



Commercial

# HERCULES

The brains and brawn redefining  
air conditioning efficiencies.



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



**ActronAir**



# ActronAir. Because Australia needs Australian air conditioning.

HERCULES

The year 1984 saw Advanced Australia Fair become our National Anthem, the 1 dollar coin come into circulation and a small family air conditioning business open its doors. Today, ActronAir is a proud Australian company recognised for making world-class air conditioners. Well, it stands to reason. The team at ActronAir experience our harsh Australian conditions first hand, and our climate places demands on air conditioning not found in other parts of the world.

And that's why ActronAir's engineers have developed the most advanced air conditioning systems specifically for the unique and harsh Australian environment.

Made with a superior operating range of -10°C to 50°C, and a host of innovative features, ActronAir's Hercules system is engineered to withstand the hottest and coldest conditions Australia can throw at it.

Business in Australia depends on reliable, cost effective and energy efficient air conditioning.

Business in Australia can rely on ActronAir's Hercules.



  
**More than  
a quarter of a  
million Aussies  
take comfort in  
ActronAir**

## Hercules - big on performance, big on thinking.

Hercules is the most advanced, energy efficient packaged unit ever made in Australia.

The first packaged system to have twin inverter compressors, it's big in lots of ways. Rated to a superior operating range, Hercules can handle the most extreme conditions Australia can throw at it, designed for large spaces such as warehouse stores, shopping centres, airport terminals, and car showrooms. But along with all that brawn comes some very brainy, energy efficient thinking.



### A superior operating range **made for Australia**

It took Australian engineers to design a large commercial system that can handle everything Australia's climate can throw at it.

Most overseas air conditioners only work up to 46°C, some just 43°C. Fair enough, they come from cooler climates. Hercules has an operating range up to 50°C. Given that large packaged units will typically be found on the roof in the direct sun, this is important.

In the Australian sun, where other air conditioners can struggle and even shut down, it's better for business to have a system you can rely on.

“ Nothing beats performing under extremes. Engineered for Australia, you can trust ActronAir to be there when you need it most. ”

**Mark 'Frosty' Winterbottom**  
2015 V8 Supercars Champion





### Built to perform

- Extra large outdoor heat exchanger coils engineered using enhanced rifle bored tubing with wave type fin profile to maximise system performance. Louvre fin profile is used on the indoor.
- Electronic Expansion Valve (EEV) that accurately responds to variable load demands, protecting the compressor for longer lasting performance.
- Hercules has dual inverter compressor's.

### Aussie tough

- Powder coated outdoor panels (60~80 microns) tested to withstand 1,000-hour salt spray exposure (AS/NZS 4506:2005).
- Removable louvre coil guard protection for easy cleaning and maintenance. This also provides additional protection from mechanical damage such as hail storms.
- Comes standard with E-Prime™ Evaporator Drain Tray.

### Total peace of mind

- Discharge and suction pressure transducers.
- High and low pressure cut-outs.
- Crankcase heater for compressor protection.
- Blue fin epoxy coated hydrophilic coil protection on both indoor and outdoor coils.
- External stainless steel screws with protective coating to reduce corrosion.

### Intuitive operation

- Continuous heating during defrost operation.
- De-ice operation that is interlocked and independent for each circuit to maintain 50% heating capacity.
- Preheat delay to minimise cold drafts on start-up in the heating cycle.





*This unit has been fitted with optional economy cycle dampers*

## Engineered for ease

- Structurally enhanced independent base engineered using hot dipped galvanised 'C' channel.
- Sloped indoor coil drain pan, designed so that the system can be installed level.
- Filter slide rail for convenience and ease of access when replacing filters.
- Hinged access doors for easy access.
- Forklift holes and lifting lugs for easy movement.

## It's all in the detail

- Differential pressure sensor for air filters and fans.
- 25mm foil faced polyethylene insulation with zero fire rating and sweat tested to AS3823.1.2:2012 Section 6.4.
- Factory fitted lockable three phase load break isolation switch, which helps to reduce installer cost and time on-site.

## A quiet achiever

The outdoor sound level of Hercules is significantly reduced through the use of generously sized heat exchange coils, variable speed EC condenser fans and variable speed inverter compressors. When Hercules is in part load operation, the sound levels are reduced even further.

## Big on choice

- Economy cycle option with and without spill air damper
- Coil coat protection option
- Reheat option
- Various supply and return air handing options available

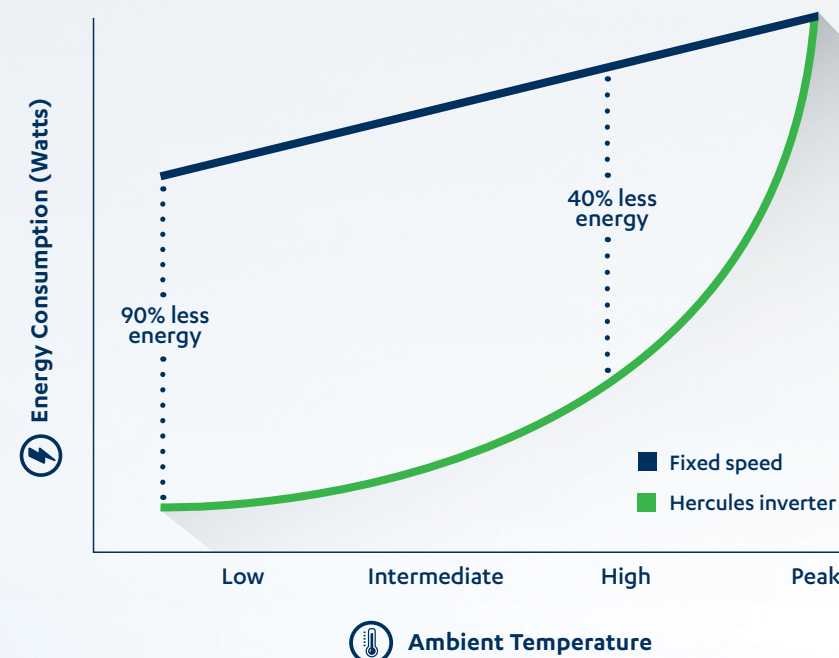


## Improved energy efficiency through new technology

Hercules' latest generation inverter compressor technology has superb part-load performance characteristics that provide improved energy efficiency.

A technological first, the system has two variable speed compressors that closely match the thermal load needs of a building. With a system turn down ratio of 4:1, the capacity can be adjusted right down to 25%. Both independent compressors simultaneously ramp up and down to maintain temperature while minimising energy use.

### Compressor power consumption vs ambient temperature



### Key benefits:

- Turn down ratio of 4:1, with a capacity range of 25%-100%.
- A unique compressor start-up program that helps to reduce start-up noise, electrical and mechanical stress, and improves reliability.
- Optimised algorithms to improve part-load energy efficiency.
- Full compressor operation at 50°C ambient conditions.
- In-built compressor runtime equalisation.
- In-built compressor protection to assist in reducing downtime.
- ActronAir Smart Logic that ensures that each compressor has run time equalisation, resulting in improved performance and reliability.
- Two stage system that allows for 50% redundancy



## High efficiency EC fan technology

### EC indoor fan

EC plug fans deliver exact airflow requirements while minimising power usage at the same time. In fact EC plug fan technology is up to 50% more efficient than traditional forward curve belt and pulley systems. Hercules has been engineered to intuitively deliver constant airflow.

Key benefits include:

- Constant air-flow for improved efficiency and comfort.
- Program control feature for exact airflow requirements.
- High static easily achieved (up to 500Pa).
- Significant time saved for on-site commissioning.
- Eliminates belt dust and belt adjustment, providing a cleaner environment, and lowers operational maintenance cost.
- Automatic compensation for loaded filters to deliver constant airflow requirements.
- Improved occupant comfort.



### EC outdoor fan

EC outdoor fans deliver improved performance and efficiency when compared to AC technology. While AC motors have an efficiency of 50-70%, EC motors perform with up to 90% efficiency.

This not only results in better use of primary energy, it's achieved with less heat loss, adding up to a longer product life cycle.

Hercules technology also delivers low ambient cooling, ducted condenser fan discharge with up to a maximum of 80Pa – 120Pa (model dependent), and full performance operation at 50°C.

And because the fans are controlled by ActronAir Smart Logic, they automatically deliver just the right amount of airflow for all operating conditions, which is generally around 70-80% of its maximum design. It also means that Hercules operates at lower sound levels than other systems.





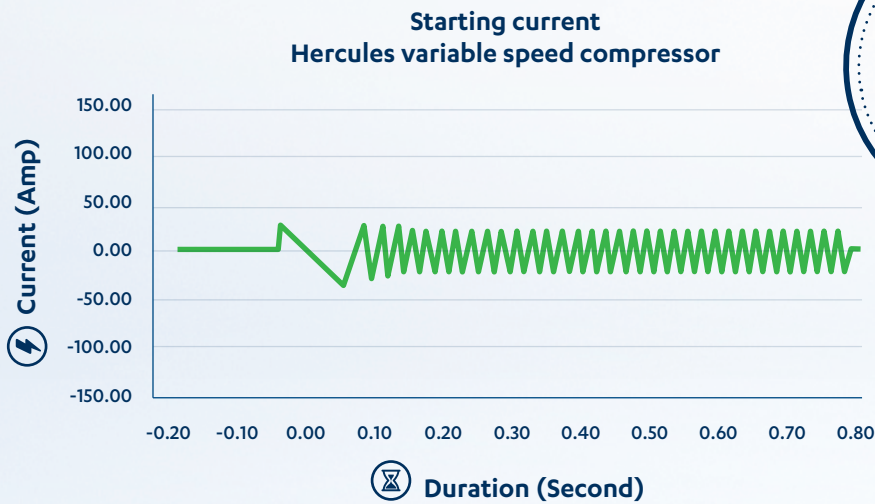
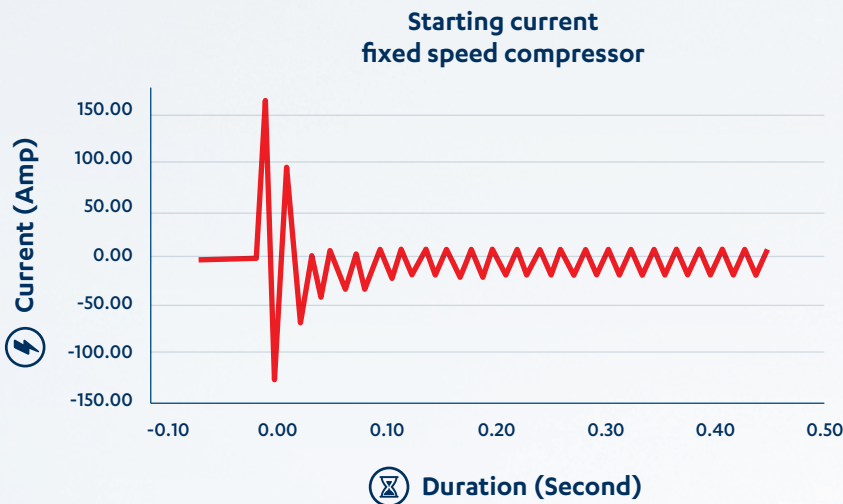
A Herculean difference - big thinking with a small start-up current

For such a large unit, Hercules starts up with a deceptively small nudge – just 25 amps at start-up. That’s smaller than a lot of home air conditioners, and it can make a huge difference when it comes to the cost of installation.

It may mean lower infrastructure costs such as cables and transformers. It also reduces the load on the power grid, and stress on the compressor. It drastically lowers complexity and time constraints for consultants, builders and electrical engineers. It might make the difference between having to upgrade the entire electrical mains at enormous cost.

So big, yet surprisingly so accommodating when it comes to installation, Hercules packs a versatile punch.

Start-up current comparison – fixed speed vs Hercules



HERCULES  
USES JUST  
25 AMPS  
AT START-UP

Better Comfort

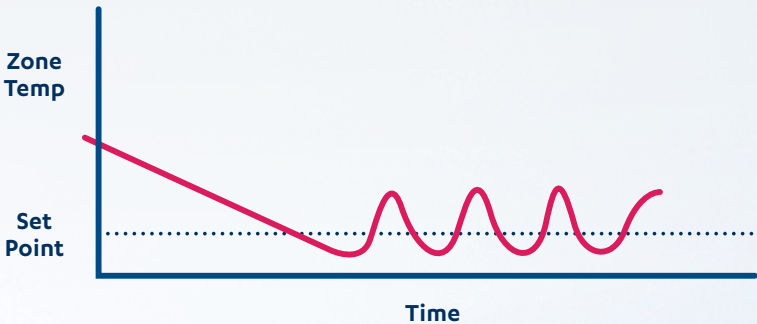
So comfortable people will want to stay

In Australia, people are drawn to air conditioning. When the mercury hits big numbers, people head to shopping centres or clubs looking for relief. They’ll stay a little longer too. So without doubt, reliable comfort is good for business.

Thanks to its variable speed capability, Hercules can deliver temperature stability up to  $\pm 0.3^{\circ}\text{C}$  of a degree at the sensor location. It also automatically adjusts its fan speed as the filters get dirty, to ensure continuous optimal performance. And furthermore, comfort levels can be maintained on or off-site, thanks to Hercules’ compatibility with most Building Management Systems (BMS), and can provide you with system operation knowledge and control.

Without Variable Speed

Supply air temperature will fluctuate more than needed because of on/off operation of the compressor.



With Variable Speed

Supply air temperature is closer to set point. Zone temperature is kept tightly near set point at all times by continuous load-matching operation.





# Better Energy Efficiency

HERCULES



## Big, better, best

Hercules delivers the highest energy efficiency in its class with an **IEER of 4.29**.  
IEER, or Integrated Energy Efficiency Ratio, is a measure of seasonal energy efficiency.  
In fact Hercules is **over 46% more efficient** than the minimum BCA compliant system.



## A gentle giant

Although designed to handle a 195kW load, the Hercules can ramp right down to 25%, saving you a lot of energy when load requirements are down. It's a pressing 21st century business issue, especially when your carbon footprint can put the boot into your bottom line.

Hercules was born out of the need for a big performing, incredibly energy efficient packaged unit. It made sense. In research conducted by ActronAir, it was revealed that commercial buildings operated at part-load 98% of the time.

Hercules offers improved reliability, flexibility, noise emissions, occupant comfort, installation, commissioning and controls.

## Case Study: Narellan Town Centre, Narellan NSW

In independent research at a shopping centre at Narellan, a newly installed Hercules was compared with an existing two stage fixed speed AC technology. Over the 14-day testing period, Hercules achieved **total energy consumption savings of 40%** compared to the two stage fixed speed air conditioner. On a daily basis, energy consumption savings of between 21% and 69% were achieved.

Based on historical weather observations, the total electrical energy savings expected from the Hercules unit across the four month summer period is estimated to be 46%. This equates to an estimated **financial saving of \$6,297** (based on \$0.18 per kWh) for the same period.

Hercules provided more comfort too. During the trial the hottest temperature day was 38.2°C. The conditioned area for the two stage fixed speed technology reached 26.7°C, while Hercules achieved a temperature of 24.9°C.

On that same day, and despite achieving a cooler temperature, **Hercules consumed 62% less electrical energy** than the two stage fixed unit.





## Better maintenance and service means better business

Hercules makes life easier for technicians with its CP10 control interface providing easy access to system operation information such as:

- Low pressure
- High pressure
- Supply air volume
- System temperatures
- System mode

## Set airflow in a flash

Instead of a maintenance job that could take all day, adjusting the airflow takes just minutes. It's as easy as 1,2,3:

1. Look up the 'Supply Air Volume Setpoint' menu.
2. Enter the required airflow.
3. Exit the menu. You'll now have the required airflow volume provided the installed duct static is within the fan limits shown in the fan graph table.

Each outlet airflow still requires balancing but the total volume of air will be correct provided the total system resistance does not exceed the fan limit.



# Better Service

## Fast response, great service

Our Hercules is designed and manufactured in Australia. So you'll never have to call overseas or wait long for service and support.

ActronAir's call centre is on-site, not in some far flung part of the world. When you call, you'll speak to someone who's responsive and knowledgeable, and based near you.

We also excel at fast response times and having stock on hand, even carrying spare parts for products up to 12 years old. Our flexibility allows us to get orders built fast, tailored to your specifications with any variation requirements taken into account. We know how important short lead times are for business, and that waiting for weeks for a part to come from overseas is simply not good enough, and neither is having to talk to someone overseas to order it.

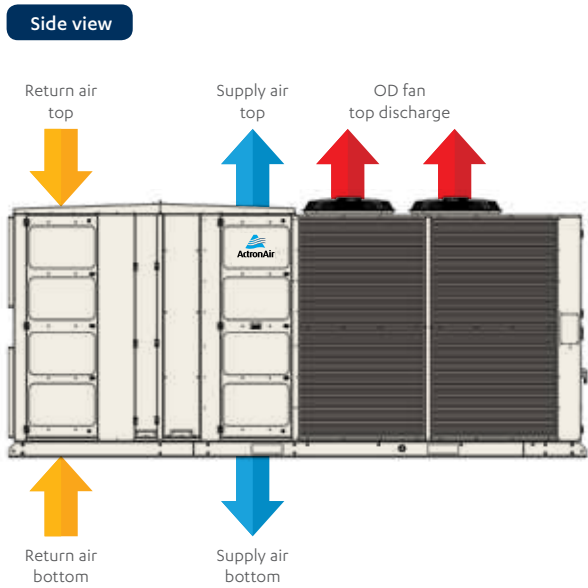
In an industry where some businesses have had to wait 12 weeks for a part to come in from overseas, service counts for a lot. Being locally based and proudly service oriented, we've always gone that extra mile to provide prompt and friendly service to our customers all over Australia.



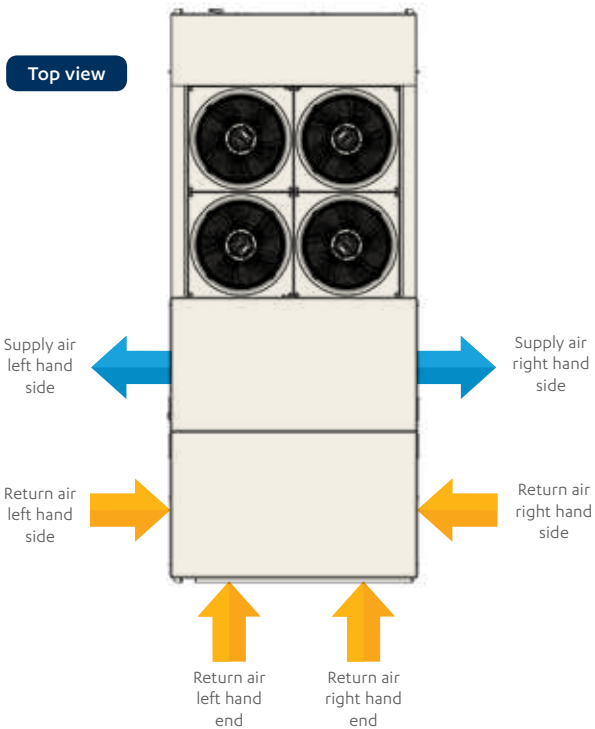
## Designed for easy installation and configuration

Hercules offers enough flexibility to suit most applications, including:

- Multiple handing options
- Outside air can be introduced manually or automatically to comply with the Building Code of Australia (BCA). Using the auto option and third party controls, the correct amount of outside air can be set to maximise energy efficiency.
- Recessed low profile condenser fans improve aesthetics and minimise system height. This helps with design and placement on-site to meet customer and council requirements.
- Container transportable for ease of transit to site.
- Quicker installation time. With the flexibility of ductwork connections, installation time can be cut down providing minimum disruption during changeover.
- Structurally enhanced independent base engineered using hot dipped galvanised 'C' channel. This base frame may eliminate the need for a platform. Only support posts need to be installed with a WHS compliant working area around the unit, and this can reduce the installation cost.
- Reduced capital outlay on electrical supply costs including transformers and cables due to:
  - Minimal start-up in-rush current
  - Low operating current at maximum load.
  - High in-built power correction factor 0.92
- Factory fitted lockable three-phase load break isolation switch. Reduces installer cost and time on-site.



Customised handing available on request





Hercules - big on control

With Hercules, running a big system doesn't mean you need a degree in rocket science. ActronAir is renowned for its controls, logic and electronics, and a lot of thought has gone into making controlling Hercules flexible, comprehensive and user friendly.

Features include:

- BMS compatibility to integrate with most MODBUS and BACNET operating systems
- Allows 3rd party web browsing
- Constant air volume control
- Fault diagnostics
- Factory fitted LCD user interface
- Maintenance and service activities are enhanced with a 100-event fault register
- Dedicated input for remote stop/start and fire alarms
- In-built full head pressure control
- Smart high and low head pressure safety management system
- Programmable differential pressure for filters and fans
- 7/365 day time clock scheduler with programmable operating times (two on/off cycles per day)
- 12 special event days
- Secondary optional remote LCD user interface
- Time clock is programmable for daylight saving time



CP10 interface



CM100 control

Better Solutions

Hercules vs. VRF – A much simpler solution

Features	Hercules	VRF	Comparison
Faster, simpler installation	✓	✗	With built-in controls, Hercules is operational as soon as it is powered. VRF requires more complicated installation and higher associated costs: <ul style="list-style-type: none"><li>• Power wired to each outdoor and indoor unit.</li><li>• Complicated network of brazed copper pipes for refrigerant transport.</li></ul>
Elimination of potential water leaks	✓	✗	Hercules eliminates this requirement. VRF systems require condensate drainage from each indoor unit. Blockages may result in potential water leakage in the ceiling.
Reduced potential for refrigerant leaks	✓	✗	Hercules is a fully charged system. VRF systems have higher risk of refrigerant leaks due to multiple connections.
Reduced ongoing maintenance costs	✓	✗	Hercules is engineered as one purpose built unit. VRF requires more complex maintenance with multiple indoor and outdoor units.
Outside air can be easily introduced	✓	✗	Hercules can easily incorporate outside air. VRF requires a totally separate system to be installed.
Average technical skill required for service and maintenance	✓	✗	Designed with the installer in mind, Hercules has many features to assist in service and maintenance. VRF requires a highly skilled mechanic to maintain and service the system.
Simpler 2 year parts and labour warranty	✓	✗	Some VRF systems only offer 12 months warranty, with labour additional charge.

Hercules vs. Chilled Water system – The advantages all add up

Features	Hercules	Chilled Water	Comparison
Faster, simpler installation	✓	✗	Chilled Water systems require more complicated installation and higher associated costs. With built-in controls, Hercules is operational as soon as it is powered.
Elimination of potential water leaks	✓	✗	Chilled Water systems pump water around the building with increased risk of leaks. Blockages in condensate drainage of the air handling units or fan coil units may result in potential water leakage in the ceiling. Hercules eliminates this requirement.
Reduced ongoing maintenance costs	✓	✗	Chilled Water central plant systems require higher ongoing maintenance i.e. water treatment, annual cleaning of the condenser tubes, water pump maintenance, vee belt adjustment and complicated controls. Water-cooled Chilled Water systems have cooling towers which impose additional legislative and maintenance requirements.
May allow for greater lettable floor space	✓	✗	Hercules eliminates the need for plantroom space thus providing a greater return on investment for floor space.
Average technical skill required for service and maintenance	✓	✗	A higher skilled mechanic is required to service and maintain a Chilled Water system. This skill level can be difficult to access in some geographical areas. Hercules has been designed with ease of serviceability for the mechanic.
Simpler 2 year parts and labour warranty	✓	✗	With Chilled Water systems, warranty can be complicated as there are many component suppliers with different warranty terms.



Package Unit Variable Capacity 140-195kW (Three Phase)

Technical Information							
PACKAGE MODEL		PKV1400T		PKV1700T		PKV2000T	
		Part Load Capacity	Maximum Capacity	Part Load Capacity	Maximum Capacity	Part Load Capacity	Maximum Capacity
<sup>1</sup> Total (Gross) Capacity (kW) (AS/NZS3823.1.2)	Cooling (Min - Max)	110.00 (35.50 -140.00)	140.00 (35.50 -140.00)	140.00 (42.50 -169.11)	169.11 (42.50 -169.11)	155.00 (49.00 -195.50)	195.50 (49.00 -195.50)
	Heating	113.50	147.00	138.50	177.92	162.30	202.10
Nett (Rated) Capacity (kW) (AS/NZS3823.1.2)	Cooling	106.68	135.00	137.12	163.31	150.50	187.50
	Heating	116.58	152.50	141.50	184.32	166.90	210.00
Total Input Power (kW) (AS/NZS3823.1.2)	Cooling	28.28	39.84	38.05	52.22	37.55	53.75
	Heating	24.82	34.00	31.90	48.03	38.40	51.70
Nett (Rated) Input Power (kW) (AS/NZS3823.1.2)	Cooling	31.60	44.84	40.93	58.02	42.05	61.75
	Heating	27.90	39.50	34.90	54.43	43.00	59.60
EER Total (AS/NZS3823.1.2) COP Total (AS/NZS3823.1.2)	Cooling	3.89	3.51	3.68	3.24	4.13	3.64
	Heating	4.57	4.32	4.34	3.70	4.23	3.91
<sup>2</sup> EER Rated (AS/NZS3823.1.2)	Cooling	3.38	3.01	3.35	2.81	3.58	3.04
<sup>3</sup> COP Rated (AS/NZS3823.1.2)	Heating	4.18	3.86	4.05	3.39	3.88	3.52
Power Supply (V / Ph / Hz)		400V / 3Ph + N / 50Hz					
Rated Amps (AS/NZS3823.1.2)		52.9	71.6	63.7	92.1	66.7	86.0
Full Load Amps (AS/ NZS3823.1.2)		89.9		114.1		117.0	
<sup>4</sup> Circuit Breaker Amps		100.00		125.0		125.0	
IP Rating		IP44					
Compressor	Type / No. per Unit	Variable Capacity Scroll with Inverter Drive / 2					
	Starting Method	Soft Start					
No. of Refrigeration Circuits/Capacity Range		2 / Variable (33.50kW-140.00kW)		2 / Variable (42.50kW-170.00kW)		2 / Variable (155.00kW-195.50kW)	
Refrigerant		R410A					
Fans (Type x Number per unit)	Outdoor	Variable Speed ECM / Direct Drive Axial Fan x 4					
	Indoor	Variable Speed ECM / Direct Drive Backward Curve Plug Fan x 4					
Airflow Indoor (l/s)	Maximum	6960	8880	8880	10680	9480	11200
	Nominal	5800	7400	7400	8900	7900	9900
	Minimum	4640	5920	5920	7120	6320	7920
External Static Pressure (Pa) at:	Maximum Airflow	500	210	500	410	500	420
	Nominal Airflow	500	465	500	500	500	500
Unit Dimensions (mm)	Depth	5250					
	Height	2360					
	Width	2300					
<sup>5</sup> Nominal Weight (kgs)		2716		2993		3012	
<sup>6</sup> Sound Pressure Level (dBA)	Outdoor (high/maximum)	54.4 / 66.2	59.1 / 66.2	59.1 / 66.2	61.9 / 66.2	60.7/ 66.2	66.2 / 66.2
<sup>7</sup> Sound Power Level (dBA)	Outdoor (high/maximum)	71.5 / 83.2	76.1 / 83.2	76.1 / 83.2	78.9 / 83.2	77.7 / 83.2	83.2 / 83.2
BCA Compliant		Yes	Yes	Yes	Yes	Yes	Yes
<sup>9</sup> Demand Response Capability (AS4755.3)		Capable					

**Foot Notes 1-8**

1. Based on unit rating excluding indoor fan kW.

2. EER Rated = Energy Efficiency Ratio (Rated Capacity Cooling / Rated Input Cooling).

3. COP Rated = Coefficient of Performance (Rated Capacity Heating / Rated Input Heating).

4. Refer to AS/NZS 3000 "Australian/New Zealand Wiring Rules" for more details.

5. Refer to Catalogue Unit Weight Distribution Guide section for details of weight points.

6. Sound Pressure Level at 3m distance is determined as the measured sound pressure at 3m perpendicular to the coil side of the condenser.

7. Determination of Sound Power Levels of Noise Sources, AS12172 - Precision Methods for Broad-Band Sources in Reverberation Rooms.

8. Return air sensor needs to be relocated by installer. Specific to site requirements.

9. When Demand Response capability is chosen, the air conditioner will fully comply with AS4755.3 in the following modes: DRM 1, 2, 3.

**Important Notes:**

- The Local Electricity Supply Authority may require limits on - starting current, running current and voltage drop, please check prior to purchase.
- When the outdoor temperature exceeds the rated conditions, the cooling/heating capacities may decrease the rated nett values.
- Specifications subject to change without notice.
- When Demand Response capability is chosen, the air conditioner will fully comply with AS4755.3 in the following modes: DRM 1, 2, 3.

**Rated Conditions:**

Cooling: 35°C DB Outdoor / Air Entering Indoor 27°C DB, 19°C WB

Heating: 7°C DB, 6°C WB Outdoor / Air Entering Indoor 20°C DB

**Warranty:**

For full terms and conditions of ActronAir warranty, please refer to warranty terms document - [www.actronair.com.au](http://www.actronair.com.au)

Control Options and Features			
PACKAGE MODEL	PKV1400T	PKV1700T	PKV2000T
CP10 Control Interface with LCD Display for System Operation	Included	Included	Included
Automatic / Manual Operation	Yes	Yes	Yes
7 Day Programmable Time-Clock	Standard	Standard	Standard
Bi-Flow Electronic Expansion Valve (EEV)	Standard	Standard	Standard
Compressor Discharge Temperature Control	Standard	Standard	Standard
Adjustable Indoor Fan Airflow Setpoint	Standard	Standard	Standard
Indoor Coil Anti-Freeze Protection	Standard	Standard	Standard
Return Air Offset	Standard	Standard	Standard
High and Low Pressure Protection	Standard	Standard	Standard
Three Phase protection on all Motors	Standard	Standard	Standard
Alarm Fault Data Logger	Standard	Standard	Standard
BMS Compatibility	Optional	Optional	Optional
CP05 / CP10 Control Interface (Available as Dual Option)	Optional	Optional	Optional

Field Information			
Refrigerant Factory Charge - (g)		19,500 & 19,500	28,000 & 28,000
Condensate Drain Connection - Size/Type	Indoor Section	31.8 mm (1-1/4") Ø BSP Female Socket	
	Outdoor Section	31.8 mm (1-1/4") Ø BSP Female Socket	
Air Duct Connection	Supply Duct W x L - (mm)	553 x 1953	
	Return Duct W x L - (mm)	803 x 1953	

Variations			
B - Floor Mesh Supply Air - Down Supply Air	Optional	Optional	Optional
C - Floor Mesh Return Air - Bottom Return Air	Optional	Optional	Optional
<sup>8</sup> E - Economiser without Spill Air	Optional	Optional	Optional
F - Economy Control 3 <sup>rd</sup> Party Components	Optional	Optional	Optional
<sup>8</sup> G - Outside Air Auto	Optional	Optional	Optional
<sup>8</sup> H - Outside Air Manual	Optional	Optional	Optional
K - Additional Coil Coat Protection (Outdoor Section)	Optional	Optional	Optional
L - Additional Coil Coat Protection (Indoor Section)	Optional	Optional	Optional
<sup>8</sup> M - Economy Cycle with Spill Air	Optional	Optional	Optional
W - Reheat - For RH Control*	Optional	Optional	Optional
X - IP55 Rated	Optional	Optional	Optional







# ActronAir

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**actronair.com.au**

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