

# GUIDE SPECIFICATIONS

## VARIABLE CAPACITY COMMERCIAL PACKAGE DUCTED UNITS 72-96kW



<b>GENERAL:</b>	
<b>MODEL NUMBER</b>	<b>Package Ducted Systems with Inverter Compressor:</b> <ul style="list-style-type: none"> <li>PKV720T, PKV850T and PKV960T</li> </ul>
<b>SYSTEM DESCRIPTION</b>	<b>The unit shall:</b> <ul style="list-style-type: none"> <li>Air cooled direct expansion, split ducted system with Variable Capacity technology specifically designed for continuous operation with temperatures of between -10° C DB and 54° C DB.</li> <li>Manufactured using two variable speed, variable capacity compressors.</li> <li>Designed with independent refrigerant circuits, one for each compressor.</li> <li>Low inrush current compressor and fan drives.</li> <li>Manufactured with EC variable speed backward curve indoor plug fans and EC variable speed Axial outdoor fans.</li> <li>Reverse cycle operation.</li> <li>Specifically designed for R410A refrigerant.</li> <li>PI (Proportional Band + Time Integral) controlled Compressor, Evaporator and Condenser Fans.</li> </ul>
<b>COMPLIANCE</b>	<b>The unit shall be compliant with the following standards and regulations</b> <ul style="list-style-type: none"> <li>Minimum Energy Performance Standards (MEPS) as set out in AS/NZS 3823.2.</li> <li>Greenhouse and Energy Minimum Standard Determination 2019</li> <li>AS/NZS 3000 Electrical Installations (known as the Australian/New Zealand Wiring Rules).</li> <li>All Equipment safety requirements outlined in AS/NZS 60335.2.40 in conjunction with AS/NZS 60335.1. Household and similar appliances - Electrical Safety.</li> <li>AS/NZS CISPR 11 (Group 1 Class A) EMC Compatibility.</li> <li>A minimum Protection Rating of IP44, compliant with Australian Standards AS 60529.</li> <li>Demand Response Capable as per AS4577.3.1:2012.</li> </ul>
<b>QUALITY ASSURANCE</b>	<b>The unit shall be compliant with the following Quality Assurance:</b> <ul style="list-style-type: none"> <li>Net performance shall be rated in accordance with latest AS/NZS 3823.1.2 including all amendments.</li> <li>All system components shall be selected to have a maximum operating pressure of no less than 4500kPa (650PSI).</li> <li>Unit shall carry a rating label in accordance with AS/NZS 3823.1.2.</li> <li>The Unit cabinet shall be capable of withstanding 500-hour salt spray exposure as per latest AS/NZS 4506.</li> <li>Unit shall be run tested at the factory.</li> <li>Units shall be manufactured in an ISO9001 certified manufacturing facility.</li> </ul>

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<b>EQUIPMENT:</b>	
<b>PERFORMANCE CRITERIA</b>	<p><b>The unit shall be capable of:</b></p> <ul style="list-style-type: none"> <li>Starting and running at 54°C ambient outdoor temperature.</li> <li>Meeting AS/NZS 3823.1.2, Table 2 - T1 and Table 7 - H1 "Cooling and Heating Capacity Rating Condition".</li> </ul>
<b>UNIT CABINET</b>	<p><b>The outside of the cabinet shall:</b></p> <ul style="list-style-type: none"> <li>Include as standard Louvre grill on coil sides to provide the outdoor coil/s with mechanical protection and to reduce solar heat gain. Exposed outdoor coils are unacceptable.</li> <li>Be constructed from galvanized steel casing with a thermosetting powder coat paint that meets and/or exceeds requirements of AS3715.</li> <li>Have a powder coat finish of no less than 60micron.</li> <li>Be capable of withstanding 500-hour salt spray exposure as per AS/NZS 4506.</li> <li>Incorporate Service Access Panels.</li> </ul> <p><b>The inside of the cabinet shall incorporate:</b></p> <ul style="list-style-type: none"> <li>Isolated compressor compartment for easier servicing and reduced noise.</li> <li>An electrical compartment with minimum IP44 rating.</li> <li>All internal edges are sealed to prevent leakages.</li> <li>Foil face polyethylene insulation (25mm) in the evaporator. Insulation shall not be compressed.</li> <li>An evaporator coil condensate tray with an epoxy-based powder primer or to be manufactured from ABS plastic.</li> <li>An indoor coil condensate tray with an epoxy based powder coat applied to all sides.</li> <li>Filter cavity and rails for return air filters.</li> <li>An electrical compartment with minimum IP44 rating.</li> <li>Foil face polyethylene insulation (25mm) in the evaporator. Insulation shall not be compressed.</li> </ul>
<b>REFRIGERATION COMPONENTS</b>	<p><b>Unit shall use:</b></p> <ul style="list-style-type: none"> <li>One fully Hermetic, Variable Speed Scroll Compressor for each independent refrigeration circuit.</li> <li>Solder Type field connections, no flare or flange connections are to be used, thus reducing the risk of leaks.</li> <li>Anti-vibration rubber and rubber clamps where applicable to damper the resonance of the pipe vibration, reduce noise, and improve pipe reliability.</li> <li>Fitted with ball valves for both suction and liquid line of each stage for ease of isolating the system for maintenance and diagnostic.</li> <li>Electronic expansion valves for metering refrigerant flow for both cooling and heating cycles. Fixed orifice or piston type metering devices shall not be used.</li> <li>1 x EEV with PI control for each refrigeration circuit.</li> <li>Dual strainer per EEV to protect and filter the EEV from dirt and contaminant.</li> </ul> <p><b>Compressors shall be:</b></p> <ul style="list-style-type: none"> <li>High Efficiency Variable Speed type.</li> <li>Suction gas cooled for prolonged life.</li> <li>Externally protected from high discharge temperature conditions.</li> <li>Protected from an over-temperature and over-ampereage conditions by an external motor overload device.</li> <li>Protected by suction line accumulator from liquid refrigerant flood-back.</li> </ul>
<b>SERVICE VALVES</b>	<p><b>Unit shall be fitted with:</b></p> <ul style="list-style-type: none"> <li>Schrader valves for reading high and low pressures during cooling and heating. During pressure measurements, the condenser coil shall not have its airflow affected by the removal of panels.</li> <li>Stemless Schrader valve where applicable to minimise cracks and improve reliability.</li> </ul>

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<b>PRESSURE TRANSDUCER</b>	<p><b>Unit shall use:</b></p> <ul style="list-style-type: none"> <li>High and Low Pressure Transducer for pressure measurement and smart control for enhanced system reliability.</li> </ul>
<b>METERING DEVICES</b>	<p><b>Unit shall be provided with:</b></p> <ul style="list-style-type: none"> <li>Electronic expansion valves for metering refrigerant flow for both cooling and heating cycles.</li> </ul>
<b>COILS</b>	<p><b>Coils shall be:</b></p> <ul style="list-style-type: none"> <li>Constructed of seamless riffle bore copper tubes no larger in diameter than 8mm, mechanically bonded to aluminum fins.</li> <li>Shall have Blue Hydrophilic Coat Coil Fin Protection, as standard.</li> <li>Additional coil protection to safeguard against corrosion, and combat mould / bacteria, as optional.</li> </ul> <p><b>Evaporator Coil:</b></p> <ul style="list-style-type: none"> <li>Aluminum fins shall be lanced with straight edge.</li> <li>Shall be of multi pass type with circuitry optimized for R410A.</li> <li>To reduce moisture carryover, air velocity over the coil is not to exceed 2.5m/s or as specified for tropical or special purpose applications.</li> <li>Shall be cleaned, dehydrated and pressurized at the factory prior to shipment to site.</li> <li>Shall have Blue Epoxy Coat Coil Fin Protection.</li> </ul> <p><b>Condenser Coil:</b></p> <ul style="list-style-type: none"> <li>Shall be corrugated/wave type. Split fin or Louvre fin is not acceptable due to performance loss over time due to extra build up of particles.</li> <li>Shall have a Blue Epoxy Coat Coil Fin Protection.</li> <li>Shall be of multi pass type with circuitry optimized for R410A.</li> </ul>
<b>FANS</b>	<p><b>The Evaporator fan and blower shall consist of the following as standard:</b></p> <ul style="list-style-type: none"> <li>EC Electronically Commutated motor for maximum efficiency and minimal EMC harmonics.</li> <li>AC motor with inverters / VSD shall not be used.</li> <li>Direct drive only. Belts or pulleys will not be acceptable.</li> <li>Motor insulation class "F".</li> <li>Low In-rush current, with optimized ramp up time.</li> <li>Phase protection (sequence and loss).</li> <li>Non-overloading backward curve impeller.</li> </ul> <p><b>The Condenser fan shall consist of the following:</b></p> <ul style="list-style-type: none"> <li>EC Electronically Commutated motor for maximum efficiency and minimal EMC harmonics. AC motor with inverters / VSD shall not be used.</li> <li>External rotor design.</li> <li>Low noise axial type.</li> <li>Bearings shall be ball bearing type.</li> <li>Motor insulation class "F".</li> <li>Material of guard grille shall be Steel-phosphate and coated in black plastic.</li> <li>Fan assembly shall have a minimum protection rating of IP54, compliant with Australian Standards AS 60529-2004.</li> </ul>
<b>AIR FILTER</b>	<p><b>Unit shall be fitted with:</b></p> <ul style="list-style-type: none"> <li>Filter channel to accept 100mm pleated air filters.</li> <li>Filter slides to assist with servicing of filters.</li> </ul>

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<b>CONTROL STANDARD FEATURES</b>	<p><b>Unit Controls shall include:</b></p> <ul style="list-style-type: none"> <li>• Selectable Auto / Cool / Heat / Fan Only Mode of Operation.</li> <li>• 7-Day Time Clock with 2 On / Off events per day.</li> <li>• Daylight Saving Time Function.</li> <li>• Settable External Static Pressure up to 90pa for Outdoor Fan Operation.</li> <li>• PI Compressor Algorithm (Proportional Band + Time Integral).</li> <li>• PI Outdoor Fan Control for EC Fans.</li> <li>• Adaptive Demand Defrost.</li> <li>• After Hours Compatibility.</li> <li>• Ability to connect with up to 3 wall controllers.</li> <li>• Night Mode function, which allows the outdoor fans and compressor to operate quieter whilst delivering performance, depend upon the ambient temperature.</li> <li>• Filter clean adjustable time period and LED indication.</li> <li>• Optional wall mounted controller fully integrated with the system with a 24-hour Timer and 7-Day Time Clock.</li> <li>• Ability to connect commercial (LC7-2) or Group Control (CG1000K) ActronAir controller.</li> <li>• Available casing in white or grey for LC7.</li> <li>• The ability to connect two remote temperature sensors in addition to wall controllers.</li> <li>• Displays which clearly show (in English) the set temperature, mode of operation and selected fan speed.</li> <li>• Single Speed Indoor Fan Setting with Optional 3 Speed Setting (High, Med, Low). Settable Indoor Fan Operation - (Continuous / Auto Mode)</li> <li>• Mode status</li> <li>• Fault codes displayed on outdoor control boards.</li> <li>• Reverse cycle, indoor fan and compressor third party control available.</li> <li>• Automatic restart to previous operational state after power failure when using ActronAir Controller.</li> <li>• Hot Start function (Heating Mode).</li> <li>• Self-diagnosis.</li> <li>• Run and Fault indication output.</li> <li>• Remote ON/OFF function.</li> <li>• Low ambient cooling operation.</li> </ul>
<b>UNIT CONTROLS</b>	<p><b>Unit Controls shall include:</b></p> <ul style="list-style-type: none"> <li>• Three selectable speeds for the Indoor Fan.</li> <li>• Mode status display on outdoor control boards and ActronAir wall controllers.</li> <li>• Automatic restart to previous operational state after power failure when using ActronAir Controller.</li> <li>• Hot Start function (Heating Mode)</li> <li>• Up to 3 x LC7 controllers.</li> <li>• CG1000K Group Control</li> <li>• Low ambient cooling operation to +5°C as standard.</li> <li>• The ability to connect 3rd party controls directly to the outdoor PCB.</li> <li>• All safety switches and protection logic will remain in circuit for maximum system protection.</li> <li>• Adaptive demand defrost operation.</li> <li>• Ability to connect commercial (LC7-2) ActronAir controller.</li> <li>• Demand Response ready OR Third party 0-10V control (Reverse cycle, indoor fan and compressor).</li> </ul>

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<b>DEFROST</b>	<p><b>System shall include integrated defrost system to prevent excessive frost accumulation during heating mode, and shall be controlled as follows:</b></p> <ul style="list-style-type: none"> <li>• Defrost shall be initiated on the basis of time and coil temperature or pressure.</li> <li>• Defrost cycle shall terminate when coil temperature or pressure sensor is satisfied and shall have a positive termination time of approximately 10 minutes (except for ice clearing cycle).</li> </ul> <p><b>Defrost system shall also include:</b></p> <ul style="list-style-type: none"> <li>• Defrost Cycle Indicator LED for defrost status.</li> <li>• Adaptive Demand Defrost logic which adjusts itself for a longer or shorter defrost according to prevailing conditions.</li> <li>• Ice clearing cycle every 4th cycle to reduce or eliminate Ice Creep.</li> </ul>
<b>ELECTRICAL SYSTEM FEATURES</b>	<p><b>Electrical System Features shall include:</b></p> <ul style="list-style-type: none"> <li>• Control Circuit Breaker (no fuses to be used) and thermal overload protection.</li> <li>• Electrical panel control wiring that is easily identifiable by colour or number.</li> <li>• Electrical panel component's labelling for easy identification.</li> <li>• 3rd Party Control remote ON/OFF Inputs, as standard.</li> <li>• Group control as an accessory.</li> <li>• Home/Building Automation as an accessory</li> </ul>
<b>CONTROL SAFETY FEATURES</b>	<p><b>Unit shall have the following safeties as standard equipment:</b></p> <ul style="list-style-type: none"> <li>• Pressure switches and transducers that are fully encapsulated solder type with no flare connections.</li> <li>• Compressor envelope management.</li> <li>• Low Pressure and High Pressure Control.</li> <li>• Indoor Coil Anti-Freeze Protection.</li> <li>• High Discharge Temp Control.</li> <li>• Compressor minimum run time 90 seconds and minimum off time 3 minutes.</li> <li>• Over Heat Protection.</li> <li>• Smart Crankcase Heater Control.</li> <li>• An independent High and Low Pressure switch to protect each refrigeration circuit.</li> <li>• An independent High and Low Pressure Transducer to protect each refrigeration circuit.</li> </ul>