AIR CONDITIONING

Airwell
From EMAILAIR

Service & Installation Manual

XLM9RCA
XLM12RCA
XLM14RCA

20/06/03

CONTENTS

GENERAL INSTALLATION INSTRUCTIONS OF AIR CONDITIONERS

1. RECEIVING UNIT

Upon receipt, the unit should be carefully examined for any damage which may have occurred in transit, and such damage should be noted on the carrier's delivery documents.

It is the consignee's responsibility to make any subsequent claims upon the carrier or the respective insurance company.

2. LIFTING UNIT

When slinging the unit care must be taken to prevent rope damage to the paintwork or components. In particular the drain connections on the indoor unit must be avoided.

3. LOCATION

OUTDOOR UNIT

The unit must be installed on a firm level foundation, of adequate strength to support its full operating weight. Some form of vibration isolation such as rubber waffle pads should be installed between the unit and the supporting structure.

3.1 The unit must not be located where it will be subjected to heavy downpour and must be above ground level in areas that are prone to stormwater flooding.

3.2 It must be high enough to permit good drainage of defrost water and allow any heavy ice to fall away from the coil during defrost cycle.

Minimum recommended height is 250mm above ground level.

3.3 When locating unit give consideration to, and locate unit as remote as possible from neighbour's sleeping areas to minimise noise, as heat pump loads are greatest at night time.

3.4 Where prevailing winter winds are known, it possible, position the outdoor coil away from the winds to reduce defrost cycle time.

3.5 If possible, orient the unit outdoor coil towards the morning sun. This increases efficiency in heating and decreases the solar load on the unit in the summer cooling cycle.

3.6 Service and air flow clearances must be allowed as indicated on the unit dimension sheet. If should be noted that major service may require removal of the top panels. Particular attention should be paid to avoiding obstructions to the condenser air discharge which may result in recirculation of the outdoor air.

3.7 The standard outdoor fans fitted to the units will not accept any resistance to air flow. Consequently, should it be necessary to duct outdoor air to or from the unit, the ductwork system (including entering and leaving weatherproof louvres if fitted) must be negligible pressure loss.

3.8 In addition to the service clearances noted on the dimension sheet it is essential that provision is made for adequate and safe service access.

INDOOR UNIT

The unit must be installed in a manner adequate in strength to support its full operating weight.

3.9 The unit must be level to provide positive drainage of condensate.

3.10 Minimum Clearance

- Wall mounted split systems
  100mm from ceiling
  200mm from LH + RH sides
- Floor mounted consoles
  200mm from floor
  200mm from LH + RH sides

DUCTED SYSTEMS

3.11 Where building regulations require an auxiliary drip tray, it must be located under the unit ensuring that the tray is adequately supported on a suitable frame.

3.12 All electrical and ductwork connections to the unit must be made via flexible connections to prevent transmission of vibration

3.13 The indoor unit is not weatherproof and protection from the weather **MUST** be provided if it is installed outside. A separate weatherproof enclosure is the recommended method of weatherproofing.

3.14 Service clearance of 1 metre is required at the blower and motor access panel.

4. DRAINAGE

The condensate drain must slope down continually from the INDOOR units drain pan.

DUCTED UNITS ONLY:-

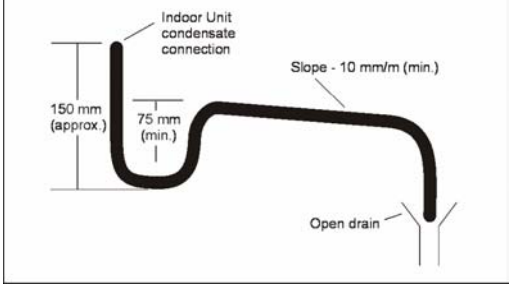
INDOOR UNIT

Provision is made for the connection of a condensate drain from the indoor section. It is essential that this drain is adequately trapped (re. Fig. 1) as the negative pressure caused by the unit's supply air fan, may prevent proper drainage resulting in flooding of the unit and adjacent area.

Run condensate drain to a suitable disposal point, preferably a stormwater drain.

Where building regulations demand an auxiliary drip tray, this must be located first ensuring the tray is adequately supported on timber bearers or a suitable frame.

FIG. 1



OUTDOOR UNIT

During the heating cycle ice forms on the surface of the outdoor coil. This ice is periodically removed during the unit's defrost cycle and fairly large quantities of water (melted ice) will be dumped onto the area beneath the unit. Where the unit is mounted on a roof this should not be a problem. However, where the free run off of this water is not acceptable, the supplied drain connection must be connected to the unit and the drain pipe must slope down continually from the unit.

INSTALLATION - cont.

5. All duct designs and heat loads must be calculated by a qualified air conditioning consultant or contractor in accordance with normal good ducting practices.

Dimensions of duct connections are shown on the dimension sheet. Connection to the unit must be made via flexible connections to prevent transmission of vibration and facilitate easy removal of panel work for major service access. All ductwork must be insulated against noise and heat transmission.

6. FRESH AIR INTAKE

If required this must be fitted to the return air ducting as no special provision is made within the unit. All fresh air intakes must be provided with air filters if they are connected to the ductwork between the return air filter and the unit.

Consideration should be made to the return air sensor. The ducted units have a return air sensor mounted near the return air coil. Fresh air influences may affect the room temperature. Relocating the position of the return air sensor may be required.

7. AIR FILTERS – DUCTED SYSTEMS

Air filters are not provided and no provision is made for fitting them within the unit as standard. Air filters should however be provided by the installing contractor and located in an accessible location between the return air grille and the unit. These filters must be sized for a maximum face velocity of 2.0 m/sec.

8. REFRIGERANT LINES

The refrigeration installation, evacuation & charging must be carried out by a competent licensed refrigeration mechanic in accordance with local authority regulations & compliance.

New, clean, moisture free refrigerant quality copper tube must be used when piping up the unit.

Correct size tube **MUST** be used at all times. Maximum permissible line runs and maximum permissible vertical lifts must never be exceeded to avoid the risk of loss of warranty.

8.1 Using specified diameter tubing, run liquid and gas lines from the outdoor unit to the indoor unit avoiding hot surfaces such as hot water pipes, boiler, flues, etc.

8.2 The refrigerant piping should be as short and straight as possible to obtain the most efficient performance.

8.3 All vertical gas rises must be fitted with an oil trap every 5 metres, when outdoor unit is above the indoor unit.

8.4 Both lines should be insulated separately along its entire length with a water and rodent resistant material such as Ensolex or Armaflex. **Insulate both refrigerant lines separately.**

8.5 Both lines must be adequately supported to prevent vibration. Maximum recommended support centres are:

Line Size	Max. Support Centres
12.7 OD	1.6M
15.9 OD	1.8M
28.9 OD	2.0M
34.9 OD	2.6M

8.6 When soldering joints the system must be purged with dry nitrogen to prevent oxidation of pipework.

9. LEAK TESTING

9.1 Charge the system with R22 vapour to 200 kPa gauge pressure.

9.2 Boost the pressure in system to 1400 kPa with nitrogen or dry air.

9.3 Conduct a leak test at all system joints and components and repair leaks as required.

10. EVACUATION

10.1 Evacuate the system for minimum of 2 hours to 500 microns with a vacuum pump.

10.2 Stop the vacuum pump, close the valves and wait for 30 minutes and check for pressure rise.

- If the rise in pressure is no more than 50 microns then the system is leak free.
- If the pressure rise is more than 50 microns, this indicates the presence of contaminants and/or leaks in the system.

Repeat leak test, repair and evacuation procedures.

11. CHARGING THE SYSTEM

11.1 Open both Suction & Liquid line service valves to release refrigerant

11.2 The condensing unit is precharged for up to 6m of refrigeration pipe.

11.3 Weigh the specified amount of additional line charge of R22 into the charging cylinder.

11.4 Run the unit and bleed the remaining refrigerant vapour through the suction line.

Close off the charging line valve and carry out a leak test to all pipe joints.

WARNING

DO NOT UNDER ANY CIRCUMSTANCES RECHARGE THIS EQUIPMENT WITH FLAMMABLE HYDROCARBON REFRIGERANTS. THE USE OF FLAMMABLE HYDROCARBON REFRIGERANTS CAN CAUSE EXPLOSIONS.

INSTALLATION – cont.

12. ELECTRICAL INSTALLATION

The electrical installation must be carried out by a competent licensed electrician in accordance with local power supply authority regulations & compliance and the appropriate unit wiring diagram.

Any modifications carried out without the approval of ECP (Australia) may void the unit warranty.

Mains supply cables must be sized to ensure adequate voltage at the unit terminals when the unit is starting and during full load operation.

Selection of supply cables must be determined by the following criteria:

1. Length of run supply cables.
2. Maximum starting current of unit – cables must supply adequate voltage at unit terminals for starting.
3. Method of installation of supply cables.
4. Capability of cables to carry unit full load current.

Starting and full load currents must be provided on the unit's circuit diagram.

Short circuit protection must be provided at switchboard using HRC fuses or circuit breakers.

Low Voltage wiring including sensor wire must be wired using shielded cable and must not be run in conduits with power wiring (240/415 volt) as any induced voltage will cause unreliable operation of the unit and service problems.

13. OPERATING UNITS

For reliable, efficient, trouble free operation of the unit, it is essential that the unit is correctly sized for the job, and operates within its recommend supply air quantity.

Units must not be selected to operate outside the range of operating conditions as shown in the selection data.

14. WARRANTY

ECP (Australia) warrants its Air Conditioning Products to be free of defects in workmanship or material under normal use and service.

As ECP (Australia) has no direct control over field work done during installation, claims resulting from damage to equipment which can be attributed to this field work cannot be accepted.

The warranty period is 5 years in human comfort cooling applications.

Please refer to the terms, conditions and warranty exclusions which are detailed in the Warranty card supplied with the product.

INSTALLATION – cont.

SUPPLY CABLE SIZING – AIR CONDITIONING UNITS

The manual provides a method of selecting cable sizes which are large enough to ensure adequate voltage at the unit terminals when starting and during normal full load operation. The sizes determined are the minimum acceptable to ECP (Australia) to ensure satisfactory operation of the equipment.

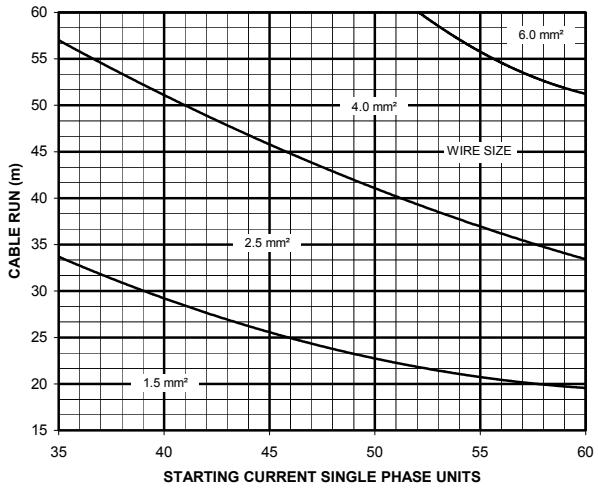
Local wiring rules may appear to allow smaller wire sizes to be used; however use of smaller sizes may lead to operational problems and will void your warranty.

Selection of supply cables must be determined by the following criteria:

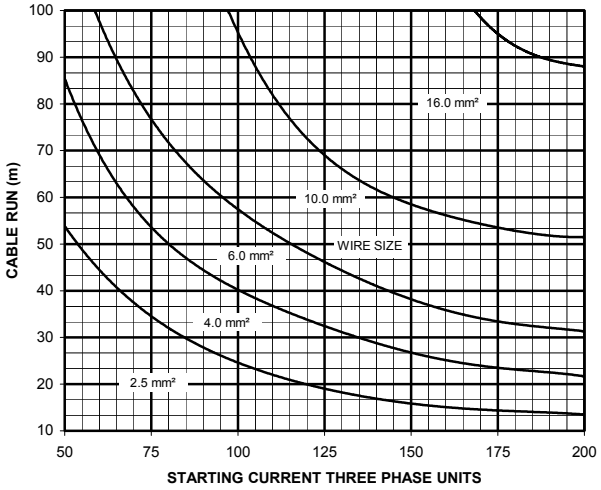
1. Length of run of supply cables.
2. Maximum starting current of unit – cables must supply adequate voltage at unit terminals for starting.
3. Method of installation of supply cables.
4. Capability of cables to carry unit full load current. (Starting and full load currents are provided on the unit's circuit diagram.)

Procedure

1. Select minimum acceptable wire size to handle starting current – Graph. 1.
2. Check that wire size from step 1 is adequate for full load current – increase size as necessary – Graph. 2.
3. Check that larger wire size determined from 1 to 2 is acceptable under local wiring rules.



Graph 1



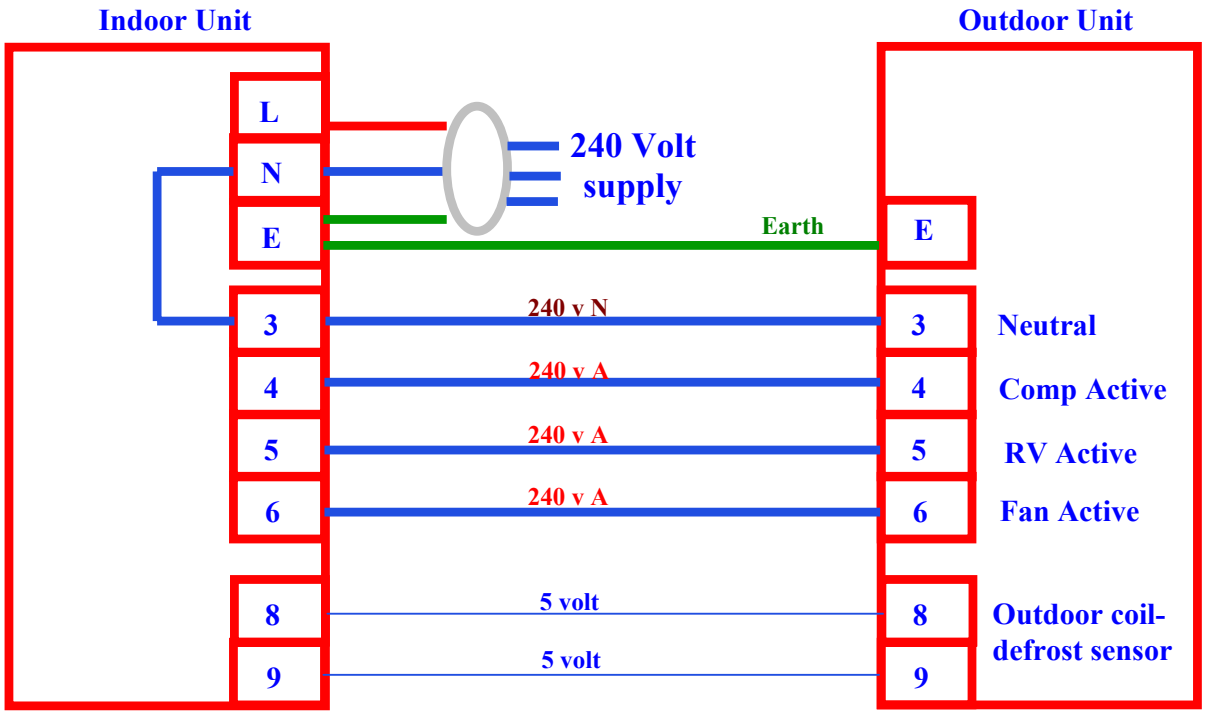
Graph 2

CURRENT CARRYING CAPACITY – AMPS. (Normal Full Load Current)											
Single Phase					Three Phase						
1.5	2.5	4.0	6.0	Cable Size	2.5	4.0	6.0	10.0	16	25	35
10	12	16	20	Completely Surrounded By thermal nsulation	12	16	20	25	32	40	50
16	20	25	32	Partially surrounded by thermal insulation	16	20	25	32	50	63	84
16	20	25	32	Enclosed in air (In Conduit)	20	25	32	40	50	80	92
20	25	32	40	Unenclosed in air (Not in Conduit)	20	25	40	50	63	80	100
25	32	40	50	Buried in ground or underground enclosure	25	32	40	63	80	100	120

INSTALLATION – cont.

Installation Wiring Connections

Single Systems Single Phase



Power Supply to Indoor Unit

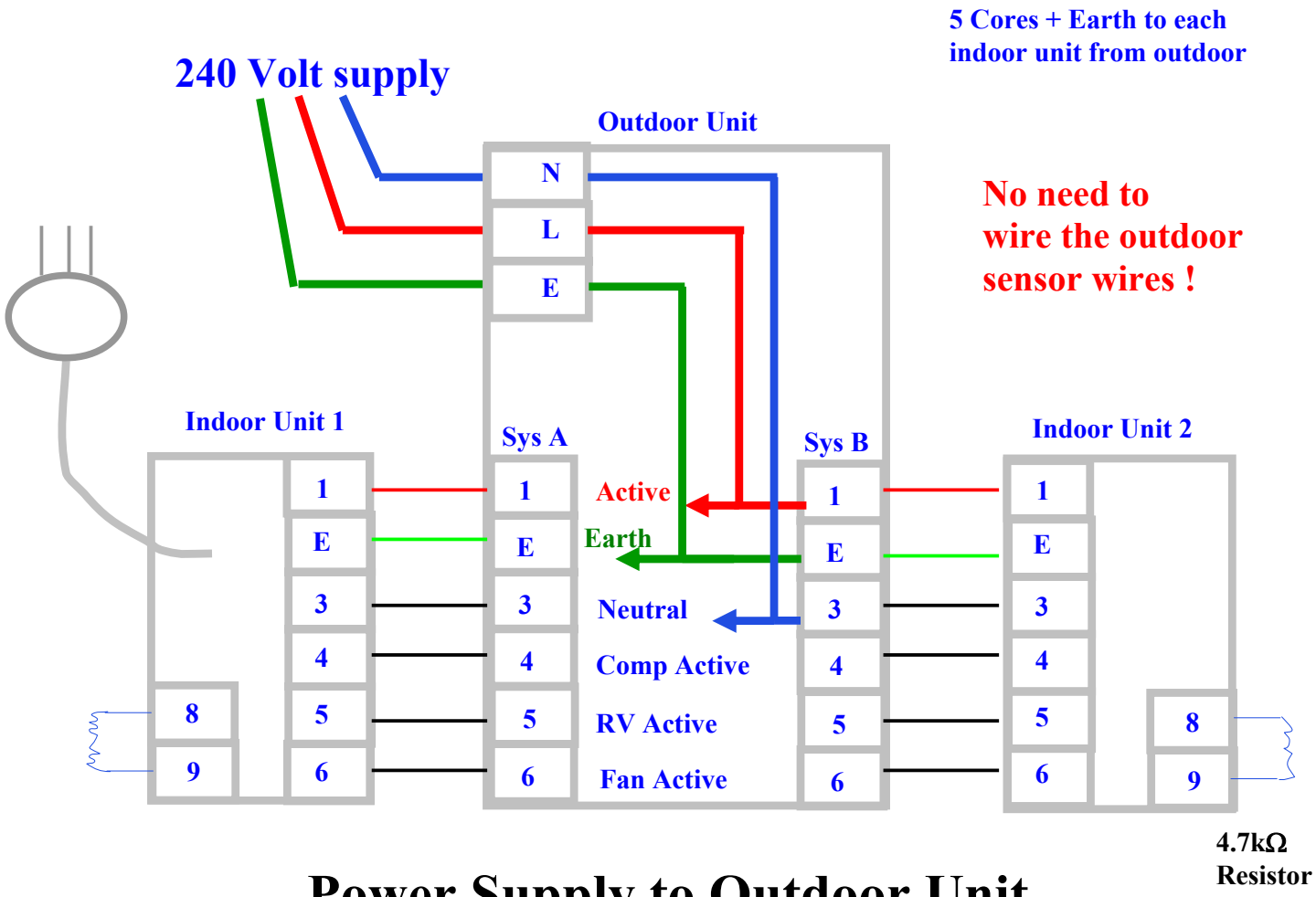
4 Cores + Earth + two core sensor wires indoor to outdoor

Keep Low Voltage Sensor (5Volt) Cable Separate (100mm away) from the Power Wiring or use shielded cable, to Avoid Induction on the Sensor Cable and Unreliable Sensor Operation.

INSTALLATION – cont.

Installation Wiring Connections

Duo & Quattro Systems Single Phase



Power Supply to Outdoor Unit

Remove 3 Pin Power plugs from Indoor unit

COMMISSIONING.

1. PRE-START CHECK LIST

1.1 Electrical Check

(a) Electrical installation has been carried out according to unit wiring diagram and the Supply Authority Regulations.
(b) Correct size fuses or circuit breaker installed at switchboard.
(c) Supply voltages as specified on unit circuit diagram.

1.2 Visual Check

(a) Clearance around unit including condenser air entry and discharge and service access.
(b) Unit mounted as specified.
(c) For loose or missing bolts or screws.
(d) For refrigerant leaks in connections and components.

1.3 Ducting and Indoor Fan

(a) Ducting
  (i) Connections flexible type, secure and detachable for service access.
  (ii) Seams and joints airtight.

(b) Air Filter
  (i) Correctly located and accessible.
  (ii) Correct material.
  (iii) Correct dimensions.

(c) Fans
  (i) Clearance: Spin fans by hand and check clearance.

2. OPERATING CHECK LIST

2.1 Indoor Fan & Drive Ducted Units

(a) Rotation: Check direction of rotation.
(b) Static Pressure Loss and Air Quantity
The indoor air quantity must be within the application limits of the unit supply air fan (see fan curves). The associated static pressure must be such that the motor is operating within its normal power rating.
(c) Motor Load
With all panels in place measure current in each phase of the indoor fan motor using clip-on type ammeter. Compare this to the nameplate full load current.

2.2 Outdoor Fans

(a) Clearance: Spin fans by hand and check clearance.
(b) Rotation: Start fan motors and check direction of rotation.

2.3 Compressors and Refrigeration Systems

(a) Running check: Start the compressor. Check for any unusual noise and vibration. Where three phase Scroll Compressors are fitted a test is necessary to ensure the compressor is in fact running in the correct direction. If the compressor is pumping it is operating correctly. If it is noisy and not pumping it is running the wrong direction and will fail within minutes. Reverse two of the phases to correct the running direction of the compressor and retest.
(b) Operating Pressures: Operate the unit for a minimum of 20 minutes to ensure that the refrigerant pressures have stabilised, and check that they are within normal operating limits.
(c) Operating Temperature: Check discharge, suction and liquid temperatures.
Discharge temperature on cooling cycle should normally not exceed 95^{o}C.
Suction superheat should be 6^{o}C ± 2^{o}C.
Liquid should be sub-cooled.

2.4 General

Check for any unusual noises or vibration in the running components, particularly the indoor fan drive system.

3. ELECTRICAL

3.1 (a) Set point of compressor overload relay.
(b) Set point of indoor fan motor overload relay.
NOTE: The fan motors are fitted with internal automatic reset overload devices.

3.2 Operating voltage: Recheck voltage at unit supply terminals.

3.3 General

With unit switched off at main isolator check:
(a) All terminals tight.
(b) Wiring clear of and protected from pipework and sharp edges.

4. FINAL CHECK

4.1 Schroeder valve caps in place and secure.

4.2 All panels and fan guards in place and secure.

4.3 Unit clean and free of excess installation material.

4.4 Leak test all refrigeration connections.

It is important to ascertain proper operation of the air conditioner in all the modes of operation of the remote control device.

5. CUSTOMER INSTRUCTIONS

Upon completing the installation, instruct the customer as to how to use the air conditioner. Instructions shall include:

1. How to operate the remote control device?
2. How to cool and how to heat?
3. How to achieve the desired temperature preferred by the customer?
4. Cleaning the air conditioner filter,
   - Specify to the customer the time intervals for cleaning the filter.
   - Show the customer how to clean the filter and how to put it back.

REGULAR MAINTENANCE

These units have been designed for minimum maintenance through the use of permanently lubricated components. However, there are operational maintenance requirements that require regular attention to ensure optimum performance.

Maintenance must be performed by appropriately experienced personnel.

WARNING: Isolate unit from power supply before working on unit.

1. REMOVAL OF PANELS

All access panels are removable by unscrewing the self-tapping retaining screws.

2. FILTER CLEANING

The Filters should be washed in warm soapy water at regular intervals, as required by the application and the environment of the installation. The electrostatic and carbon activated filters should be replaced as required.

2.1 Filter Cleaning – Ducted Units

The filters are provided and fitted by the installer and consequently specifications will vary with personal preference. For normal air conditioning duty the common filter is either a 25 mm or 50 mm thick permanent type which may be cleaned with the aid of a vacuum cleaner then washed in a weak solution of detergent and warm water. However, the installer's recommendation should be sought to ascertain the method and frequency of cleaning best suited to the type used and the needs of the particular installation.

3. FAN DRIVE SYSTEM (Indoor)

Fan shaft and motor bearings are of permanently lubricated, sealed type and require no regular maintenance other than a check on their general condition.

4. OUTDOOR COIL

The coil surface will become laden with dust and may be blocked by leaves or papers over a period of time. The surface should be inspected periodically and cleaned down by hosing or steam cleaning as required.

5. ELECTRICAL

The contact surfaces of relays and contactors should be inspected regularly by an electrician and replaced as judged necessary. On these occasions the control box should be blown out with compressed air to remove any accumulation of dust or other contaminants.

6. REFRIGERATION

The refrigeration system is hermetically sealed and should require no regular maintenance. However, it is recommended that the system be leak tested and the general operating and control systems be checked on a regular basis. The operating pressures should be checked particularly at these times as they are an excellent guide to other areas of the system in need of maintenance.

7. MAINTENANCE CHECK LIST

7.1 Electrical Check

(a) Clean down external panels.

(b) Remove panels.

(c) Check insulation for damage or deterioration and repair as necessary.

7.2 Condensate Drain Check

(a) Check drain ports and piping are clear.

(b) Clean out accumulated dirt.

(c) Check for signs of rusting.

7.3 Refrigeration System

(a) Gas leak check.

(b) Check pipes or capillaries rubbing or vibrating.

(c) Check compressor for unusual noise or vibration.

(d) Check discharge temperature.

(e) Test refrigerant charge using Suction superheat method.

7.4 Outdoor Coil

(a) Clean fin surfaces as required.

(b) Note condition of fans and motors.

7.5 Indoor Section

(a) Check fin surface is clean.

(b) Clean filters.

(c) Check condition of fan and fan motor.

(d) Check fan bearings for signs of wear.

7.6 Electrical

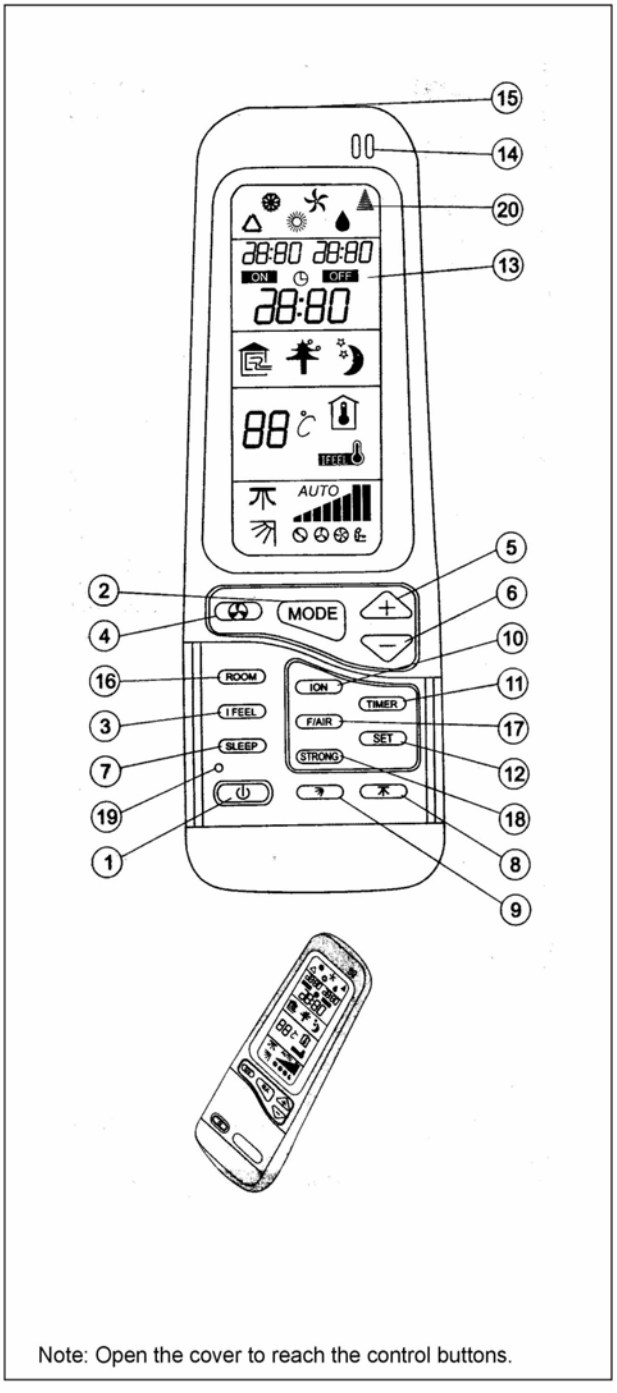
(a) Check fuse rating and condition.

(b) Check for loose terminal screws.

(c) Generally check for loose wiring.

7.7 Replace panels, replacing any missing screws.

RC3 SILVER REMOTE CONTROL



Note: Open the cover to reach the control buttons.

1. START/STOP button
2. Operation mode selection buttor
   - COOLING
   - HEATING
   - AUTO COOL / HEAT
   - DRY
   - FAN
3. I FEEL temperature sensing mode button
4. FAN SPEED and AUTO FAN button
5. Room temperature UP button
6. Room temperature DOWN button
7. SLEEP button
8. Airflow direction AUTO-CONTROL button
9. HORIZONTAL Airflow direction AUTO-CONTROL button
10. IONIZER button
11. TIMER button
12. TIMER SET button
13. LCD operation display
14. I FEEL sensor
15. Infrared signal transmitter
16. ROOM temperature display button
17. FRESH AIR button
18. STRONG button
19. LOCK Button
20. Transmission sign

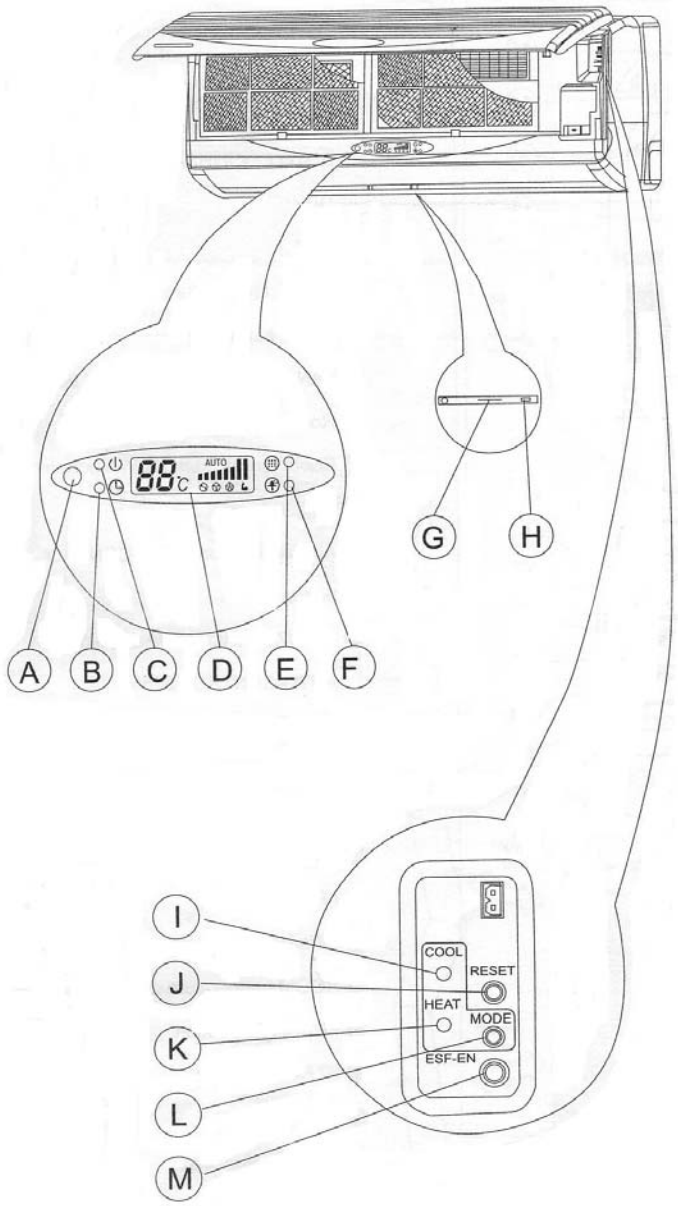
RC3 (Silver) MODES OF OPERATION
FUNCTIONS AND FEATURES

 COOL	Cools, dehumidifies and filters the room air. Maintains desired room temperature.
 HEAT	Heats and filters the room air. Maintains desired room temperature.
 AUTO	Automatically selects heating or cooling mode according to the requirement then controls the temperature in that mode. It does not change from cooling to heating or visa versa.
 DRY	Dehumidifies and softly cools the room In DRY Mode, the air conditioner operates at an increased dehumidifying power. This function is recommended to be used when temperature is rather low but the humidity is high.
 FAN	Recirculates and filters the room air. Maintains constant air movement in the room
 AUTO FAN	The air conditioner automatically selects the FAN speed in accordance with the room temperature. At the start, the unit operates at high fan speed. As the room air approaches to the desired temperature, the fan switches to a lower speed for quieter operation.
HOT KEEP	IN HEATING and in AUTO FAN, the fan will be turned off when the compressor is not in operation and will not be started, unless the indoor coil reaches adequate temperature. This HOT KEEP feature prevents uncomfortable cold air drafts. Use of AUTO FAN is, therefore, recommended when air conditioner is in HEATING mode.
 I FEEL	Switches the temperature sensing point to the place where the remote control is located. (Generally the temperature sensor is located behind the intake grille of the air conditioner). This function is designed to provide a personalized environment by transmitting the temperature control command from the location next to you. The communication between the Remote Control and the unit is done by infra-red signal. Therefore, in using this function, the Remote Control should always be aimed, without obstructions, at the air conditioner.
 TIMER	Real time control and display , automatically turns the air conditioner ON and OFF according to the time of day setting, ensuring comfort conditions before returning home, without wasting electricity. It turns the air conditioner off automatically when sleeping.
 SLEEP	Designed to create comfortable sleeping conditions. When in COOLING mode, the temperature rises one degree centigrade after each consecutive hour, up to three hours, from the start of the mode. The temperature rise prevents the feeling of over-cooling while sleeping (when your body is at rest). In HEATING mode the reverse occurs; the air conditioner lowers its temperature one degree every hour. When in SLEEP mode, the air conditioner will be automatically turned off after seven hours. The result is a more comfortable and invigorating sleep, which leaves you feeling fresh and energetic in the morning.

RC3 (Silver) MODES OF OPERATION
FUNCTIONS AND FEATURES Continued.

AUTO FLAP (LOUVRE)	The air flap (louvre) is automatically positioned for the most suitable blow-out angle, when COOL, HEAT, DRY or FAN modes are selected. When the air conditioner is turned off, the flap will close automatically for an aesthetic appearance.
 VERTICAL AIR SWING	Automatic swing of supply air in vertical direction. The flap moves automatically in upward and downward direction to spread the conditioned air evenly throughout the room.
 HORIZONTAL AIR SWING	Automatic swing of Horizontal air flow in Horizontal direction. The flap move automatically in right and left direction to spread the conditioned air evenly throughout the room.
 ROOM TEMPERATURE	Measures and displays room temperature.
 BUZZER	A soft buzzer will sound from indoor unit display to indicate that a command sent by the remote control has been accepted and stored in the unit's memory. This feature may be easily cancelled bu the user from the display panel.
ON UNIT OPERATION	The air conditioner can be turned ON for COOLING or HEATING or be turned OFF directly from the indoor unit display panel without the use of the remote control.
3-MIN DELAYED RUN	This compressor is protected by a three minute delayed restart.
LOCK	Freezes the last operation setting on the remote control. When LOCK is activated, the remote control will not be able to control the air-conditioner
MEMORY	The microprocessor retains the last data entry whether or not the unit is plugged in. Therefore, when the unit restarts after a power disruption or failure, it will resume operating in the same mode as before the power was disrupted.
FRESH AIR (optional)	This function can induct the fresh air from outside into the room and make your room more fresh.
ELECTROSTATIC FILTER	They are capable of capturing small particles down to 0.1 microns, such as atmosphere and household dust, coal dust, insecticide dust, mites, pollen, pet danger, tobacco smoke particles, cooking smoke and grease, mould fungi, bacteria, viruses and more.
IONIZER	IONIZER makes the air more fresh and more comfort. Slide switch (O) to the ON position and use the remote control to activate the IONIZER. The blue light indicator (N) on the unit will light up indicating the IONIZER in operation. To cancel the operation set slide switch to OFF position. Important Notice: When the air conditioner is turned OFF or if the indoor fan stops operation the IONIZER stops automatically.

CONTROL LIGHTS AND FUNCTIONS.



A. Signal receiver
Receiver signals from the remote control.

B. Timer indicator
Lights up during timer and sleep operation.

C. Stand-by/Operation indicator
Lights up in red when connected to power.
Lights up in blue during operation.

D. LCD display

E. Filter indicator
Lights up when air filter requires cleaning.

F. Fresh-air/Ionizer indicator
Lights up when the fresh-air or Ionizer operation.

G. Ionizer indicator
Lights up during the ionizer is open.

H. Ionizer on/off
Used to switch the ionizer.

I. Cooling indicator
Lights up only when mode (L) is pressed.

J. Reset button
Press to turn off the filter indicator or cancel the buzzer announcer.

K. Heating indicator
Lights up when mode (L) is pressed.

L. Unit mode button
Used to switch the unit for cooling or heating without the remote control.

M. Electrostatic filter safety button
Turn off the Electrostatic filter when you open the grill.

RC3 SILVER REMOTE CONTROL DIP SWITCH SETTINGS

REMOTE CONTROLLER DIP SWITCHES.

The DIP switches are located above the batteries under the battery door at the back of the remote control.

1). LEFT DIP SWITCH (When looking at the back)

UP = LCD Remote control for XLM9, 12, &14 RCA with LCD (Standard setting**).**
DOWN = Standard RC3 remote control for all other units.

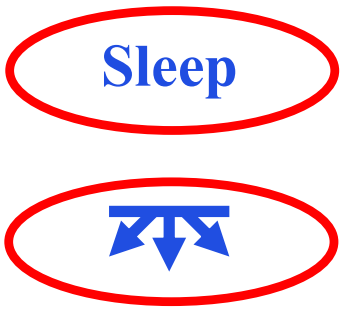
2). RIGHT DIP SWITCH (When looking at the back)

UP = Cooling only units.
DOWN = Heat pump operation.

RESETTING REMOTE CONTROL.

The remote control must be reset after changing DIP switches, replacing the batteries or for any other reason which is causes the remote control to malfunction, (the remote is dropped, got too hot etc.).

To reset the control press the "SLEEP" and the "HORIZONTAL SWING (On Right)" buttons together for 4 seconds, this will clear the display and reset the remote control.



Press Both for 4 Seconds.

CONTROL LOGIC DESCRIPTION.

SOFTWARE AND HARDWARE OPERATION POINTS.

1). **CLK Remote clock terminals**. There are no ”CLK” terminals for remote start/stop in this range of units.
2). **Ioniser & Power electrostatic filter.** New clean air features provided by the IONISER and the 4800 Volt powered electrostatic filter.
3). **Outdoor fan operation.** Outdoor fan runs on for 15 secs after compressor has stopped.
4). **Strong function.** The strong function on the remote will run the indoor fan at super high speed for 15 mins and then will revert to its previous setting.
5). **Power LED.** Power/Operation indicator lights up red when connected to power and standing by waiting for a command from the remote control, (OFF mode). Changes to green during operation.
6). **I Feel mode.** In “I Feel” mode if the control PCB has not received an I Feel signal from the remote control within 4 mins the unit will revert to units return air sensor control. If the I Feel data is then received the unit will resume the I feel operation. The remote control must be in line of sight of the unit and measuring the room temperature without any “other” temperature influences.
7). **TEST Operation.** For “test operation”, with unit in standby, press the “sleep” button for 3 secs, 5 beeps will sound and the unit will run in cooling with high speed indoor fan for 30 minutes.
8). **AUTO Mode.** The Auto mode on these units selects either heating or cooling mode according to requirements and then runs in that mode until turned OFF. It does not swap from heating to cooling mode.
9). **Filter Clean LED.** The filter clean LED is illuminated when the indoor fan has run for 512 hours. Press the reset button on the indoor unit to clear the filter LED after cleaning the filters.

MICROPROCESSOR PCB JUMPERS PLUGS.

There are several **“Jumpers”** on the PCB which select the unit model and mode. The PCB’s come configured for the model designated by the control box assembly and for this reason the assemblies or boards should not be interchanged without first checking the jumpers.

JUMPER DESCRIPTION. Refer PCB Layout page 18.

1). **J1, J2 & J3** on PCB are to choose unit mode.

J1	J2	J3	MODE
1	0	0	XLM-LCD

NOTE: 1 = Jumper shorted. 2 = Jumper open.
XLM-LCD = **XLM**9, 12,14RCA with **L**iquid **C**rystal **D**isplay.

2). **J4** is unused.
3). **J5** is for self test mode, when power is switched off short **J5** so unit will go into self test mode when powered on. Refer page 18.
4). **J6** is for cooling only/reverse cycle mode, if **J6** is shorted the unit is a cooling only model.
5). **J7, J8 & J9** are model selection jumpers.

J7	J8	J9	MODEL
0	1	1	XLM9RCA
1	1	0	XLM12RCA
1	0	0	XLM14RCA

NOTE: 1 = Jumper shorted. 0 = Jumper open.

CONTROL LOGIC DESCRIPTION, Cont.

PROTECTION MODES AND DELAYS.

1). OUTDOOR COIL HIGH-TEMP PROTECTION IN COOLING MODE. When the outdoor coil temperature (OCT) is >61°C the indoor fan slows to low speed. When OCT increases to >66°C compressor cycles off and outdoor fan is forced on. When OCT drops back to <55°C the indoor fan is restored to normal and when OCT drops to <52°C the compressor and outdoor fan resume normal operation. The operation LED flashes during this protection mode. See more detail Page 22.

2). INDOOR COIL LOW-TEMP PROTECTION IN COOLING MODE. After 5 mins of compressor operation and the indoor coil temperature (ICT) is below -3°C for a duration of 1 min the compressor and the outdoor fan cycle off. When ICT increases to +7°C the compressor and outdoor fan resume normal operation.

3). INDOOR COIL HIGH-TEMP PROTECTION IN HEATING MODE. When the indoor coil temperature (ICT) is >61°C the outdoor fan turns off. When ICT increases to >66°C for 10 secs the compressor cycles off. When ICT drops back to <55°C the outdoor fan turns on and when ICT drops to <52°C the compressor resumes normal operation. See more detail Page 22.

4). Compressor Minimum Run Time. Minimum run time on compressor is 5 mins & minimum off time delay is 3 mins.

5). Fan Speed Change Delay. There is a 3 min delay when increasing the indoor fan speed, but no delay on decreasing fan speed, to avoid the fan speeds changing frequently.

6). Relay Delay. If all function relays would be required to start together there is a 0.5 sec delay between each relay activation.

7). Heat to Cool Delay. When switching from heating to cooling and visa versa modes the compressor start is delayed by the 3 minutes minimum off time & also by the R/V 2 min delay.

UNIT INDICATOR DIAGNOSTICS.

Power/Operating LED Flashes, indicating fault as per table below.

THERMISTOR FAULT	STANDBY LED DIAGNOSIS
Return Air Thermistor Fault.	1 Flash.
Indoor Coil Thermistor Fault.	2 Flashes.
Outdoor Coil Thermistor Fault.	3 Flashes.
Indoor Fan Motor Fault.	4 Flashes.

Operation LED Flashes Continuously During:-

1). OCT High Pressure Protection Mode.

2). De-icing in heating mode.

DIAGNOSTIC LOGIC

1). When microprocessor detects one or more of RT, ICT and OCT sensors is below -40°C (open circuit) or over 85°C (short circuit) the sensor is considered to be faulty as indicated in the above table, but the air conditioner operates as per note 2 below, using a default value for the faulty sensor.

2). When a faulty sensor is detected in Cooling or Heating mode, compressor cycles on for 20 mins and cycles off for 5 mins, and runs continuously cycle by cycle. In Dehumidification mode, compressor cycles on for 10 mins and cycles off for 6 mins.

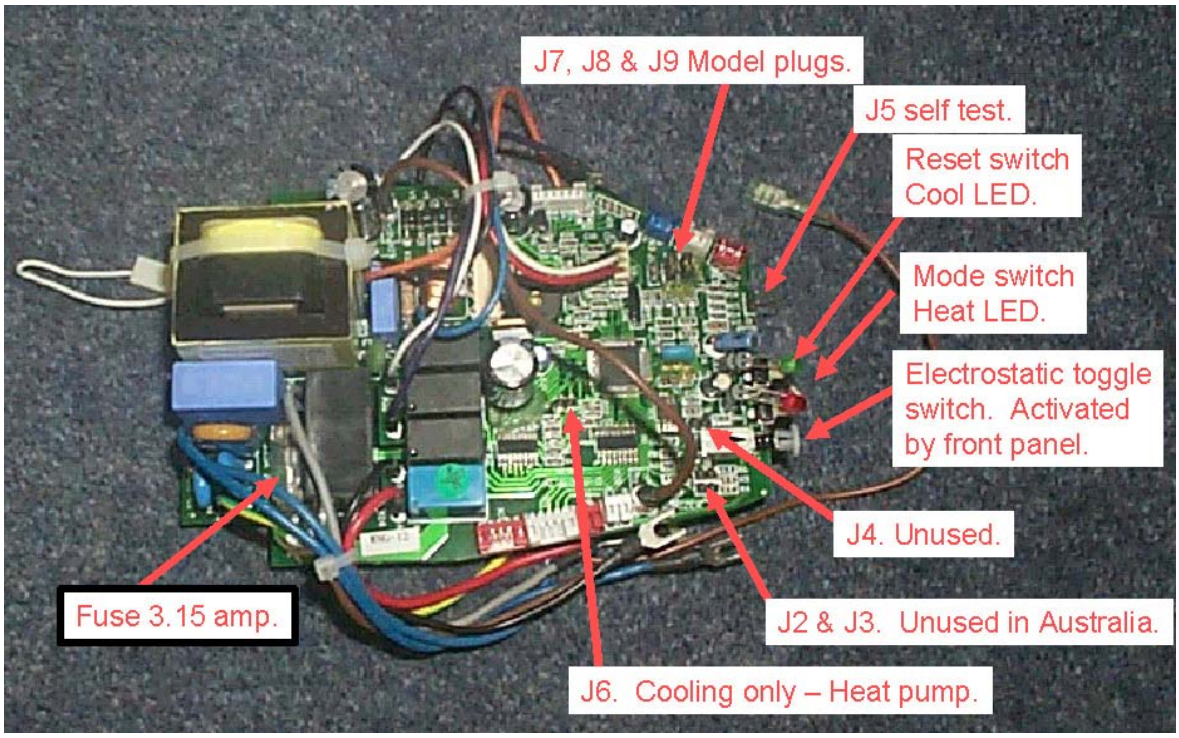
CONTROL LOGIC DESCRIPTION, Cont.

SELF TEST MODE

With power off, short jumper J5 (See page 16 and PCB Layout below). When the power is turned on the following SELF TEST MODE is in operation.
Self test mode runs at intervals of 1 second per action as follows:-
One beep > Cool LED on > Cool LED off, Heat LED on > Heat LED off, Power LED on > Power LED off, Operation LED on > Operation LED off, Timer LED on > Timer LED off, Filter LED on > Filter LED off > Louver motor (A and B) run to MAX angle > IFAN in Mid speed > Comp on > Comp off, OFAN on > OFAN off, RV on > RV off, Electrostatic Filter on > Electrostatic Filter off, Fresh Air on > Fresh Air off, Ionizer on > Ionizer off > Run sensor test (See Note below) > Step motor (A and B) run to MIN angle > Two beeps then self test finished. Turn off power and remove jumper J5.

NOTE: Sensor test.
If **OCT** sensor is not 25° ± 2°C power LED and operation LED are on, if **RT** sensor is not 25°±2°C operation LED and timer LED are on, if **ICT** sensor is not 25° ±2°C timer LED and filter LED are on.

PCB LAYOUT.



CONTROL LOGIC DESCRIPTION, Cont.

DE-ICE OPERATION.

DE-ICE INITIATION.

De-icing starts when OCT≤-6°C and meets one of the following conditions.

1). If ICT is <39°C and IFAN has been running for 20 mins and compressor has been running for 5 mins, and ICT decreases 1°C every 6 mins and this occurs 3 times in succession a defrost will be initiated.
2). If ICT is <39°C and compressor run time in total is >3 hours and compressor runs for 20mins a defrost will be initiated.
3). If ICT minus RT is <16°C for 5 mins and compressor run time in total is >45 mins and compressor runs for 20mins a defrost will be initiated.

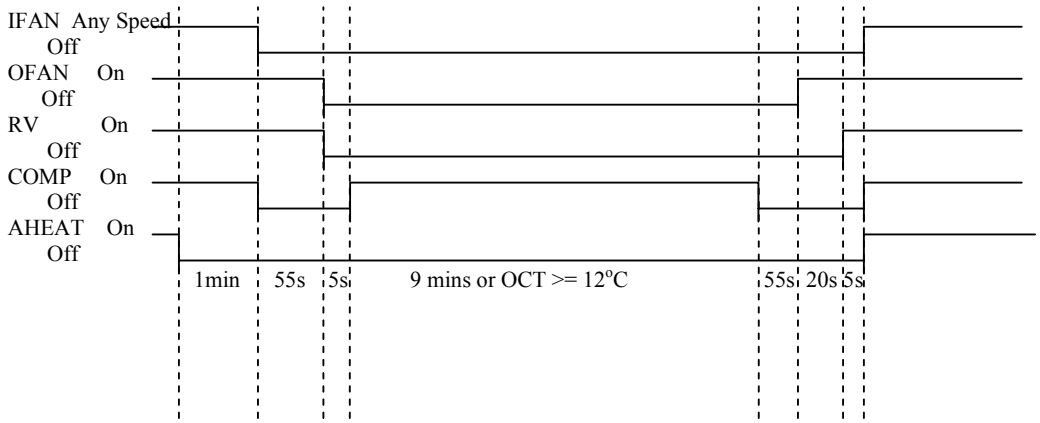
Note:
1). If OCT is in default value, (OCT Fault), ignore ICT and compressor run time in total is >3 hours, or compressor runs for 20 a defrost will be initiated.
2). If ICT is in default value, and OCT is OK, and compressor run time in total is >45 mins a defrost will be initiated.

DE-ICE TERMINATION

De-icing ends when OCT ≥12°C or de-icing time is more than 9 mins.

Note:
If OCT is in Default value, (OCT Fault), de-icing mode terminates 5 mins after initiation

De-icing process:



THERMISTOR RESISTANCE VS. TEMPERATURE

Temp - c	Rthern (Ω)	Rmin. (Ω)	Rmax. (Ω)	Temp - c	Rthern (Ω)	Rmin. (Ω)	Rmax. (Ω)
-20	102062	98850	105061	26	9573	9359	9776
-19	96064	93066	98866	27	9166	8963	9359
-18	90462	87661	93080	28	8779	8586	8963
-17	85226	82608	87674	29	8412	8228	8587
-16	80331	77883	82621	30	8061	7886	8228
-15	75751	73462	77894	31	7728	7561	7887
-14	71465	69322	73472	32	7410	7251	7561
-13	67452	65445	69332	33	7107	6956	7252
-12	63692	91812	65454	34	6819	6675	6956
-11	60168	58406	61821	35	6544	6407	6675
-10	56864	55212	58414	36	6282	6151	6407
-9	53764	52214	55219	37	6032	5907	6151
-8	50855	49400	52221	38	5793	5674	5907
-7	48123	46757	49406	39	5565	5451	5674
-6	45557	44274	46763	40	5348	5239	5452
-5	43145	41939	44279	41	5140	5036	5239
-4	40878	39744	41944	42	4942	4843	5037
-3	38745	37679	39748	43	4752	4658	4843
-2	36738	35764	37683	44	4571	4481	4658
-1	34848	33904	35738	45	4398	4312	4481
0	33069	32179	33907	46	4233	4150	4312
1	31392	30554	32183	47	4074	3995	4150
2	29812	29022	30557	48	3923	3847	3995
3	28322	27577	29025	49	3778	3705	3847
4	26916	26213	27579	50	3639	3570	3705
5	25590	24926	26216	51	3506	3440	3570
6	24337	23711	24929	52	3379	3315	3440
7	23154	22563	23713	53	5257	3196	3315
8	22037	21478	22565	54	3140	3082	3196
9	20981	20453	21480	55	3028	2972	3082
10	19982	19483	20454	56	2921	2867	2973
11	19037	18565	19484	57	2818	2767	2868
12	18144	17697	18567	58	2720	2670	2767
13	17298	16875	17698	59	2625	2578	2670
14	16497	16096	16876	60	2534	2489	2578
15	15738	15359	16097	61	2447	2404	2489
16	15019	14659	15360	62	2363	2322	2404
17	14337	13997	14661	63	2283	2243	2322
18	13691	13368	19998	64	2206	2167	2243
19	13078	12772	13369	65	2132	2095	2167
20	12497	12206	12773	66	2061	2025	2095
21	11945	11669	12207	67	1992	1958	2025
22	11420	11158	11669	68	1926	1894	1958
23	10923	10674	11159	69	1863	1832	1894
24	10450	10213	10674	70	1802	1772	1832
25	10000	9775	10214				

All Three Thermistors on the unit have the same resistance values.

DC VOLTAGE IN THERMISTORS

Temp	Volts All other	DUO De-icer Volts
-20	4.554	
-19	4.529	
-18	4.502	
-17	4.475	
-16	4.446	
-15	4.417	
-14	4.386	
-13	4.354	
-12	4.322	
-11	4.287	
-10	4.252	7.65
-9	4.216	7.59
-8	4.178	7.52
-7	4.140	7.45
-6	4.100	7.38
-5	4.059	7.31
-4	4.017	7.23
-3	3.974	7.15
-2	3.930	7.07
-1	3.885	6.99
0	3.839	6.91
1	3.792	6.83
2	3.744	6.74
3	3.695	6.65
4	3.646	6.56
5	3.595	6.47
6	3.544	6.38
7	3.492	6.29
8	3.443	6.19
9	3.388	6.09
10	3.333	6.00
11	3.278	5.9
12	3.223	5.8
13	3.168	5.7
14	3.113	5.6
15	3.257	5.5
16	3.002	5.4
17	2.946	5.3
18	2.890	5.4
19	2.833	5.1
20	2.777	5
21	2.722	4.9
22	2.666	4.8
23	2.610	4.7

Temp	Volts All other	DUO De-icer Volts
24	2.555	4.6
25	2.500	4.5
26	2.445	
27	2.391	
28	2.338	
29	2.284	
30	2.232	4.02
31	2.180	
32	2.128	
33	2.077	
34	2.027	
35	1.978	3.56
36	1.929	
37	1.881	
38	1.834	
39	1.798	
40	1.742	3.14
41	1.698	
42	1.654	
43	1.611	
44	1.569	
45	1.527	2.75
46	1.487	
47	1.447	
48	1.409	
49	1.371	
50	1.334	2.4
51	1.298	
52	1.263	
53	1.228	
54	1.195	
55	1.162	2.09
56	1.130	
57	1.009	
58	1.069	
59	1.040	
60	1.011	
61	0.983	
62	0.956	
63	0.929	
64	0.904	
65	0.879	
66	0.854	
67	0.831	

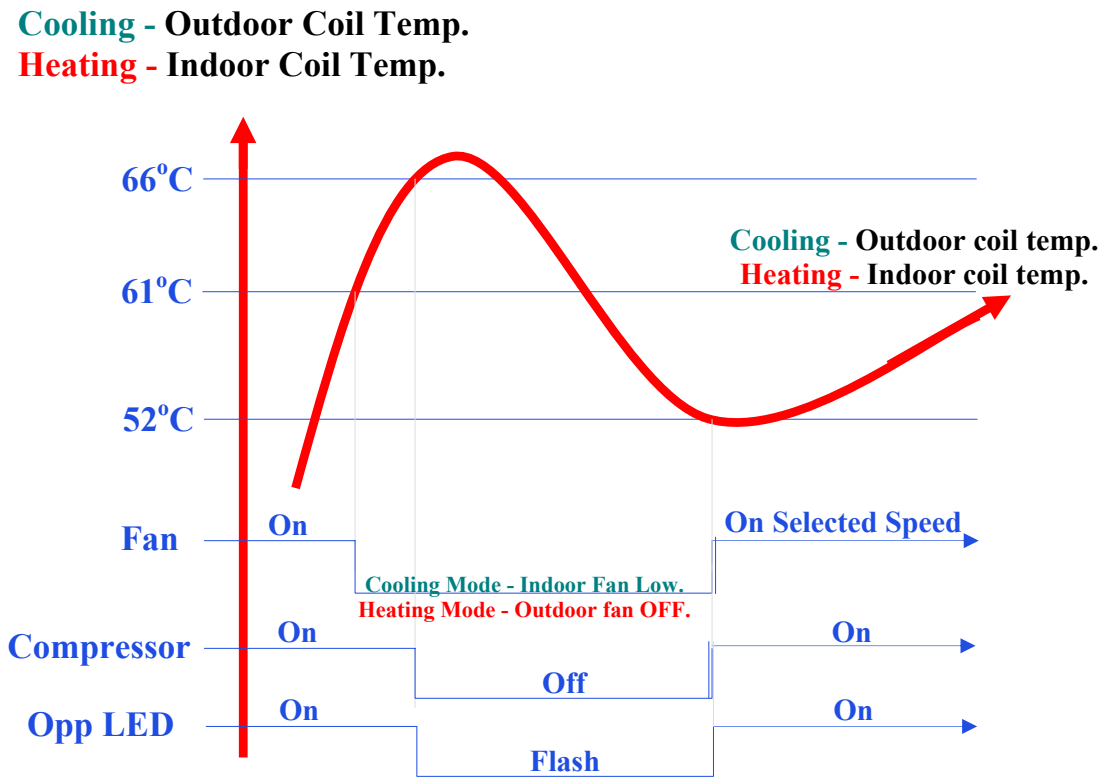
All Three Thermistors on the unit have the same resistance values and therefore the same voltage readings, except for the “Duo de-icer volts,” the voltage reading on the outdoor coil on the duo units fitted with a double de-icer or typhoon PCB.

Process of Operation

High outdoor coil temperature protection mode and indoor fan operation in Cooling mode.

AND

High indoor coil temperature protection mode and outdoor fan operation in Heating mode.



Cooling Protection Mode.

High outdoor coil temperature protection mode and indoor fan operation in Cooling mode.
Indoor fan goes to low speed at 61°C to reduce the unit's capacity therefore reducing the outdoor coil temperature.
Compressor cuts out at 66°C. (outdoor coil high temperature protection).
This condition can be experienced if the unit is overcharged or under normal cooling operation on a very high ambient day > 40°C.

Heating Protection Mode

High indoor coil temperature protection mode and outdoor fan operation in Heating mode.
Outdoor fan cuts off at 61°C to reduce the unit's capacity therefore reducing the indoor coil temperature.
Compressor cuts out at 66°C. (indoor coil high temperature protection).
This condition can be experienced if the unit is overcharged or under normal heating operation on a high ambient day > 16°C.

Notes

ECP (Australia) Pty Ltd

HEAD OFFICE

745 Springvale Road Tel (03) 9271 3505 Fax (03) 9271 3515
Mulgrave, 3170, Victoria. Tech Support Freecall 1800 1800 04.
Email info@ecp-au.com Website www.airwell.com.au

VICTORIA

745 Springvale Road Tel (03) 9271 3513 Fax (03) 9271 3540
Mulgrave, 3170, Victoria.

NEW SOUTH WALES

Sydney

Cnr Marion St & Airport Ave Tel (02) 9793 3644 Fax (02) 9793 3688
Bankstown Airport, 2200, NSW.

Newcastle

Suite 3, 19 Darby St, Tel (02) 4940 4652 Fax (02) 4940 4653
Newcastle, 2300, NSW.

QUEENSLAND

Unit 9, 123 Muriel Ave Tel (07) 3392 8113 Fax (07) 3392 8115
Moorooka, 4105, QLD.

WESTERN AUSTRALIA

Suite 23, Cambridge Forum Tel (08) 9284 0800 Fax (08) 9284 0600
350 Cambridge St, Wembley WA 6014.

SOUTH AUSTRALIA

Offices on the Park Tel (08) 8372 7866 Fax (08) 8372 7816
Suite 27, 8 Greenhill Rd, Wayville SA 5034.

NEW ZEALAND

517a Rosebank Rd Tel (09) 920 0333 Fax (09) 820 0332
Avondale, Auckland NZ

ABN 37 082 755 655 June 2003.