

GUIDE SPECIFICATIONS

VARIABLE CAPACITY COMMERCIAL PACKAGE DUCTED UNITS 72-96kW



GENERAL:

MODEL NUMBER	Package Ducted Systems with Inverter Compressor: • PRV72AT • PRV85AT • PRV96AT
SYSTEM DESCRIPTION	The unit shall: • Air cooled direct expansion, rooftop system with Variable Capacity technology specifically designed for continuous operation with temperatures of between -10° C DB and up to 57°C DB depending on the model. • Manufactured using two variable speed, variable capacity compressors. • Designed with independent refrigerant circuits, one for each compressor. • Low inrush current compressor and fan drives. • Manufactured with EC variable speed backward curve indoor plug fans and EC variable speed Axial outdoor fans. • Reverse cycle operation. • Specifically designed for R-32 refrigerant. • PI (Proportional Band + Time Integral) controlled Compressor, Evaporator and Condenser Fans.
COMPLIANCE	The unit shall be compliant with the following standards and regulations • Minimum Energy Performance Standards (MEPS) as set out in AS/NZS 3823.2. • Greenhouse and Energy Minimum Standard Determination 2019 • AS/NZS 3000 Electrical Installations (known as the Australian/New Zealand Wiring Rules). • All Equipment safety requirements outlined in AS/NZS 60335.2.40 in conjunction with AS/NZS 60335.1. Household and similar appliances - Electrical Safety. • AS/NZS CISPR 11 (Group 1 Class A) EMC Compatibility. • A minimum Protection Rating of IP44, compliant with Australian Standards AS 60529. • Demand Response Capable as per AS 4577.3.1:2012.

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QUALITY ASSURANCE	The unit shall be compliant with the following Quality Assurance: • Net performance shall be rated in accordance with latest AS/NZS 3823.1.2 including all amendments. • All system components shall be selected to have a maximum operating pressure of no less than 4500kPa (650PSI). • Unit shall carry a rating label in accordance with AS/NZS 3823.1.2. • The Unit cabinet shall be capable of withstanding 500-hour salt spray exposure as per latest AS/NZS 4506. • Unit shall be run tested at the factory. • Units shall be manufactured in an ISO9001 certified manufacturing facility.
EQUIPMENT:	
PERFORMANCE CRITERIA	The unit shall be capable of: • Starting and running at 57°C ambient outdoor temperature. • Meeting AS/NZS 3823.1.2, Table 2 - T1 and Table 7 - H1 "Cooling and Heating Capacity Rating Condition".
UNIT CABINET	The outside of the cabinet shall: • 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. • Be constructed from galvanized steel casing with a thermosetting powder coat paint that meets and/or exceeds requirements of AS 3715. • Have a powder coat finish of no less than 60micron. • Be capable of withstanding 500-hour salt spray exposure as per AS/NZS 4506. • Incorporate Service Access Panels. The inside of the cabinet shall incorporate: • Isolated compressor compartment for easier servicing and reduced noise. • An electrical compartment with minimum IP44 rating. • All internal edges are sealed to prevent leakages. • Foil face polyethylene insulation (25mm) in the evaporator. Insulation shall not be compressed. • An evaporator coil condensate tray with an epoxy-based powder primer or to be manufactured from ABS plastic. • An indoor coil condensate tray with an epoxy based powder coat applied to all sides. • Filter cavity and rails for return air filters. • An electrical compartment with minimum IP44 rating. • Foil face polyethylene insulation (25mm) in the evaporator. Insulation shall not be compressed.
REFRIGERATION COMPONENTS	Unit shall use: • One fully Hermetic, Variable Speed Scroll Compressor for each independent refrigeration circuit. • Anti-vibration rubber and rubber clamps where applicable to damper the resonance of the pipe vibration, reduce noise, and improve pipe reliability. • Electronic expansion valves for metering refrigerant flow for both cooling and heating cycles. Fixed orifice or piston type metering devices shall not be used. • 1 x EEV with PI control for each refrigeration circuit. • Dual strainer per EEV to protect and filter the EEV from dirt and contaminant. Compressors shall be: • High Efficiency Variable Speed type. • Suction gas cooled for prolonged life. • Externally protected from high discharge temperature conditions. • Protected from an over-temperature and over-ampereage conditions by an external motor overload device. • Protected by suction line accumulator from liquid refrigerant flood-back.

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SERVICE VALVES	Unit shall be fitted with: - 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. - Stemless Schrader valve where applicable to minimise cracks and improve reliability.
PRESSURE TRANSDUCER	Unit shall use: High and Low Pressure Transducer for pressure measurement and smart control for enhanced system reliability.
METERING DEVICES	Unit shall be provided with: Electronic expansion valves for metering refrigerant flow for both cooling and heating cycles.
COILS	Coils shall be: - Constructed of seamless riddle bore copper tubes no larger in diameter than 8mm, mechanically bonded to aluminum fins. - Shall have Blue Hydrophilic Coat Coil Fin Protection, as standard. - Additional coil protection to safeguard against corrosion, and combat mould / bacteria, as optional. - For applications requiring additional protection from the environment, coils (including the end plates and return bends) shall be treated using coil protection that includes a mould retardant. Evaporator Coil: - Aluminum fins shall be lanced with straight edge. - Shall be of multi pass type with circuitry optimized for R-32. - 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. - Shall be cleaned, dehydrated and pressurized at the factory prior to shipment to site. - Shall have Blue Hydrophilic Coat Coil Fin Protection. Condenser Coil: - 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. - Shall have a Blue Hydrophilic Coat Coil Fin Protection. - Shall be of multi pass type with circuitry optimized for R-32.
FANS	The Evaporator fan and blower shall consist of the following as standard: - EC Electronically Commutated motor for maximum efficiency and minimal EMC harmonics. - AC motor with inverters / VSD shall not be used. - Direct drive only. Belts or pulleys will not be acceptable. - Motor insulation class "F". - Low In-rush current, with optimized ramp up time. - Phase protection (sequence and loss). - Non-overloading backward curve impeller. The Condenser fan shall consist of the following: - EC Electronically Commutated motor for maximum efficiency and minimal EMC harmonics. AC motor with inverters / VSD shall not be used. - External rotor design. - Low noise axial type. - Bearings shall be ball bearing type. - Motor insulation class "F". - Material of guard grille shall be Steel-phosphate and coated in black plastic. - Fan assembly shall have a minimum protection rating of IP54, compliant with Australian Standards AS 60529-2004.

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AIR FILTER	Unit shall be fitted with: • Filter channel to accept 100mm pleated air filters. • Filter slides to assist with servicing of filters.
CONTROL STANDARD FEATURES	Unit Controls shall include: • BTC Control Interface for local operation and commissioning. • Optional Secondary Remote LCD Control Interface. • Selectable Auto / Cool / Heat / Fan Only / Dry Mode of Operation. • Mode Status and Fault Display on Control Interface. • Heat Mode Hot Start Control (Pre-Heat Delay). • 7-Day Time Clock with 2 On / Off events per day. • 12 Programmable Special Days with 2 On/Off events per day. • Daylight Saving Time Function. • Single Speed Indoor Fan Setting with Optional 3 Speed Setting (High, Med, Low). • Adjustable Airflow Setting via Control Interface. • Three settable speed for Indoor Fan Operation + Volume control and Variable Fan Technology (VFT). • Settable External Static Pressure up to 90pa for Outdoor Fan Operation. • Variable Speed Outdoor Fan. • PI Outdoor Fan Control for EC Fans. • PI Compressor Algorithm (Proportional Band + Time Integral). • Discharge Sensor for each compressor. • Adaptive Demand Defrost. • Indoor Coil Anti Freeze Protection. • Discharge Temperature Protection. • An Independent High and Low Pressure switch to protect each refrigerant circuit. • Crankcase Heater Control. • Demand Response Capability in compliance with AS/NZS 4755.3.1:2012. • Bird mesh will be included when economiser option is selected. • Economy Cycle Compatibility (Dry Bulb Temperature Only). • 3rd Party 0-10VDC abd 24VAC Control. • Optional Communication with BMS through MODBUS RS-485. • Access to system operation information such as system low pressure, high pressure, errors and system temperatures to aid with correct servicing of unit. • Automatic Restart to Previous Operational State after Power Failure. • Temperature Away Mode. • After Hours Compatibility. • Dedicated Input for Remote Stop / Start. • Password Protected Service menu. • Alarm Fault Diagnosis with up to 15 Recent Alarm Logs. • Volt Free Contact available for External Alarm. • Settable Time Based Air Filter Warning. • Night Mode function, which allows the outdoor fans and compressor to operate quieter whilst delivering performance, depend upon the ambient temperature. • CO2 sensor input for Demand Controlled Ventilation. • Filter clean adjustable time period and LED indication. • Optional wall mounted controller fully integrated with the system with a 24-hour Timer and 7-Day Time Clock. • Ability to connect commercial (LC7-2) and NEO or Group Control (CG1000K) ActronAir controller. • Indoor Drain Pan Overflow Sensor. • Desuper Heater. • Variable Fan Technology - Pressure control. • Supply Air Temperature Control.
	• A2L/R-32 Sensor • Available casing in white or grey for LC7. • The ability to connect two remote temperature sensors in addition to wall controllers. • Displays which clearly show (in English) the set temperature, mode of operation and selected fan speed.

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CONTROL STANDARD FEATURES	• Fault codes displayed on outdoor control boards. • Reverse cycle, indoor fan and compressor third party control available. • Self-diagnosis. • Run and Fault indication output. • Remote ON/OFF function. • Low ambient cooling operation.
UNIT CONTROLS	Unit Controls shall include: • Three selectable speeds for the Indoor Fan + Volume control and VFT. • Mode status display on outdoor control boards and ActronAir wall controllers. • Automatic restart to previous operational state after power failure when using ActronAir Controller. • Hot Start function (Heating Mode) • Up to 3 x LC7 controllers. • CG1000K Group Control . • Low ambient cooling operation to +5°C as standard. • The ability to connect 3rd party controls directly to the outdoor PCB. • All safety switches and protection logic will remain in circuit for maximum system protection. • Adaptive demand defrost operation. • Ability to connect commercial (LC7-2) and NEO ActronAir controller. • Demand Response ready OR Third party 0-10V control (Reverse cycle, indoor fan and compressor).
DEFROST	System shall include integrated defrost system to prevent excessive frost accumulation during heating mode, and shall be controlled as follows: • Defrost shall be initiated on the basis of time and coil temperature or pressure. • 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). Defrost system shall also include: • Adaptive Demand Defrost logic which adjusts itself for a longer or shorter defrost according to prevailing conditions. • Ice clearing cycle every 4th cycle to reduce or eliminate Ice Creep. • Logic to ensure only one stage enters defrost at any time. • Defrost termination by either time or temperature or pressure. • Defrost Cycle Indicator LED for defrost status
ELECTRICAL SYSTEM FEATURES	Electrical System Features shall include: • Internal 10A GPO with RCD protection for service and maintenance • Control Circuit Breaker (no fuses to be used) and thermal overload protection. • Electrical panel control wiring that is easily identifiable by colour or number. • Electrical panel component's labelling for easy identification. • 3rd Party Control remote ON/OFF Inputs, as standard. • Group control as an accessory. • Home/Building Automation as an accessory • A complete wiring schematic that is weather resistant and durable

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CONTROL SAFETY FEATURES

Unit shall have the following safeties as standard equipment:

- Pressure switches and transducers that are fully encapsulated solder type with no flare connections.
- High Pressure switch shall use a different colour wire than the low pressure switch for servicing.
- Compressor minimum run time 3 minutes and minimum off time 3 minutes.
- Compressor envelope management.
- Low Pressure and High Pressure Control.
- Anti Freeze control.
- Indoor Coil Anti-Freeze Protection.
- High Discharge Temp Control.
- Compression ratio control.
- Over Heat Protection.
- Smart Crankcase Heater Control.
- An independent High and Low Pressure switch to protect each refrigeration circuit.
- An independent High and Low Pressure Transducer to protect each refrigeration circuit.