

# Variable Capacity Commercial Package Ducted Units

Installation and Commissioning Guide



## Model Numbers

Under/Over Configuration

PKV160T

PKV180T

PKV210T

PKV240T

### **IMPORTANT NOTE:**

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

*That's better. That's Actron.*



## Table of Contents

<b>01. Inspections.....</b>	<b>3</b>
<b>02. General Information .....</b>	<b>3</b>
<b>03. Safety Instructions .....</b>	<b>4</b>
<b>04. Installation Information.....</b>	<b>5</b>
<b>05. Wall Control Operation Instruction Access.....</b>	<b>7</b>
<b>06. Components Overview .....</b>	<b>7</b>
<b>07. Package Unit Dimensions and Clearances.....</b>	<b>9</b>
07.01. Package Models: PKV160T / PKV180T	9
07.02. Package Models : PKV210T / PKV240T	11
<b>08. Unit Lifting Procedure .....</b>	<b>13</b>
<b>09. Package Unit Preparation.....</b>	<b>15</b>
<b>10. Condensate and Safety Tray Drainage Instructions .....</b>	<b>18</b>
<b>11. Electrical Installation .....</b>	<b>19</b>
<b>12. Package Unit Electrical Connection.....</b>	<b>20</b>
<b>13. Maximum Cable Length .....</b>	<b>21</b>
13.01. Wall Controller Options	21
13.02. Wiring Configuration 1 : Recommended	22
13.03. Wiring Configuration 2 : Alternate	23
<b>14. Wiring Connections .....</b>	<b>24</b>
14.01. LC7-2 Wall Control Wiring Connections	24
14.02. NEO Wall Control Wiring Connections	24
14.03. LM-RS-2 Optional Sensor Wiring Connections	25
14.04. AERSS Optional Duct Sensor Wiring Connections	25
<b>15. Configuring and Commissioning Setup .....</b>	<b>26</b>
15.01. Menu and Navigation	26
15.02. Configuring Compressor and Capacity (cnFg)	26
15.03. Configuring Control Source (CtrS)	26
15.04. Configuring Indoor Fan Setting (iduS)	27
<b>16. Optional Output/Input Relay.....</b>	<b>35</b>
16.01. Filter Indication Relay Output (CMI Board)	35
16.02. Fan Run Indication Output (CMI Board)	36
16.03. Optional Outside Air Damper Control Output (CMI Board)	36
16.04. Third Party Control Input (CMI Board and/or Outdoor)	36
16.05. Demand Response Management (Outdoor Board)	39
16.06. Run and Fault Indication Output (Outdoor Board)	40
16.07. Remote ON/OFF (Outdoor Board)	40
<b>17. Indoor Fan Table And Fan Curve .....</b>	<b>41</b>
17.01. PKV160T	41
17.02. PKV180T	43
17.03. PKV210T	45
17.04. PKV240T	47
<b>18. Refrigerant Charging .....</b>	<b>49</b>
<b>19. Maintenance Procedures .....</b>	<b>52</b>
<b>20. Maintenance Frequency Checklist.....</b>	<b>54</b>
<b>21. Start Up and Commissioning Report .....</b>	<b>56</b>

## 01. Inspections

### Information About This Guide

This guide provides installation instructions, specific to your package unit. Read this manual thoroughly and take into consideration all specifications and instructions to ensure correct installation and safe operation of your air conditioning system.

#### NOTE

Keep this document for future reference. Ensure all technicians that work on the unit can refer to this manual at any time.

### 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 and electrical rated specifications are correct.

### Codes, Regulations and Standards

The installer and/or contractor assumes responsibility to ensure that 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 Variable Capacity 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, advanced variable speed driven compressor, EC indoor fans, low-noise outdoor fans and an intelligent electronic control.

For optimum efficiency, your air conditioning unit will deliver just the right amount of cooling or heating capacity you demand. Even in extreme conditions, the unit will still supply the required demand at peak performance.

### Energy Efficient Refrigeration Circuits

The ActronAir Variable Capacity system is designed with a highly efficient 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 capacity scroll compressor with individual compressor drive
- Hydrophilic coated condenser coil designed for optimum performance and efficiency with corrugated fins and ruffled tubing
- Hydrophilic coated evaporator coil designed for optimum performance and efficiency with lanced fins and ruffled tubing
- Electronic expansion valve (EEV), to maintain efficiency at different operating conditions

### Evaporator Section

The evaporator section 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 variable speed EC motor that uses less energy than the traditional AC motor
- Easy indoor fan commissioning via intelligent controllers
- Low noise operation
- Adjustable Indoor Airflow

**Condenser Section**

Uses two (2) axial fans and an Inverter Compressor, with the following features:

- Efficient Tru-Inverter Compressor and Inverter Drive combination
- Efficient axial fans with direct drive AC motor
- Low noise operation
- Variable compressor capacity (40% - 100%)
- Multi speed outdoor fan
- Low ambients cooling operation to +5°C

**Electrical Section**

The electrical section is composed of a panel for controls and a separate panel enclosure for the variable speed drive.

**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 galvanized 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 Hydrophilic coil fins provide protection to your heat exchangers and enhanced heat transfer with increased performance efficiency.

External fasteners in all Outdoor and Package unit are stainless steel screws Gem-Cote coating.

**System Flexibility**

The ActronAir Variable Capacity range air conditioning units is the first choice for commercial applications, both for new construction or retrofitting projects.

**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 jewelry and protect long hair by wearing a cap.
- Make sure that safety guards and panel covers are always firmly secured and not damaged before and during operation of unit.
- 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 the latest edition of the AS/NZS 3000 (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.

 **DANGER****Hazardous Voltage - Risk of Electrocutation.**

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.

 **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.

 **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.

### CAUTION

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

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.

### 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.
- 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 with the latest edition of the AS/NZS 3000 (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.

### NOTES

- This unit is supplied with factory charged R-410A refrigerant.
- Be aware of all the relevant regulations concerning the handling of refrigerant.

## 05. Wall Control Operation Instruction Access

Download from website

### LC7-2

Operation Instruction can be downloaded through our website shown below.

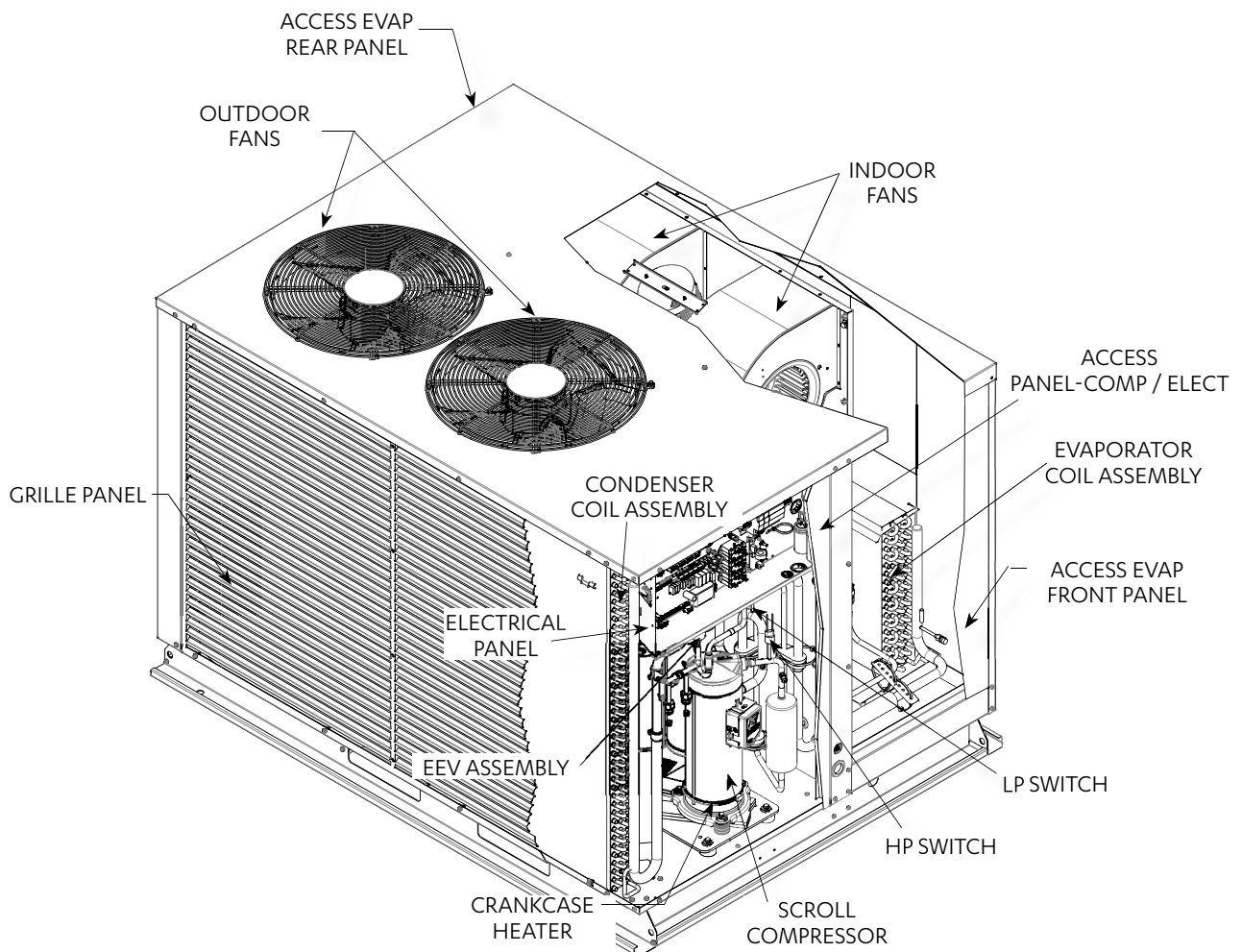
<https://www.actronair.com.au/brochures-manuals/#operating-manuals>

### NEO

Operation Instructions can be accessed through our website shown below.

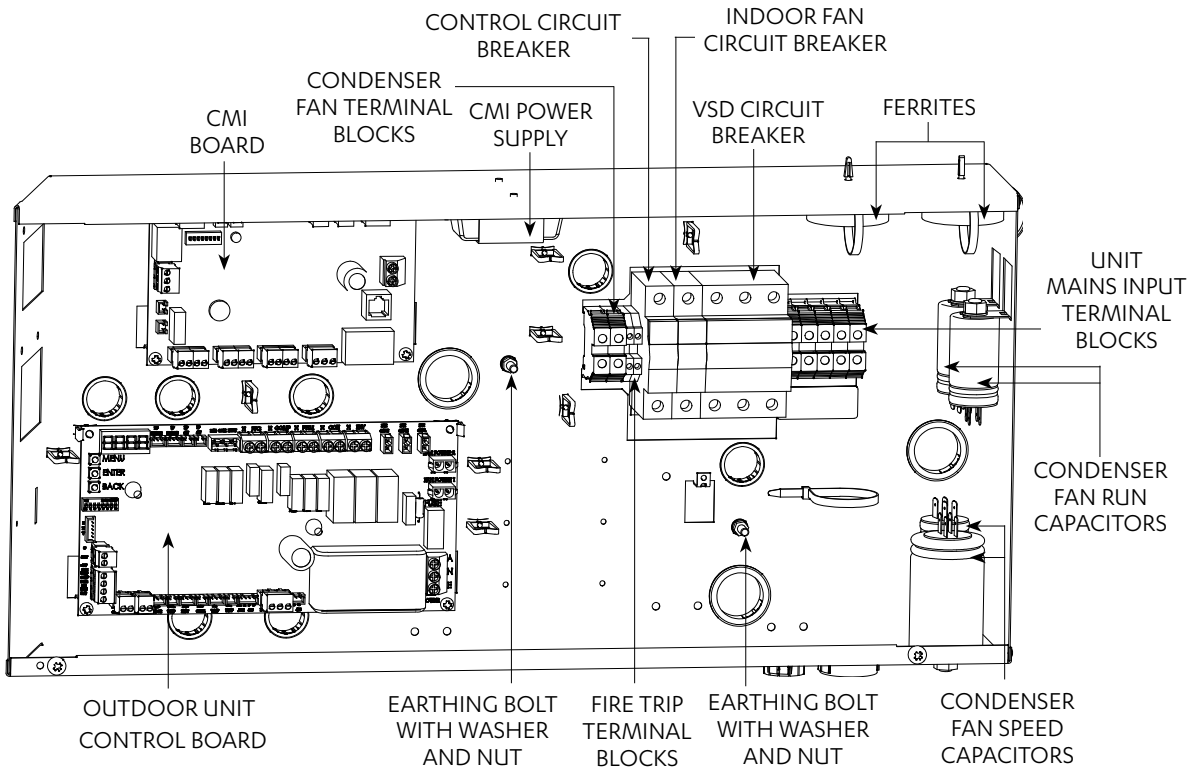
<http://neo.actronair.com.au/user-guide/>

## 06. Components Overview

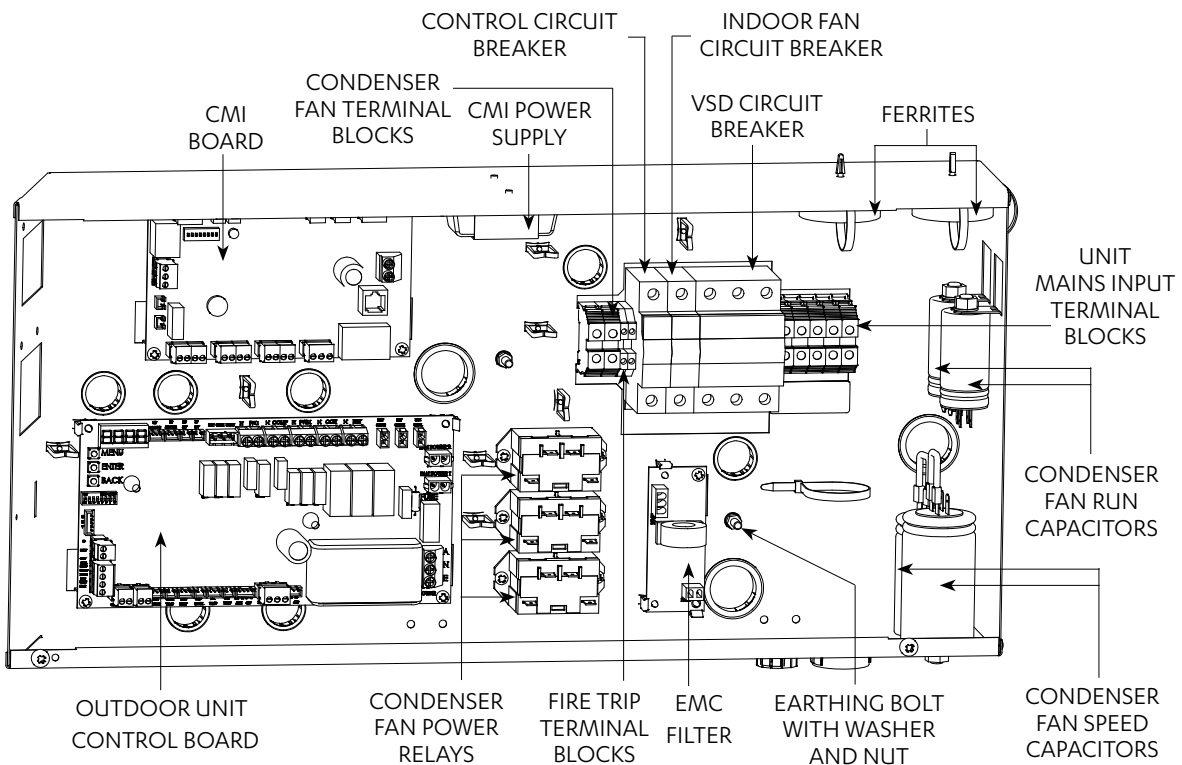


Outdoor Unit Electrical Panel Overview

PKV160T/PKV180T



PKV210T/PKV240T

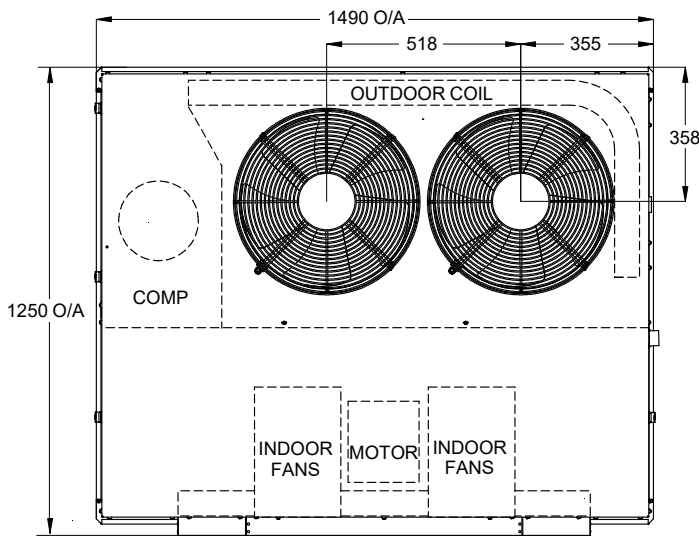




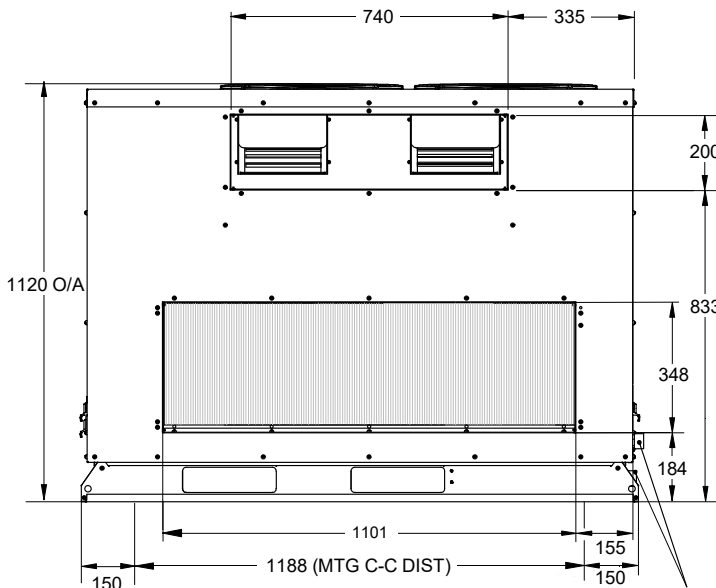
## 07. Package Unit Dimensions and Clearances

### 07.01. Package Models: PKV160T / PKV180T

OVERALL NOMINAL DIMENSION (H x W x L)  
 = 1120 x 1490 x 1250  
 SUPPLY DUCT (H x W) = 200 x 740  
 RETURN DUCT (H x W) = 348 x 1101  
 DRAIN CONNECTION = DN 25mm PN12

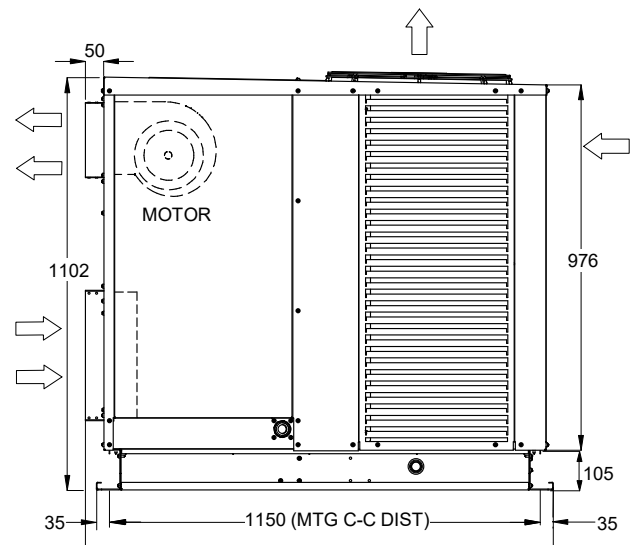


TOP VIEW



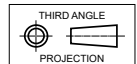
FRONT VIEW

CONDENSATE  
 DRAIN POINTS  
 DN 25mm PN12



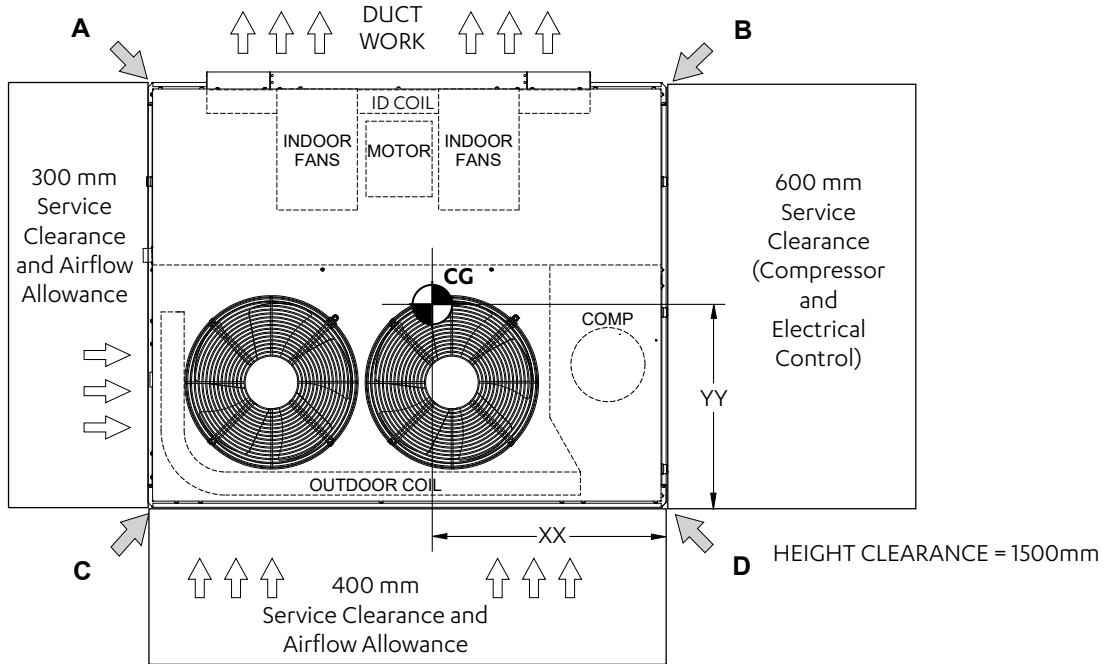
SIDE VIEW

**NOTES:**



1. Do not scale drawing. All dimensions are in mm unless specified. Refer to corresponding unit dimensional drawing for mounting hole details.
2. 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.
3. 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. STACKING OF UNITS: Ensure that minimum airflow and clearances are met.
6. MTG C-C DIST = Mounting Centre to Centre Distance.
7. Use M12 bolt for feet mounting.

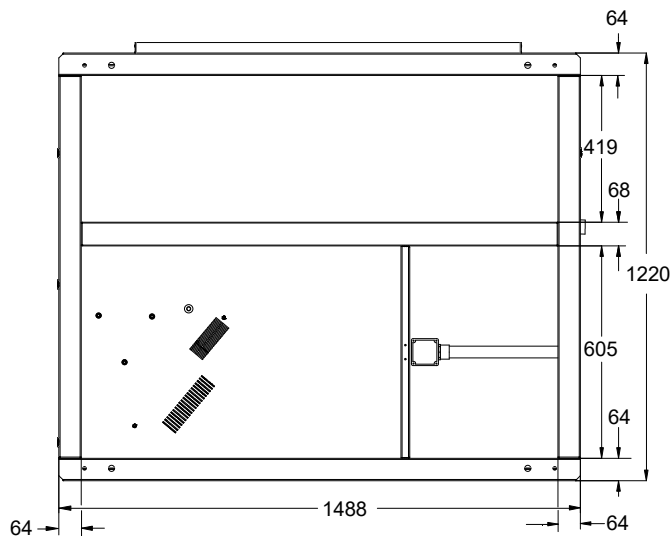
Minimum Service Access Clearances and Airflow Space Allowances



NOTES

- Under all circumstances, Condenser Air must not recirculate back onto Condenser Coil.
- Keep all clearances free of any obstructions.

Base Mounting Details

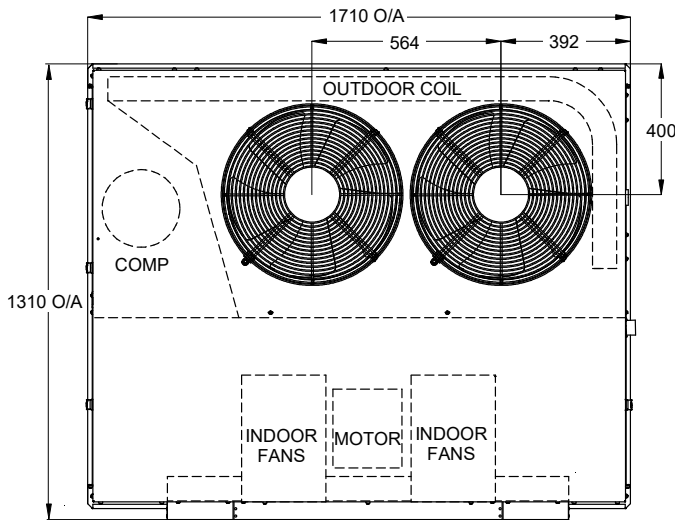


Unit Model Number	Unit Weight (Kg)	Corner Weights (Kg)				Center of Gravity	
		A	B	C	D	XX	YY
PKV160T	259	45	76	67	71	665	570
PKV180T	267	48	76	65	78	665	570

07.02. Package Models : PKV210T / PKV240T

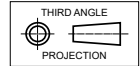
OVERALL NOMINAL DIMENSION (H x W x L)  
 = 1170 x 1710 x 1310  
 SUPPLY DUCT (H x W) = 240 x 740  
 RETURN DUCT (H x W) = 422 x 1203  
 DRAIN CONNECTION = DN 25mm PN12

PKV210-240T-T

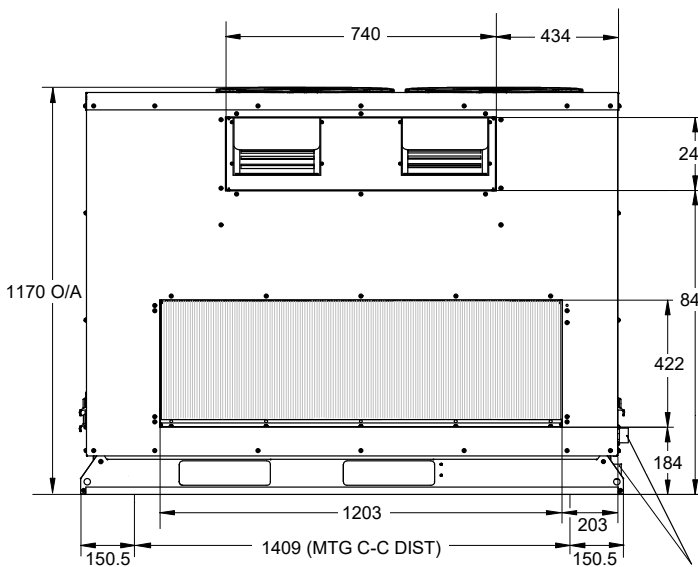


TOP VIEW

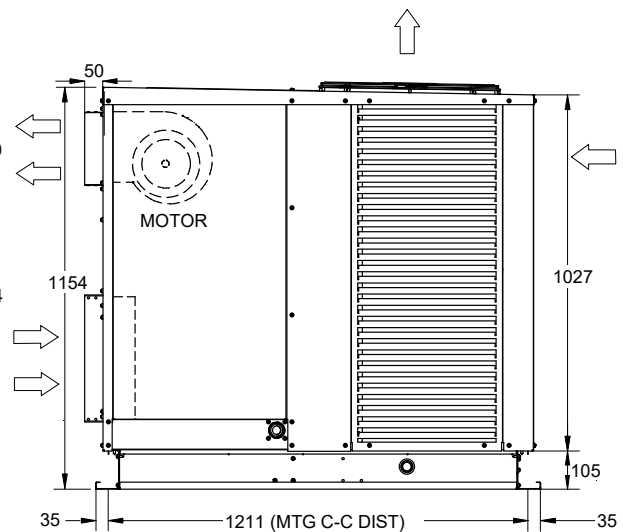
NOTES:



1. Do not scale drawing. All dimensions are in mm unless specified. Refer to corresponding unit dimensional drawing for mounting hole details.
2. 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.
3. 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. STACKING OF UNITS: Ensure that minimum airflow and clearances are met.
6. MTG C-C DIST = Mounting Centre to Centre Distance.
7. Use M12 bolt for feet mounting.



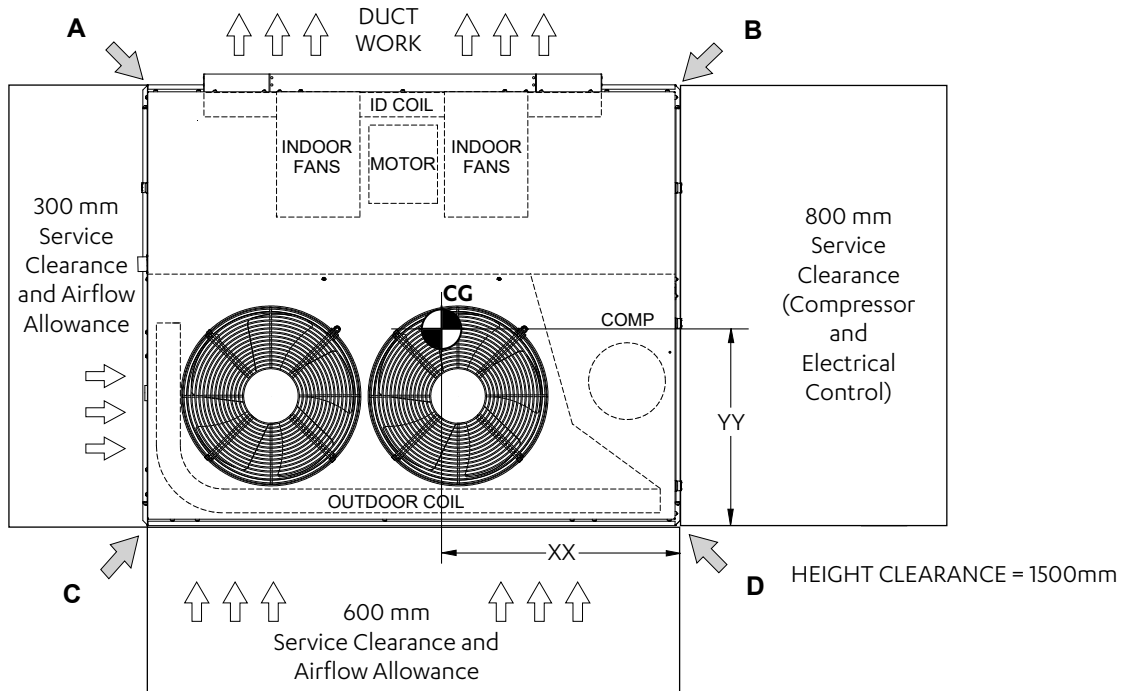
FRONT VIEW



SIDE VIEW

CONDENSATE DRAIN POINTS DN 25mm PN12

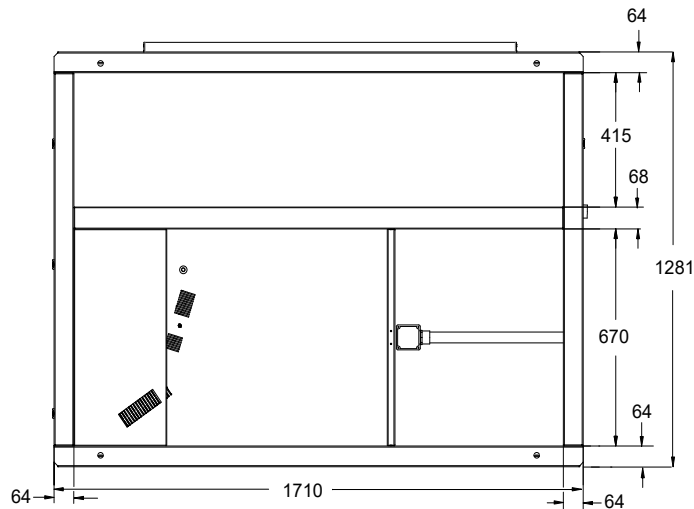
## Minimum Service Access Clearances and Airflow Space Allowances



### NOTES

- Under all circumstances, Condenser Air must not recirculate back onto Condenser Coil.
- Keep all clearances free of any obstructions.

### Base Mounting Details



Unit Model Number	Unit Weight (Kg)	Corner Weights (Kg)				Center of Gravity	
		A	B	C	D	XX	YY
PKV210T	316	88	54	47	127	745	605
PKV240T	331	90	59	54	128	745	605

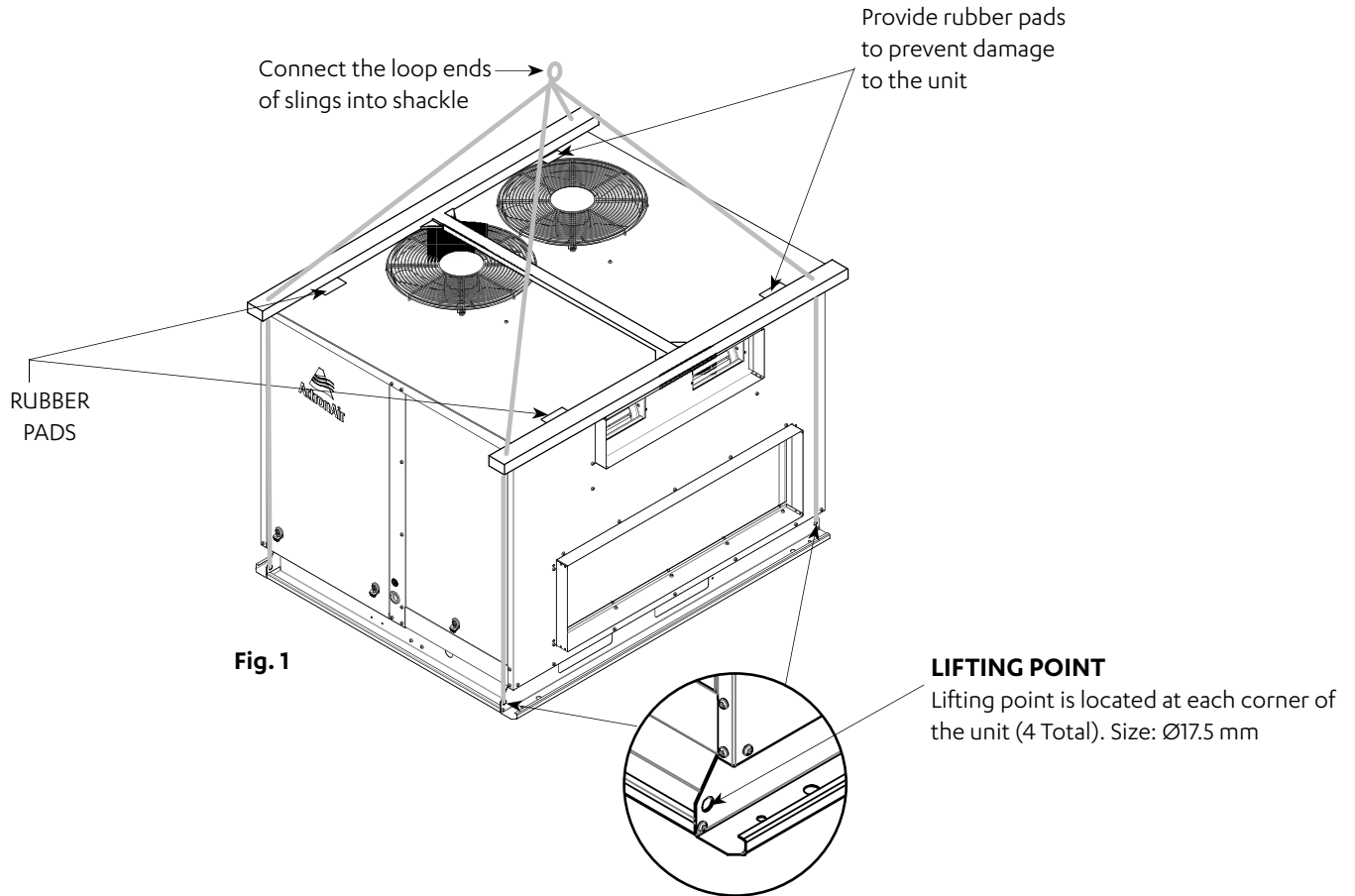
## 08. Unit Lifting Procedure

### WARNING

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

#### 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 Bar

#### NOTE

Refer to Unit Dimensions and Clearances section for unit weight before selecting shackles and slings.

## PROCEDURE:

1. Remove all screws and washers that secure the unit to the timber pallet.
2. Use 4 x Bow or Dee shackle to connect the lifting holes.
3. Slip nylon slings through all shackles.
4. Ensure slings are protected by rubber pads or similar if slings are draped across the unit edges and corners. This will prevent the unit from being damaged during lifting.
5. SPREADER BAR must be used when lifting the unit.

## 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. Check unit weight and weight distribution points on unit drawing dimensions section.

## NOTES

- Lifting procedure and unit model shown are suggestions and for illustration purposes only.
- It is highly recommended that installer observe current industry safe and sound rigging and lifting procedure.

## CAUTION

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

## Fork Lift Method

### Procedure:

1. To move the unit around with a forklift, insert the fork tines through the unit feet assembly, 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)

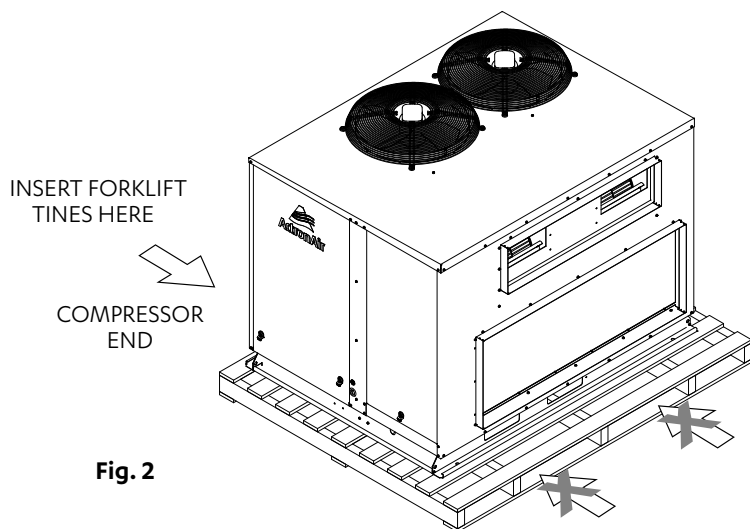


Fig. 2

## CAUTION

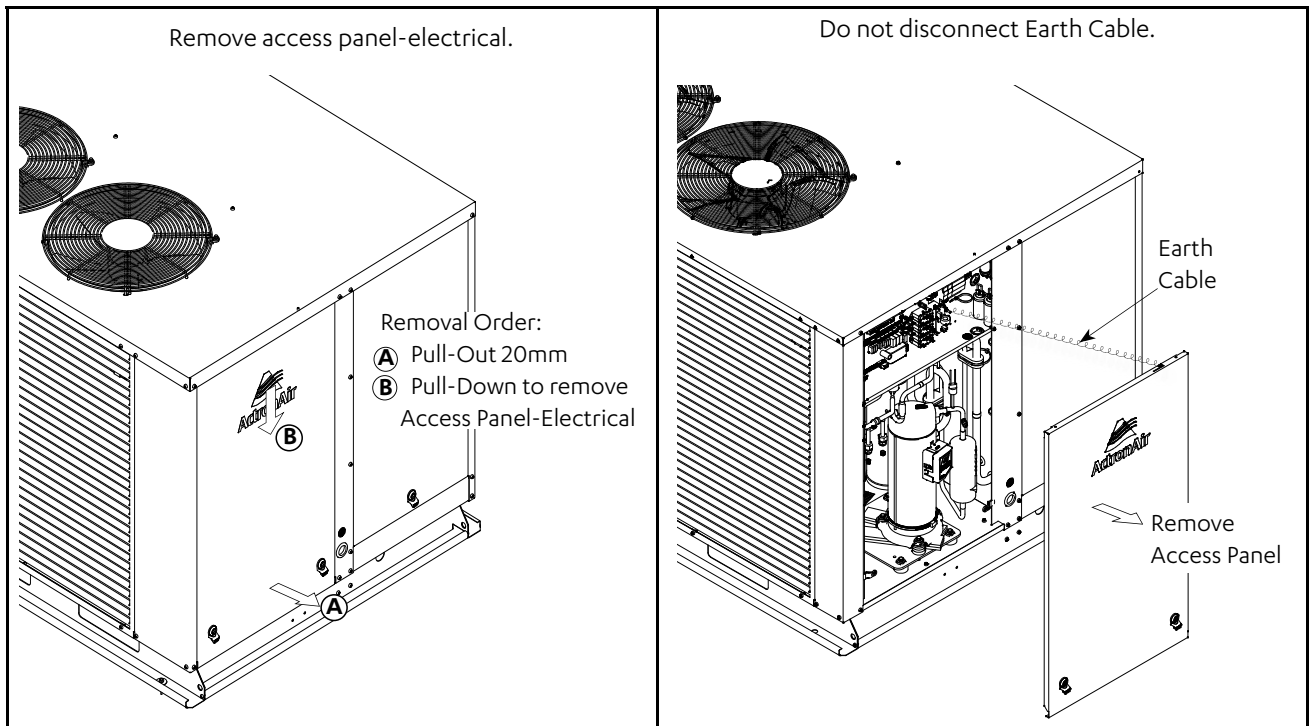
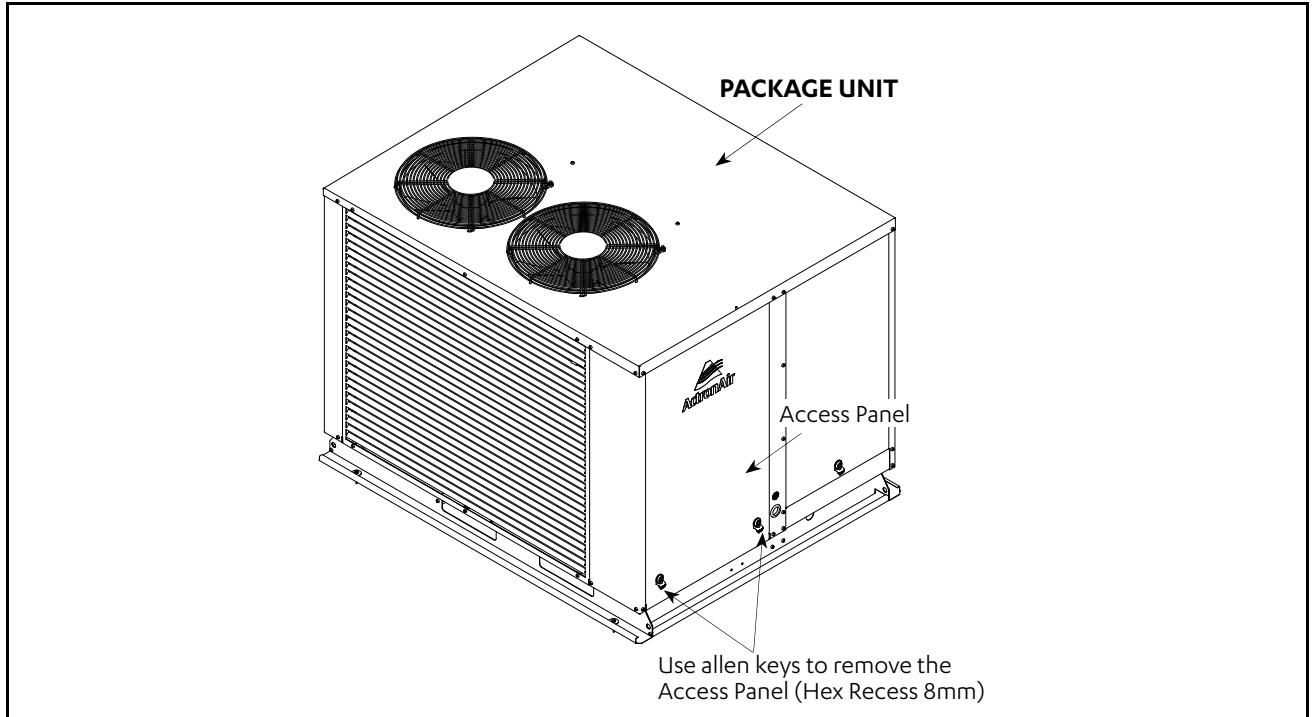
DO NOT LIFT from this end

## 09. Package Unit Preparation

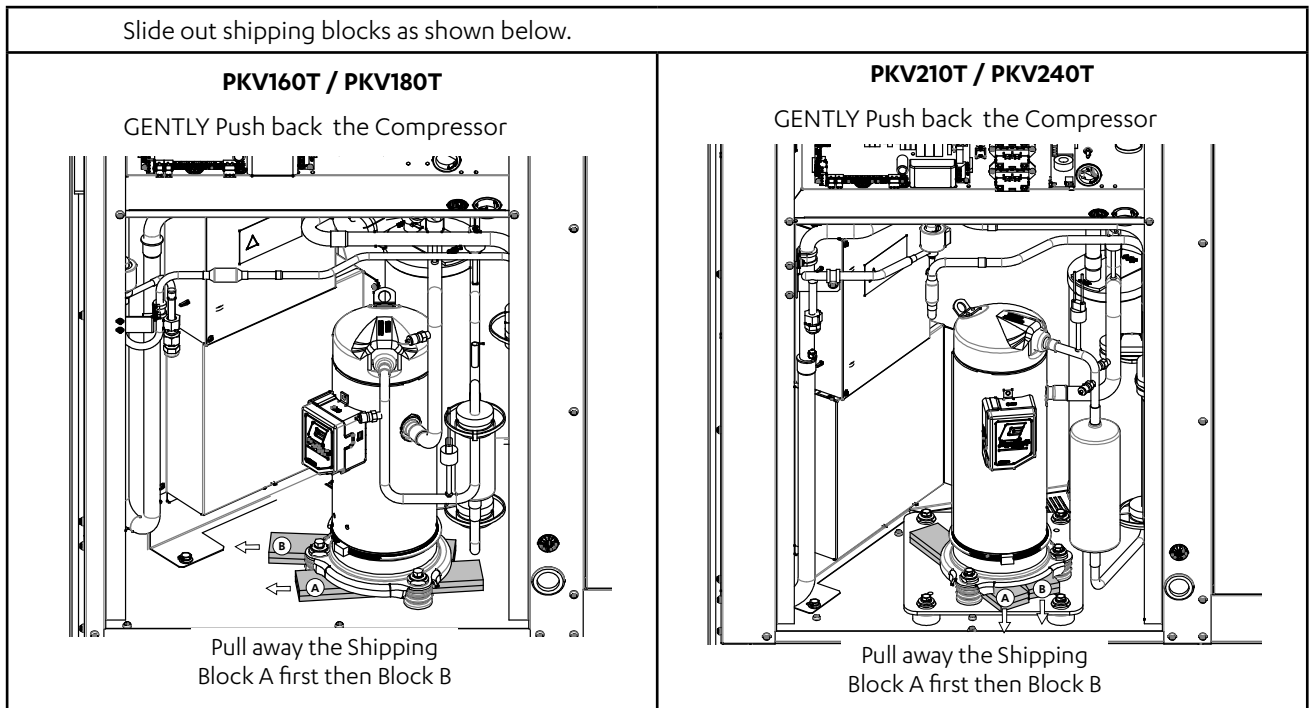
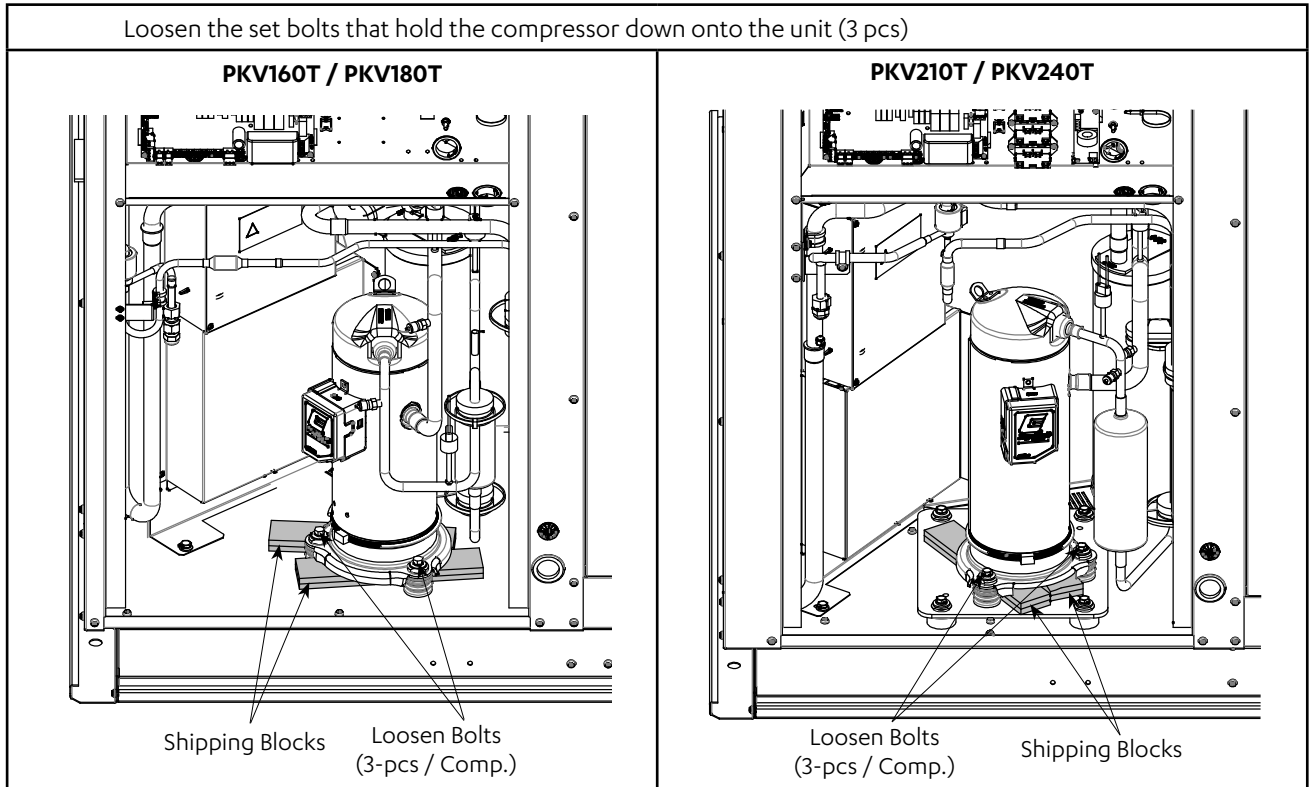
**NOTE**

It is important to remove the shipping blocks before unit operation.

Step 1. Remove Access Panel, as shown below:

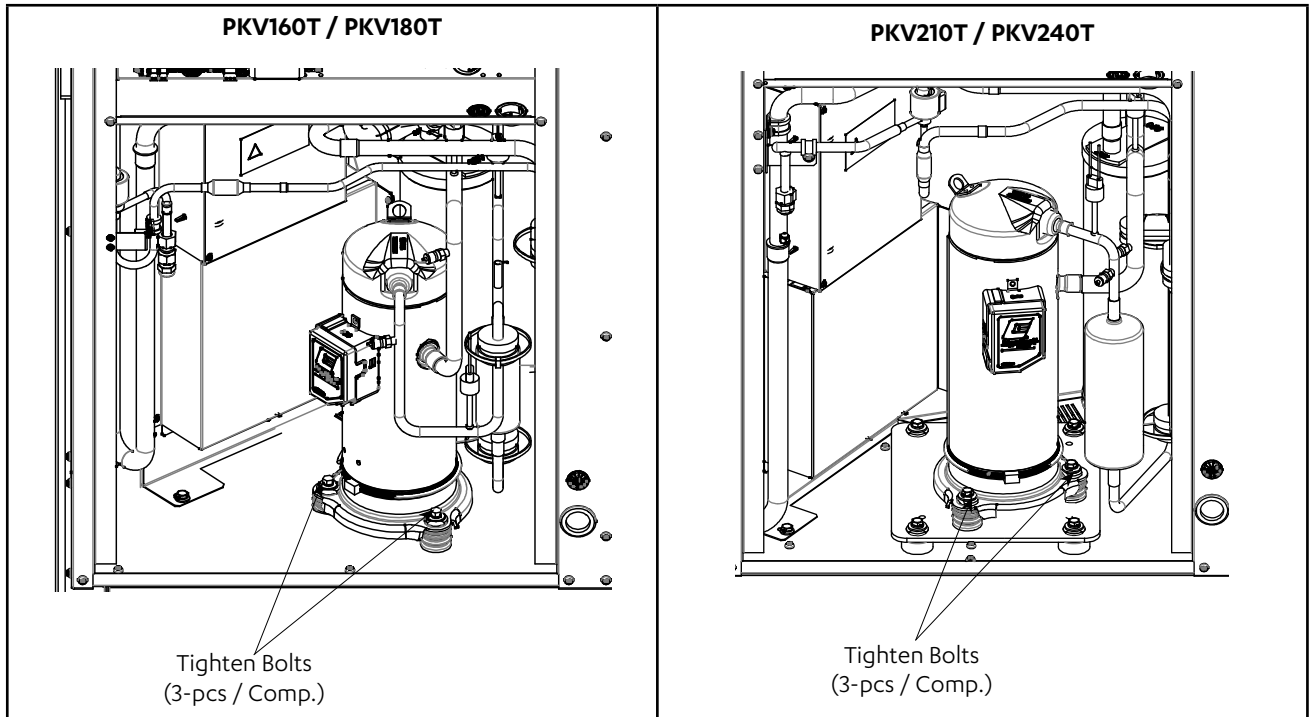


Step 2. Remove Shipping Blocks.

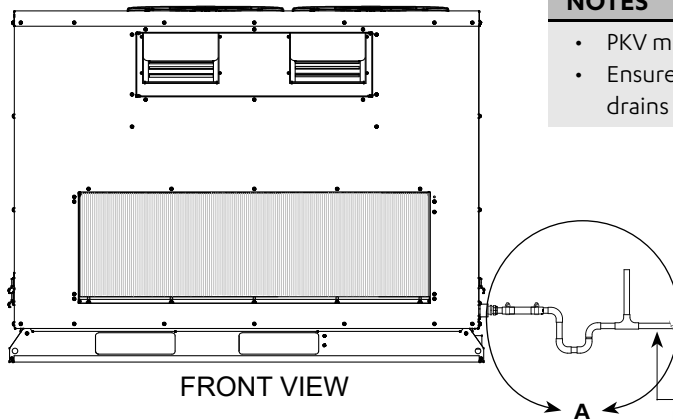
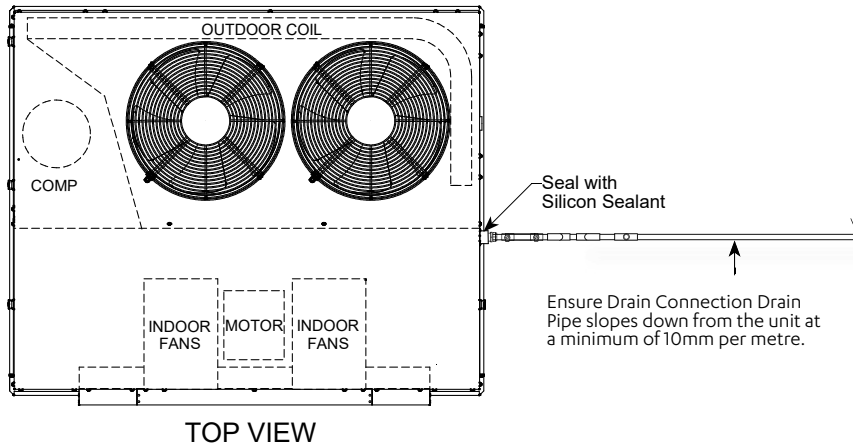




Step 3. Tighten back the set bolts that hold the compressor down onto the unit (3pcs).



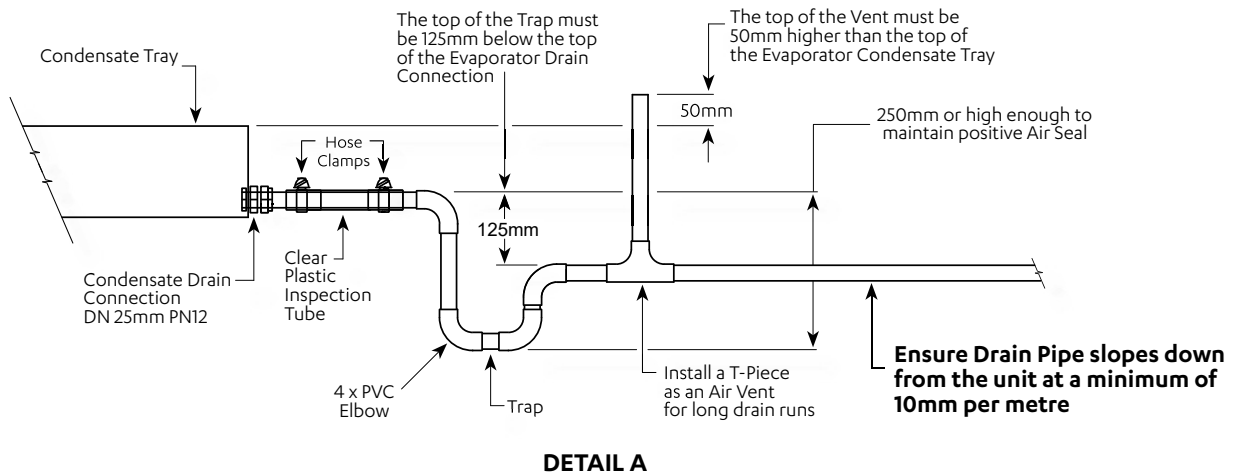
## 10. Condensate and Safety Tray Drainage Instructions



### NOTES

- PKV model shown for illustration purposes only.
- Ensure that Condenser and Evaporator condensate drains are connected separately.

### SUGGESTED DRAIN TRAP DETAILS



### NOTES

- Parts for the Condensate Trap are not supplied with the unit.

## 11. Electrical Installation

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

### DANGER

#### **Live Electrical Supply !**

- During installation of your air conditioning unit, it may be necessary to work in close proximity to live electricity.
- Only qualified technicians 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 connections are satisfied.

#### **Supply Power Requirements and Procedures**

It is the installer's responsibility to provide power supply wiring to the unit's Mains Power Supply terminal block. Ensure all wirings 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 within +10% to -6% of the rated voltage as per AS60038.
- Protect electrical service from over current and short circuit conditions in accordance with the latest edition of the AS/NZS 3000 "Australian / New Zealand Wiring Rules". Size protection devices according to the electrical data of the unit.
- Secure the power/control cables. Use the cable ties provided in the control box.
- Provide proper unit earthing in accordance with the local and national codes.

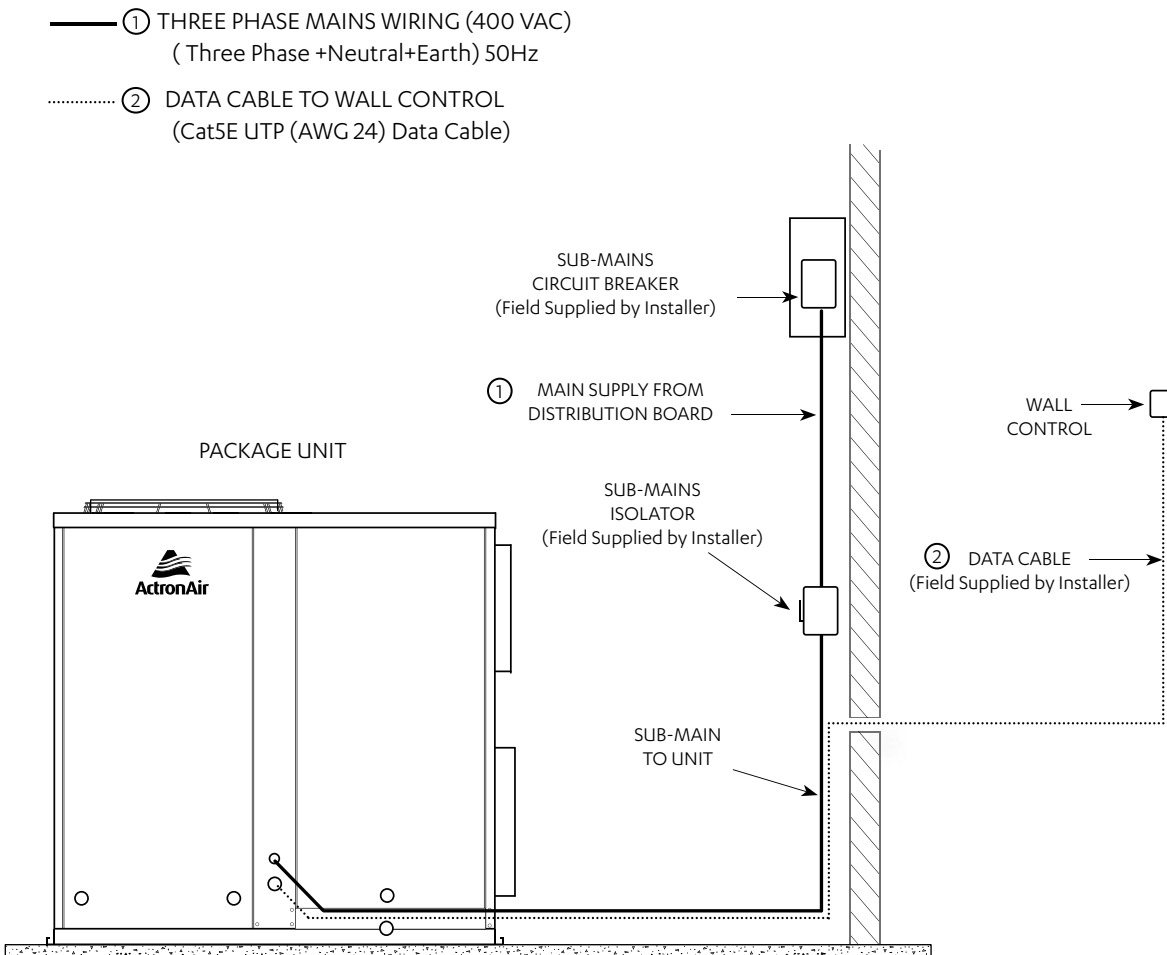
#### **Compressor Voltage Balance Requirement**

Check the voltage at the compressor 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  $\pm 2.0\%$ , check the unit wiring connections to locate and rectify the faults, should the voltage imbalance exceed this value.

## 12. Package Unit Electrical Connection

**DETAILED WIRING DIAGRAM IS PROVIDED WITH THE UNIT**

Condenser Side: Located at the back of electrical/compressor access panel.



**CIRCUIT BREAKER SIZE AND CABLE SIZE REQUIREMENT**

Model	Circuit Breaker Size	Cable Size * (mm <sup>2</sup> )
	Amps	Main
PKV160T	20.0	2.5
PKV180T	20.0	2.5
PKV210T	25.0	4.0
PKV240T	25.0	4.0

\* Suggested Minimum Cable Size should be used as a guide only. Larger size cables may be required dependent on installation method, length of cables and ambient temperature. Refer to the latest edition of the AS/NZS 3000 "Australian / New Zealand Wiring Rules" for more details.

## 13. Maximum Cable Length

### 13.01. Wall Controller Options

Maximum of three (3) wall controllers in below combinations is allowed on unit. See below table.

Combinations	Wall Controllers		
	WC 1	WC 2	WC 3
1st Option	NEO		
2nd Option	NEO	NEO	
3rd Option	NEO	NEO	LC7-2
4th Option	NEO	LC7-2	
5th Option	NEO	LC7-2	LC7-2
6th Option	LC7-2		
7th Option	LC7-2	LC7-2	
8th Option	LC7-2	LC7-2	LC7-2

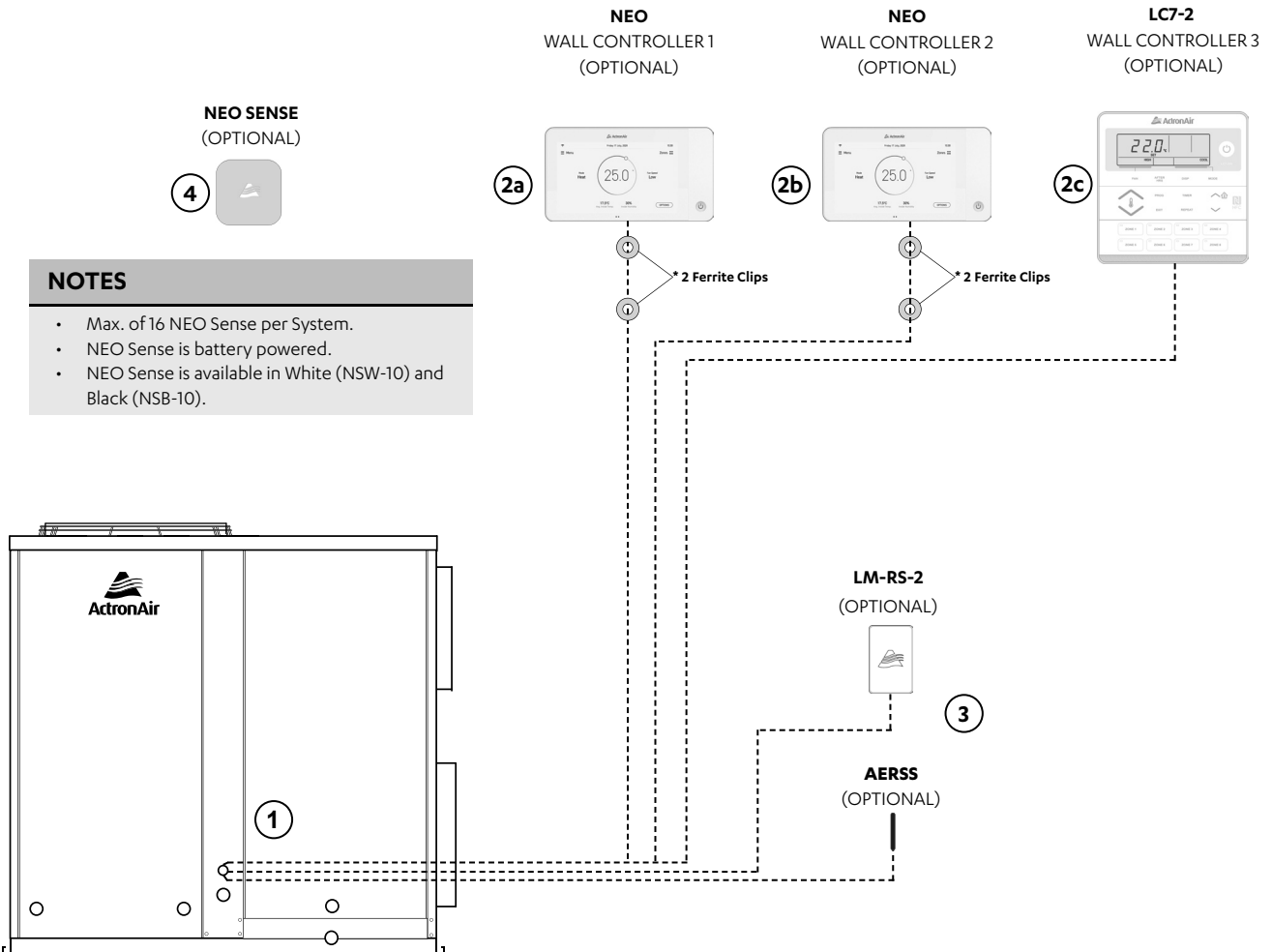
#### NOTES

- NEO - Available in White (NTW-1000) and Black (NTB-1000) colours.
- LC7-2 - Available in White and Grey colours.
- In the instance of a combination of NEO and LC7-2 being connected together, the NEO will always need to be addressed as C1.

13.02. Wiring Configuration 1 : Recommended

NOTES

- Diagram shown below is a general representation only. Refer to individual unit wiring diagram for complete wiring connection details.
- Long runs beside Mains cables or TV antenna cables should be avoided.
- Wiring configuration for LR7-1 and LC7-2 wall controller is the same.
- Daisy connection is not allowed for the NEO wall controller.
- Two Ferrite Clips\*, if supplied, are to be placed 200mm and 400mm from the NEO controller.



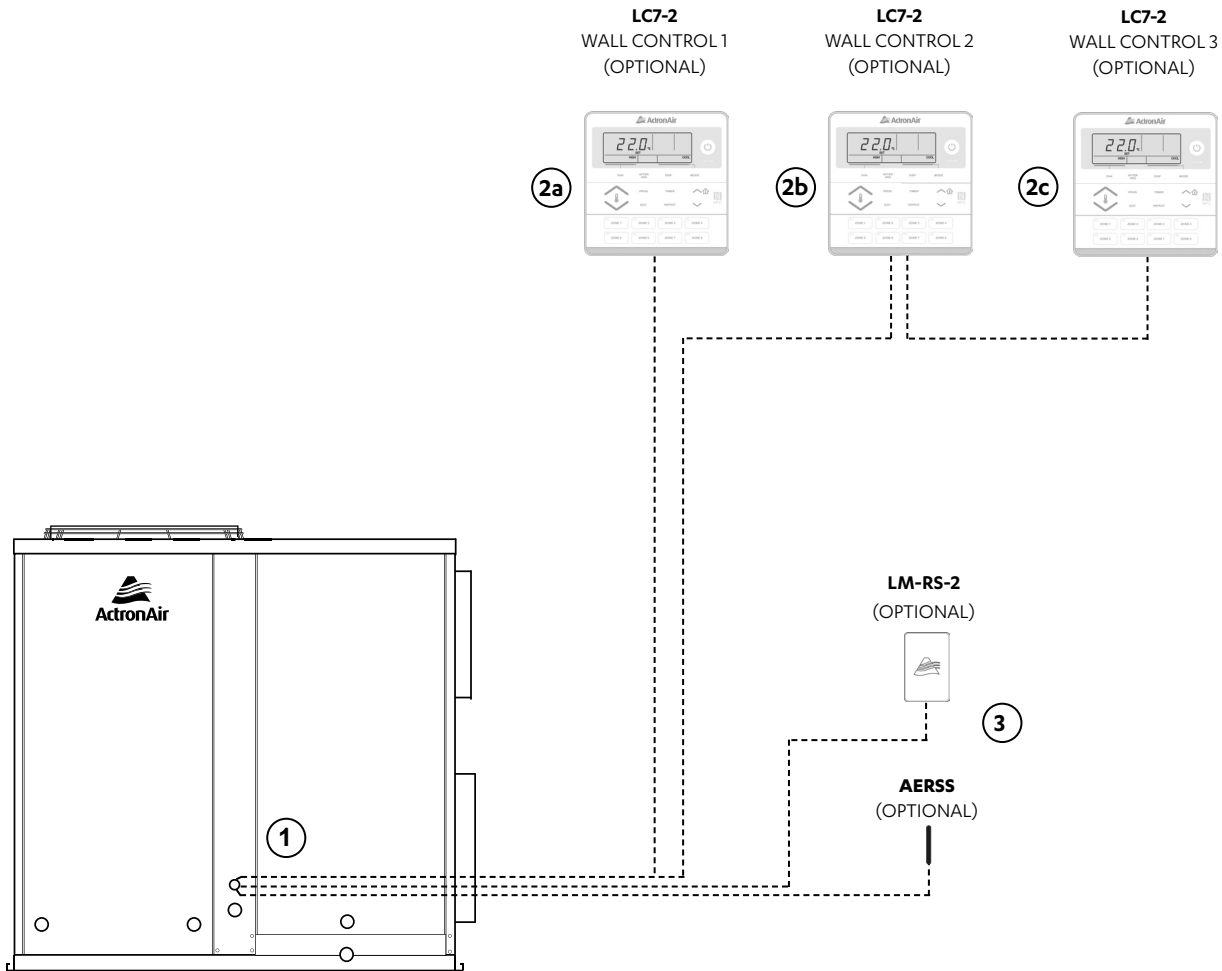
NOTES

- Max. of 16 NEO Sense per System.
- NEO Sense is battery powered.
- NEO Sense is available in White (NSW-10) and Black (NSB-10).

Item	Description	Maximum Cable Length
1 to 2a, 1 to 2b	Indoor PCB to Wall Control 1 and 2	90 m
1 to 2c	Indoor PCB to Wall Control 3	100 m
1 to 3	Indoor PCB to Remote Sensor	100 m

Description	Cable Type
LC7-2 and NEO Field Control Wiring	Cat5E UTP (AWG 24) Data Cable
Indoor to Remote Sensor	Cat5E UTP (AWG24) Data Cable

13.03. Wiring Configuration 2 : Alternate



NOTES

- Diagram shown above is a general representation only. Refer to individual unit wiring diagram for complete wiring connection details.
- Long runs beside Mains cables or TV antenna cables should be avoided where possible.

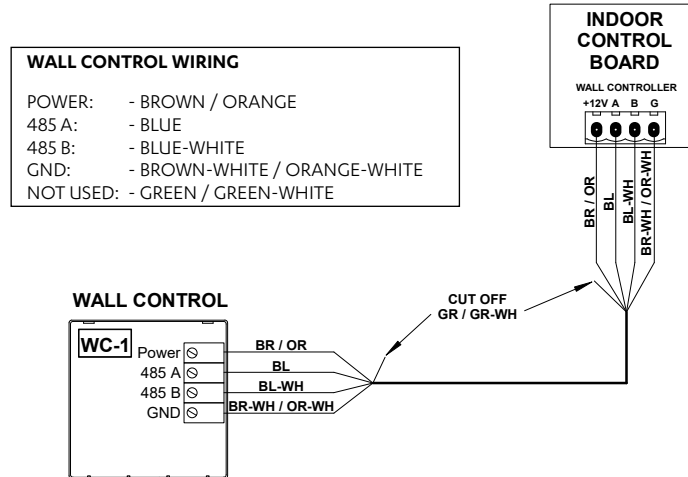
ITEM	DESCRIPTION	MAXIMUM CABLE LENGTH
1 to 2a	Indoor PCB to Wall Control 1 (optional)	100 m
1 to 2c	Indoor PCB to Wall Control 3 (optional)	75m total (Daisy Chain)*
1 to 3	Indoor PCB to Remote Sensor	100 m

\* Maximum Daisy Chain connection is up to 2 Wall Control.

DESCRIPTION	CABLE TYPE
LC7-2 Field Control Wiring	Cat5E UTP (AWG 24) Data Cable
Indoor to Remote Sensor	Cat5E UTP (AWG24) Data Cable

## 14. Wiring Connections

### 14.01. LC7-2 Wall Control Wiring Connections

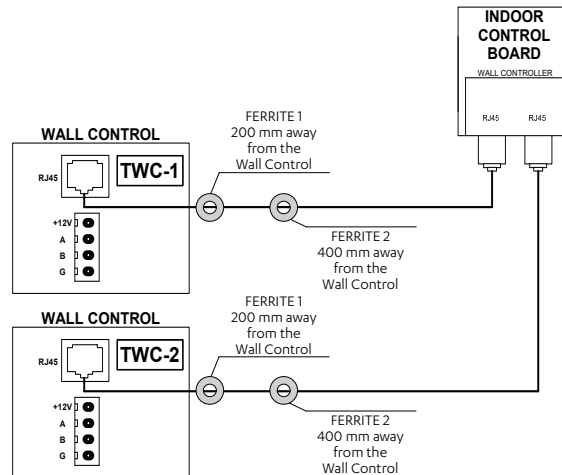


### 14.02. NEO Wall Control Wiring Connections

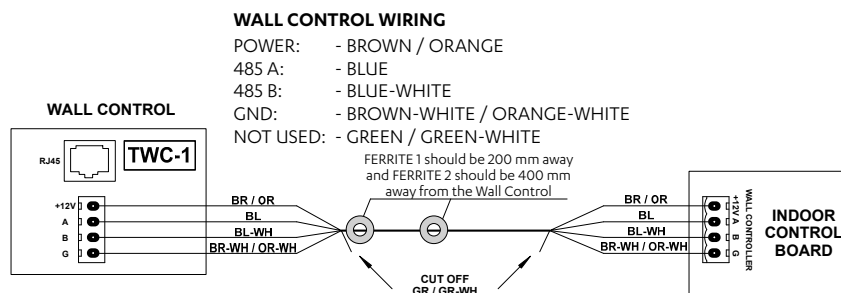
**NOTE**

Two Ferrite Clips, if supplied, are to be placed 200mm and 400mm from the NEO controller.

#### 14.02.01. NEO RJ45 Wiring

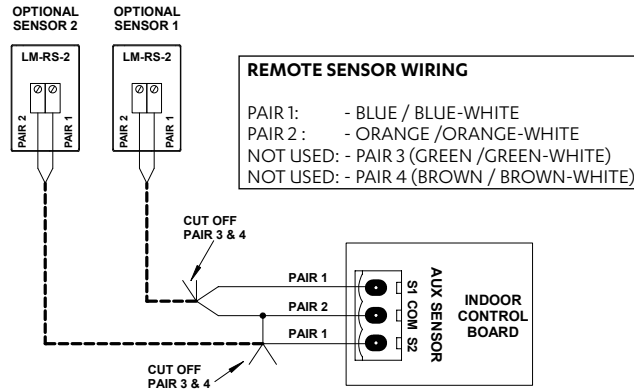


#### 14.02.02. NEO Hard Wiring





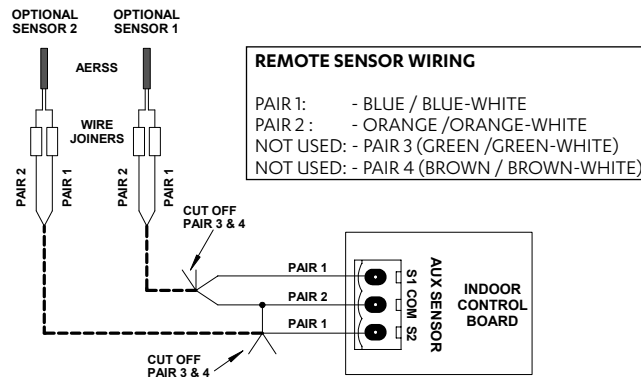
### 14.03. LM-RS-2 Optional Sensor Wiring Connections



**NOTE:**

- PAIR 1 AND 2 USED FOR ILLUSTRATION PURPOSES ONLY.
- CUT OFF AND TERMINATE ANY UNUSED PAIRS TO ENSURE NO WIRING IS LEFT EXPOSED

### 14.04. AERSS Optional Duct Sensor Wiring Connections



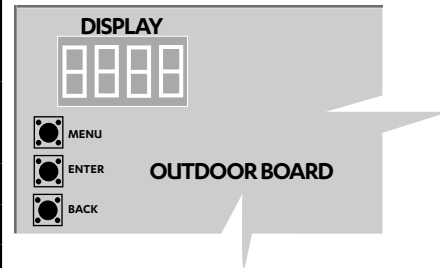
**NOTE:**

- PAIR 1 AND 2 USED FOR ILLUSTRATION PURPOSES ONLY.
- CUT OFF AND TERMINATE ANY UNUSED PAIRS TO ENSURE NO WIRING IS LEFT EXPOSED

## 15. Configuring and Commissioning Setup

### 15.01. Menu and Navigation

diS (Display)	Display system's status and settings	
SEr (Service)	Service use only	
SEt (Settings)	cnFg	04.00 = Family*
		04.24 = Capacity*
	CtrS	Ct. 0 = 3rd Party
		Ct. 1 = Wall Control (default)
		Ct. 2 = Basic BMS
		Ct. 3 = Wall Control + Basic BMS
		Ct. 4 = Advanced BMS
	iduS	FP1 = IDU Fan Low PWM setting
		FP2 = IDU Fan Med PWM setting
		FP3 = IDU Fan High PWM setting
		Fr1 = IDU Fan Low RPM setting
		Fr2 = IDU Fan Med RPM setting
		Fr3 = IDU Fan High RPM setting
		FPd = IDU Fan Defrost PWM setting
		FPc = IDU Reduced Airflow PWM setting
		FiL = IDU Fan Filter Hours setting
		Econ = IDU Econ 0-10V Output setting
		FnSE = Indoor Fan Setting
	HtSt = HotStart On/Of	
	SoFt	no = Soft Start not enabled (default)
		YES = Soft Start enabled
	run	no = Indoor Fan and Compressor (default)
		YES = Compressor only
odFs	Hi = High Start-up Speed (default)	
	Lo = Low Start-up Speed	



#### MENU

Scroll through the items at the same menu level. Increment the value being set.

#### ENTER

Go into the selected menu. Lock in selected value.

#### BACK

Go back to the parent menu. Press and hold to go back to main menu

\* Family and Capacity are the representative values only and may vary depend on the model purchased as seen below table .

Model	PKV160T	PKV180T	PKV210T	PKV240T
Family	Capacity (kW)			
04	16	18	21	24

### 15.02. Configuring Compressor and Capacity (cnFg)

Configure the compressor type and capacity. The unit is factory configured. **Do not change this setting.**

### 15.03. Configuring Control Source (CtrS)

This commissioning is applicable for BMS and other Wall Control. Configurable settings are as follows:

#### Third Party Control

The unit can be controlled by a non-ActronAir Wall Control. To do this, **CtrS** on the Outdoor Board has to be set to **Ct. 0**.

For connection details, see the wiring diagram supplied with the outdoor unit.

### Wall Control

ActronAir offers NEO and LC7-2, wall controls that can control the available features and maximise the function and operation of the air conditioner. To do this, **CtrS** on the Outdoor Board has to be set to **Ct. 1**.

### Basic BMS

The unit can be connected to a network through a BMS card (ICUNO-MOD). This allows the unit to be operated in the same way the as the NEO and LC7-2 does. To do this, **CtrS** on the Outdoor Board has to be set to **Ct. 2**.

### Wall Control + Basic BMS

The unit can be connected to a network (Basic BMS) and at the same time be controlled using the NEO or LC7-2 control. Priority will be given to the most recent command. To do this, **CtrS** on the Outdoor Board has to be set to **Ct. 3**.

### Advanced BMS

The unit can be connected for system that requires customised functions not included in the existing software or logic in the Outdoor Board but still retaining the safety logic. To do this, **CtrS** on the Outdoor Board has to be set to **Ct. 4**.

## 15.04. Configuring Indoor Fan Setting (iduS)

The fan settings may be configured using Three options: the Condenser CPU Board, NEO or LC7-2 Wall Control and Third Party Control.

### 15.04.01. Indoor Fan Speed Commissioning

The Variable Capacity Commercial indoor fan operation is supplied as a single speed system, with speed settings model dependent. This speed is adjustable via outdoor board and the NEO or LC7-2 wall control (when connected). Refer to the fan curve and the fan table section of each models fan speed setting.

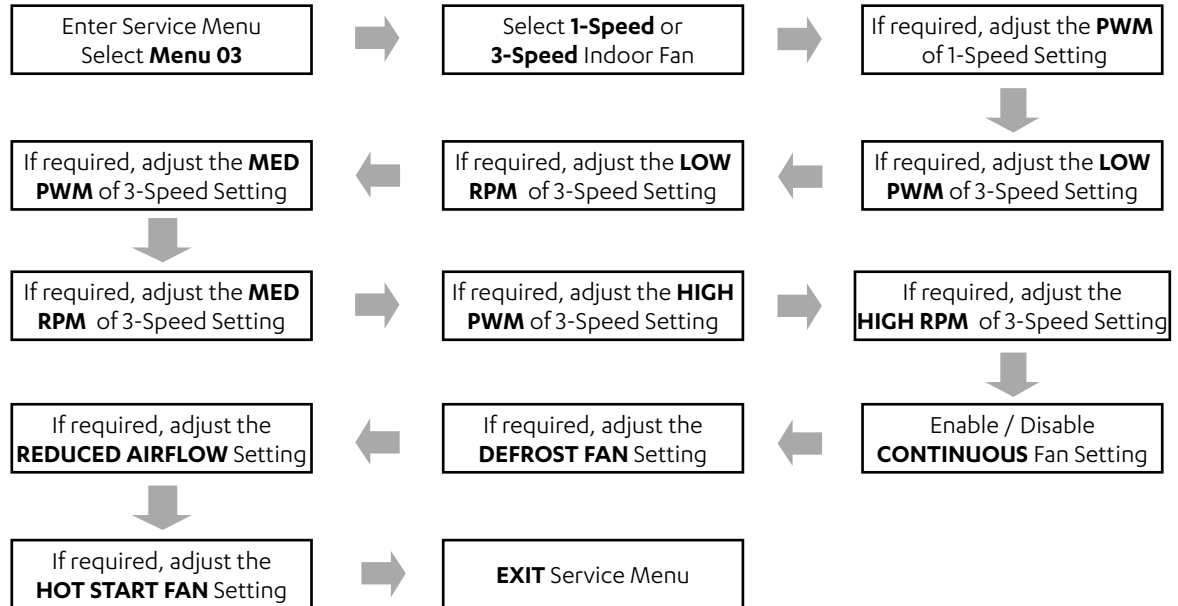
When the NEO or LC7-2 Wall Control is connected, the option of a 3-speed indoor fan is available to be programmed. The default speed settings for each of the three speeds (High, Medium and Low) are also shown in the table below. See Option 2: via Outdoor Board. For more details see Option 1: via Wall Control (NEO or LC7-2).

#### NOTES

ActronAir do not recommend adjusting the RPM limit. Before making any changes, please contact ActronAir Technical Support on 1800 119 229.

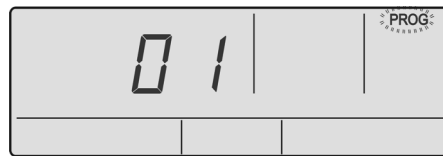
## Option 1: Via LC7-2 Wall Control

### Summary :

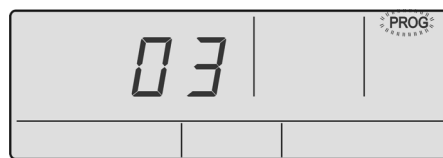


### Procedure:

1. Press and hold the **REPEAT** and the **TIMER** buttons for 3 seconds then release to enter Service Menu.



2. Press the **▼** button to scroll through to Service Menu **03**.



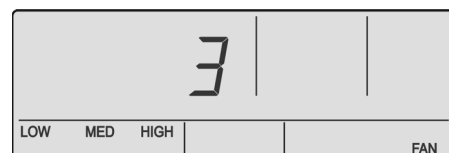
3. Press the **PROG** button to enter Service Menu **03**. Display will show the indoor fan speed selection.

### NOTES





- 1 Speed indicated with number **1** and **MED** being illuminated.
- 3 Speed indicated with number **3** and **LOW**, **MED** and **HIGH** being illuminated.



**1- Speed Indoor Fan DEFAULT**





**3- Speed Indoor Fan**

- Press the  or  buttons to select 1 or 3-Speed indoor fan setting. Then press the PROG button to accept the selection.
- Display will show the current **PWM** (speed) setting. Also displayed are **MED, FAN** and the **1** to signify that you are about to change the fan speed of 1-speed fan setting. Press the  or  buttons to adjust the single speed indoor fan PWM. Then press the **PROG** button to accept.

### NOTES

It is not possible to skip this step even if 3-speed fan setting was selected. Either adjust the PWM or accept the default setting.





- Display shows **LOW, MED, HIGH, 3** and **FAN**. With **LOW** blinking to signify current **LOW PWM** settings for 3-speed fan. Press the  or  buttons to adjust the PWM setting. Then press the **PROG** button to accept.

### NOTE

Default setting and adjustable range may vary depending on indoor models.



- Next display will show the RPM setting for **LOW SPEED**. Press the  or  buttons to adjust the RPM setting. Then press the **PROG** button to accept.

### NOTES

- The RPM numbers displayed should be multiplied by 10 to get the actual RPM setting. Example here is  $110 \times 10 = 1100$  RPM.
- ActronAir do not recommend adjusting the RPM limit.
- Before making any changes, please contact ActronAir Technical Support on 1800 119 229.



- Repeat Steps 6-7 to set **MED** and then **HIGH** PWM and RPM limit settings.
- Press **EXIT** button twice to leave the service menu.

### Option 2: via Outdoor Board

The outdoor PCB has a 7 segment display, with 3 adjacent buttons, used for commissioning the indoor fan.

MENU → SET → iduS →	PWM / RPM				SPEED SETTING	
	PKV160T	PKV180T	PKV210T	PKV240T	3 - SPEED	1 - SPEED
FP1	48	57	39	41	Low PWM	-
FP2	63	78	54	56	Med PWM	Med PWM
FP3	83	93	75	80	High PWM	-
Fr1	1150	1150	1150	1150	Low RPM	-
Fr2	1290	1290	1290	1290	Med RPM	Med RPM
Fr3	1500	1500	1500	1500	High RPM	-

#### Procedure:

1. Using the **MENU** and the **ENTER** buttons, navigate to **SEt** (Settings) → **iduS** (Indoor Settings).
2. If required, adjust and set **FP1** (Low PWM), **FP2** (Medium PWM) and **FP3** (High PWM).
3. If required, adjust and set **Fr1** (Low RPM Limit), **Fr2** (Medium RPM Limit) and **Fr3** (High RPM Limit).

#### NOTE

**FP1** (Low PWM), **FP2** (Medium PWM), **FP3** (High PWM) are adjustable settings within PWM high and low range limits. Refer to Section 15 for more details.

### Option 3: Third Party Control

#### (0-10V Fan)

1. On the Outdoor Board, set Control Source to Third Party. Using the **MENU** and the **ENTER** buttons, navigate to **SEt** (Settings) → **CtrS** (Control Source).
2. Use the **MENU** button to navigate to **0** to select Third Party Control as the control source. Press the **ENTER** button to save the setting.
3. On the CMI Board, set the first dip switch to **ON** and also ensure dip switch is **ON**.



4. Indoor Fan operation is now operational via 0-10V Third Party Control. For airflow and static pressure, see the fan curve and the fan table section for reference. Adjustable airflow range will vary from model to model.

#### (Fixed Speed)

1. On the Outdoor Board, set Control Source to Third Party. Using the **MENU** and the **ENTER** buttons, navigate to **SEt** (Settings) → **CtrS** (Control Source).
2. Use the **MENU** button to navigate to **0** to select Third Party Control as the control source. Press the **ENTER** button to save the setting.

#### NOTES

Adjustable airflow range will vary from model to model.  
Medium Speed is the speed setting for 1-speed Fan.

3. If medium speed setting (1-speed fan setting) is required to be changed, using the **MENU** and the **ENTER** buttons, navigate to **SEt** (Settings) → **iduS** (Indoor Settings) → **FP2** and **Fr2**.

- On the CMI Board, ensure that all dip switches are set as per below image.



- Indoor Fan operation is now operational via Third Party Control (1-speed).

### 15.04.02. Defrost Fan Setting

This feature allows the installer to set the indoor fan speed (PWM) during defrost mode. By default, this is set to **0** PWM (Fan Off) to avoid cold air draft. However, in some applications, continuous air circulation may be required even when the system went to defrost cycle. Note that if Continuous Fan is enabled, it takes precedence over continuous fan.

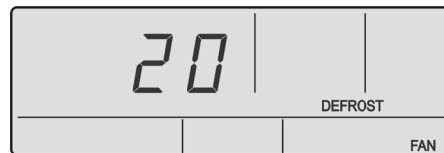
The Defrost Indoor fan speed (PWM) is can be set through the LC7-2 wall control or Outdoor PCB. Procedures are shown below:

#### Option 1: LC7-2 Wall Control

- Press and hold the **REPEAT** and the **TIMER** buttons for 3 seconds then release to enter Service Menu. The display will show the Service Menu **01**.
- Press the or buttons to scroll to Service Menu **03**. Press the **PROG** button to enter the Service Menu **03**.
- Press the **PROG** button 9 x times to enter the Defrost Fan Settings.



- Press the or buttons to select the desired indoor fan PWM then press the **PROG** button to accept. The available range is from 10 to 100. OFF means that the indoor fan is OFF during the defrost cycle. The sample screen below shows the indoor fan to 20.



- Press the **EXIT** button twice to go back to the original status display.

#### Option 2: Outdoor Unit CPU Board

- Using the **MENU** and the **ENTER** buttons, navigate to **Set** (Settings) → **iduS** (Indoor Settings) → **FPd** (Defrost PWM)
- Keep pressing the **MENU** button to select the desired indoor fan speed PWM is shown. By default, the indoor fan PWM is set to **0** and it is adjustable from **0** to **100**.

Note: **0** means the indoor fan is off during the defrost cycle.




- Press the **ENTER** button to confirm the PWM settings.
- Press the **BACK** button three times to go back to the original status display.

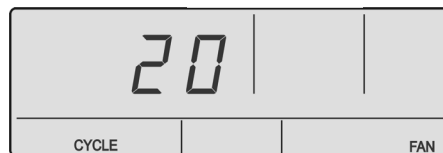
### 15.04.03. Reduced Airflow




This feature allows the system to run at lower airflow down to 20% (below system normal application range) when the compressor is not active (cycle off). This feature is useful to reduce the indoor fan power consumption during system operation but maintain the essential air circulation in the room. Note that if Continuous Fan is enabled, it takes precedent over the Reduced Airflow.

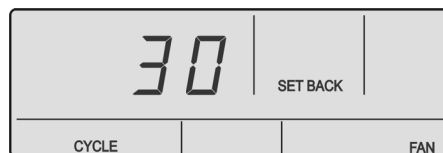
The available airflow range of reduced airflow is presented on the fan table Reduced Airflow (Compressor Off) on the next pages. By default, this option is enabled and set to **20** PWM. To turn OFF or change the PWM value:

#### Option 1: LC7-2 Wall Control

1. Press and hold the **REPEAT** and the **TIMER** buttons for 3 sec then release to enter Service Menu. The display will show the Service Menu **01**.
2. Press the   or  buttons to scroll to Service Menu **03**. Press the **PROG** button to enter the Service Menu **03**.
3. Press the **PROG** button 10 x times to enter the Reduced Airflow Settings.



4. Press the   or  buttons to select the desired indoor fan PWM then press the **PROG** button to accept. The available range is from 20 to 100. OFF means that this function is disabled. The sample screen below shows the indoor fan is set to 30 PWM.



5. Press the **EXIT** button once to go back to the original status display.




#### Option 2: Outdoor Unit CPU Board

1. Using the **MENU** and the **ENTER** buttons, navigate to **SEt** (Settings) → **iduS** (Indoor Settings) → **FPc** (Reduced PWM)
2. Keep pressing the **MENU** button to select the desired indoor fan speed PWM is shown. By default, the indoor fan PWM is set to **20** and it is adjustable from **20-100**.  
Note: **0** means the Reduce Airflow Mode is disabled.
3. Press the **ENTER** button to confirm the PWM settings.
4. Press the **BACK** button three times to go back to the original status display.

### 15.04.04. Hot Start (Draft Reduction)

Hot Start is a feature only applicable in the heating cycle, that delays the indoor fans start-up. This allows the indoor coil to heat up before the indoor fan starts so an initial cold draft is prevented. When Hot Start is disabled the compressor and fan will start at approximately the same time.




#### LC7-2 Wall Control

1. Press and hold the **REPEAT** and **TIMER** buttons for 3 seconds then release to enter Service Menu. The display will show Service Menu **01**.
2. Press the   or  buttons to scroll to Service Menu **03**. Press the **PROG** button to enter the Service Menu **03**.



- Press the **PROG** button 11x times to enter the Hot Start Settings.



- Press the   or  buttons to enable/disable the hot start operation.



- Press the **PROG** button to accept the Hot Start setting.
- Press the **EXIT** button once to return to the Main Screen.

#### 15.04.05. Air Filter Hours

This feature allows the installer to change the alarm time of Filter Notification. By default, the time before the filter alarm notification will appear is set to **200** hours. This is adjustable from **0** to **990** hrs.

##### Outdoor Unit CPU Board

- Using the **MENU** and the **ENTER** buttons, navigate to **Set** (Settings) → **idus** (Indoor Settings) → **FiL** (Filter)
- Keep pressing the **MENU** button to select the desired filter notification alarm time is shown. By default, alarm time is set to **200** hrs and is adjustable from **0** to **990**




Note: **0** means the Filter Alarm is disabled

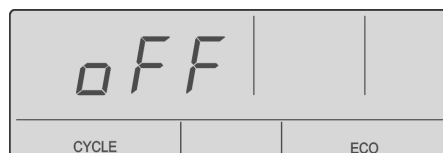
- Press **ENTER** to confirm the alarm time settings.
- Press the **BACK** button twice to go back to the original status display.



#### 15.04.06. Economy Damper

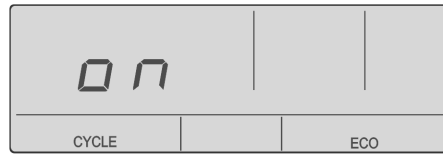
This feature allows to set the optional outside air damper opening. The available output signal is from **0** to **10V**.

##### Option 1: LC7-2 Wall Control

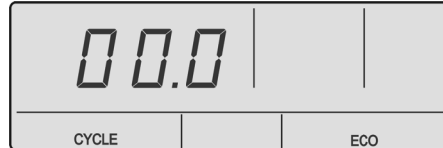
- Press and hold the **REPEAT** and the **TIMER** buttons for 3 sec then release to enter Service Menu. The display will show the Service Menu **01**.
- Press the   or  buttons to scroll to Service Menu **10**. Press the **PROG** button to enter the Service Menu **10**.
- Press the **PROG** button enter economy damper menu.





- Press the  or  buttons to enable economy damper, then press **PROG** to accept.



- Press the **PROG** button enter economy damper setting.



- Press the  or  buttons to adjust the voltage output in 0.1V increments (**0 to 10V**), then press **PROG** to accept. Sample below shows 3.0V output



- Press the **EXIT** button once to go back to the original status display.



**Option 2: Outdoor Unit CPU Board**

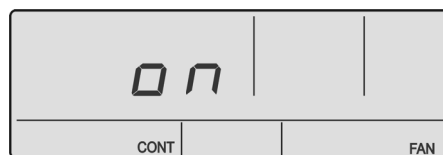
- Using the **MENU** and the **ENTER** buttons, navigate to **Set** (Settings) → **iduS** (Indoor Settings) → **Econ(0 to 10V Output)**
- Keep pressing the **MENU** button to select the desired opening (in voltage). By default, this is set to **0** (damper closed). Adjustable setting is from **0 to 10V**. (Note that in LED 7 segment display, 10.0V will show **100**.)
- Press **ENTER** button to confirm the desired damper voltage. Press **BACK** button to leave the Menu.
- Press the **BACK** button three times to go back to the original status display.



**15.04.07. Fan Continuous ON/OFF**

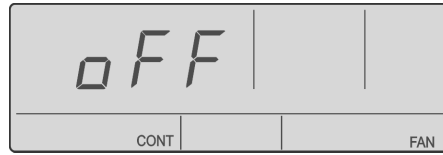
This feature allows the user to access Continuous Fan Operation. Disabling this will hide the function from the wall control. By default, this function is enabled. To disable, follow the instruction below.

**LC7-2 Wall Control**

- Press and hold the **REPEAT** and the **TIMER** buttons for 3 sec then release to enter Service Menu. The display will show the Service Menu **01**.
- Press the  or  buttons to scroll to Service Menu **03**. Press the **PROG** button to enter the Service Menu **03**.
- Press the **PROG** button 7 x times to enter the Fan Continuous Settings.



- Press the  or  buttons to select OFF. Then press the **PROG** button to accept.



- Press the **BACK** button twice to go back to the original status display.

### 15.04.08. Run and Fault Indication Output

Run Output is configurable to indicate that the unit is running. There are two configurations in which this can be set

- Either the compressor or the Indoor Fan only is running
- Only Compressor is running.

By default, this is set to **No**, where indicator will turn on when either on ID Fan Only Operation mode or Compressor is running. To set up to compressor run indication only, in OD Board Menu follow below steps.

**Procedure:**

- Using the **MENU** and the **ENTER** buttons, navigate to **Set** (Settings) → **run** (Unit Operation Indicator Settings).
- If required, press **MENU** button to navigate to **YES**.

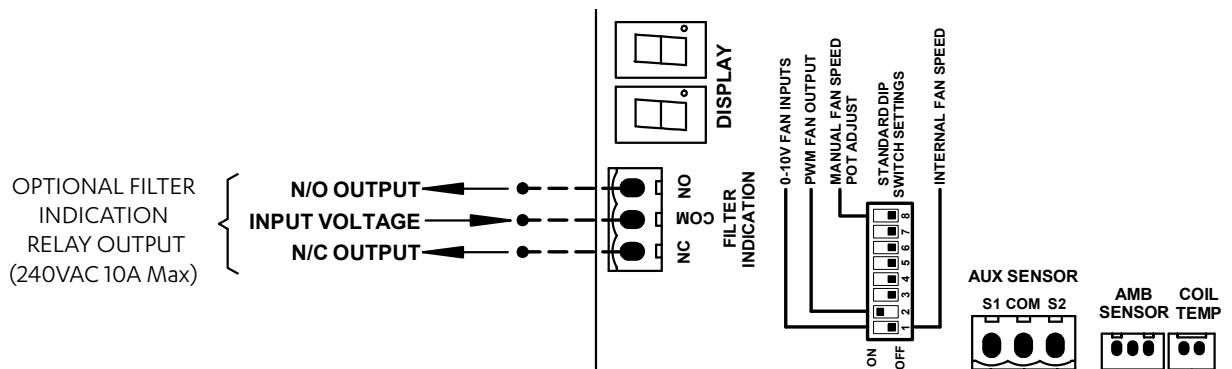
## 16. Optional Output/Input Relay

### 16.01. Filter Indication Relay Output (CMI Board)

Allows for optional connection for Filter Indication Relay (10A/240V). Option to use either normally open or normally close relay.

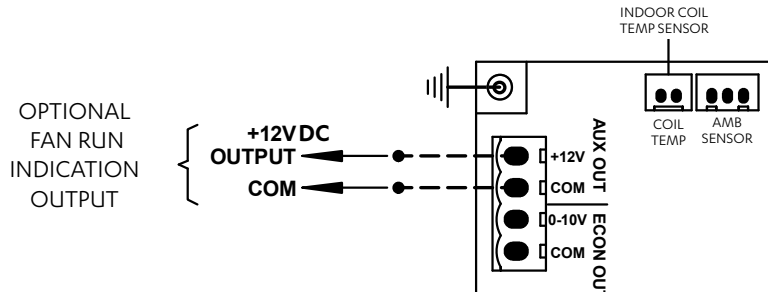
**NOTE**

To reset the alarm notification via Outdoor Board when using third party control, set the time again to clear/reset the filter alarm output.



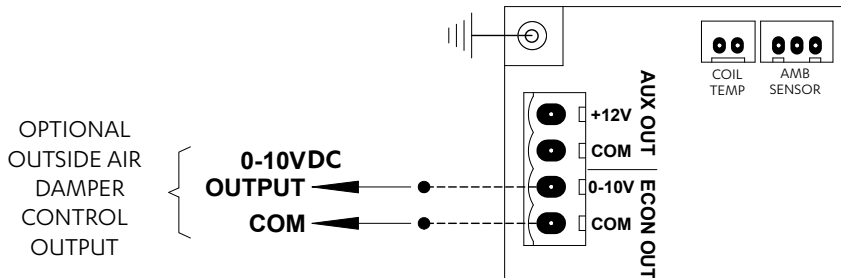
### 16.02. Fan Run Indication Output (CMI Board)

Allows for optional Fan Run Indication (12VDC)



### 16.03. Optional Outside Air Damper Control Output (CMI Board)

This feature allows to set the optional outside air damper opening (0-10V). To set-up, see 15.04.06 (Economy Damper).



### 16.04. Third Party Control Input (CMI Board and/or Outdoor)

This option allows Fan, Compressor and Reversing Valve to be controlled by a Third Party Control. There are two ways on how the Indoor Fan may be controlled, using 0-10V Analogue Input or Fixed Indoor Fan Speed. To configure the Outdoor board and Indoor Board dip switch setting, see 15.04.01 Option 3: Third Party Control.

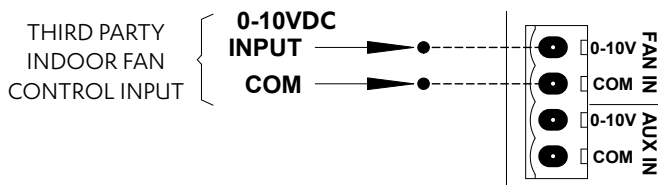
#### NOTES

- Demand Response Management (DRM) is not available if Third Party Control Option is used.
- Make sure control source has been configured for Third Party Control (Refer to section 15.03).

#### 16.04.01. 0-10V Analogue Input for Compressor and Indoor Fan

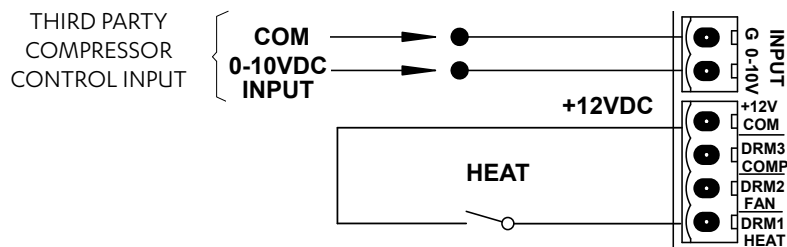
##### Fan Connection (CMI Board)

On the Indoor Board, set the first dip switch to **ON**.



Input (DC)	Output	Fan Status
0.0V to 0.99 V	0%	Off
1.0V to 1.49 V	0 or 20%	Off or On
1.5V to 9.5 V	20% to 100%	On
9.5V to 10 V	100%	On

**Compressor and Reversing Valve Connection (Outdoor Board)**



Input (DC)	Output	Compressor Status
0 - 0.99 V	0%	Off
1 - 1.49 V	0 or 20%	Off/On (hysteresis)
1.5 - 9.5 V	20% to 100%	On
9.5 - 10 V	100%	On

**NOTES**

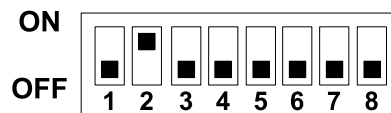
- As the compressor turns ON and the Indoor fan signal is not available then indoor fan will start to run on medium PWM speed.
- If the compressor turn ON, during reduced fan operation, the controller will increase the fan speed to the "low PWM fan limit" if it is running less than the low PWM Limits .
- Indoor fan low and high PWM limits depends upon the model. Refer to Section 17 for more details.
- The Voltage can be linearly interpolated using the above table to determine the desired PWM or unit output.

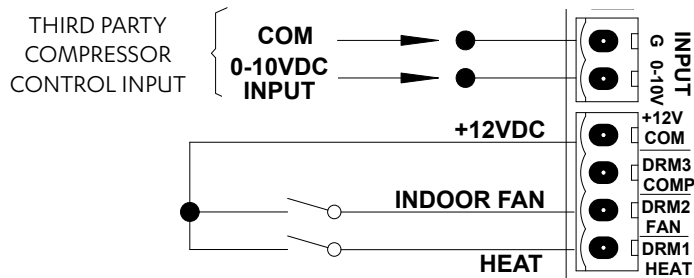
**16.04.02. 0-10V Analogue Input for Compressor with Fixed Indoor Fan Speed**

This feature allows for the Indoor Fan to be controlled externally (ON/OFF only).

**Fan, Compressor and Reversing Valve Connection (Outdoor Board)**

On the indoor board ensure dip switch ONE is **OFF**.





**NOTES**

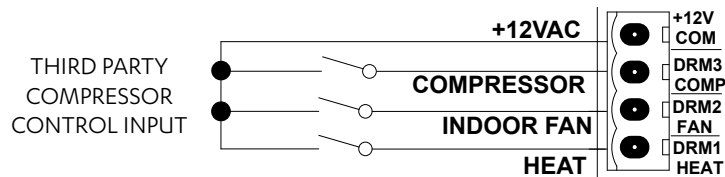
- As the compressor turns ON and the Indoor fan signal is not available then indoor fan will start to run on medium PWM speed.
- Indoor fan operation when fan signal is available:
  - Compressor ON : Indoor fan will run on medium speed.
  - Compressor OFF : Indoor fan will run on reduce airflow operation.

**16.04.03. Analogue Input for Fixed Compressor with Fixed Indoor Fan Speed**

This feature allows for both Compressor and Indoor Fan to be controlled externally (ON/OFF only).

**Fan, Compressor and Reversing Valve Connection (Outdoor Board)**

On the indoor board ensure dip switch ONE is **OFF**.

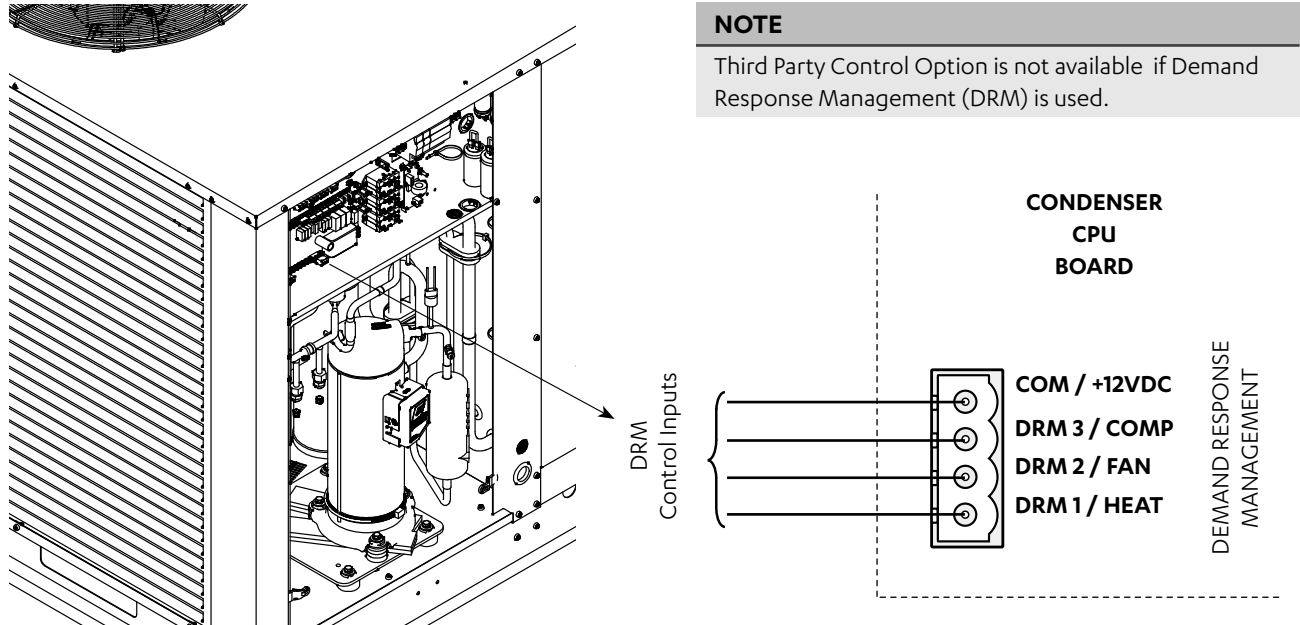


**NOTES**

- As the compressor turns ON and the Indoor fan signal is not available then indoor fan will start to run on medium PWM speed.
- Indoor fan operation when fan signal is available:
  - Compressor ON : Indoor fan will run on medium speed.
  - Compressor OFF : Indoor fan will run on reduce airflow operation.

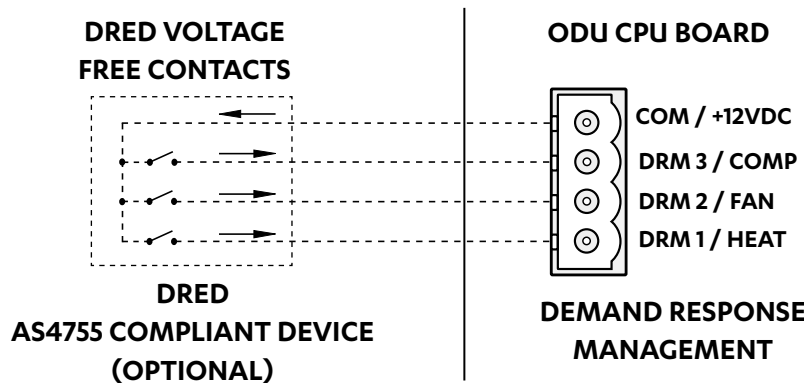
**16.05. Demand Response Management (Outdoor Board)**

These products are compliant to AS/NZS 4755.3.1:2012



1. Thread and Route DRM input cables into the Unit (as per previous wiring installation procedure).
2. Connect cables into terminals (as shown above and as per wiring diagram provided with the unit).

**DEMAND RESPONSE ENABLING DEVICE (DRED) CIRCUIT DIAGRAM**

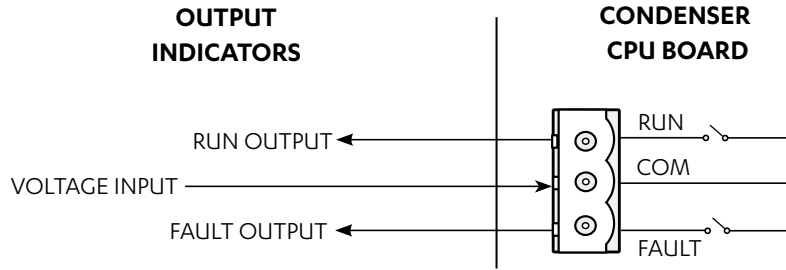


Demand Management Mode	Description Of Mode Allowable Range (%)	Operating Mode
DRM1	Compressor Off Mode	Compressor ONLY will cycle OFF and remain off for the entire Demand Response event. All other functions will operate as normal (i.e. Indoor Fan)
DRM2	Maximum 50% power use mode with 0 to <50% allowable power use range	Compressor 0 to < 50% operation range for the total Demand Response event.
DRM3	Maximum 75% power use mode with 0 to <75% allowable power use range	Compressor 0 to < 75% operation range for the total Demand Response event.

### 16.06. Run and Fault Indication Output (Outdoor Board)

To activate, the unit must be wired as illustrated below. See Section 15.04.08 for configuration. If required, a fault output connection terminal is also available to show any error/fault with the a/c system.

#### RUN/FAULT relay outputs (230VAC/5A MAX) connection

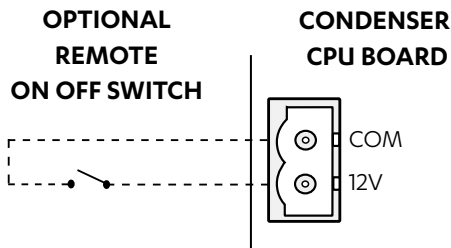


### 16.07. Remote ON/OFF (Outdoor Board)

To activate, the unit must be wired as illustrated below. This will enable unit to be turned ON and OFF from the Outdoor board.

**NOTE**

The system must be operating in Wall Controller only (control mode 1) or BMS + Wall Controller (control mode 3) for this function to work.



**TURNING THE SYSTEM ON AND OFF BY REMOTE METHOD**

Turning the system On	Status 1: The system is Off and the remote switch/relay has been left in the open position. 1. Close remote switch/relay. 2. System will start in approximately 1 minute.
	Status 2: The system is Off and the remote switch/relay has been left in the closed position. 1. Open remote switch/relay for a minimum of 5 seconds. 2. Close remote switch/relay. 3. System will start in approximately 30 seconds.
Turning the system Off	Status 3: The system is On and the remote switch/relay has been left in the closed position. 1. Open remote switch/relay. 2. System will turn Off in approximately 1 minute.
	Status 4: The system is On and the remote switch/relay has been left in the open position. 1. Close remote switch/relay for a minimum of 5 seconds. 2. Open remote switch/relay. 3. System will turn Off in approximately 30 seconds.



## 17. Indoor Fan Table And Fan Curve

### 17.01. PKV160T

APPLICATION RANGE (COMPRESSOR ON)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
600	40	139	48	199	54	257	60	317	69	380	92	450
650	45	164	52	223	59	290	65	351	76	421	99	492
700	51	196	58	261	64	322	71	393	86	465	MOTOR / BLOWER LIMIT	
<b>750</b>	57	231	<b>63</b>	<b>291</b>	70	362	78	443	95	509		
800	62	259	70	339	77	413	84	485				
850	69	304	77	387	83	459	94	539				
900	76	349	83	431	89	507						

REDUCED AIRFLOW *(COMPRESSOR OFF)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
200	MOTOR / BLOWER LIMIT				22	87	27	123	31	150		
250			21	73	26	108	30	139	35	181	44	220
300			24	85	29	121	34	162	38	197	51	245
350	21	61	27	98	33	142	38	184	43	223	58	279
400	22	64	30	109	36	155	42	206	48	255	64	306
450	27	82	34	129	40	176	46	228	53	284	70	338
500	31	98	38	149	44	197	51	259	58	316	76	373
550	36	122	42	169	49	227	55	282	63	346	84	411

#### NOTES

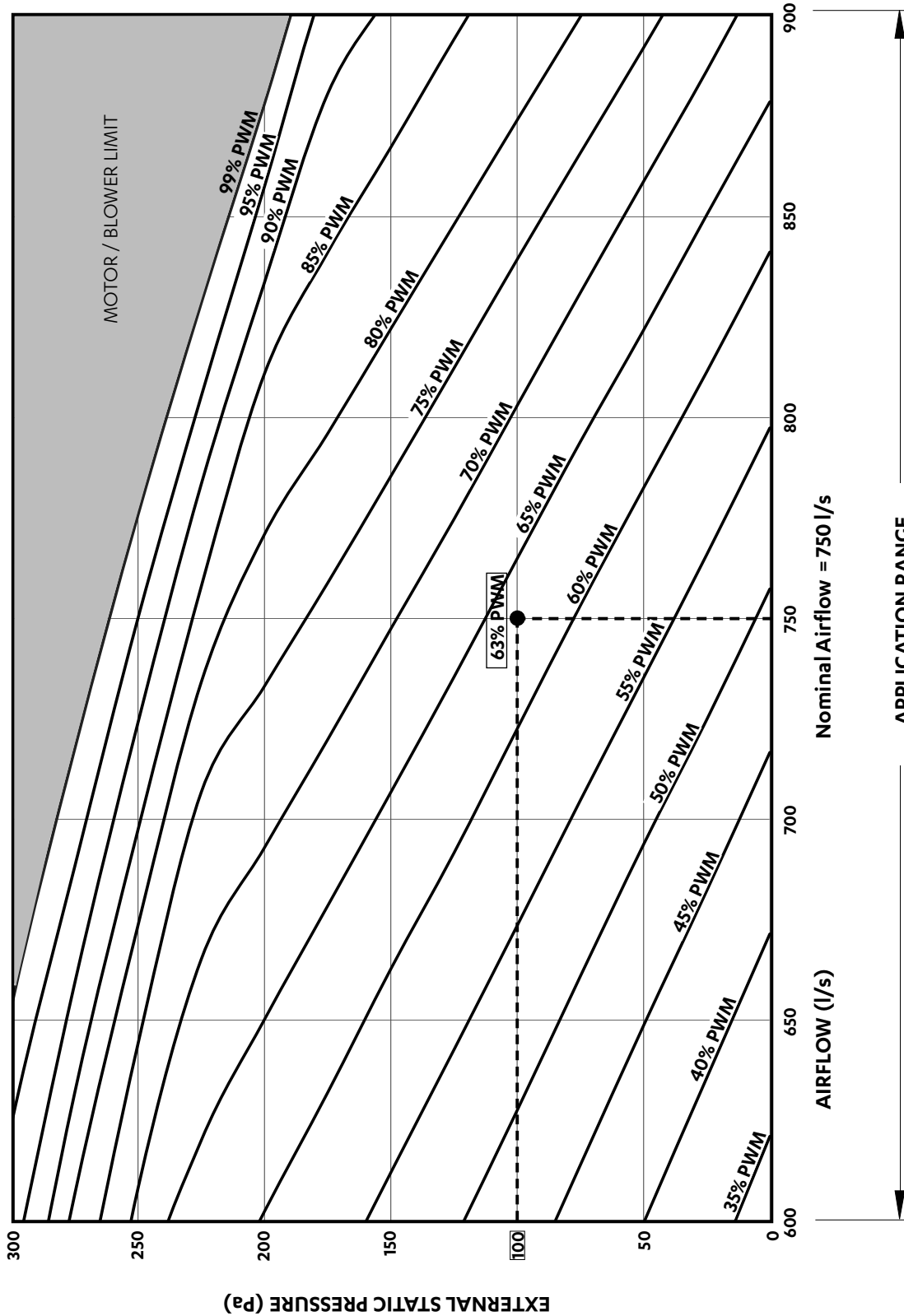
\* Reduced fan airflow is the airflow during compressor OFF operation (optional feature)

W = Indoor Fan Power, Watts

PWM = Pulse Width Modulation Setting, % PWM (Adjustable through the LC7-2 Control Interface or Outdoor Board).

Default Fan Speed Value at 100Pa	
Speed	Default PWM (adjustable)
High PWM (%)	83
Medium PWM (%)	63
Low PWM (%)	48

Indoor Fan PWM Limits	
PWM High Limit	99
PWM Low Limit	40



**Notes:**

1. Performance Fan Curve shown is at Dry Coil Condition.
2. Airflow should be reduced with respect to the moisture content in the air.
3. All data provided does not include filters. Please review filter manufacturer for application.
4. 2.5 m/s face velocity point will occur at 1025 l/s.

17.02. PKV180T

APPLICATION RANGE (COMPRESSOR ON)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
680	50	191	57	254	64	320	71	391	81	456	MOTOR / BLOWER LIMIT	
700	52	201	59	265	66	333	73	405	85	475		
750	58	236	65	303	72	372	79	445	93	524		
800	64	271	71	340	79	422	86	499				
<b>850</b>	71	315	<b>78</b>	<b>386</b>	85	468	94	558				
900	78	360	85	440	93	528						
950	85	412	93	499								
1000	93	467										
1020	96	489										

REDUCED AIRFLOW *(COMPRESSOR OFF)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
200	11	35	18	63	23	96	28	132	32	163	37	203
250	16	48	21	76	26	110	31	148	36	188	45	230
300	18	53	24	87	30	129	34	162	39	206	51	250
350	21	63	28	106	33	142	39	192	44	235	57	285
400	23	66	31	117	37	163	43	214	48	257	64	300
450	28	89	35	137	41	184	47	235	54	295	69	348
500	32	105	39	157	45	204	52	266	59	324	76	386
550	36	122	43	175	50	233	56	288	64	357	83	426
600	41	146	48	201	55	261	61	322	69	389	91	469

**NOTES**

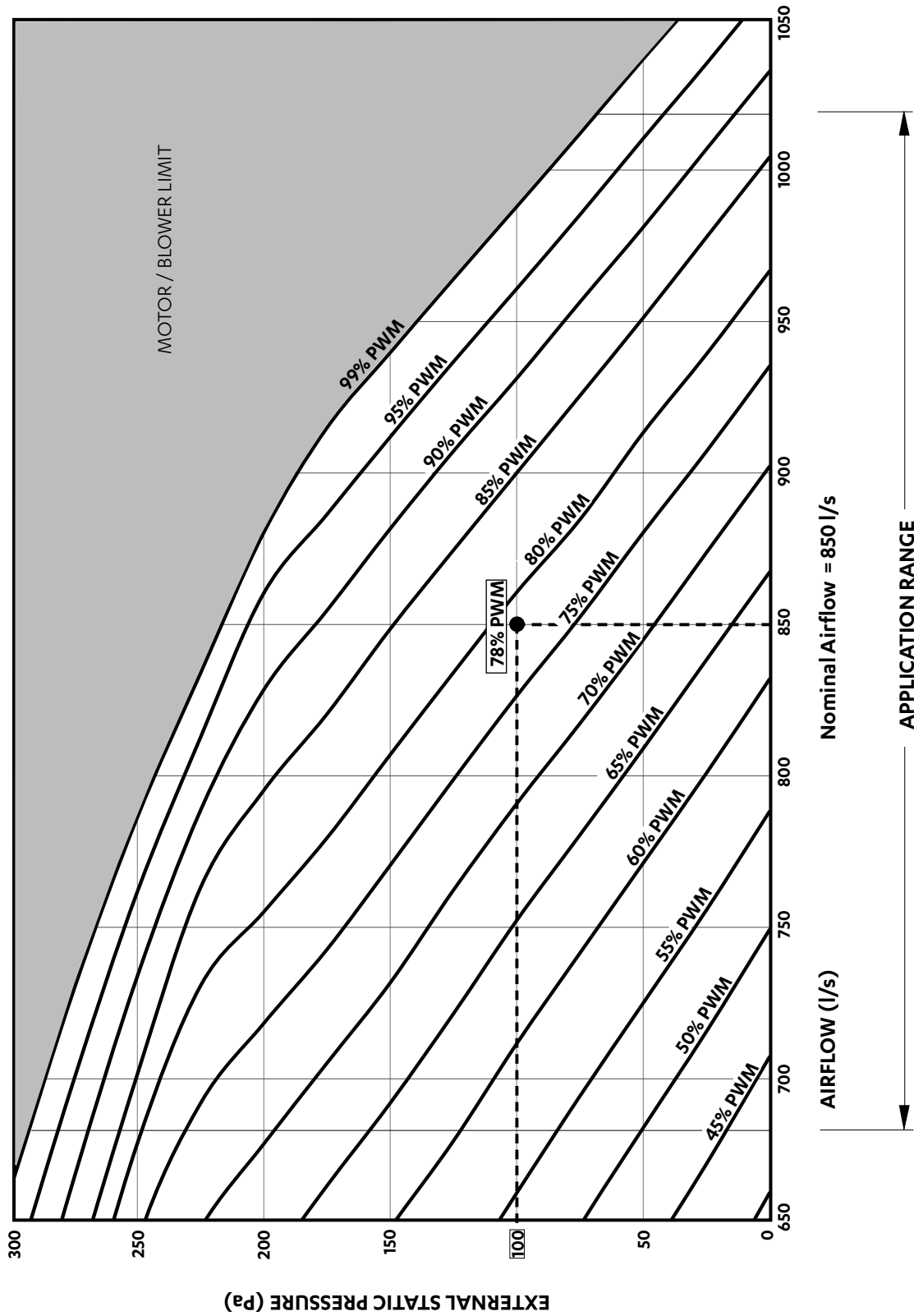
\* Reduced fan airflow is the airflow during compressor OFF operation (optional feature)

W = Indoor Fan Power, Watts

PWM = Pulse Width Modulation Setting, % PWM (Adjustable through the LC7-2 Control Interface or Outdoor Board).

Default Fan Speed Value at 100Pa	
Speed	Default PWM (adjustable)
High PWM (%)	99
Medium PWM (%)	78
Low PWM (%)	57

Indoor Fan PWM Limits	
PWM High Limit	99
PWM Low Limit	50



**Notes:**

1. Performance Fan Curve shown is at Dry Coil Condition.
2. Airflow should be reduced with respect to the moisture content in the air.
3. All data provided does not include filters. Please review filter manufacturer for application.
4. 2.5 m/s face velocity point will occur at 1025 l/s.

17.03. PKV210T

APPLICATION RANGE (COMPRESSOR ON)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
800	35	204	39	262	44	330	48	391	57	467	76	534
850	38	228	43	295	47	354	52	429	62	507	81	584
900	42	260	46	316	51	394	56	469	70	552	88	630
950	46	293	50	354	55	431	61	515	75	600	96	684
<b>1000</b>	49	315	<b>54</b>	<b>391</b>	60	477	65	563	82	646	MOTOR / BLOWER LIMIT	
1050	54	364	60	449	64	518	70	607	90	699		
1100	59	406	64	487	69	578	78	669	97	750		
1150	64	456	69	545	75	643	86	723				
1200	69	512	75	607	80	700	95	872				

REDUCED AIRFLOW *(COMPRESSOR OFF)														
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)													
	50		100		150		200		250		300			
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W		
200	MOTOR / BLOWER LIMIT								20	153	25	200		
250									21	172	27	208		
300									20	150	23	185	29	235
350									22	165	26	210	31	254
400									25	187	28	228	34	282
450	20	122	24	165	27	202	32	261	40	300				
500	22	134	26	178	30	228	34	284	45	332				
550	20	102	24	142	28	191	32	243	37	305	50	361		
600	22	113	27	167	31	216	35	269	39	326	56	395		
650	25	130	30	189	34	241	38	299	43	356	58	427		
700	28	152	33	213	37	269	41	329	47	392	62	460		
750	31	172	36	236	40	310	45	363	51	425	69	495		

**NOTES**

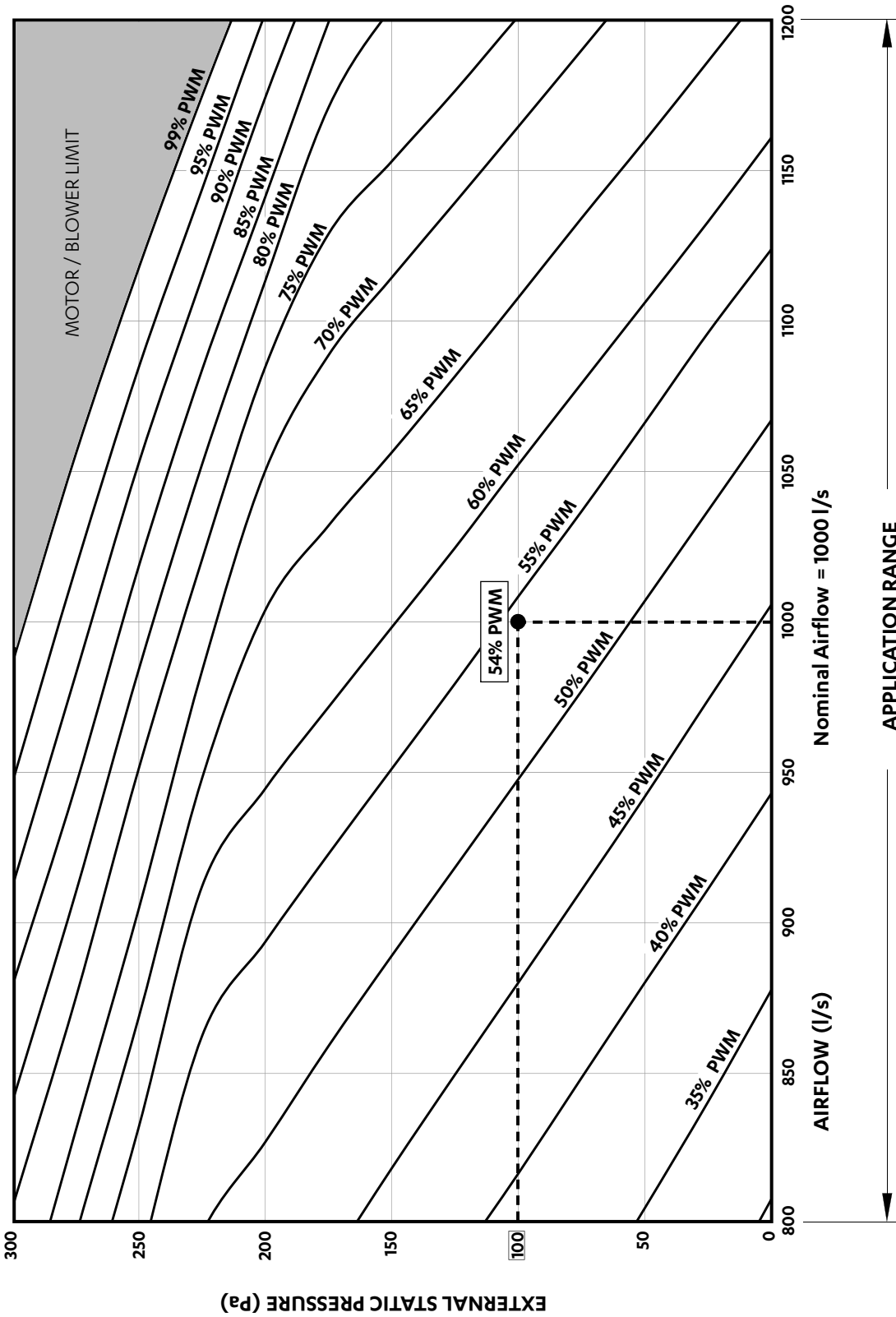
\* Reduced fan airflow is the airflow during compressor OFF operation (optional feature)

W = Indoor Fan Power, Watts

PWM = Pulse Width Modulation Setting, % PWM (Adjustable through the LC7-2 Control Interface or Outdoor Board).

Default Fan Speed Value at 100Pa	
Speed	Default PWM (adjustable)
High PWM (%)	75
Medium PWM (%)	54
Low PWM (%)	39

Indoor Fan PWM Limits	
PWM High Limit	99
PWM Low Limit	34



**Notes:**

1. Performance Fan Curve shown is at Dry Coil Condition.
2. Airflow should be reduced with respect to the moisture content in the air.
3. All data provided does not include filters. Please review filter manufacturer for application.
4. 2.5 m/s face velocity point will occur at 1045 l/s.

17.04. PKV240T

APPLICATION RANGE (COMPRESSOR ON)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
880	36	273	41	350	45	426	49	506	63	582	81	674
900	38	296	42	367	46	443	50	522	65	597	84	688
950	41	328	45	401	49	489	55	567	72	653	90	744
1000	45	380	48	444	52	523	61	615	79	706	96	803
1050	48	419	52	498	57	585	68	671	86	765	MOTOR / BLOWER LIMIT	
1100	51	455	56	552	60	633	76	735	94	837		
1150	56	524	60	604	66	700	84	797				
1200	60	576	64	661	74	767	92	870				
1250	64	631	69	735	84	841						
1300	69	706	76	818	93	923						
1320	71	741	80	845.5	97	959						

REDUCED AIRFLOW *(COMPRESSOR OFF)												
AIRFLOW (l/s)	EXTERNAL STATIC PRESSURE (Pa)											
	50		100		150		200		250		300	
	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W	% PWM	W
200	MOTOR / BLOWER LIMIT										22	213
250											25	228
300											30	254
350											34	283
400											40	315
450			21	166	24	216	27	253	40	315		
500			23	185	26	230	29	277	45	349		
550			25	201	28	250	32	303	49	384		
600			27	224	31	285	35	349	53	419		
650	21	127	25	182	29	243	33	306	38	368	57	458
700	23	141	27	201	31	263	35	330	42	409	60	492
750	26	174	30	232	34	298	38	365	45	440	65	533
800	28	186	32	250	36	315	41	400	49	469	69	564
850	31	219	35	281	40	367	43	426	54	507	73	599

NOTES

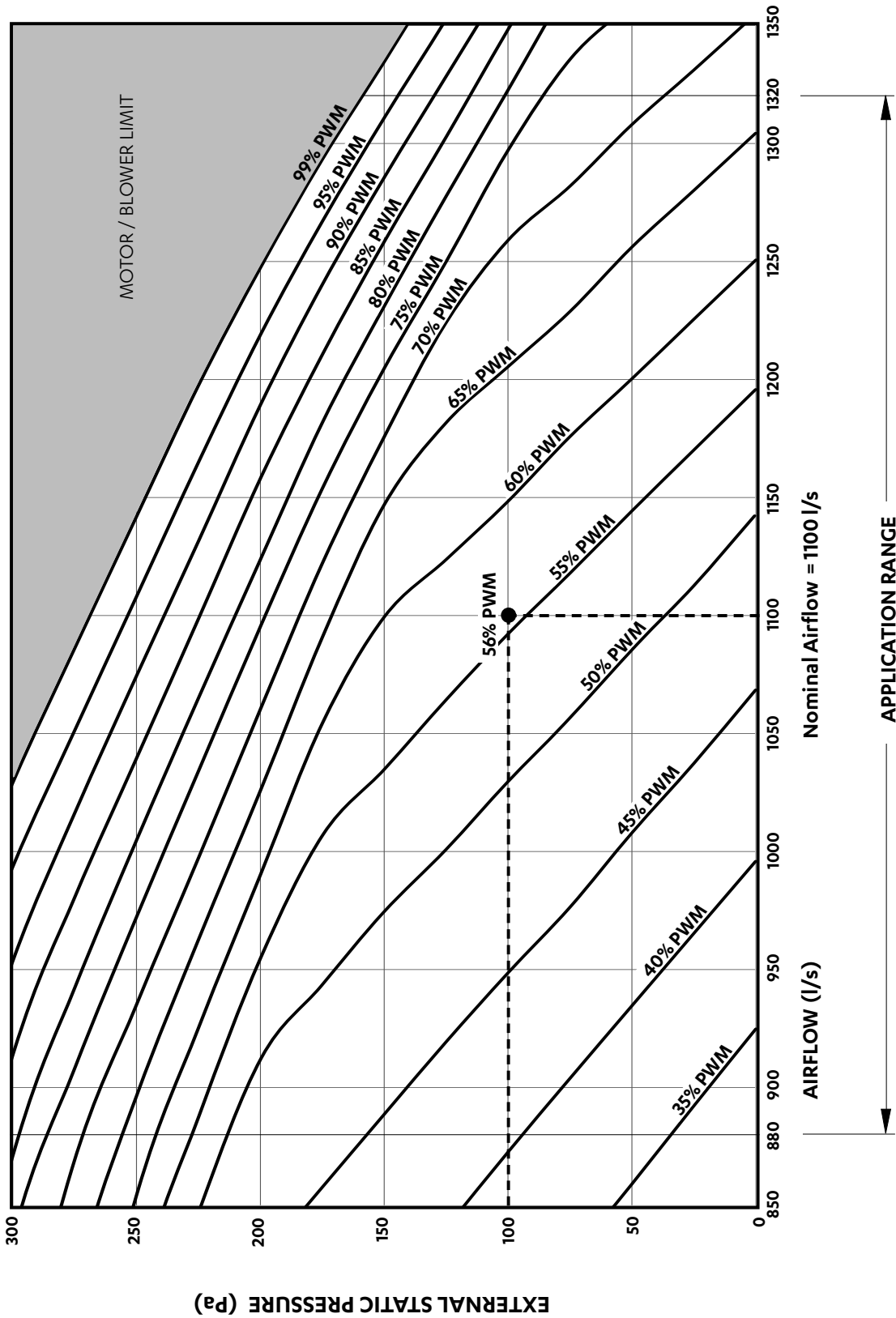
\* Reduced fan airflow is the airflow during compressor OFF operation (optional feature)

W = Indoor Fan Power, Watts

PWM = Pulse Width Modulation Setting, % PWM (Adjustable through LC7-2 Control Interface or Outdoor Board).

Default Fan Speed Value at 100Pa	
Speed	Default PWM (adjustable)
High PWM (%)	80
Medium PWM (%)	56
Low PWM (%)	41

Indoor Fan PWM Limits	
PWM High Limit	99
PWM Low Limit	34



**Notes:**

1. Performance Fan Curve shown is at Dry Coil Condition.
2. Airflow should be reduced with respect to the moisture content in the air.
3. All data provided does not include filters. Please review filter manufacturer for application.
4. 2.5 m/s face velocity point will occur at 1045 l/s.



## 18. Refrigerant Charging

- The units detailed on this guide are factory charged with R-410A refrigerant. Should there be need to add or remove 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.

### 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 (g)
PKV160T	5,600
PKV180T	6,680
PKV210T	6,800
PKV240T	8,050

### SUBCOOLING AND SUPERHEAT CHARGING METHOD

#### Parameters:

**LLT** = Liquid Line Temperature

**SLT** = Suction Line Temperature

**SCT** = Saturated Condensing Temperature

**SST** = Saturated Suction Temperature

#### Cooling and Heating Operation:

Adjust the refrigerant charge to obtain the correct superheat and subcooling 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 outside 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.

Record the discharge pressure, suction pressure, liquid line temperature and suction line temperature for all of the refrigeration circuits:

Discharge Pressure:	kPa
Liquid Line Temperature ( <b>LLT</b> ):	°C
Suction Pressure:	kPa
Suction Line Temperature ( <b>SLT</b> )	°C

## NOTE

Accurate pressure and temperature measuring tools should be used to achieve satisfactory results.

### Checking for Subcooling:

- From the R-410A Pressure/Temperature Chart record the corresponding Saturated Condensing Temperature (**SCT**) at the given discharge pressure.
- Calculate the system subcooling using the formula below:  
**Subcooling = SCT - LLT**
- If subcooling is within the range (see charging table below), 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.

- From the R-410A Pressure/Temperature Chart record the corresponding Saturated Suction Temperature (**SST**) at the given suction pressure.
- Calculate the system superheat using the formula below:  
**Superheat = SLT - SST**
- 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:

Models	COOLING		HEATING	
	Subcooling	Superheat	Subcooling	Superheat
PKV160T	7 ±1	3 ±1	12 ±1	2 ±1
PKV180T	8 ±1	4 ±1	13 ±1	6 ±1
PKV210T	8 ±1	4 ±1	14 ±1	2 ±1
PKV240T	9 ±1	7 ±1	14 ±1	1 ±1

## NOTES

The above subcooling 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.

**R-410A PRESSURE / TEMPERATURE CHART**

Temp °C	Pressure kPa
-60	-34.4
-59	-30.7
-58	-26.8
-57	-22.8
-56	-18.6
-55	-14.2
-54	-9.6
-53	-4.8
-52	0.8
-51	5.3
-50	10.7
-49	16.3
-48	22.2
-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
-36	111.5
-35	120.8
-34	130.4
-33	140.3
-32	150.5
-31	161.1
-30	171.9
-29	183.3

Temp °C	Pressure 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	417.7
-12	436.2
-11	455.1
-10	474.6
-9	494.6
-8	515.1
-7	536.2
-6	557.8
-5	579.8
-4	602.6
-3	625.9
-2	649.8
-1	674.3
0	699.4
1	724.9
2	751.3
3	778.3

Temp °C	Pressure 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
17	1227.5
18	1265.2
19	1303.6
20	1342.9
21	1382.9
22	1423.9
23	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 °C	Pressure 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

## 19. Maintenance Procedures

This section describes the procedure that must be performed as a part of normal maintenance PROG. 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 maintenance. It is always a safe practice to observe all safety warnings and cautions when conducting maintenance tasks.

### DANGER

#### **Live Electrical Connections !**

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

### 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.

#### **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 and drive fan is operating correctly.

#### **Cleaning the Condenser Coils**

Clean the coils at least once a year or more frequently if the 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.

 **CAUTION****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 Drive!**

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.

 **CAUTION****Be Careful Not to Spray Water into the Electrical Components !**

## 20. Maintenance Frequency Checklist

ELECTRICAL											
Parts	Service Period								Detail of Service Check	Service Methods	
	1 Mth	3 Mths	6 Mths	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs			
Printed Circuit Boards				✓						Visual Inspection	Tighten Terminals as necessary on printed circuit boards
Electrical Connections				✓						Check all electrical terminals, mains, communications, etc	Re-tighten if loose.

INDOOR SECTION											
Parts	Service Period								Detail of Service Check	Service Methods	
	1 Mth	3 Mths	6 Mths	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs			
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 / repaint 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 to earth with insulation tester. Insulation resistance should be more than 1MΩ.
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.
Ducting				✓						Inspect duct works for air gaps.	Re-tape any loose ducts.

\* 1-3 month, subject to operating conditions and environment.

OUTDOOR SECTION											
Parts	Service Period					Detail of Service Check	Service Methods				
	1 Mth	3 Mths	6 Mths	1 Yr	2 Yrs			3 Yrs	4 Yrs	5 Yrs	
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 to earth with insulation tester. Insulation resistance should be more than 1MΩ.
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 1MΩ.
Refrigeration Operational Readings				✓						Make note of operational reading in test cool/heat	Check operating pressures, record superheat and subcooling 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.
Outdoor Fan Speed Capacitor				✓						Check for any bulge on the capacitors & capacitance.	Make it electrically safe prior to measure the capacitor capacitance. Measured capacitance should be within the printed tolerances on the capacitor.

## 21. Start Up and Commissioning Report

INSTALLATION INFORMATION			
CUSTOMER	Name:		Tel. Number:
	Address:		
INSTALLER	Name:		Tel. Number:
	Address:		
Site Address:			Date Installed:

Model:	Serial Number:
--------	----------------

CIRCUIT TEMPERATURE SETTINGS AND AMBIENT TEMPERATURE			
SYSTEM 1		SYSTEM 2	
Supply Air Temperature	°C	Supply Air Temperature	°C
Return Air Temperature	°C	Return Air Temperature	°C
Suction Temperature	°C	Suction Temperature	°C
Discharge Temperature	°C	Discharge Temperature	°C
Condenser Coil Temperature	°C	Condenser Coil Temperature	°C

Ambient Temperature	°C
---------------------	----

INDOOR FAN SETTINGS			
Indoor Fan Current	Amps	Outdoor Fan Current	Amps
Indoor Fan Airflow	l/s	Indoor Fan PWM	%
Set Static	Pa		

Check No Active Error Codes on the Unit	Checked:	<input type="checkbox"/>	Date Checked:	
---	----------	--------------------------	---------------	--

### NOTES

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



**THIS PAGE WAS INTENTIONALLY LEFT BLANK**

**THIS PAGE WAS INTENTIONALLY LEFT BLANK**

**THIS PAGE WAS INTENTIONALLY LEFT BLANK**



# ActronAir

*That's better. That's Actron.*

actronair.com.au

1300 522 722



©Copyright 2019 Actron Engineering Pty Limited ABN 34 002767240. ®Registered Trade Marks of Actron Engineering Pty Limited. ActronAir is constantly seeking ways to improve the design of its products, therefore specifications are subject to change without notice.

Document: 0525-076 Ver. 4 Issue Date: 10/2022