all parts of the unit and with sufficient room to remove fans, compressors, coils or heat exchangers as required.
- Minimum space requirements:
  - 600 mm for electrical access;
  - 1000 mm from Fresh Air inlet;
  - 1000 mm from all access doors on the unit in accordance with the design and construction to allow servicing or removal of parts.

Ductwork Considerations

The unit must be situated close to the point of use to prevent unnecessary long runs of ductwork.

Fresh Air Inlet Precautions

- The location of the Fresh Air inlets should adhere to AS1668.2.

- The Fresh Air intake should be positioned clear of any objects which could obstruct the airflow and be away from any exhaust discharge ducts from the unit or any adjacent equipment.
- The Fresh Air inlet should be fitted with a weather shelter and inlet and exhaust points should be minimum 6 m apart.

Noise Levels

- Do not sit unit adjacent to sleeping quarters unless background noise levels have been checked and permitted by the appropriate authority.
- It is recommended that rubber supporting or vibration absorbing pads are used to support the unit to minimise any vibration being transmitted into the building structure. We recommend wafer pads be used under the frame. We also recommend flexible couplings be fitted to the supply and return ducts to reduce vibration transfer.

Drainage

IMPORTANT
Installation of a “P” Trap is mandatory for all drainage points. Air Change will not accept any liability for any water damage resulting from incorrect installation. A minimum of 50 mm elevation difference between three levels are required. Schematics are as follows.

All drainage needs to be trapped (standard “P” trap). Prior to start up, charge the external “P” trap by pouring several litres of water into the drip tray, allowing run off to seal the drain outlets to prevent outside air being drawn into the unit.

IMPORTANT
External drip trays are mandatory for units installed in plant rooms or inside roof space. Drainage from the unit and external drip tray is the responsibility of the installing contractor. A separate safety tray must be fitted under the unit and drained separately.
Air Change will not accept any liability for any water damage resulting from incorrect installation.

- The unit should be installed with a positive fall to ensure water drains away freely through drain holes provided. Drain lines must be as large as or larger than the fitting to which the line is being connected. Ensure that drain lines are fitted to both the dump outlet as well as the overflow outlet (if necessary). Drain lines should have a minimum fall of 20 mm per m length.
- If drain lines are to be extended from the inside to the outside of the building, they must be extended *beyond* the walls of the building to eliminate the possibility of damage caused by drain water running down the exterior surface of the building wall.
- Where drain lines are likely to be exposed to freezing temperatures or when they are subject to the formation of condensation, the lines should be insulated.

Phase Rotation

(Applicable to PCU-D models only)

Correct phasing:

- Phase sequencing: the scroll compressor is designed to operate with the motor in only one direction.

Miswiring of 3-phase Power

- Miswiring of 3-phase power (phase reversal) will cause the compressor to operate in the wrong rotation. The compressor will damage itself if the phasing is incorrect, will not pump refrigerant and will draw minimal current. As a result, the discharge line and pressures will be well below normal. The unit is fitted with a PPR (Phase Protection Relay). If there is a phase reverse or phase loss, the PPR will shut down all fans and compressor.
- All 3-phase motors are phase connected and sequence tested in the factory. If fan motors are 3-phase, run the condenser fans. If they run in the correct direction, then compressors will have correct rotation. If running backwards, the current 3-phase connection is incorrect.

IMPORTANT
Do not change phases at compressor terminal or contactor.

Filters

IMPORTANT

Never operate the unit without filters fitted to the Return and Fresh Air intakes with blower access panels removed.

Make-up air quantity (if any) is to be incorporated into outdoor air filtered airflow.

- G4 panel and bag filters are included in standard units.
- **NOTE:** If these units are being used during construction when adhesive or sealants are in use, and if ducts and carpets are being installed or removed, make sure all equipment is fitted and adequately protected. We recommend using disposable or temporary filters during commissioning and during pre-hand over running.

Electrical/Electronic Connections

- For power requirements and voltages, see the unit specifications.
- The electrical diagram is attached on the wall of the electrical board cabinet.

Mains Power Supply and Fusing

- A power supply rated at 415 V +/- 10% 3-phase or 240 V +/- 10% 1-phase, 50 Hz is required to operate the machine within manufacturer's tolerances.
- Mains cables are to be connected as per the wiring diagram.
- Field wiring on the sensor and HLI communication to the controller (if any) need to be done on site.
- The units require a mains circuit breaker or HRC fusing capable of handling the full load of the unit and selected in accordance with SAA Wiring Rules to be fixed external to the unit.
- A mains switch is fitted to the electrical board inside unit.

Electrical Connection and Supply Size Precaution

- We recommend an isolator be mounted externally to the unit (not supplied) and a suitably sized fuse mounted back at the distribution board to provide local isolation during service and maintenance periods. The unit has a 3-phase switch internally on the electrical board.

Ducting

- Flexiduct ducting is recommended for use with all Air Change systems. See image below.

- Ducts should be insulated in accordance with ASHRAE Standard 90.1.
- Fan inlet conditions can affect the fan performance, particularly ducting elbows which can cause non-uniform inlet flow and swirl at the inlet. To reduce losses due to fan system effect, adequate length of straight duct between elbow and fan inlet should be provided or turning vanes used in the elbow.
- Poor fan outlet conditions can affect the fan performance, particularly the effective duct length. For 100% recovery, the duct must meet requirements for 100% effective duct length.
- Ducts should be sized to accommodate a maximum airflow velocity of no greater than 6 m/s through the duct.

3. REFRIGERATION PIPING

(Applicable to PCU-D Systems only)

IMPORTANT

The unit is designed for use with specific refrigerants (R-410A or R-407C). Check serial number plate for type of refrigerant. The use of other refrigerants is not authorised or approved by Air Change, and may cause operational problems such as poor performance and efficiency, loss of capacity, degradation of materials, and refrigerant leaks.

DANGER

The use of flammable or explosive materials as a refrigerant creates the additional risks of fire and explosion which may result in property damage, personal injury or death.

General

- Design pipe work to prevent drainage of liquid refrigerant into the compressor during off cycle, and to ensure return of oil to the compressor.

Piping

- Pipe diameters vary with unit capacity.
- Use only clean sealed refrigeration grade piping and cut only with a pipe cutter.
- Insulate the gas line and seal all insulation joints.

Charging

- Evacuate the indoor unit and interconnecting pipe work to a standard pressure of 500 microns which is to be held for minimum of 15 minutes.
- Open the service valve at both the indoor and outdoor unit to allow refrigerant to flow through the system.
- Start by altering the refrigerant charge to match the nominal amount specified for the total line length installed.
- Check the superheat on the suction line is in the 3°C – 5°C range under the following conditions:
  - 21°C – 27°C (indoor temperature)
  - 24°C – 35°C (outdoor temperature).

4. SYSTEM COMPONENTS

Requirement

- The PCU has been developed by Air Change to dehumidify outdoor air and maintain the supply air temperature. The PCU incorporates a series of sensible heat exchangers that transfer temperature only.
- These units are manufactured to meet the design criteria. The system is professionally assembled, and internally wired throughout, with large access panels where required for service and maintenance.
- If specified, for corrosive air applications, the required components are coated with corrosion resistant materials selected by Air Change. Upon request, specifications of the treatments used can be supplied.

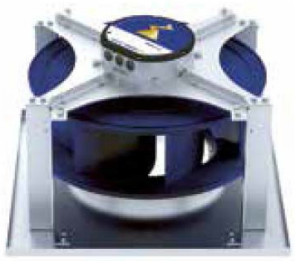
System Components

The unit employs 100% outside air and comprises of the following components:

Cabinet

- Prefabricated wall and ceiling panels are made of stressed skin insulated sandwich construction, consisting of metal internal parts and external skins bonded under pressure with thermosetting adhesive to a core of rigid cellular insulation.
- Insulation is a single layer of rigid Polyisocyanurate sheet to AS1366.3 Class SL continuous without voids, free of line faults through or across the sheet.
- Purpose built UV treated polymer joiners are used to insulate against heat loss through the body of the unit. The cabinet is fully weatherproof and designed for outdoor use.
- Galvanised steel RHS construction on base.
- Air Change units are designed with extremely large access doors to ensure that all parts are accessible for servicing and replacement.

Fans



- Supply fans in standard units are aerofoil single inlet backward inclined centrifugal impellers with three dimensional profiled blades made from one cast, without welds.
- The fan is directly driven by high efficiency variable speed EC (electronically commutated) motor and controlled via 0-10 V through constant volume air controller
- The fan motor is fitted with sealed-for-life ball bearings with in-built diagnostic/service LEDs.

Heat Exchanger

- The sensible heat exchanger uses counter flow with transfer media between moulded plastic air guiding frames for a very high efficiency and long life.

  There is no cross contamination between the air paths.
- The Heat Reclaim (sensible) counter flow heat exchanger incorporated into the unit has efficiency of 80% when both airstream are of equal volume flowrate.

IMPORTANT
DO NOT ATTEMPT TO CHANGE THE LENGTH OF THE HEAT EXCHANGER BY REMOVING END PLATES AND PLASTIC PLATES.

This can cause the media between the plates to dislodge from its position, resulting in a lack of performance because of an increased pressure drop through the heat exchanger or damage to the Sensible media. Any tampering with the heat exchanger may invalidate our warranty and Air Change will not be held responsible for compromised performance or a pressure drop.

If the heat exchanger is the incorrect length, please return to Air Change for a replacement unit.

- Heat Exchangers are constructed of plastic moulded plates with media between each plate. The heat exchanger has been secured by end plates under pressure. Sensible heat exchanger has end plates and corner/middle fixings of powder coated aluminium with sensible Mylar media between the plates.

Scroll Compressors

(Not applicable in PCU-D Systems only)

- Air Change units employ Scroll compressors.
- Scroll compressors and all electrical components are housed in their own separate compartment, together with reversing valves, other refrigerant parts and pipe work.
- Compressors are suitable for condensing temperatures of not greater than 55°C at design ambient.
- Scroll compressors are of rigid design with limited number of moving parts. They provide constant and stable compression at variable speed.
- If there is a need to detect a leak in the refrigerant system, never subject the compressor to a pressure greater than 1400 kPa.
- Should a compressor fail and burn out, follow the guidelines for correct replacement and properly clean out the system including the liquid line drier (where fitted) and fit a suction line drier to remove contaminants from the system. The suction line drier must be checked and replaced before returning the system to normal operating condition.
- All compressors are fitted with internal line break overloads. Should there be a problem such that the internal overloads trip, it may take several hours for them to reset (or longer on very hot days).

IMPORTANT
The compressor can only cycle a maximum of 12 times per hour. The controller will optimize the starting time by making sure the minimum time delay between each start-up is 5 min. **Never disconnect the compressor contractor from the controller.**

Do not condemn a compressor until time has been allowed for reset of internal line break overloads.

- Accompanied with the scroll compressor are characteristic sounds that do not affect reliability or indicate that the compressor is defective.
  - **At start up:** Under conditions of low refrigerant flows (low suction pressures) such as start-up, a rattling sound may emanate from the compressor. This will be heard until the head pressure is great enough to allow the thermal expansion valve to flow sufficient refrigerant and increase the suction pressure.
  - **At shut down:** The gas within the scrolls expands and causes momentary reverse rotation, resulting in a 'flutter' type noise.
  - **Refrigerant flooding:** If the compressor experiences severe liquid slugging during operation, the compressor will make a loud rattling sound. This is normal because of the separation of the scrolls which allow the liquid refrigerant to pass through the compressor without damage.

Electrical

- An electrical diagram is attached to the inside of the access door.
- The electrical switchboard incorporated in the unit is fully internally wired and housed within the compressor enclosure. It is of industrial standard and conforms to Australian Standards and specific state electrical authorities.
- All wiring is independently colour coded.
- The main power entering the system is protected by an isolation switch inside the unit. Circuit breakers, contactors and overloads are used on the three-phase fan motors to ensure maximum protection at all times.
- Internal controls are 24VAC.

Coils

- Condenser and evaporator coils are constructed of inner groove copper tubing and aluminium fins. If specified by the client, coils can be treated against corrosion using coil saver epoxy.
- Hot water coils in the PCU can be designed into units according to the client's requirements.
- Velocity through coils is designed at around 2.0 m/s for a low pressure drop and high efficiency.

Control System

- All controllers are installed on the main electrical board inside the unit.
- Outdoor Air, Air Off Coil and Supply Air sensors are pre-fitted inside the unit.
- The controller is designed to automatically energise the unit by receiving a start signal from an external digital input or from the LCD touch screen on the field controller or from HLI (optional).
- The controller will automatically turn off some components when a fault occurs. The fault code, name, time and date are traceable from the controller
- The controller has a built-in function to short cycling of compressors and reversing valve (*if applicable*)
- The controller is powered by a 240/24VAC transformer on the electrical board. No external power is needed for the controller.
- Please refer to control system manual for operation detail.

IMPORTANT
Under no circumstances should the any unit electrical compartment bypass the controller. Failure in this may damage the unit and void the warranty.

Optional Fire Control Circuitry

Units can be supplied with a 24 V DC circuit supplied by the Fire Department's Fire Control Board. In case of fire, the 24 V DC circuit will be de-activated, causing the unit to switch off, shutting down the system completely except for the exhaust fans which act independently for smoke exhaust.

The 24 V DC circuit can only be reset by the Fire Department.

5. OPERATIONS

Start-up Procedures

CAUTION

Start-up to be conducted by qualified service engineers familiar with equipment.

- Ensure that drain lines are fitted to both the dump outlet as well as the overflow outlet (if necessary).
- Ensure drain lines have been charged with water.
- Check all duct work connections are clean, and clear of any obstruction. Ensure all relevant dampers and fire dampers are open or at the correct setting.
- Check if there are any signs of excessive vibration on fans.
- Ensure filters have been fitted in the outdoor air inlet.
- Check that sufficient electrical power is available.

Unit Air Flows

- The Supply airflow quantity set point has been pre-set in the factory, allowing the fan to automatically adjust the speed to meet the required airflow. The airflow setpoint can still be adjusted using the air volume controller (UNIcon CPG). Please contact the Air Change technical support team for instructions.

6. EC PLUG FAN AIR VOLUME CONTROLLER SETPOINT CHANGE PROCEDURE

EC Plug Fans employ a UNIcon CPG Controller from Ziehl-Abegg to deliver the correct amount of air volume.

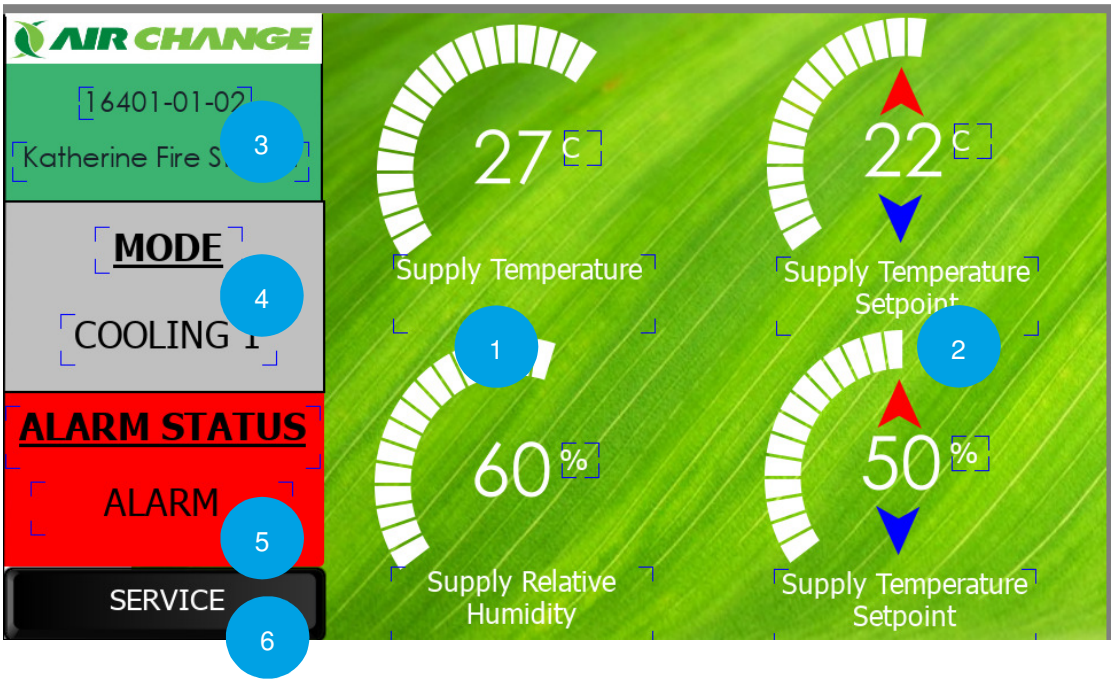
IMPORTANT
Do NOT change any parameters under the BASE SETUP menu. Alteration of any parameter under this menu will reset the entire program and result in fans not delivering accurate air volume.

1. Press ▼ **and** ▲ simultaneously to enter the Main Menu.
2. Press ▼ **or** ▲ to find “Setting” and press **P** to enter.
3. Under Setpoint 1 press **P** button until the value flashes and press ▼**or** ▲ to change.
4. Press **P** to save the new value.
5. Press ▼ **and** ▲ again to return to main menu.
6. The “Info” menu is read-only, and displays key running parameters such as actual airflow, and control voltage reference.

7. CLIMASYNC™ CONTROLLER

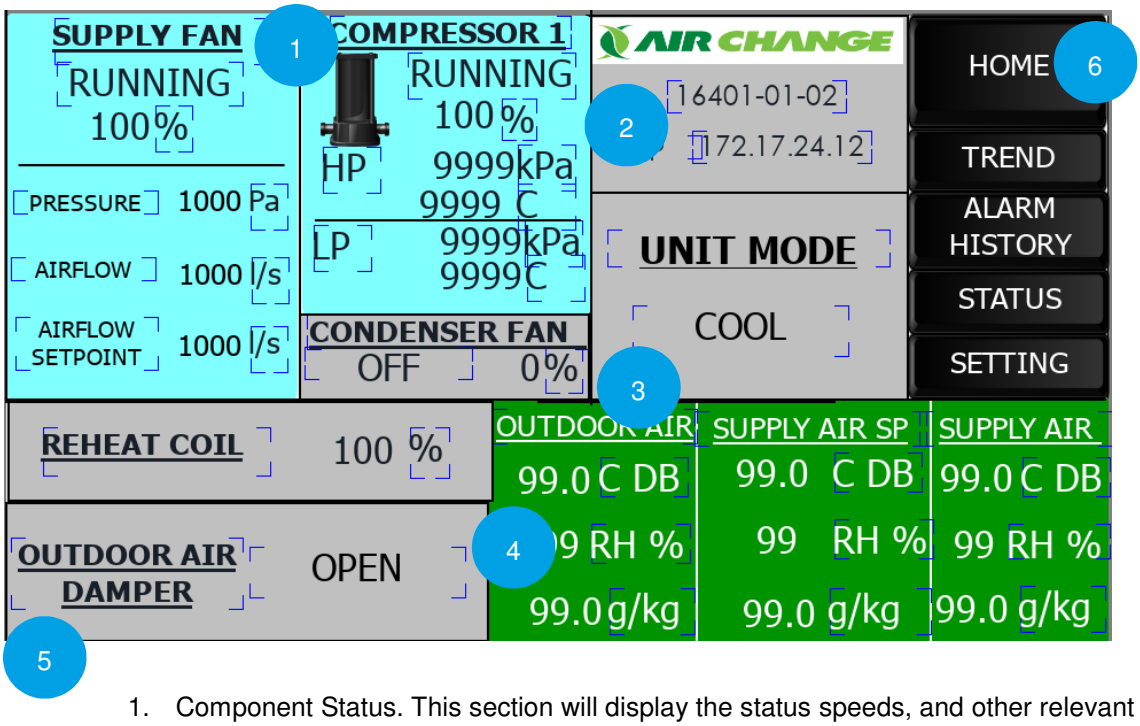
The following is a general guide for the use of Air Change units which have the Climasync™ Control option with touch screen interface (ABB CP620 HMI). Please be advised that Air Change units and the accompanying Climasync™ controls package ips custom made, and may differ from this guide.

Home Page



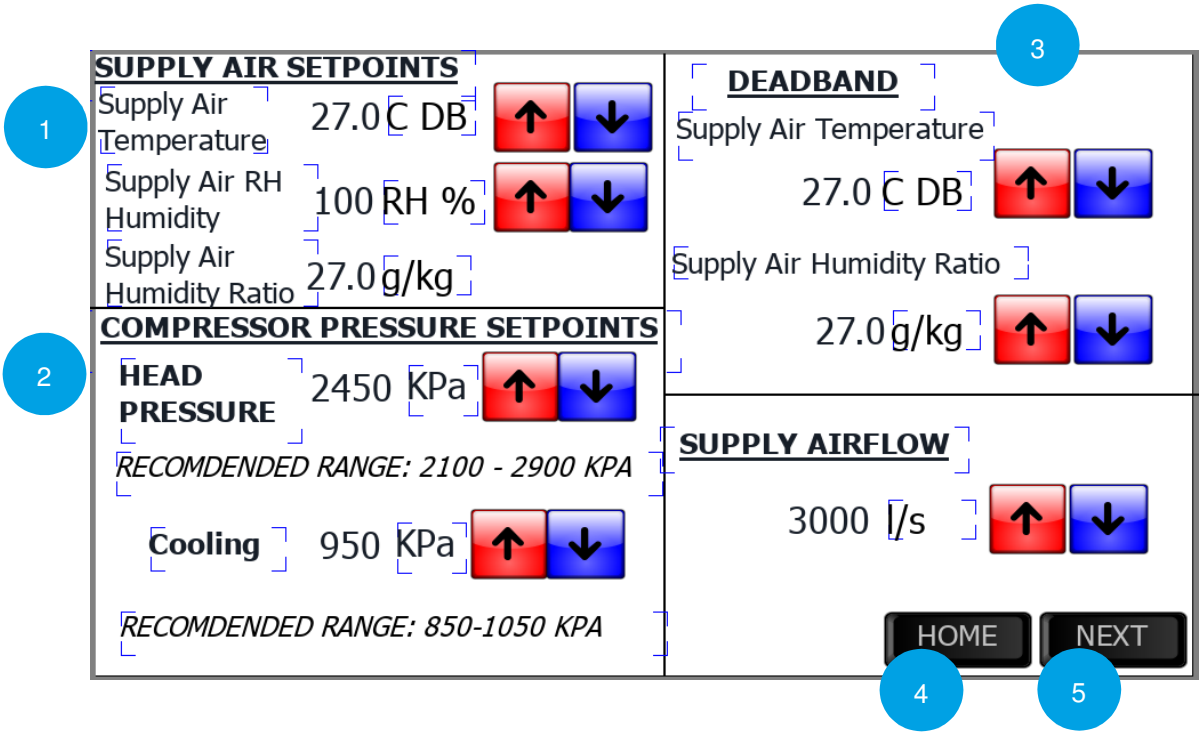
1. Displays the main temperature and humidity readings;
2. Temperature and/or humidity set points. Adjust using up and down arrows;
3. The serial number and name for the unit;
4. The mode the unit is running in. The number refers to the number of compressors running ie COOLING 2 means the unit is in cooling mode with 2 compressors running;
5. Alarm status will display “NORMAL” when there are no faults and “ALARM” when there are faults. For more information on faults go to SERVICE page then press STATUS;
6. Service page button.

Service Page



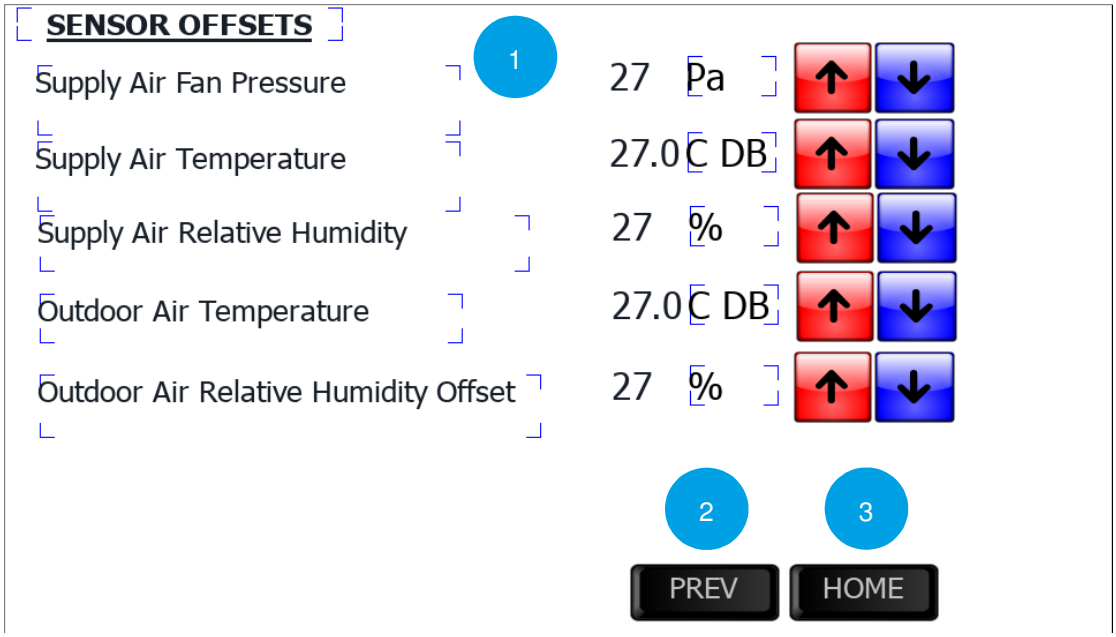
1. Component Status. This section will display the status speeds, and other relevant information of components such as compressors, fans etc. There is a general colour code to display the state of the component:
    - Grey: OFF
    - Blue: RUNNING
    - Red: ALARM
2. Displays the job number and the IP address of the HMI;
3. The mode the unit is running in. The number refers to the number of compressors running. For example, COOLING 1 means the unit is in cooling mode with 1 compressor running;
4. Displays temperature and humidity readings and set points;
5. Displays damper position and speeds or positions of other components if necessary;
6. Buttons to other pages.

Settings Page 1



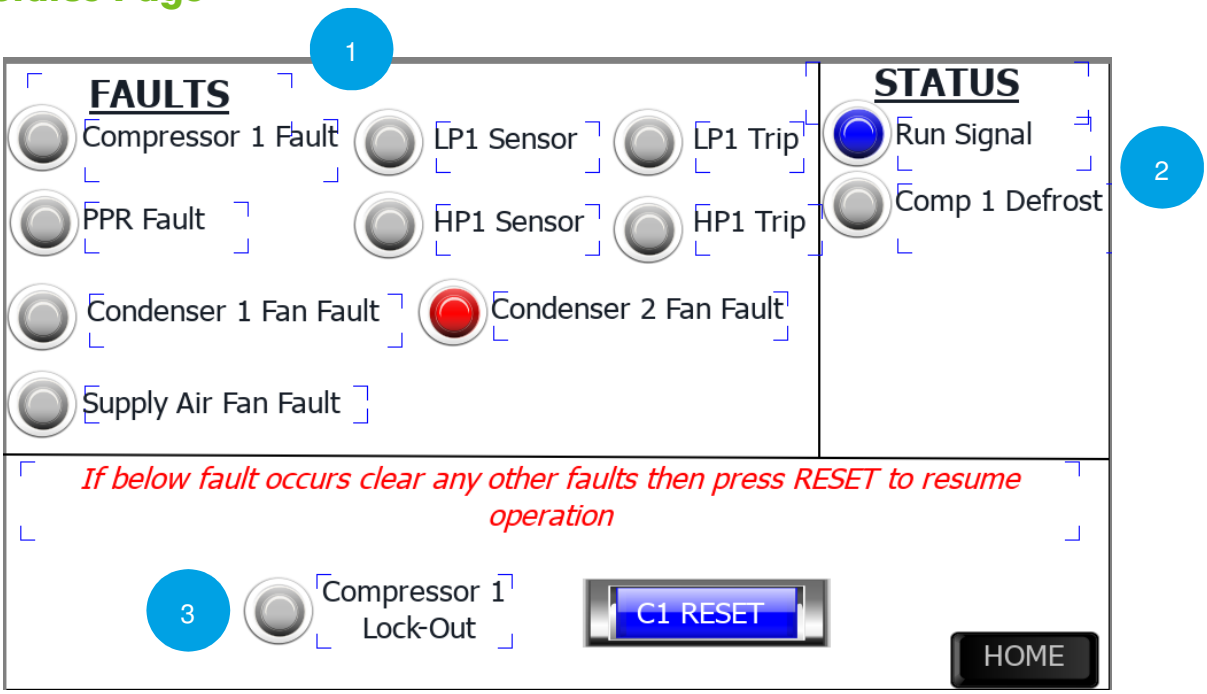
1. Set points for unit. Depending on the unit this can be temperature, humidity or pressure set points. They can be adjusted by using the up and down arrows;
2. Compressor pressure set points. It is recommended to keep these within the recommended range to avoid premature wear or failure of the compressor;
3. Dead band for the thermostat. This is the temperature range for the set point. For example, if the set point is 27 degrees and the dead band is 0.5 degrees the unit will run so that the temperature in the room is between 26.5 and 27.5 degrees. It is recommended to set dead bands to a minimum value of 0.5 to ensure stable operation.
4. Home button will take you back to the service page
5. Next button will take you to the next settings page

Settings Page 2



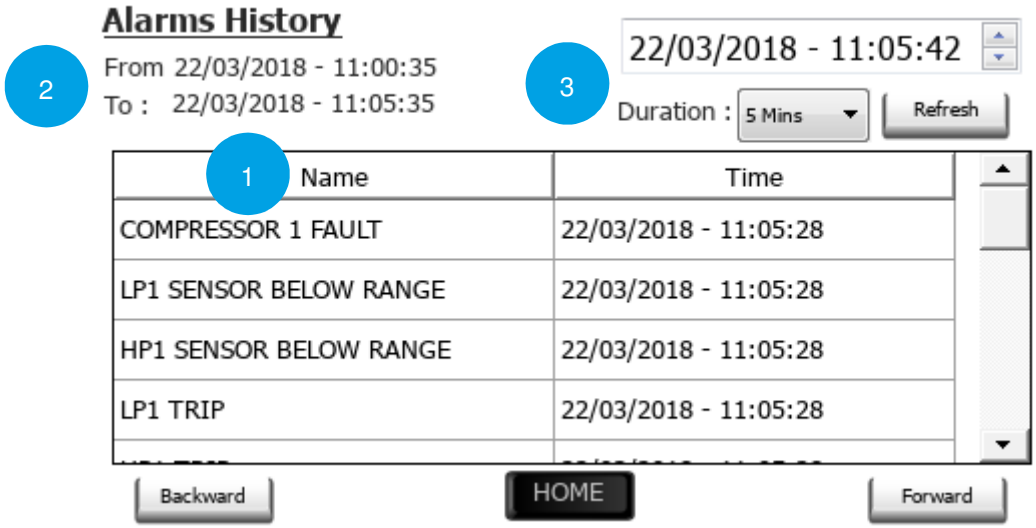
1. Sensor Offsets. Sensors can be calibrated if necessary. Use up and down arrows to adjust;
2. Previous page button will take you to the previous page;
3. Home button will take you back to the service page.

Status Page



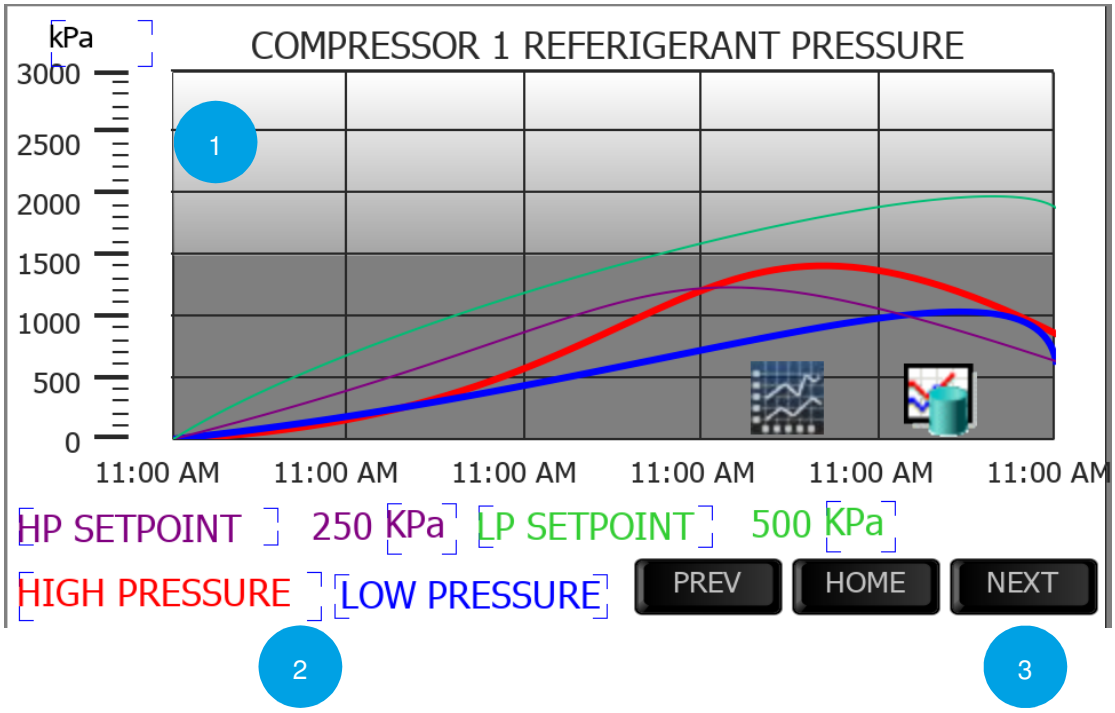
1. Displays all faults on units;
2. Displays component run status;
3. Compressor lockout. If a compressor has 3 faults within 1 hour the compressor will be locked out. The fault must be fixed then the reset button can be pressed to unlock the compressor.

Alarm History



1. Displays Faults with a timestamp;
2. Shows the time range of the faults being displayed;
3. Time settings. Time and time range can be adjusted.

Trends



1. Displays a trend graph of different parameters of the unit. Depending on the unit there will be a trend graph for Refrigerant Pressure, Temperature, Humidity, Component Speeds etc.
2. Colour coded legend as well as any set points for certain parameters;
3. Press next to see other trend graphs like temperature, humidity, component speeds etc.

8. SERVICE & MAINTENANCE

Heat exchangers

Air Change Sensible Heat Exchangers

IMPORTANT

Outdoor air filters must be changed/cleaned regularly to ensure airflow is unrestricted. The heat exchanger warranty may be voided if filters are not cleaned according to maintenance schedule and if proper filtration standards are not adhered to.

Note: Air Change can provide a heat exchanger replacement service on request.

WARNING

Switch off unit before attempting to remove parts for cleaning.

- The Sensible Heat exchanger has clear Mylar heat exchange media between the plates which can be wiped over with a damp cloth or gently hosed clean.

Maintenance Schedule

WARNING

Always disconnect line voltage before servicing electrical equipment. Ensure there are no loose electrical connections at services intervals.

IMPORTANT

Failure to carry out regular maintenance with a licensed and reputable refrigeration company may render warranty claims invalid if faults have been caused by lack of proper maintenance. Air Change may request to see the maintenance schedule carried out.

General

- Air Change systems are designed for easy maintenance, with highest quality materials and components used throughout.
- Preventative maintenance programs will vary according to actual working conditions and location and hours of usage by the client.
- Air Change will be pleased to provide expert advice on special service requirements for particular installations.

Monthly Maintenance Schedules

- A washable bag filter is provided by Air Change as factory-fitted standard. New filters can be supplied by Air Change if required.
- Filters should be inspected frequently immediately after installation to confirm the frequency of cleaning needed for the particular location. Regular change/clean of filters is necessary to ensure normal operating conditions.
- The filters should be cleaned monthly and the filter media should be replaced every 12 months.

Three-Monthly Checks

- Repeat the Monthly Schedule.
- Clean Heat Exchanger (see page 27).
- Check the blower wheels for dirt build-up and tightness on shaft.
- Check all cabinet panels for correct fitting, alignment and seals, and clean cabinet as required.
- Ensure no insulation has been detached from panels.
- Check for signs of excessive vibration on fans.
- All electrical terminals should be checked for tension on each maintenance visit with main switch off.
- Clear coils of obstructions or dirt.
- Clean condensate drain trays.

Annual Maintenance

- Repeat monthly and three-monthly checks.
- Apply grease into fan bearings through greasing points (only applicable for pillow block bearings).
- Connect service gauges and record operating pressures and mode.
- Test the superheat setting by placing a thermocouple at suction outlet and subtract the temperature from the suction temperature at the compressor. A reading between 4°C to 11°C is acceptable.
- Check the cabinet for any paint chips or abrasions and treat accordingly.
- Measure and record the amperage of each motor against nameplate details.
- Record voltages between phases and amperage at each phase.
- Check the VSD fan for any build-up of dust. Remove the fan and clean it by blowing out the VSD casing. Refit the fan.
- Check the VSD fault history and record any faults on the maintenance report. Take action on any and all faults.

9. TROUBLESHOOTING GUIDE

Problem	Probable Cause	Correction Method
Lock out due to low P	Blocked supply-air filter	Clean/replace filter
	Gas leak	Find leak, repair appropriately
	Faulty expansion device	Repair or replace
Lock out due to high P	Blocked condenser coil	Clean coil
	Overcharging of refrigerant	Check superheat and adjust
	Faulty condenser fan motor	Repair or replace
Lock out due to electrical trip	Voltage problem	Check phase voltage and rectify
	Insulation breakdown	Replace faulty component
	Dirty/loose contacts	Clean/tighten or replace
Tripped circuit breaker	Short Circuit	Trace and correct
	Earth leakage or overheating cables due to high load	Meggar and place as necessary
	Power fluctuations	Contact electricity supplier
Evaporator fan running but **no** cooling or heating	Faulty condenser fan motor	Check operation
	Controller SA temperature setpoint	Check the SA temperature setting
No heating; normal cooling	Reversing valve malfunction	Check coil then valve
Iced-over condenser coil	Defrost sensor not working	Check and replace as necessary

10. TECHNICAL DATA - TABLES

Heat Exchanger Data

Specification	Small Heat Exchanger	Large Heat Exchanger
Height	710 mm	1290 mm
Depth	330 mm	640 mm
Width	645 mm	650 mm
Weight	25 kg/m	75 kg/m
Pressure Drop	150 Pa @ 750 L/s per metre up to 250 Pa @ 1000 L/s per metre	120 Pa @ 1000L/s per metre up to 150 Pa @1700 L/s per metre
Reclaimed Heat	Enthalpy Heat exchanger - up to 75%. Sensible Heat Exchanger - up to 80%	Enthalpy Heat exchanger - up to 75%. Sensible Heat Exchanger - up to 80%
Insulation	5 mm thick black poly-ethylene with adhesive backing, fire resistant	5 mm thick black poly-ethylene with adhesive backing, fire resistant
Material	Poly-propylene solvent resistant	High impact poly-styrene solvent resistant
Temperature Range	Plates withstand a temperature range of -50°C to 150°C	Plates withstand a temperature range of -50°C to 120°C
Transfer Media	Enthalpy media - moisture permissible. Exchanges moisture and temperature.	
Maintenance	Supply and exhaust air must be filtered to avoid particles entering the heat exchanger	

Sandwich Panel Data

Skins	
CRP Colorbond	0.6 mm
Australian Standard	AS 2728 Category 2 and/or 3
Substrate	ZINCFORM® G300 BFC Z275 1
Pretreatment	Corrosion resistant proprietary conversion coating
Primer Coat	Universal corrosion inhibitive epoxy primer. Nominal thickness 5 µm each side.
Finish Coat	Custom formulated system. Nominal thickness 20 µm on the top or weather side. The standard colour is off white.
Backing Coat	Custom formulated Foam Grey, specially designed to facilitate adhesion to foam cores. Nominal film thickness 5 µm
Gloss	Nominal 25% (60°)
Dimensions	
Width	Standard 1200 mm (coverage)
Length	To design requirements (limited by handling/transportation consideration)
Thickness	Standard 50 mm
Weight	11.3 kg/m
Panel Spans	
Walls	5400 mm
Ceilings	3000 mm
Insulation Factors	
R Value	2.65 m/Kw
Fire Hazard Properties	
Ignitability Index	0 (scale 0 - 20)
Spread of Flame Index	0 (scale 0 - 10)
Heat Evolved Index	0 (scale 0 - 10)
Smoke Developed Index	0 (scale 0 - 10)

11. WARRANTY INFORMATION, TERMS & CONDITIONS

Failure to carry out regular maintenance with a licensed and reputable refrigeration company may render warranty claims invalid if faults have been caused by lack of Maintenance. Air Change may request to see the maintenance schedule carried out.

Management will need to keep records provided by service companies, which will detail the service done to each unit. This record is a summary of your service documentation for easy reference for management in case of a warranty claim.

Your equipment is a major investment and will last for many years if properly maintained and serviced.

Air Change Australia Pty Ltd will only accept a completed warranty card (issued in each manual; see page 32) or a copy of the original invoice complete with matching serial numbers as proof of purchase. This information must be verified before the authorisation of any warranty claims. We also require details of servicing with all warranty claims.

Warranty Claim Form

All warranty claims are subject to sale/service terms & conditions.
Please fill in the form and **fax back to (02) 8774 1490**.

Project name			
Address		**State**	
		Postcode	
Reported by		**Phone**	
Site Contact		**Phone**	
MODEL #		**SERIAL #**	
Details of problem			
Print Name		**Signature**	
Position			

AIR CHANGE OFFICE USE ONLY

Service Agent:		**M1 PO#**	
Technician Name:		**Phone:**	
Warranty Claim Number (WAN):	**Approved / Declined**	**BY:**	
		DATE:	

Details of Approval/Decline:

Parts List:		**Send Date**	
		Invoice #	
		Receive Date:	
		Invoice #	

Completion Date:		**Date Client Informed**	

Please remember to send "Details of Servicing Report" with this page if warranty is required.

Details of Servicing

DATE	CONTRACTOR /SERVICING FIRM	DETAILS
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12. WARRANTY POLICY

For The SALE AND SUPPLY OF PRODUCTS from AIR CHANGE AUSTRALIA PTY LTD

1. Applicability

1.1. This Warranty Policy applies to any Products sold and/or supplied by Air Change Australia Pty Ltd (**"Air Change"**) to a Purchaser and supersedes any terms and conditions of the Purchaser.

1.2. This Warranty Policy is also subject to the Terms and Conditions for the sale and supply of Products from Air Change (**"Terms and Conditions"**), a copy of which is available on the web site www.airchange.com.au and forms part of any Quotation or Order Confirmation from, and any Contract with, Air Change.

2. Definitions

2.1. "*Contract*" shall mean any and all agreements for the sale and/or supply of Products(s) from Air Change.

2.2. "*Parties*" shall mean Air Change and the Purchaser jointly.

2.3. "*Price*" shall mean the price to be paid by the Purchaser for the Product(s) excluding Goods and Services Tax (GST).

2.4. "*Product*" shall mean the product(s) as set out in the Contract.

2.5. "*Purchaser*" shall mean any and all party / parties entering into a Contract with Air Change for the sale and/or supply of Product(s) by Air Change.

3. Parts Warranty

3.1. Unless otherwise agreed in writing and subject to the terms and conditions of this Warranty Policy and the Terms and Conditions, Air Change warrants (a) that the Products are free of manufacturing defects in materials and workmanship, and (b) that the Products will deliver the rated heating and cooling capacity specified in the quotation and published technical details for such Product.

3.2. If during a period of 12 months from the date of delivery of the Product(s) to the Purchaser (**"Warranty Period"**) any part manufactured by Air Change is found upon inspection by Air Change to have proved defective in design, material or workmanship under normal use and service and when properly installed, connected and commissioned as per the manual, Air Change will supply an exchange replacement part(s) free of charge to the Purchaser provided that the Purchaser has complied with the conditions of warranty (**"Warranty Conditions"**) including those in clauses 5 and 6.

3.3. The Warranty Period may be extended so that the 12 month period commences upon commissioning of the Product(s) provided that (a) the date of commissioning occurs within 3 months of delivery of the Product(s) and (b) a commissioning report which specifies the date of commissioning is delivered to Air Change within 21 days of the date of commissioning.

3.4. Unless prior agreed by Air Change in writing, any cost or expense incurred by any persons removing or refitting or rebuilding the replacement part(s) shall be borne by the Purchaser except where Labour warranty has been specifically included in the sale.

3.5. If the Purchaser does not make a warranty claim within the Warranty Period, even if the defect occurs during the Warranty Period, the Purchaser shall lose all benefit of the Parts Warranty and any Labour Warranty.

4. Labour Warranty

4.1. The Purchaser may obtain a 12 month labour warranty (**"Labour Warranty"**) from Air Change at an additional cost of 2.5% of the Price plus GST subject to the Warranty Conditions and this clause.

4.2. The Labour Warranty must be purchased and paid for prior to any warranty claim being actioned.

4.3. The Labour Warranty shall entitle the Purchaser, in addition to the parts warranty in clause 3, during the Warranty Period having the costs of the labour of installing any replacement part(s) supplied pursuant to the parts warranty being costs paid by Air Change.

4.4. The labour covered by the Labour Warranty shall be undertaken (a) by Air Change or (b) by sub-contractors chosen and arranged by Air Change or (c) subject to the prior approval of Air Change, by the Purchaser or its agents or subcontractors, provided that in these circumstances labour shall be no more than $65.00 per hour and refrigerant shall be no more than $15.00 per kilogram and there shall be no charges for initial call out fees, quotations, travelling time, overtime, hire equipment, apprentice labour or brazing rod and nitrogen.

5. Warranty Conditions

5.1. The full Price in addition to GST and any other costs and charges pursuant to the Contract and the Terms and Conditions must have been paid.

5.2. The Product(s) must be in its first installation.

5.3. The Product(s) must have been installed in compliance with all of the conditions specified in the installation manual supplied with the Product(s).

5.4. The Product(s) must be operated and serviced in strict accordance with the installation instructions, operation instructions, service instructions, industry standards and relevant Government and industry codes and regulations.

5.5. The Product(s) must not have been subject to misuse, negligence, damage or accident in transit where the customer was responsible for transport.

5.6. The Product(s) must not have been modified, altered or supplemented in any way whatsoever without prior approval of such modifications, alterations or supplements being given by Air Change.

5.7. Where Air Change recommends the use of particular fluids, refrigerants, consumables, materials or other accessories with the Product(s), the Product(s) must not have been used with other fluids, refrigerants, consumables, materials or accessories.

5.8. No part of the Product(s) shall be considered defective due to failure to correspond with information regarding the quality or use of the Product(s) given by someone other than Air Change.

5.9. No part of the Product(s) shall be considered defective if it is properly characterised as a consumable or due to normal wear or deterioration.

5.10. Any identification or serial number on the Product(s) or the part(s) must not have been altered, defaced or removed.

5.11. The warranty is subject to inspection of the Product(s) or potentially defective parts of the Product(s) by Air Change, although Air Change may in its sole discretion waive the requirement for inspection.

5.12. The source of all part(s) supplied by Air Change pursuant to the Parts Warranty shall be sourced from or through Air Change and at the sole discretion of Air Change. Air Change shall not be liable for replacement parts sourced from other suppliers, manufacturers or wholesalers.

5.13. Air Change shall not be liable for defects arising out of materials provided by or a design stipulated by the Purchaser.

6. Making a Warranty Claim

6.1. In order for a Purchaser to make a claim under the Parts Warranty or the Labour Warranty, the Purchaser must provide to Air Change (a) a completed warranty card (supplied with the installation or instruction manual provided with the Product(s)) or a copy of the original invoice with matching serial numbers as proof of purchase and (b) full written details of the defect, fault or problem and (c) if requested by Air Change, photographs, servicing information, commissioning report, and/or the potentially defective part.

6.2. Any part(s) sent to Air Change must be accompanied by written details of the warranty claim and identification of the model and serial number of the Product(s).

6.3. In the event that Air Change provides a replacement part(s) and requests return of a defective part(s), the defective part shall become the property of Air Change and if the defective part(s) is not returned within 14 days the Purchaser shall be liable for the full cost and transport cost of the replacement part(s).

7. Limitation of Liability

7.1. Except as expressly provided in this Warranty Policy, Air Change shall have no obligations or liabilities whatsoever to the Purchaser in respect of the delivered Product(s) or any part thereof. Consequently, without limiting the generality of the above, Air Change shall under no circumstances be liable to the Purchaser for liquidated damages, loss of production, loss of profit, loss of revenue, loss of use, cost of capital, costs connected with interruption of operation or other consequential or indirect loss or damages arising out of or in connection with any Product(s) supplied.

7.2. At the expiration of the Warranty Period all liability whatsoever on the part of Air Change ceases.

8. Force Majeure

8.1. If Air Change fails to fulfil its obligations pursuant to the Warranty Policy due to industrial disputes or any other circumstances beyond its reasonable control, which Air Change could not have reasonably expected or taken into account and which consequences Air Change could not reasonably have avoided or overcome (including but not limited to fire, flood, power blackout, earthquake, war or delays in deliveries by sub- contractors) it shall be regarded as a case for relief and Air Change will not be liable for any damages or any other relief or remedies.