ESP Digital Split Ducted Unit

Installation and Commissioning Guide - Outdoor



Model Numbers

SRD131C

SRD151C

SRD173C

SRD191C

SRD203C SRD233C

IMPORTANT NOTE:

Please read this manual carefully before installing or operating your air conditioning unit.



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01. Inspections

01.01. Product Inspections

Check your air conditioning unit and all items against the invoice upon receiving your shipment. Inspect the unit, components and accessories for any sign of damage. If there is any damage to the unit, contact ActronAir Customer Care Department immediately on: **1300 522 722** to obtain a Goods Return Number.

Check the unit nameplate to verify the model, serial number, electrical rated specifications are correct.

01.02. Codes, Regulations and Standards

The installer and/or contractor assumes responsibility to ensure that the unit installation complies with the relevant council, state / federal codes, regulations and building code standards. All electrical wiring must be in accordance with current electrical authority regulations and all wiring connections to be as per electrical diagram provided with the unit.

02. General Information

The ActronAir air conditioning units are designed for applications where superior performance, high efficiency, reliability, supply air quality and quiet operation are the prime priorities. The units are built with the latest technology, which incorporated the advanced scroll compressor, EC indoor fans, low-noise outdoor fans and an intelligent electronic control.

For optimum efficiency, your air conditioning unit will deliver the right amount of cooling or heating capacity that you demand. At extreme ambient conditions, the unit can still supply the air conditioning requirement at peak performance.

Energy Efficient Refrigeration Circuits

The ActronAir Ducted system is designed with a variable capacity refrigeration circuit that delivers only the amount of cooling or heating actually required to maintain your desired comfort at the most optimum efficiency.

The refrigeration circuit consists of:

- High efficiency variable digital scroll compressor
- Blue Epoxy coated condenser coil designed for optimum performance and efficiency with corrugated fins and riffled tubing
- Blue Epoxy coated evaporator coil designed for optimum performance and efficiency with lanced fins and riffled tubing
- Electronic expansion valve (EEV), to maintain efficiency at different operating conditions.

Evaporator Section

The ESP series has EC fans which deliver just the right amount of airflow, depending on requirements. The fans provide superior performance for your comfort at optimum efficiency:

- Highly efficient EC motor that uses less energy than the traditional AC motor.
- · Low noise operation.
- Easy indoor fan commissioning via intelligent controllers (applicable to ESP series only).

Condenser Section

Uses two (2) efficient axial fans and a state of the art scroll compressor, with the following features:

- Digital scroll compressor
- · Highly efficient axial fans with direct drive AC motor
- Low noise operation

Electrical Section

The electrical section is composed of a separate panel for controls, protecting the components from the elements.

Split Ducted ESP Digital

Durable Design and Construction

ActronAir is an Australian manufacturer with proven high quality air conditioning products. Known for their durability and reliable performance, these products are designed and built to withstand the extreme weather conditions.

The heavy gauge zinc and galvanised steel cabinet, with powder coated epoxy enamel finish, resists the toughest conditions. The louvered outdoor coil guard protects the condenser coil from any potential damage brought by hail, stones and other solid objects that may be projected to the unit.

Blue Epoxy coated condenser coil fins provide protection to your heat exchangers and enhanced heat transfer with increased performance efficiency.

System Flexibility

The ActronAir air conditioning units are the first choice for residential, office, schools and other air conditioning facilities applications, both for new construction or retrofitting projects.

Sustainability and Environmentally Friendly

The air conditioning system is supplied with zero ozone depleting R-410A refrigerant, which has no phase out or replacement concern.

With cooling and heating performance capacity that are among the best in the market, the ActronAir units are the solution for the reduction of energy consumption, CO₃ emission, high fuel dependency and high network grid demand.

Refrigerant Handling and Accountability

ActronAir strongly urges that all service technicians make every effort possible to reduce the emission of refrigerants to the atmosphere. Everyone must act in a responsible manner to conserve refrigerants in accordance to the industry code of practice.

03. Safety Instructions

- Only licensed HVAC technicians* should install and service this air conditioning equipment. Improper service or alteration by an unqualified technician could result in significant and major damage to the product or property which may render your warranty null and void. Such unqualified service could also lead to severe physical injury or death. Follow all safety instructions in this literature and all warning labels that are attached to the equipment.
- Prevailing WH&S regulations must be observed and will take precedence to the safety instructions contained on this manual. Safe work practices and environment must be the paramount importance in the performance of all the service procedures.
- Ensure that unit installation complies with relevant council regulations and building code standards.
- All electrical wiring must be in accordance with current electrical authority regulations and all wiring connections to be as per electrical diagram provided.
- · Secure the fans against accidental contact. Beware of pinch point and sharp edges which can cause cutting injury.
- Always wear appropriate PPE, remove any dangling jewellery and protect long hair by wearing a cap.
- · Make sure that safety guards and panel covers are always firmly secured and not damaged.
- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely. Young children should be supervised to ensure that they do not play with the appliance.
- Installer must incorporate a means of electrical disconnection (isolator) in the sub mains fixed wiring in accordance with AS/NZS 3000:2018 (also known as Australian Wiring Rules).
- Secure the power cords and control cables that goes in/out the unit. Use the cable ties provided in the control box.

 *Qualifications required will be appropriate Electrical, Refrigeration and Refrigerant Handling License and Training dependent on local State/Territory regulations.

Split Ducted ESP Digital

M DANGER

Hazardous Voltage - Risk of Electrocution.

TURN-OFF the power from main isolator before proceeding with any service work of the unit. Observe proper LOCK-OUT/TAG-OUT (LOTO) procedures for electrical appliances in order to prevent accidental switching-on of the power supply.

A WARNING

EC Motors are fitted with high power capacitors and can have dangerous residual voltages at motor terminals after power has been isolated. Wait at least 5 minutes after power isolation and test for any residual voltage before beginning service work.

A CAUTION

Beware of Rotating Fans!

Ensure that indoor and outdoor fans are isolated and have come to a complete stand still before servicing the equipment. Beware of pinch point and sharp edges which can cause cutting injury. Secure the fans against accidental contact. Always wear appropriate PPE and remove any dangling jewellery and protect long hair by wearing a cap. Ensure that no loose clothing can be caught / entangled in moving parts.

VISUAL INSPECTION and WORK ASSESSMENT

Work areas and conditions must first be assessed and evaluated for any potential hazardous conditions. It is also important to be familiar with the unit parts and components before proceeding with any service task.

04. Installation Information

All service technicians handling refrigerant must be licensed to handle refrigerant gases.

Recover and Recycle Refrigerants

Never release refrigerant to the atmosphere! It is an offence in Australia to do so. Always recover, recycle and reuse refrigerants. When removing from the system, properly contain and identify refrigerants in its dedicated container for proper disposal and/or storage. Always consider the recycle or reclaim requirements of the refrigerant before beginning the recovery procedures. Obtain a chemical analysis of the refrigerant if necessary. Refer recovered refrigerant and acceptable refrigerant quality to existing standards and regulations.

Refrigerant Handling and Safety

Consult the refrigerant manufacturer's safety data sheet (SDS) for information on proper handling and to fully understand health, safety, storage and disposal requirements. Use the approved containment vessels and refer to appropriate safety standards. Comply with all applicable transportation standards when shipping refrigerant containers.

Service Equipment and Recovery Procedures

Always use refrigerant reclaiming equipment in order to minimise refrigerant emissions. Use equipment and methods which will pull the lowest possible system vacuum while recovering and condensing refrigerant. Equipment capable of pulling a vacuum of less than 500 microns is required.

Do not open the system to the atmosphere for service work until refrigerant is fully removed and/or recovered. Perform refrigeration system evacuation, prior to charging, in accordance with AIRAH / IRHACE Refrigerant handling code of practice.

Let the unit stand for 1 hour and with the vacuum not rising above 500 microns. A rise above 500 microns indicates a leak from the system and a leak test is required to locate and repair any leak.

ACAUTION

A leak test is always required on any repaired section of the refrigeration system.

Split Ducted ESP Digital

Charge refrigerant into the system only after the equipment does not leak or contain moisture. Ensure that R-410A is only charged in liquid form. Take into consideration the correct amount of refrigerant charge specified for the system to ensure efficient unit operations. When charging is complete, reclaim refrigerant from charging lines into an approved refrigerant container. Seal all used refrigerant containers with approved closure devices to prevent unused refrigerant from escaping to the atmosphere. Take extra care to maintain all service equipment directly supporting refrigerant service work such as gauges, hoses, vacuum pumps and recycling equipment.

Use only cleaning solvents that do not have ozone depletion factors. Properly dispose of used cleaning materials.

INSTALLATION PREPARATION (Pre-Installation considerations)

The following items must be considered before beginning the unit installation:

- · Verify the unit capacities and ratings with the unit nameplate
- Make certain the floor or foundation is level, solid and have sufficient structural strength to support the unit and accessories weight.
- Install anti-vibration rubber (installer to supply) under **all of the unit's feet** to help reduce noise and minimise vibration transfer through the foundation. Ensure that all anti-vibration rubbers are rated to provide stable support without impairing the unit's structural integrity.
- Diameter or width of anti-vibration rubber's must be at least equal to the width of the actual feet to prevent deformation overtime.
- Preferably use anti-vibration rubber pads on residential units (up to 26kW split ducted).
- Allow minimum recommended clearances for periodic maintenance and service access.
- Allow sufficient space above the unit for the outdoor air discharge. Condenser air inlet, located on the coil side of the unit, requires sufficient airflow clearance for the optimum unit performance.
- Note the conditioned supply air and return air location. Ensure sufficient spaces are allocated for these purposes.
- · Refer connection and location of condensate drain in the unit drawing and dimensions section of this manual.
- Wiring connections must be in accordance with the wiring diagram provided with the unit.
- Make sure all wirings are in accordance with local electricity authority regulations and standards.
- Do not install the unit close to an area where there is a danger of fire due to volatile, explosive, flammable and/or hazardous materials.
- Ensure that spaces around the unit are free from any obstructions for optimum unit performance.
- Installer to ensure correct size/type that main circuit breaker and cable is installed in unit sub-mains to protect the sub-mains and unit wiring.
- Installer to ensure correctly rated residual current device (RCD) is installed as per AS/NZS 3000:2018 (also known as Australian Wiring Rules).
- Secure the power cords and control cables that goes in/out the unit. Use the cable ties provided in the control box.

- This outdoor unit is designed to match only with ActronAir indoor unit as specified in the Technical Selection Catalogue.
- This unit is designed for use with R-410A refrigerant only.
- The unit is supplied with factory charged R-410A refrigerant. Be aware of all the relevant regulations concerning the handling of refrigerant.

05. Operation Manual Access

05.01. Download from website

Operation manuals can be downloaded through our website shown below. https://www.actronair.com.au/brochures-manuals/#operating-manuals

05.02. Near Filed Communication (NFC) Tag

LC7-2 is NFC capable that allows the users to view and download the operation manual. There are a wide variety of NFC reader Apps, below is an example of one App that can be used.

05.02.01. iOS Users

NOTE

Images may vary from those shown below.

1. Go to App Store and download 2. Open NFC App. Read through 3. Place the mobile device close NFC Reader for iPhone. NFC App Information and Click to **NFC** Tag on the controller. on Let's get started. Follow the instructions on App. **NFC Reader** for iPhone Scan NFC NDEF Tags can I get more help? 4. Once the tag has successfully scanned the image 5. A pop-up window will appear to redirect you to below will appear. https://www.actronair.com.au/nfc

6. List of Controller Models will appear on the screen of your mobile device. Select the model number of your controller to view the operation manual.

NOTE

The Model number of your controller can be found underneath the Power On/Off button of the controller.

05.02.07. Android Users

NOTE

Images may vary from those shown below.

2. Tap Android Beam

3. Follow the on-screen instructions.

3. Follow the on-screen instructions.

3. Follow the on-screen instructions.

- 4. Once successfully scanned, a pop-up window will appear to redirect you to external website. https://www.actronair.com.au/nfc
- 5. List of Controller Models will appear on the screen of your mobile device.

 Select the model number of your controller to view the operation manual.

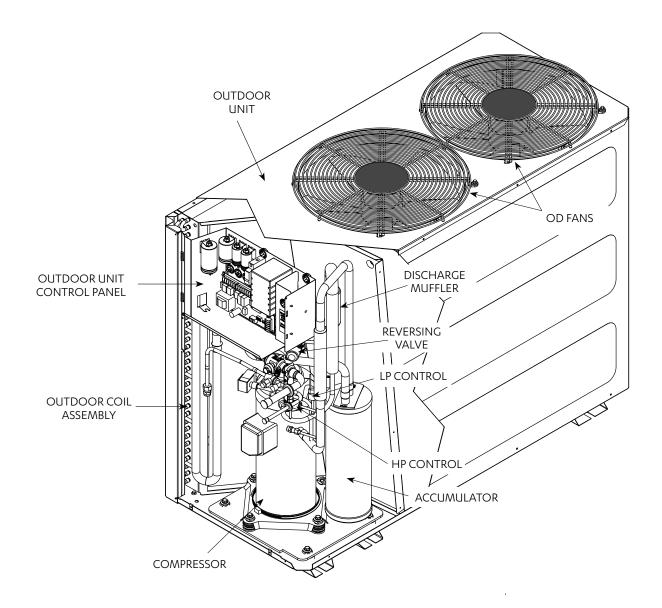
NOTE

The Model number of your controller can be found underneath the Power On/Off button of the controller.

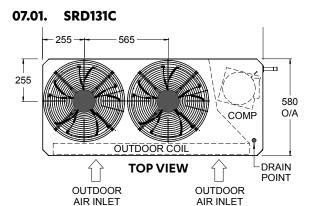
06. Components Overview

OUTDOOR UNIT COMPONENTS OVERVIEW

(SRD131C-151C shown for illustration purposes only)

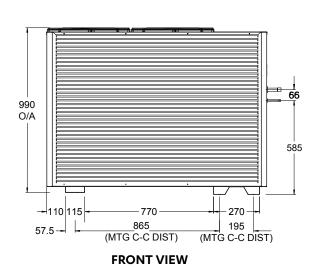


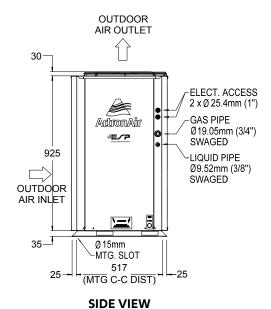
07. Outdoor Unit Dimensions / Clearances



OVERALL NOMINAL DIMENSION (H X W X L) = 990 X 1320 X 580

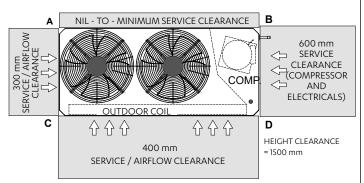
PLEASE NOTE THAT UNDER ALL CIRCUMSTANCES,
CONDENSER AIR MUST NOT RECIRCULATE BACK ONTO
CONDENSER COIL. KEEP ALL CLEARANCES FREE OF
ANY OBSTRUCTIONS





UNIT MODEL	UNIT WEIGHT	C	ORNER W	EIGHTS (k	g)
NUMBER	(kg)	Α	В	С	D
SRD131C	146	15.0	54.1	15.0	61.9

MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES

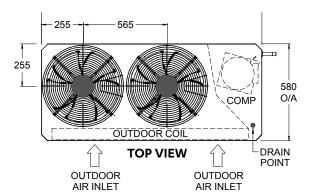




- Do not scale drawing. All dimensions are in mm unless specified. Refer to corresponding unit dimensional drawing for mounting hole details.
- Service Access Areas and Spaces for Airflow Clearances given above are suggested minimum based on the condition that the spaces around the units are free from any obstructions and a walkway passage of 1000mm between the units or between the unit and the outside perimeter is available.
- Minimum service access areas and spaces for airflow clearances are responsibilities of the installer, ActronAir will not be held liable for any extra charges incurred due to lack of access and space for airflow.
- Under all circumstances, condenser air must not recirculate back onto condenser coil. Keep all clearance free of any obstructions.
- 5. Maximum External Static of Outdoor Fans is 5 Pa.
- STACKING OF UNITS: Ensure that minimum airflow and clearances are met.
- 7. Refer to Pipe Connection Details on Specifications Sheet.
- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- 9. Use M12 bolt for feet mounting.

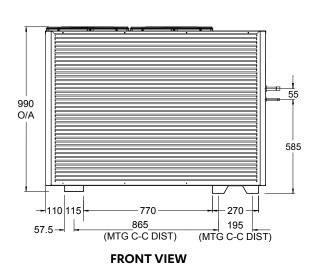
Split Ducted ESP Digital

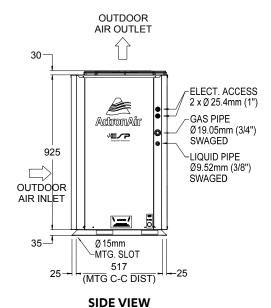
07.02. SRD151C



OVERALL NOMINAL DIMENSION (H X W X L) = 990 X 1320 X 580

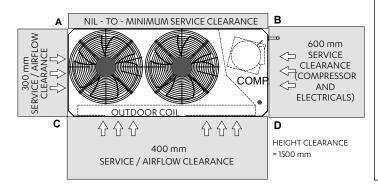
PLEASE NOTE THAT UNDER ALL CIRCUMSTANCES,
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ANY OBSTRUCTIONS





UNIT MODEL	UNIT WEIGHT	C	ORNER W	EIGHTS (k	g)
NUMBER	(kg)	Α	В	С	D
SRD151C	155	15.9	57.5	15.9	65.7

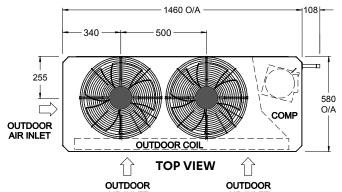
MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES





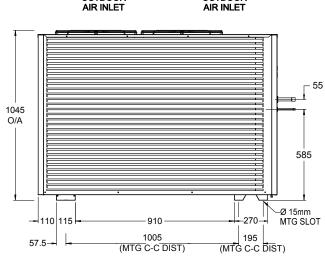
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- Minimum service access areas and spaces for airflow clearances are responsibilities of the installer, ActronAir will not be held liable for any extra charges incurred due to lack of access and space for airflow.
- Under all circumstances, condenser air must not recirculate back onto condenser coil. Keep all clearance free of any obstructions.
- 5. Maximum External Static of Outdoor Fans is 5 Pa.
- 6. STACKING OF UNITS: Ensure that minimum airflow and clearances are met.
- 7. Refer to Pipe Connection Details on Specifications Sheet.
- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- 9. Use M12 bolt for feet mounting.

07.03. SRD173C

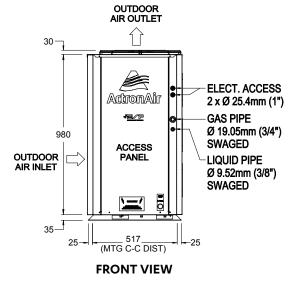


OVERALL NOMINAL DIMENSION (H X W X L) = 1045 X 1460 X 580

PLEASE NOTE THAT UNDER ALL CIRCUMSTANCES,
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CONDENSER COIL. KEEP ALL CLEARANCES FREE OF
ANY OBSTRUCTIONS

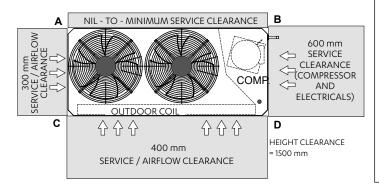


SIDE VIEW



UNIT MODEL	UNIT	C	ORNER W	EIGHTS (k	g)
NUMBER	(kg)	Α	В	С	D
SRD173C	186	44.4	51.5	8.1	82.0

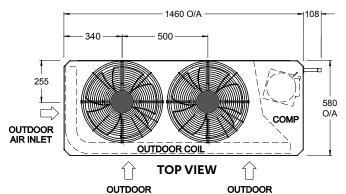
MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES





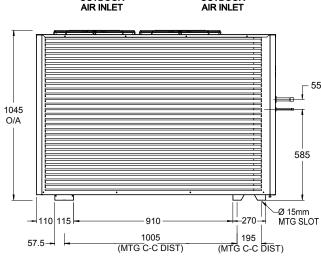
- 1. Do not scale drawing. All dimensions are in mm unless specified. Refer to corresponding unit dimensional drawing for mounting hole details.
- Service Access Areas and Spaces for Airflow Clearances given above are suggested minimum based on the condition that the spaces around the units are free from any obstructions and a walkway passage of 1000mm between the units or between the unit and the outside perimeter is available.
- Minimum service access areas and spaces for airflow clearances are responsibilities of the installer, ActronAir will not be held liable for any extra charges incurred due to lack of access and space for airflow.
- 4. Under all circumstances, condenser air must not recirculate back onto condenser coil. Keep all clearance free of any obstructions.
- 5. Maximum External Static of Outdoor Fans is 5 Pa.
- 6. STACKING OF UNITS: Ensure that minimum airflow and clearances are
- 7. Refer to Pipe Connection Details on Specifications Sheet.
- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- 9. Use M12 bolt for feet mounting.

07.04. SRD191C

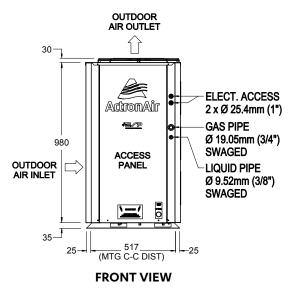


OVERALL NOMINAL DIMENSION (H X W X L) = 1045 X 1460 X 580

PLEASE NOTE THAT UNDER ALL CIRCUMSTANCES,
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CONDENSER COIL. KEEP ALL CLEARANCES FREE OF
ANY OBSTRUCTIONS

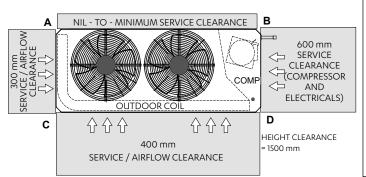


SIDE VIEW



UNIT MODEL	UNIT WEIGHT	C	ORNER W	EIGHTS (k	g)
NUMBER	(kg)	Α	В	С	D
SRD191C	200	47.8	55.4	8.6	88.2

MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES

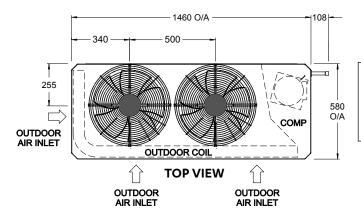




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- Minimum service access areas and spaces for airflow clearances are responsibilities of the installer, ActronAir will not be held liable for any extra charges incurred due to lack of access and space for airflow.
- 4. Under all circumstances, condenser air must not recirculate back onto condenser coil. Keep all clearance free of any obstructions.
- 5. Maximum External Static of Outdoor Fans is 5 Pa.
- STACKING OF UNITS: Ensure that minimum airflow and clearances are met
- 7. Refer to Pipe Connection Details on Specifications Sheet.
- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- Use M12 bolt for feet mounting.

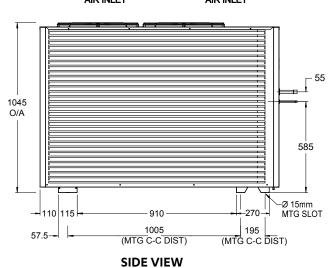
Split Ducted ESP Digital

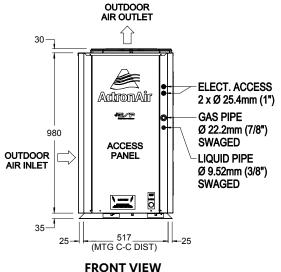
07.05. SRD203C



OVERALL NOMINAL DIMENSION (H X W X L) = 1045 X 1460 X 580

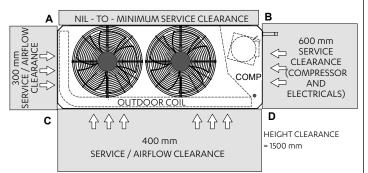
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CONDENSER COIL. KEEP ALL CLEARANCES FREE OF
ANY OBSTRUCTIONS





UNIT MODEL	UNIT WEIGHT	С	ORNER W	EIGHTS (k	g)
NUMBER	(kg)	Α	В	С	D
SRD203C	196	46.8	54.2	8.6	86.4

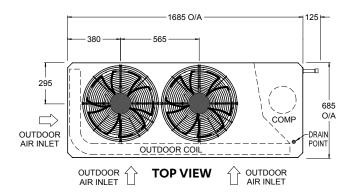
MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES





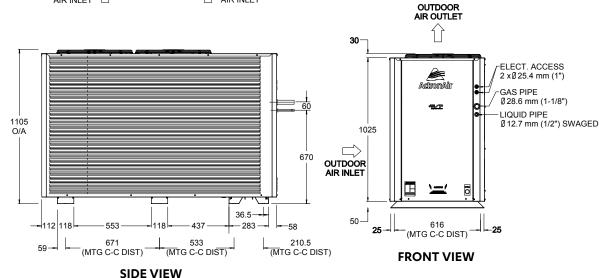
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- Under all circumstances, condenser air must not recirculate back onto condenser coil. Keep all clearance free of any obstructions.
- 5. Maximum External Static of Outdoor Fans is 5 Pa.
- 6. STACKING OF UNITS: Ensure that minimum airflow and clearances are
- 7. Refer to Pipe Connection Details on Specifications Sheet.
- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- 9. Use M12 bolt for feet mounting.

07.06. SRD233C



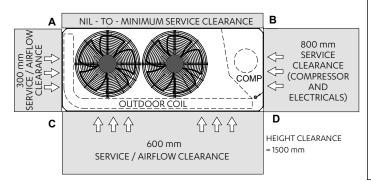
OVERALL NOMINAL DIMENSION (H X W X L) = 1105 X 1685 X 685

PLEASE NOTE THAT UNDER ALL CIRCUMSTANCES,
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CONDENSER COIL. KEEP ALL CLEARANCES FREE OF
ANY OBSTRUCTIONS



UNIT MODEL	UNIT WEIGHT		С	ORNER W	EIGHTS (k	g)	
NUMBER	(kg)	Α	В	С	D	LM	RM
SRD233C	225	19.6	72.3	29.5	82.9	7.9	12.8

MINIMUM SERVICE ACCESS AREAS AND AIRFLOW CLEARANCES





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- 8. MTG C-C DIST = Mounting Centre to Centre Distance.
- Use M12 bolt for feet mounting.

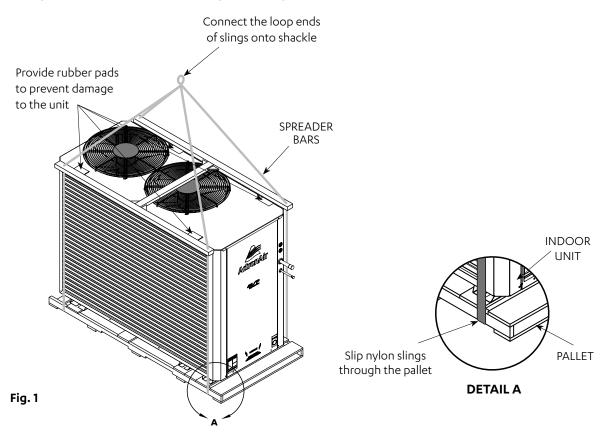
08. Unit Lifting Procedure

MARNING

WH&S regulations must be observed and will take precedence during lifting process.

08.01. Crane Lifting Method

Crane lifting method is recommended for high rise lifting.



Equipment Required For Crane Lifting:

- 1 x shackle
- 2 x nylon slings
- Spreader bars

NOTE

Refer to Unit Dimension and Weight section for unit weight before selecting shackles and slings.

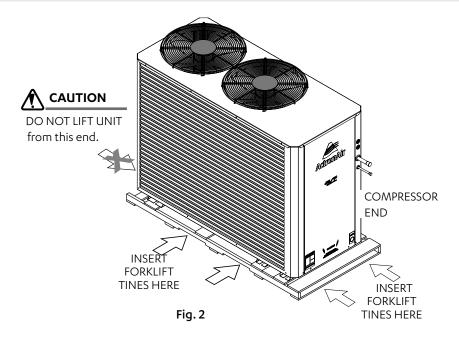
Procedure:

- 1. Slip nylon slings through the pallet as shown in Fig. 1.
- 2. Use a Bow or Dee shackle to connect the slings.
- 3. Ensure slings are protected by rubber pads or similar if slings are draped across unit edges, corners, or air grilles. This will prevent the unit from being damaged during lifting.
- 4. SPREADER BARS must be used when lifting the unit. Ensure that the spreader bar is slightly larger than the base.
- 5. Test lift the unit to determine exact unit balance and stability before hoisting it to the installation location.

08.02. Fork Lift Method

M DANGER

Make sure rigging equipment, accessories and plant are sufficiently and safely capable to lift the unit in order to prevent potential damage to property, severe personal injury or death. Please check unit weight and weight distribution points on unit drawing dimensions section.



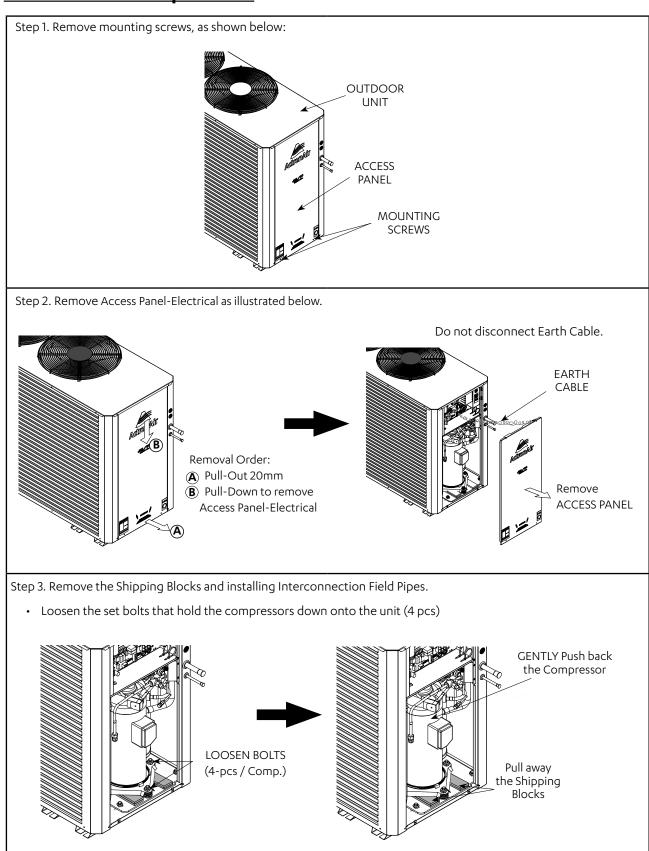
Procedure:

- 1. To move the unit around with a forklift, insert the fork tines through the pallet, as shown in Fig. 2.
- 2. Only fork the unit through compressor end or side of the unit. (See illustration for location of compressor end).

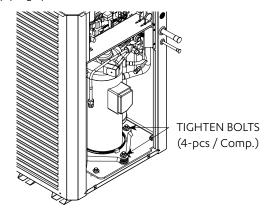
A CAUTION

Length of fork lift tines must pass the unit middle section, in order to safely carry the unit.

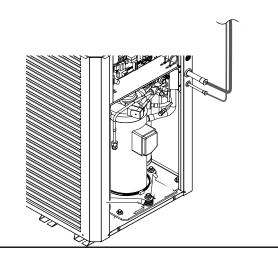
09. Outdoor Unit Preparation



- Firmly tighten the set bolts back the compressors onto the unit. Recommended torque is 13±1 Nm. Its is critically important for the grommet not to be compressed.
- Check to make sure that there are no damage to the piping systems.



 Braze refrigeration piping. Refer to piping sections for details of field pipe sizes and piping installation procedure.



10. Field Pipe Connection

A CAUTION

The units described in this guide uses R-410A refrigerant

This operates at a pressure approximately 1.6 times higher than a similar systems using R-22. When installing equipment using R-410A refrigerant, there are number of standards that must be met:

- The system of this unit operates with Polyolester (POE) oil that rapidly absorbs moisture.
- The maximum time any system can be opened to atmosphere is 15 minutes.
- It is important to work with absolute cleanliness.
- Brazing must be done with the use of Nitrogen to avoid carbon deposits into the pipes.
- The system must be evacuated thoroughly to 500 microns (see evacuation procedure).
- The system must always be charged with R-410A refrigerant in liquid state.
- · Never allow R-410A refrigerant to vent into the atmosphere. It is an offence to release refrigerant in Australia.
- · Always reclaim refrigerant using equipment and container dedicated for R-410A system use only.
- Only qualified persons are allowed to perform any work described in this guide.
- All work must be carried out in accordance with Australia and New Zealand refrigerant handling code of practice.

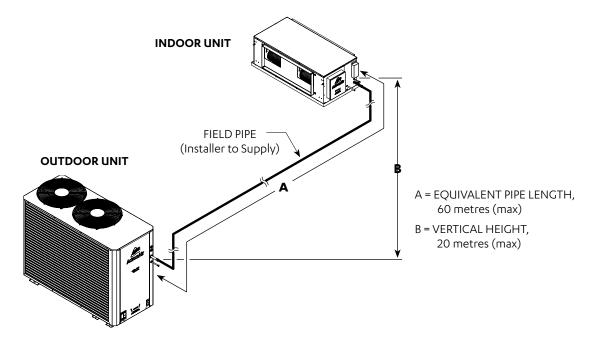
Maximum allowable total equivalent field pipe length is 60 metres, see diagram below. This includes all the equivalent pipe fitting loses and vertical height difference. Vertical height difference must not exceed 20 metres. Table 1 below shows the equivalent straight pipe length of elbow fittings.

EQUIVALENT STRAIGHT PIPE LENGTH OF ELBOW FITTINGS (METRES)							
Pipe size Nominal Diameter	90° Long Radius Elbow	90° Short Radius Elbow	45° Long Radius Elbow	45° Short Radius Elbow			
9.52 (3/8")	0.24	0.36	0.09	0.14			
15.88 (5/8")	0.30	0.45	0.15	0.23			
19.05 (3/4")	0.40	0.60	0.18	0.27			
22.22 (7/8")	0.46	0.69	0.21	0.32			
25.40 (1")	0.52	0.78	0.24	0.36			
28.58 (1-1/8")	0.55	0.83	0.27	0.41			

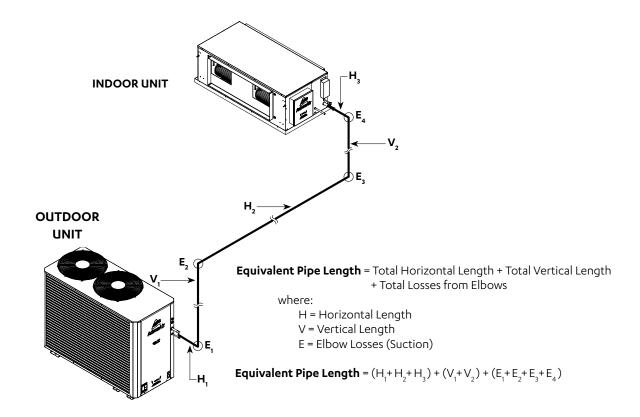
Split Ducted ESP Digital

Selected field pipe sizes must match the recommended sizes in table above. If the installation requires different field pipe diameter due to different application condition other than recommended, contact ActronAir for advice. Most of unit pipe connections are factory swagged to easily fit to the recommended field pipe diameter. When it is required to install other refrigeration devices, such as refrigerant drier, solenoid valve and the like, include the equivalent straight pipe length of the device in the calculation of total equivalent field pipe length.

Both pipes are required to be insulated.



Example of Total Equivalent Field Pipe Length Calculations



Split Ducted ESP Digital



⚠ CAUTION

Above illustration shown as calculation examples only. It is the responsibility of the Installer to design an efficient refrigeration piping lay out for optimum unit performance.

TABLE 2: REFRIGERATI	ON PIPING	ESP Digital	Single Phase		ESP Digital	Three Phase	
Outdoor Model		SRD131C	SRD151C	SRD191C	SRD173C	SRD203C	SRD233C
Indoor Model		SRV131E	SRV151E SRM151E	SRV191E SRM191E	SRV171E SRM171E	SRV201E SRM201E	SRV231E SRM231E
Max. Equivalent Pipe Length Range	metres	0 - 60	0 - 60	0 - 60	0 - 60	0 - 60	0 - 60
Max. Vertical Height Differential *	metres	20	20	20	20	20	20
Field Pipe Size							
Liquid Line	mm (inch)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	3/8 (9.52)	1/2 (12.7) **	1/2 (12.7)
Gas Line	mm (inch)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	7/8 (22.22)	1 (25.4)
Outdoor Pipe Size							
Liquid Line	mm (inch)	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) cut swaged **	1/2 (12.7) swaged
Gas Line	mm (inch)	3/4 (19.05) swaged	3/4 (19.05) swaged	3/4 (19.05) swaged	3/4 (19.05) swaged	7/8 (22.22) swaged	7/8 (22.22) swaged to 1 (25.4)
Indoor Pipe Size							
Liquid Line	mm (inch)	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) swaged	3/8 (9.52) cut swaged ***	1/2 (12.7) swaged
Gas Line	mm (inch)	3/4 (19.05) swaged	3/4 (19.05) swaged	7/8 (22.22) cut swaged **	3/4 (19.05) swaged	7/8 (22.22) swaged	1 (25.4) swaged

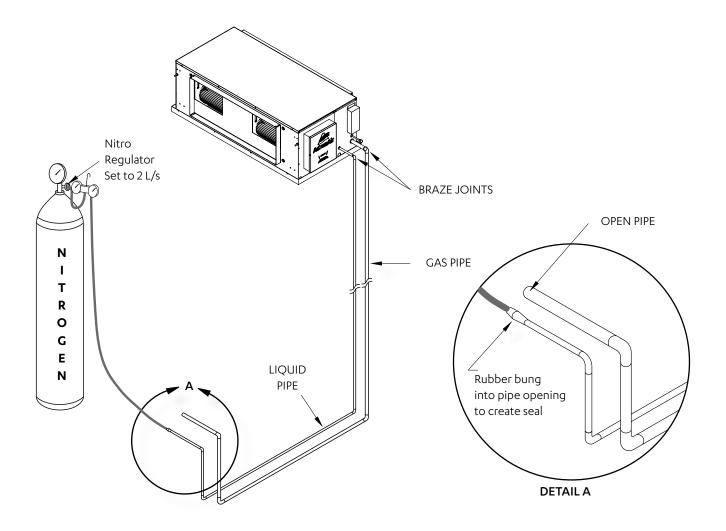
^{*} Included in maximum field pipe.

A CAUTION

Brazing joints should only be performed whilst purging Nitrogen through the system. Failure to do so will cause carbon deposits to be left on the internal pipe surface, that in turn can cause system failure and void of warranty.

^{**} For pipe run s 0-20m 3/8" can be used.

^{***} Cut Swaged End in the field to fit field pipe.



Installing interconnecting pipe work to indoor, nitrogen bleed procedure (First fit or rough in stage only)

- 1. Run interconnecting pipe work from condenser location to evaporator.
- 2. Release pressure in evaporator and remove caps.
- 3. Fit copper tube into tail, set nitro bottle and regulator up at condenser end of pipe work.
- 4. Fit nitrogen line into liquid line with rubber bung to seal the connection. The seal will prevent air being sucked into pipe work.
- 5. Leave suction line open, set nitro regulator for nitrogen to flow through pipe work at 2 l/s flow rate @20kPa.
- 6. Braze required joints as quick as possible. See Diagram Above.

Installing interconnecting pipe work to outdoor, nitrogen bleed procedure (First fit or rough in stage only)

- 1. Starting with circuit 1 system, remove piping caps from the condenser and fit pipe work into tails.
- 2. Fit nitro hose onto suction ball valve and fit open hose onto liquid line post valve.
- 3. Set nitrogen regulator to 2 l/s flow rate through pipe work and evaporator.
- 4. Braze remaining joints as quick as possible.
- 5. Allow the brazed joints to cool and conduct leak test in the connections.

Pressurize the system to 2500kPa in stages.

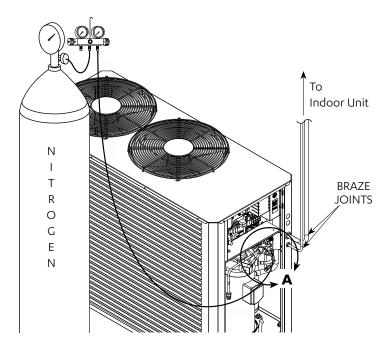
A recommended pressure test is to be performed for no less than 1 hour at 2500kPa.

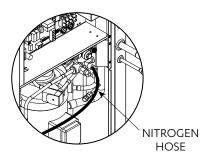
MIMPORTANT

- Any non-condensable product left in the system can cause the pressure in the high side of the system to increase and in turn, the compression temperature to rise.
- Moisture will result in adverse reaction in the refrigerant circuit.
- The PVE oil used in the R-410A compressor is hygroscopic, which means that it absorbs moisture from the air. To prevent chemical reactions in the system, any moisture must be removed at all costs.
- Oxygen (air) reacts with the compressor oil and can lead to faults such as compressor failure.

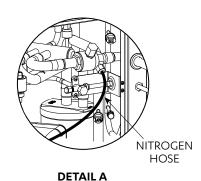
See Diagram Below:

(SRD131C shown for illustration purposes only)





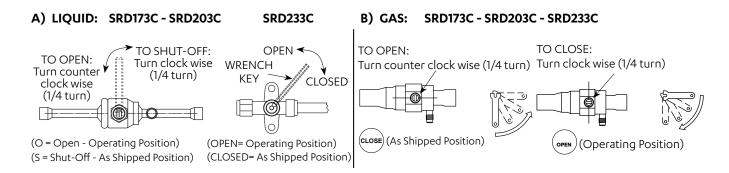
DETAIL A (SRD131C - up to - SRD203C)



(SRD233C model only)

Evacuation Procedure (Triple Evacuation)

- 1. Fit service gauges to the ball valves (liquid line service valve and suction line service valve).
- 2. Evacuate the system to 1000 microns.
- 3. Check vacuum with vacu stat. Break the vacuum with dry Nitrogen to 100kPa
- 4. Release Nitrogen pressure. Evacuate to 500 microns.
- 5. Check vacuum with vacu stat. Break the vacuum with dry Nitrogen to 100kPa
- 6. Release Nitrogen pressure. Evacuate to 500 microns.
- 7. Check vacuum with vacu stat.
- 8. Open valve



11. Electrical Installation

All electrical work must be carried out by a qualified and licensed technician. Make sure all wiring is in accordance with local wiring rules. Wiring connections should be made in accordance with the wiring diagram provided.



Live Electrical Supply!

During installation of your air conditioning unit, it may be necessary to work in close proximity to live electricity. Only licensed electricians are allowed to perform these tasks.

Follow all electrical safety precautions when exposed to live electrical components.

Wiring Diagram

The wiring diagram specific for your air conditioning system is located on the inside panel of the control access door. Always refer all wiring installation, servicing and troubleshooting of this equipment to this diagram to ensure correct electrical connection are satisfied.

Supply and Power Requirements Procedure

It is the installer's responsibility to provide power supply wiring to the mains supply terminal strip of the outdoor unit. Make sure all wiring are in accordance with local wiring rules. Wiring should conform to all current electrical authority regulations and all wiring connections to be as per electrical diagram provided with the unit.

- Confirm that the power supply available is compatible with the unit nameplate ratings. The supply power must be 230V/400VAC(+/- 6%)/50Hz.
- Protect electrical service from over current and short circuit conditions in accordance with AS/NZS 3000
 "Australian / New Zealand Wiring Rules". Size protection devices according to the electrical data of the unit and the table below.
- Installer to connect an appropriate load break (AC3) isolator in sub mains wiring.
- Secure any power and control cables that enters in/exits out of the unit. Use the cable ties provided in the main electrical panel.
- Complete the unit power supply wiring onto the main isolator.
- Secure the power cords and control cables that goes in/out the unit. Use the cable ties provided in the control box.
- Provide proper unit earth in accordance with local and national codes.

Main Voltage Balance Requirement

Check the voltage at the mains supply terminals to determine if it is balanced. Voltage imbalance on three phase systems can cause motor overheating and premature failure. The maximum allowable imbalance is + 2.0%, should voltage imbalance exceed this value, check unit wiring connections to locate and rectify faults or contact local supply authority.

MODEL	Circuit Breaker Size	Cable Size * (mm)		Wiring Diagram
	Amps	MAIN	O.D. to I.D.	
SRD131C / SRV131E	32.0	6.0	1.0	WD0870
SRD151C / SRV/M151E	32.0	6.0	1.0	WD0870
SRD191C / SRV/M191E / SRV191F	40.0	10.0	1.0	WD0870
SRD173C / SRV/M171E	20.0	2.5	1.0	WD0871
SRD203C / SRV/M201E / SRV201F	20.0	2.5	1.0	WD0871
SRD233C / SRV/M231E	25.0	4.0	1.0	WD0872

^{*} Suggested Minimum Cable Size should be used as a guide only, refer to AS/NZS 3000 "Australian / New Zealand Wiring Rules" for more details.

11.01. Split Unit Electrical Connection



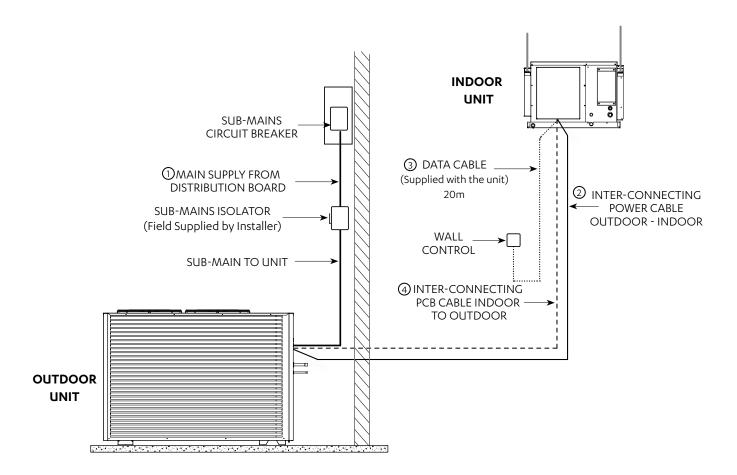
To minimise noise interference, Data and Power cable clearance should be maintained as much as possible.

UPDATED WIRING DIAGRAM IS PROVIDED WITH THE UNIT

Outdoor Unit: Located at the back of electrical/compressor access panel.

Indoor Unit: Located at the back of electrical box cover.

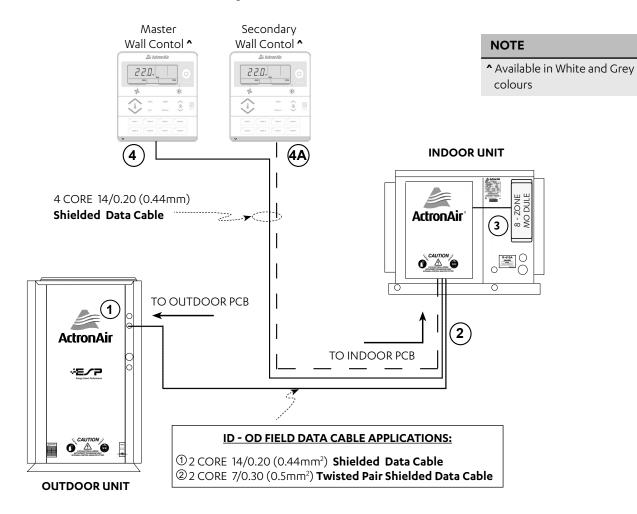
- MAINS WIRING (230VAC)
 (Single Phase + Neutral + Earth) 50Hz
 (Three Phase + Neutral + Earth) 50Hz
- —— ② CONTROL WIRING (230VAC) (Single Phase + Neutral + Earth) 50Hz
- ---- (a) EXTRA LOW VOLTAGE DATA CONTROL WIRING (2 Core Shielded Twisted Pair 7/0.30 (0.5mm²) Data Cable)



12. Wiring Connection Control Cable Length and Specification

OPTIONAL DUAL MASTER CONTROL

(Mimic Logic)



ITEM	DESCRIPTION	MAXIMUM CABLE LENGTH *
1 to 2	Outdoor PCB to Indoor PCB	60 m
2 to 3	Indoor PCB to 8-Zone Module (factory fitted)	0.60 m
2 to 4	Indoor PCB to Master Wall Control	40 m
2 to 4A	Indoor PCB to Secondary Wall Control	40m (Including 2 to 4) **

* Suggested Maximum Cable Length

Long runs beside Mains cables or TV antenna cables should be avoided where possible.

** Total Cumulative Cable Length with Secondary Controller must not exceed 40 metres. ww For example, if 2 to 4 is 30m then 2 to 4A must not exceed 10m.

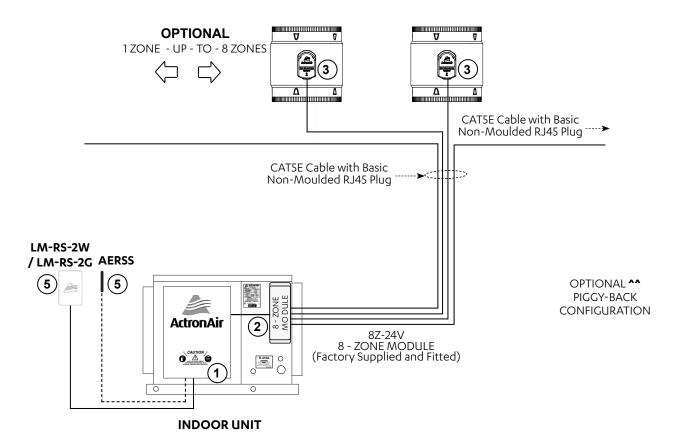
- NOTES: Trace wire connects to SCN/COM terminal at Outdoor PCB and to SCN on Indoor PCB. Do not connect at
 - · Diagram shown above is a general presentation only. Refer to individual unit wiring diagram for complete wiring connection details.

13. Zoning Cable Length and Specification

13.01. **ESP Plus**

INTEGRATED ZONE BARRELS

(1-Zone Up To 8-Zone Options / Max. of 10 Zone Motors per System ^^)



TOTAL LENGTH OF ALL ZONING CABLE MUST NOT EXCEED 250 METRES ^ TOTAL CABLE LENGTH PER INDIVIDUAL ZONE MUST NOT EXCEED 100 METRES**

ITEM	DESCRIPTION	MAXIMUM CABLE LENGTH ^
2 to 3	Integrated Zone Barrel 3 to Zone Module	100 m
2 to 4A	Maximum Cumulative Cable Length ** (per zone - 8 zone)	100 m
4 to 4A	Zone Barrel 8 to Zone Barrel 9 (Piggy-Back) ***	95 m
1 to 5	Indoor PCB to Remote Sensor (Max. of 2 Optional Sensors)	50 m

Long runs beside Mains cables or TV antenna cables should be avoided where possible.

Diagram shown is a general presentation only. Refer to individual unit wiring diagram for complete connection details.

^{**} Maximum Cumulative Cable Length per individual zone must not exceed 100 m per zone.
For Example, 2 to 4A (Optional 8 Zones Piggy-Back Configuration), if 2 to 4 is 75 m, then 3 to 3A must be less than or equal to 25 m to be within the 100m maximum length.

^{***} Recommended maximum cable length, provided total of preceding and subsequent cable connections are only 5 m.

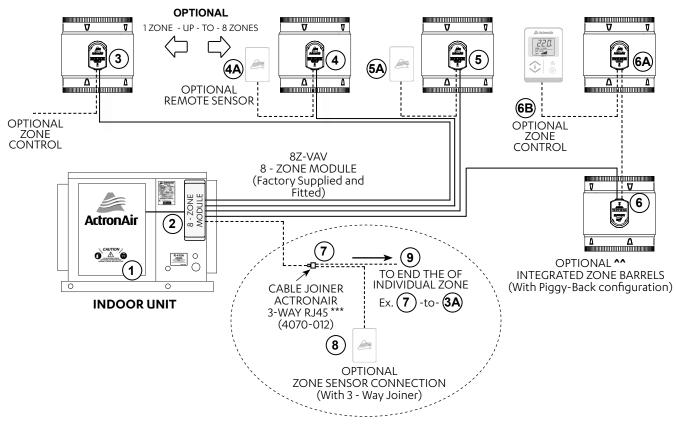
[^] Total Cumulative length of all the aggregate cable must not exceed 250 metres. Consult ActronAir for longer cable length requirement.

^{^^} Total of 10 Zone Barrels are allowed for 8Z-24V, and a maximum of 4 Zone Barrels are allowed per individual zone.

13.02. ESP Ultima

INTEGRATED ZONE BARRELS

(1-Zone Up To 8-Zone Options / Max. of 10 Zone Motors per System ^^)



TOTAL LENGTH OF ALL ZONING CABLE MUST NOT EXCEED 250 METRES ^ TOTAL CABLE LENGTH PER INDIVIDUAL ZONE MUST NOT EXCEED 100 METRES**

ITEM	DESCRIPTION	MAXIMUM CABLE LENGTH * ^
1 to 2	Indoor to Ultima Module factory fitted cable (ESP Ultima)	0.60 m
2 to 3A	Ultima Module to Zone Barrel to Zone Control **	100 m
2 to 4A	Ultima Module to Zone Barrel to Zone Sensor **	100 m
2 to 5A	Ultima Module to Zone Barrel **	100 m
2 to 6B	Ultima Module to Zone Barrel to Zone Barrel to Zone Control **	100 m
2 to 7	Ultima Module to 3-Way Cable Joiner (ActronAir 4070-012)	0.175 m
6 TO 6A	Zone Barrel 6 to Zone Barrel 6A (Piggy-Back) ****	95 m
7 to 8	3-Way Cable Joiner to Zone Sensor	50 m
7 to 9	3-Way Cable Joiner to the end of Individual Zone	50 m

^{*} Suggested Maximum Cable Length

 $Long\ runs\ beside\ Mains\ cables\ or\ TV\ antenna\ cables\ should\ be\ avoided\ where\ possible.$

Diagram shown is a general presentation only. Refer to individual unit wiring diagram for complete connection details.

For Example, 2 to 3A (Optional Zone Barrel with optional Zone Control), if 2 to 3 is 75m, then 3 to 3A must be less than or equal to 25m to be within the 100m maximum length.

2 to 6B (Optional 2 Piggy-Back Zone Barrel Configuration with optional Zone Control), if 2 to 6 is 60 m, then 6 to 6B must be 40 m to be within the 100 m maximum length.

^{**} Maximum Cumulative Cable Length per individual zone must not exceed 100 m per zone.

^{***} Recommended maximum cable length, provided total of preceding and subsequent cable connections are only 5m.

[^] Total Cumulative length of all the aggregate cable must not exceed 250 metres. Consult ActronAir for longer cable length requirement.

^{^^} Total of 10 Zone Barrels are allowed for Ultima system and a maximum of 2 Zone Barrels are allowed per individual zone.

14. Refrigerant Charging

- The units detailed on this guide are pre-charged with R-410A refrigerant. Should there be a need to add or remove some refrigerant, it is recommended to follow the charging method explained below.
- Never allow R-410A refrigerant to vent into the atmosphere. It is an offence to release refrigerant in Australia. Always
 reclaim refrigerant using equipment and container dedicated for R-410A system use only.
- All work must be carried out in accordance with Australia and New Zealand refrigerant handling code of practice.
- Only qualified technicians are allowed to perform any work described in this guide and specifically work related to addition or removal of refrigerant.
- R-410A refrigerant must always be charged in liquid state.
- Only during the compressor running condition the system can be charged through the suction service port on the compressor suction line.
- Changes in refrigerant charge must be noted to a label that is fixed to the unit for future reference

A CAUTION

The system of this unit operates with POE oil that rapidly absorbs moisture.

The maximum time any system can be opened to atmosphere is 15 minutes.

REFRIGERANT CHARGE DETAILS (R-410A)										
Model	Refrigerant Charge (grams)	Pre-charged Length (m)	Additional Refrigerant per m							
SRD131C	5150	15	50							
SRD151C	4850	15	50							
SRD173C	7050	15	50							
SRD191C	7950	15	50							
SRD203C	7450	15	50* /100							
SRD233C	10,050	10	100							

NOTE:

14.01. Charging Method: Subcooling and Superheat

Parameters:

LLT = Liquid Line Temperature **SLT =** Suction Line Temperature

Cooling and Heating Operation:

Adjust the refrigerant charge to obtain the correct super heat and subcool for optimal performance as follows:

- 1. Ensure that air filters are fitted and total system airflow is achieved. (Air filters are not supplied with the unit, it is the responsibility of the installing contractor to provide and fit adequate return air and fresh air filters).
- 2. Connect service gauges to the schrader valves.
- 3. Start the unit in cool mode ensuring that compressors are in 100% operation before taking service gauges reading. Allow the system to stabilize for next 15-30 minutes before recording.
- 4. Record the discharge pressure, suction pressure, liquid line temperature and suction line temperature for all of the refrigeration circuits:

Discharge Pressure =	kPa	Suction Pressure =	kPa
Liquid Line Temperature (LLT) =	٥С	Suction Line Temperature (SLT) =	٥С

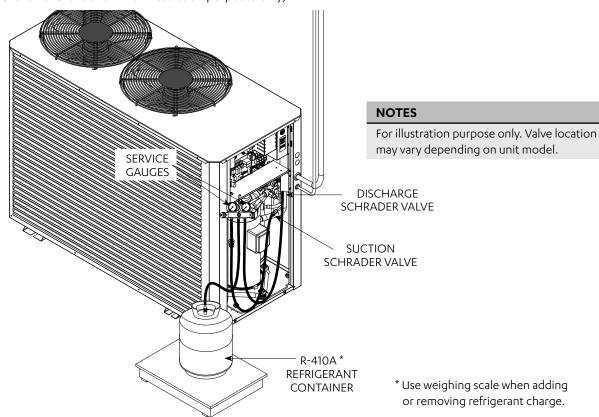
^{* 50} grams per metre is only applicable if 3/8" liquid field pipe is used (for field pipe length between 0-20m).

NOTES

- · Accurate pressure and temperature measuring tools should be used to achieve satisfactory results.
- The sensor of a thermocouple must be in good contact with the area being measured and must be insulated in order to obtain correct reading.

See Diagram Below

(SRD131C - SRD151C shown for illustration purposes only)



Checking for Subcooling:

- 1. From the R-410A Pressure/Temperature Chart record the corresponding Saturated Condensing Temperature (SCT) at the given discharge pressure.
- 2. Calculate the system subcooling using the formula below:

Subcooling = SCT - LLT

- 3. If subcooling is within the range (see charging table), there is no need to add/remove refrigerant.
 - If subcooling is lower than minimum, the system is undercharged, it is necessary to add refrigerant.
 - If subcooling is higher than maximum, the system is over charged. It is necessary to remove refrigerant.

Allow the systems to stabilise (15-30 mins) and repeat the step 1-3 until subcooling falls within the range specified in the table below.

Checking for Superheat:

Maintaining the correct superheat is important for ensuring the evaporator is achieving maximum capacity and avoiding excessive liquid refrigerant returning to the compressor.

1. From the R-410A Pressure/Temperature Chart record the corresponding Saturated Suction Temperature (**SST**) at the given suction pressure.

2. Calculate the system super heat using the formula below:

Superheat = SLT - SST

- 3. If superheat is within the range (see charging table below), there is no need to add/remove refrigerant.
 - If superheat is lower than minimum, it means that liquid refrigerant may be returning to compressor. It is necessary to remove refrigerant or check EEV settings.
 - If superheat is higher than maximum, it means that refrigeration capability of evaporator is not fully maximised. It is necessary to add refrigerant charge or check EEV settings.

Allow the systems to stabilise (15-30 mins) and repeat the step 1-3 until superheat falls within the range specified in the table below.

SUBCOOL AND SUPERHEAT TABLE								
00 - 1-1	coo	LING	HEATING					
Model	SUBCOOL	SUPERHEAT	SUBCOOL	SUPERHEAT				
ESP Digital	4 - 8	2 - 8	10 - 14	2 - 8				

NOTES

The above subcool and superheat recommendations are based on the following rated conditions:

- Cooling: 35°C DB outdoor, air entering indoor at 27°C DB / 19°C WB.
- Heating: 7°C DB / 6°C WB outdoor, air entering indoor at 20°C DB Nominal indoor airflow.

IMPORTANT INFORMATION FOR ESP DIGITAL UNIT (SRD)

Force System to Operate at 100%

To get 100% compressor operation for cooling and heating, adjust the wall control set temperature greater than 4° C from room temperature.

It maybe necessary to adjust the upper / lower limits to achieve the 4°C differential from set point. Details of upper / lower limits are available in wall control operating instructions.

Another method is to unwire the wall control sensor from the Wall Control or from indoor board. When using this method set the Wall Control to cool only or heat only mode.

This will make the system detect a temperature greater then 4°C from set point and make the compressor run at 100%. Set controller to cooling or heating mode depending on your charging preference.

Gauge Reading

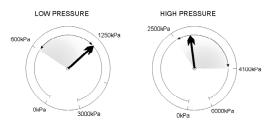
When running at 100%, ESP system will operate the same as a standard (classic) ActronAir system, with gauge pressure operating as normal.

When compressor is modulating, gauges reading will rise and fall.

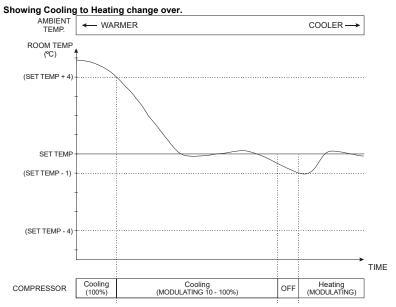
High pressure gauge will rise when the compressor is loaded and fall when the compressor is unloaded.

Low pressure gauge will fall when the compressor is loaded and rise when the compressor is unloaded.

Gauges During Modulation Typical Rise and Fall of Gauges during Modulation



Auto Heat Cool Mode Operation Time Chart



R-410A Pressure / Temperature Chart

Temp °C	Pressure KPa
-60	-34 A
-59	-34.4 -30.7
-58	-26.8
-57	-22.8
-56	-18.6
-55	-14 2
-54	-9.6
-53	-9.6 -4.8
-52	0.8
-51	5.3
-50	10.7
-49	16.3
-48	22.2 28.2
-47	28.2
-46	34.0
-45	40.9
-44	47.8
-43	54.8
-42	62.1
-41	69.6
-40	77.4
-39	85.5
-38	93.9
-37	102.5 111.5
-36	111.5
-35	120.8
-34	130.4
-33	140.3
-32	150.5
-31	161.1 171.9
-30	171.9
-29	183.3

Temp	Pressure
°C	KPa
-28	194.9
-27	206.9
-26	219.2
-25	231.9
-24	245.1
-23	258.7
-22	272.6
-21	286.9
-20	301.7
-19	316.9
-18	332.6
-17	348.7
-16	365.2
-15	382.3
-14	399.7
-13 -12	417.7
-12	436.2
-11	455.1
-10	474.6
-9	494.6
-8	515.1
-7	536.2
-6	557.8
-6 -5 -4	579.9
-4	602.6
-3	625.9
-2	649.8
-1	674.3
0	699.4
1	724.9
2	751.3
3	778.3

°C	KPa
4	805.9
5	834.1
6	862.9
7	892.6
8	922.8
9	953.8
10	985.4
11	1017.8
12	1050.9
13	1084.7
14	1119.2
15	1154.6
16	1190.7 1227.5
17	1227.5
18	1265.2
19	1303.6
20	1342.9 1382.9
21	1382.9
22	1423.9
22 23	1423.9 1465.7
24	1508.3
25	1551.8
26	1596.2
27	1641.4
28	1687.6
29	1734.6
30	1782.6
31	1831.6
32	1881.5
33	1932.3
34	1984.1
35	2036.9

Temp

Pressure

remp	Fiessule			
°C '	KPa			
36	2090.7			
37	2145.5			
38	2201.3			
39	2258.2			
40	2316.1			
41	2375.1			
42	2435.1			
43	2496.2			
44	2558.5			
45	2621.8			
46	2686.2			
47	2751.8			
48	2818.5			
49	2886.4			
50	2955.5			
51	3025.7			
52	3097.2			
53	3169.9			
54	3243.7			
55	3318.9			
56	3395.2			
57	3472.9			
58	3551.8			
59	3631.9			
60	3713.5			
61	3796.3			
62	3880.5			
63	3965.9			
64	4052.8			
65	4140.9			
66	4230.6			
67	4321.5			

Pressure

Temp

15. EC Indoor Fan Self Learn Mode - ESP Plus and Ultima

Read Installation Instructions On Outdoor Unit Access Panel

ESP Plus/Ultima Self-Learn Mode Activation

Before activating ensure the following:

- 1. Return air filter, return air box and grille are properly installed.
- 2. All bedroom doors are open or any other doors that may obstruct the path of return air back to the return air grille.
- 3. Adjustable outlets should be in open position and System Air Balance has been complete.

Initiating Self-Learn Mode:

- 1. System must be in the OFF-MODE before activating Self-Learn Mode.
- 2. Push and hold the button and then the (b) button for 5 seconds or until the **ESP** flashes on controller display, then release.
- 3. Push the button once and release.

NOTES

- Self-Learn Mode should not be activated when there are obstructions in duct system layout.
- When system layout of duct design is changed, Self-Learn Mode should be reactivated. This will allow the controller to learn the new duct layout.
- During the operation of Self-Learn **Mode**, **HIGH**, **MED** and **LOW** will appear on the controller display. After this, the display will show the set point temperature. This process can take up to 3 minutes.
- E3 or E05 may appear in the Zone Control / outdoor board during self learn mode. This is normal.

ESP Plus/Ultima Variable Fan System Check

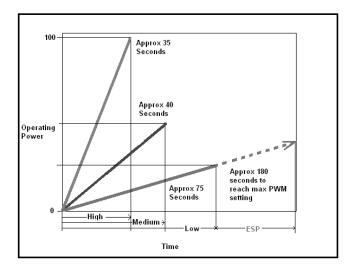
Please ensure that the Self-Learn mode operation is performed first.

ESP PLUS/ULTIMA Functionality:

- 1. Open all available zones and Select ESP mode on Wall Control
- 2. Allow 3 minutes for fan to adjust speed
- 3. Check airflow at any outlet from Zone 1
- 4. Close all zones except zone 1
- 5. Allow 3 minutes for fan to adjust speed
- 6. Check airflow at the same outlet
- 7. The airflow at this outlet should remain reasonably constant
- 8. Switch to manual mode High
- 9. A significant increase in airflow should be noted.
- 10. Switch to medium then Low and note airflow drops accordingly

NOTE

Typically in manual mode the fan takes approximately 30 seconds to reach set speed.



The above graph represents the approximate time taken for the fan to achieve its set speed upon selection.

In ESP mode the time will vary depending on the duct system and the number of zones open or closed at time of selection. Typically it will take approximately 3 minutes to achieve set speed from all zones open to 1 zone open.

16. Maintenance

Maintenance Procedures

This section describes the procedures that must be performed as a part of normal maintenance program. Regular servicing of equipment by licensed technician is highly recommended. Regular servicing of your unit helps in maintaining its optimum performance and reliability. **The checklist and service periods provided on this manual are guides only, as some sites may require more frequent servicing**. Always disconnect electrical power to the unit before performing these procedures. It is always a safe practice to observe all safety warnings and cautions when conducting maintenance tasks.

A DANGER

Live Electrical Connections!

It may be necessary to work with live electrical components on certain maintenance tasks. Only licensed electricians and qualified technicians are allowed to perform these tasks.

Beware of Rotating Fan Blades!

- Always make sure that all power supply, to the Outdoor Fans are turned off and isolated.
- · Observe WH&S safety procedures, do not wear loose clothing and any jewellery when working near the fans.
- Wear PPE whenever performing any maintenance procedures.
- Observe all necessary procedures when working on a confined space.

M WARNING

Hazardous Voltage!

Always make sure that all power supply, including remote controls, are disconnected before performing maintenance. Observe proper LOCK-OUT/TAG-OUT (LOTO) procedures to ensure that power cannot be inadvertently energised. Failure to disconnect power before maintenance procedures can result in serious injury and/or death.

EC Motors and Inverter Drives are fitted with high power capacitors and can have dangerous residual voltages at motor terminals after power has been isolated. Wait at least 5 minutes after power isolation and test for any residual voltage before beginning service work.

Split Ducted ESP Digital

Annual Maintenance Checklists

- Perform general maintenance inspections.
- Perform scheduled start-up checks.
- · Leak test refrigerant circuits.
- Inspect contacts of all contactors and relays. Replace all worn contacts as required.
- Inspect, clean and tighten all electrical connections.
- Check fans for balanced operation. Make sure that there are no loose screws / bolts, no fan blades interference and no damage to the fans and guards.
- Inspect the air filters, clean or replace as required.
- Clean and repaint any corroded panel section.
- Ensure no blockage of airflow through variable speed drive.

Cleaning the Condenser Coils

Clean the coils at least once a year or more frequently if unit is located in a dusty and dirty environment, in order to maintain your system's proper operating performance. High discharge pressures are good indication that the coils need cleaning. When using detergent or solvents to clean the coils, follow the manufacturer's instructions to avoid potential damage to the coils and to the unit.

To clean the refrigerant coils, use a soft brush and water spray, such as garden hose or pressure washer with low pressure nozzle.



Do Not Use High Alkaline Detergent!

When using detergent for coil cleaning, ensure that the alkaline level is no higher than 8.5, which can cause corrosion damage to the coils.

No Water into the Electrical Compartments!

Ensure consideration is given to the possibility of water entering the electrical compartments during cleaning of the condenser coil.

Coil Cleaning Procedures

- Disconnect power to the unit.
- Remove the louvered panels from the unit to gain access to the air inlet side of the coils.
- Use a soft brush to remove loose dirt and debris from both sides of the coils.
- Straighten bent coil fins with fin comb.
- Prepare the detergent solutions according to the manufacturer's instructions.
- Spray solution at a 90° angle to the coils, keeping a minimum nozzle spray angle of 15°, with at least a 1800mm distance from the coils and 600 psi pressure.
- Spray leaving air side of the coils first then the air inlet side. Allow the solution to stand on the coils for five minutes.
- Rinse both sides of the coils with cool clean water.
- Inspect the coils, if they are still dirty, repeat the cleaning procedure.
- Clean and wipe dry the outer and inner sides of the unit, the refrigerating parts and other components.
- Ensure that the condensate drain lines are not blocked.
- Reinstall all unit panels, covers and guards.
- Restore electrical power to the unit.

17. Maintenance Frequency Checklist

Regular servicing of equipment by a qualified technician is recommended every 12 months for residential applications and every quarter for commercial applications. Regular servicing of your unit helps in maintaining its optimum performance and reliability. The following checklist and service periods are provided as a guide only, as some sites may require more frequent servicing.

ELECTRICAL										
Do ata	Service Frequency								Datail of Consider Cheek	Camilaa Madhada
Parts	s 1 3 6 1 2 3 4 5 Mth Mth Mth Yr Yrs Yrs Yrs Yrs	Detail of Service Check	Service Methods							
Printed Circuit Boards		,,,,,,,	74.611	✓	113	113	113	113	Visual Inspection	Tighten Terminals as necessary on printed circuit boards
Electrical Connections				√					Check all electrical terminals, mains, communications, etc	Re-tighten if loose.

INDOOR UN	IT									
			Serv	ice F	requ	ency	/			
Parts	1 Mth	3 Mth	6 Mth	1 Υr	2 Yrs	3 Yrs	4 Үгs	5 Yrs	Detail of Service Check	Service Methods
Casing / Panels and Frames				√					Visual check for damage, rust and dust accumulation.	For highly corrosive environment, wash panels quarterly with water and neutral detergent solution. Wax panels. Repair / re-paint where required.
Insulation				✓					Visual check for insulation conditions.	Repair / replace insulation material.
Fan				✓					Visual check for run out of balance and dust attached	Clean off dust as necessary to negate possibility of fan running out of balance
Motor				< Ω					Visual check on wiring. Insulation resistance check to be carried out annually	Measure insulation resistance. Should be more than $1M\Omega$
Heat Exchanger				✓					Check for clogging by dust. Check for leaks / damage.	Clean air inlet side as necessary. Straighten any bent fins using fins comb.
Drain Pan/ Condensation line				√					Check for obstructions and free flow of water	Clean to eliminate obstructions/ sludge and check condition of pan. Pour water to ensure free flow.
Filter*				✓					Check for clogging by dust.	Clean Filter
Temperature Readings				✓					Measure air on and air off	Place temperature probe in return and supply air of unit.
Zone Motors				✓					Visual inspection of motors open/housing. Ensure no obstructions	Drive motors opened and closed. Ensure correct operation.
Duct Works	CI			✓					Inspect duct works for air gaps.	Re-tape any loose ducts.

^{*} Service period for filter cleaning may vary depending on operating time and surrounding environment.

Parts	Service Frequency						/				
	1 Mth	3 Mth	6 Mth	1 Үг	2 Yrs	3 Yrs	4 Үгs	5 Yrs	Detail of Service Check	Service Methods	
Casing / Panels and Frames				✓					Visual check for damage, rust and dust accumulation.	For highly corrosive environment wash panels quarterly with water and neutral detergent solution. Wax panels. Repair / re-paint where required.	
Insulation				✓					Visual check for insulation conditions.	Repair / replace insulation material.	
Fan				✓					Visual check for run out of balance and dust attached	Clean off dust as necessary to negate possibility of fan running out of balance	
Motor				√ Ω					Visual check on wiring. Insulation resistance check to be carried out annually	Measure insulation resistance. Should be more than $1M\Omega$	
Heat Exchanger				✓					Check for clogging by dust. Check for leaks / damage.	Clean air inlet side as necessary. Straighten any bent fins using fins comb.	
Condensate Drain Line (if available)				✓					Check for obstructions and free flow of water	Clean to eliminate obstructions/ sludge and check condition of drain line. Pour water to ensure free flow.	
Compressor				√ Ω					Check for high / low pressure. Measure insulation resistance. Check compressor for abnormal noise/vibrations	Measure insulation resistance. Should be more than $1M\Omega$.	
Refrigeration Operational Readings				✓					Make note of operational reading in test cool/heat	Check operating pressures, record super heat and subcool values	
Safety Devices				✓					Check calibration of safety devices such as HP and LP controls, sensors, etc	Check resistance of sensors, pressure cut in / cut out of pressure controls	
Faults				✓					Check for any previous fault history on unit.	Investigate any causes for previous faults, reset fault history.	

18. <u>Troubleshooting Guide</u>

	Possible Causes	Remedies			
B	Built-in safety timers have been activated	Wait for up to 20 minutes to pass from turn on			
<u> </u>	A breaker has turned OFF or a fuse has	time.			
	blown.	Check breakers and fuses.			
The system does not start. \top	The thermostat set point is incorrect.	Check master wall control settings are correct.			
Ir	n Wall Control.	Check the thermostat "setpoint" is set low enough for cooling or high enough for heating.			
T	The master Wall Control timer setting is	Check the master Wall Control timer settings.			
ir	ncorrect.	See Operating Instructions section.			
	Built-in safety timers have been activated	Wait for up to 20 minutes to pass from turn on time.			
	A breaker has turned OFF or a fuse has blown.	Check breakers and fuses.			
Ī	The thermostat set point is incorrect. In	Check master wall control settings are correct.			
1	Wall Control.	Check the thermostat "setpoint" is set low enough for cooling or high enough for heating.			
Т	The master Wall Control timer setting is	Check the master Wall Control timer settings.			
	ncorrect.	See Operating Instructions section.			
		Make sure the air inlet and air outlet on the			
	The cooling/heating function may not work effectively if the air inlet and air	outdoor unit is not blocked. Check that the area around the outdoor unit is			
I	outlet on the outdoor unit are blocked.	free from obstructions that may cause the airflow			
		to recirculate.			
1	The airflow across the indoor coil may	Reduce the total static pressure on the indoor fan			
	not be enough and the anti-freeze protection or over heat prevention	to increase airflow.			
1	systems can lower the cycle capacity for	For example increase duct sizes, reduce tight duct work bends or increase return air grille size.			
Cooling/Heating is not	he unit.				
sufficient.	The cool/heat load is too great for the air	Perform a heat load analysis on the conditioned space. You may need to consider upgrading your			
C	conditioner.	air conditioner with a larger system.			
1	Open windows or doors will cause nefficient operation.	Close windows and doors in conditioned areas.			
A	Appropriate zones not turned on.	Turn on appropriate zones (if applicable)			
		If you know a extreme day is coming turn the			
l l	The outside temperature is beyond the air conditioner design conditions.	air conditioner on a few hours before ambient temperatures reach extreme. This should help on			
	in conditioner design conditions.	those few extreme days.			
Y	ou may be trying to operate the whole	Change fan mode to CONT HIGH fan speed. This			
	nouse on Auto Fan Mode.	increases the total fan speed. This will boost fan capacity.			
l l	This is caused by the defrosting				
l l	operation of the outdoor units heat	This is normal during the defrost operation in			
	exchanger in heating operation in cold ambient conditions.	cold ambient conditions.			
	Condensation of water on the outdoor	This is normal during heating operation. You can			
I	coil during heating operation.	purchase drip trays to contain then drain this excess water.			
		Check the upper and lower temperature limits			
I	The master control set temperature	are set correctly. See operation manual for			
adjusted.	imits are reached.	details on setting upper and lower temperature limits.			

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Fault	Possible Causes	Remedies			
Occasional wishing noise can be heard on heating cycle.	This is the sound of the gas changing directions as de-ice cycle begins.	This is a normal function of an air conditioner. The unit is removing any ice on the outdoor unit.			
The compressor is running	You are in heating mode.	Check the temperature settings.			
but the system is not cooling.	The reversing valve has jammed between heating and cooling.	Replace reversing valve.			
The outdoor coil keeps freezing over.	Outdoor coil sensor might be faulty. See sensor (temperature/resistance) table and check resistance value.	Replace faulty sensor.			
	May have obstruction in outdoor coil.	Remove obstructions.			
There is only one condenser fan working.	The fan is faulty. Test the fan motor for correct voltage, check the motor winding resistance, open circuit, check capacitor, etc.	Replace faulty fan. If the fan motor needs to be replaced and there is no one available immediately, then just disconnect the fan electrically and cover the faulty motors fan guard. This way the unit can still operate at reduced capacity using 1 fan until you get a replacement fan motor.			
The system is short on gas. You have fixed the leak and want the system to operate at 100% so gas charge can be corrected. What can you do to ensure 100% compressor operation?	You can adjust your Wall Control temperature so you have a large differential. This will operate at the system at 100% till the temperature gets to within 4oC of the set point.	Select Cooling or heating mode. If cooling adjust setpoints more than 4oC lower than room temp. If Heating adjust setpoints more than 4oC higher than room temp. Complete refrigerant charging procedure until finished.			
The indoor unit gives out odour.	This happens when smell of the room, furniture, or cigarettes are absorbed into the unit and discharged with the airflow. Check the drain is not piped into the sewerage drain line.	If this happens, we recommend you to run the a conditioner on cooling for a period of time with the doors and windows open or have the indoor unit washed by a technician. Consult the installe from whom you bought the air conditioner. Re-pipe drain with a P-Trap and connect into household drainage or storm water drain.			

19. Fault and Status Codes

OUTDOOR CPU	LM7* Wall Control	LM24* Wall Control	FUNCTION / FAULT		
0	-	-	Cooling Mode		
1	-	-	Heating Mode		
2	-	-	Heating Mode - Compressor run time > 20 min		
3	HEAT blink every 8 s	HEAT blink every 8 s	Heating Mode - Defrost		
4	LOW speed blink 30 s	LOW speed blink 30 s	Over Heat or Anti-Freeze Protection Mode (Low Capacity Mode)		
5	HEAT blink every 8 s	HEAT blink every 8 s	Heating Mode - indoor coil pre-heat after defrost		
6	E6	E6	Fault discharge high temperature (low on refrigerant)		
7	E7	E7	Fault outdoor coil sensor (open or short circuit)		
8	E8	E8	Fault outdoor discharge sensor (open or short circuit)		
9	E9	E9	High or Low Pressure		
-	E5	E5	Communication error between outdoor and indoor		
-	E3	E3	Fault room sensor(s) (open or short circuit)		
-	E4	E4	Fault indoor coil-in sensor (open or short circuit)		
-	E2	E2	Fault indoor coil-out sensor (open or short circuit)		

NOTES

- When unit is powered up, the first No. shown on LED display will be the CPU version No., then 8 followed by normal controller status codes.
- Faults may not be displayed on the wall control until the fault occurs several times.
- Phase error will be indicated by indicator lights on the 3 phase soft starter.
- Phase correction must be applied to the incoming supply side
- * Available in White and Grey colours.

20. Commissioning Tips for Optimum ESP Ultima Performance

Starting the ActronAir System:

First, ensure that your ductwork installation is fully completed before performing air balancing and the self learn fan set up.

- 1. Turn the mains Power-ON at circuit breaker.
- 2. Set the Wall Control to HI Fan only.

NOTES

- This will automatically open all zones, if zones and Zone Controls are installed.
- The Zone Controls will automatically display FAN and all zone damper indicators will indicate fully open blade positions.
- Step 2 above can be done from any LM-Series master Wall Controls.
- 3. At this time, perform air balancing to ensure the correct amount of air flow is coming out from each supply air diffuser. This is to ensure that when the system is on ESP Fan and when you minimise the zones, the outlets are balanced to provide the correct amount of air and will not be noisy.

NOTE

Getting step 3 correct is important to the system's performance.

Good air balance is the contributing factor to a good ESP Ultima system. Once the air balance is correct, the performance improvement can be quite significant, as you have now guaranteed the set up is the way as the manufacturer has intended. Seek advice from ActronAir installation guidelines for recommendations on grille sizes, ductwork and static pressure.

Starting the Compressor:

- 1. Ensure proper evacuation procedures have been followed on interconnecting pipe work before opening the refrigerant ball valves.
- 2. Make sure the refrigerant gauges are fitted before starting compressor commissioning.
- 3. Set the Wall Control into COOLING or HEATING MODE.
- 4. Allow approximately 10 minutes for the system to stabilise coil temperatures before adding additional refrigerant for additional pipe work outside of the pre-charged lengths. (See Pipe Length section for further details).

21. Frequently Asked Questions - ESP Ultima System

O. Does the back light on the individual zone control effect brightness of the room at night?

A. No. The display back light turns off at approximately 30 seconds after any button is pressed.

Q. Can you turn the system off from the individual zone controls?

A. No, It can only be done from the master control. If you are the last zone on and you turn it off, zone 1 will automatically turn on. The unit will then run based on this zone's cooling / heating demand. This is due to the last zone safety feature default setting.

Q. Can you adjust differentials on the zone?

A. No you cannot.

Q. Is there any indication on the zone control when it is in defrost mode?

A. No. The **HEAT** indicator flashing on the master control indicates and highlights this.

Installation and Commissioning Guide

Split Ducted ESP Digital

Q. Can you put a Zone Sensor and Zone Control in each room?

A. Yes you can, it will average the temperature between the two sensors, this application is normally used for large open plan areas that may be on the same zone.

Q. Is the sensor on the master control operational?

A. Not in Ultima. The sensor on the master wall control is disregarded in Ultima.

Q. Would an in-line fan cause any operational problems if installed?

A. Yes it would. An in-line fan is not recommended on the variable fan units.

Q. Can you use a master control to act as a zone sensor controlling the varying air to that zone?

A. No, the Master control cannot be used for zone control. The sensor is not wired on the master control.

Q. Is it possible to turn all zone controls off to shut the system down?

A. Yes, if on auto fan, the system will go into a standby mode. And if the last zone safety feature is deactivated.

Q. Is it possible to use the Manual fan speed mode to increase the air into a particular zone if the ESP fan mode is not producing enough air?

A. Yes, it is recommended that in extreme conditions to turn the fan mode to either Manual High or Medium to increase the airflow into the zone thus improving the system performance.

Note: This is when using less than your total number of installed zones.

Q. Can I still piggyback 2 zone barrels together as 1 zone?

A. Yes, up to a total of 10 zone barrels per system can be installed.

Q. If the system receives 2 equal call for both Cooling and Heating while the system is in standby, what cycle starts first?

A. Cooling will start first as a default, and then when cooling is satisfied the system will swing to Heating.

Q. Can I use 2 Remote Sensors to average a large room?

A. No, for averaging large rooms you must use a 1×20 Control (Ultima only) and 1×20 Consor.

Note: Use of 2 Remote Sensors causes inconsistent temperature sensor readings.

Q. Can the zone control show the room temperature as main display instead of set point?

A. If you hold the Room Temp button in for 5 secs this display will remain on screen for 45mins then revert back to set point display. Room temp light will flash to indicate you are in room temperature display.

Q. Does the Ultima system use a different zone barrel to the standard ON/OFF type 24volt ActronAir barrels?

A. No, they are the same barrels. ActronAir designed these zone motors with the intension to communicate with the Ultima system.

Q. Can I use the master control to control the main area's temperature?

A. No, the on board sensor on the master control is disregarded when wired to the Ultima system. All temperature information is fed back from the Zone Controls and or Zone Sensors back to the Ultima module.

Q. Can I check what zone number my Zone control is from the zone control?

A. Yes, When the system is first powered up the zone number is displayed on the Zone Control display. You can also check the Zone number by Holding the room temp button and pressing the ON/OFF button. This shows the Zone Number before showing the software versions.

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Split Ducted ESP Digital

Q. Can I calibrate the on board temperature sensor on the Zone Control?

A. Yes, Hold in the Room temp button and press the ON/OFF button and release. The display will first show the zone number, then two version numbers, then 0.0 (default) This is the calibration adjustment. Adjustments to the negative will make your room sensor display a lower temperature, and adjustments to the positive will make your room sensor display a higher room temperature.

Q. How do I calibrate a Room Sensor?

A. While the power is on, remove the Room Sensor by unplugging the RJ45 connection and plug in a Zone Control. Then Hold in the Room temp button and press the ON/OFF button and release. The display will first show the zone number, then two version numbers, then 0.0 (default) This is the calibration adjustment. Adjustments to the negative will make your room sensor display a lower temperature, and adjustments to the positive will make your room sensor display a higher room temperature. When you have calibrated your desired change unplug the Zone Control and plug your Room Sensor back in. The calibration order is remembered by the Ultima module and applied to that zones room temperature.

Q. Can you adjust the Zone Controls more than 2 degree's + / - from the master wall control?

A. Yes, it is possible via the service menu but not recommended, as you may lose tight temperature control. The default has been set at 2 degree's for this reason.

Q. Can you have 2 Zone Controls averaging 1 big zone?

A. No, you must have 1 x zone control and 1 x zone sensor for temperature averaging.

Q. Do I have to assign zones or sensor to zones on commissioning?

A. No need, when the system is initially powered up the Ultima system will automatically acquire the utilized zones. Because each zone has its sensor there is no need to assign sensor's either.

Q. If I am not in ESP mode on the master will my zone still modulate the airflow?

A. Yes, it doesn't matter what fan mode your in, if your zone control is in ESP Auto mode (**ON**) the zone will modulate to control your conditions.

Q. Where would we put common zones if we wanted to use one?

A. You no longer need wasteful common zones with Ultima. Common zones are impractical, as you have to dump unwanted excess air from the fan in spaces you don't necessarily need. Common zones were introduced because of the limitations of all standard fan coils. Ultima is designed to control every zone in your house and eliminate this element of waste and maximise comfort.

Q. What is the recommended setting for air balancing?

A. For air balancing, press **FAN** button on the Wall Control and set fan to **HIGH** speed.

Q. How can I make the System run at a constant 100% capacity (for example when re-charging the system?

A. In Cooling Mode: Adjust the master wall control set temperature 4°C lower than the room temperature and set the indoor fan speed to high with all zones open.

In Heating Mode: Adjust the master wall control set temperature 4°C higher than the room temperature and set the indoor fan speed to high with all zones open.

22. Key Parts List

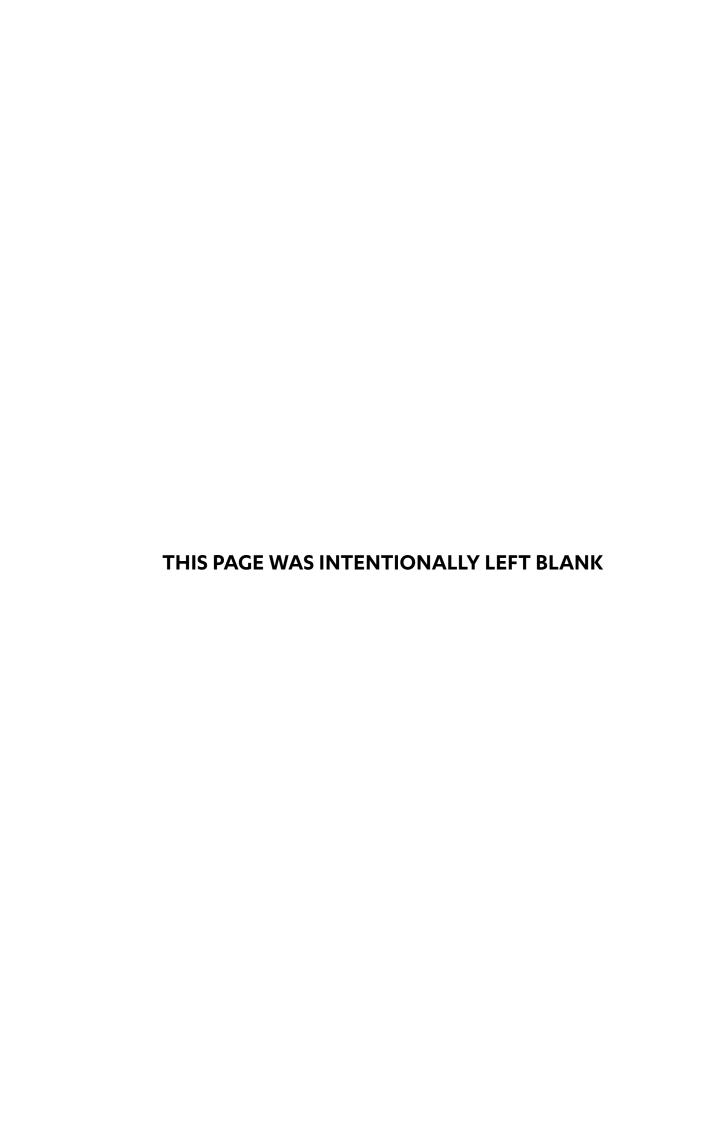
DESCRIPTION	PART NUMBER	SRD131C	SRD151C	SRD173C	SRD191C	SRD203C	SRD233C
	1560-457	1					
	1560-454		1				
	1560-464			1			
Compressor	1560-442				1		
	1560-465					1	
	1560-469						1
Outdoor Fan	2505-109	2	2	2	2	2	
Outdoor Fan	2505-130						2
Outdoor Control Board	2020-152	1	1	1	1	1	1
Metering Device - (0.591") Piston	4540-059	1					
Metering Device - (0.700") Piston	4540-070		1				
Metering Device - (0.760") Piston	4540-076			1			
Metering Device - (0.781") Piston	4540-078				1		
Metering Device - (0.807") Piston	4540-080					1	
Metering Device - (0.625") Piston	4540-062						1

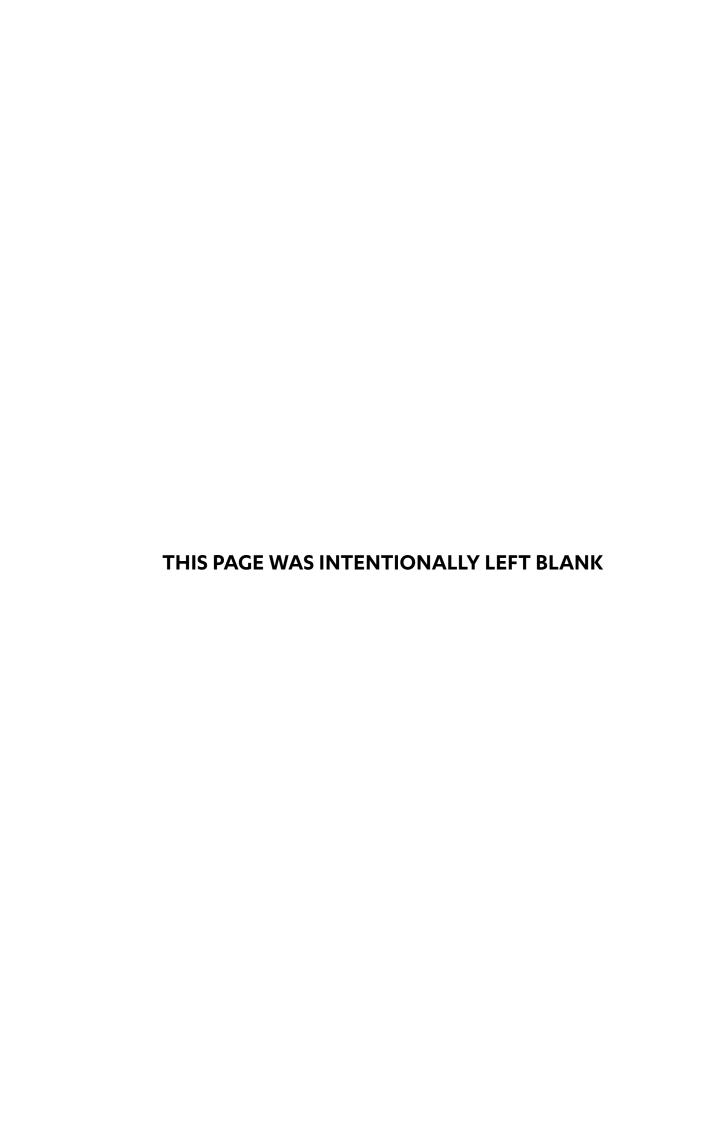
23. Start Up and Commissioning Report

INSTALLATION INFORMATION									
CUSTOMER	Name:					Tel. Number:			
CUSTOMER	Address:								
INSTALLER	Name:					Tel. Number:	Tel. Number:		
INSTALLIK	Address:								
Site Address:						Date Installed:			
Model:						Serial Number	: :		
CIRCUIT TE	MPERATURE SET	TING							
Supply Air Ter	Supply Air Temperature			°C					
Return Air Temperature				°C					
Suction Temperature				°C					
Discharge Temperature				°C					
Condenser Coil Temperature			°C						
Ambient Tem		°C							
INDOOR FA	N SETTINGS				ОПТО	OR FAN SETTINGS			
Indoor Fan Current				Amps	Outdoor Fan Current		Amps		
Indoor Fan Airflow				l/s					
Set Static				Pa					
Check No Active Error Codes on the Unit Checked:						Date Checked:			

NOTE

Ensure to record operational settings on this table for future reference. Keep this manual in a safe place and readily available for service technicians.







That's better. That's Actron.

actronair.com.au 1300 522 722









