Rooftop Packaged Range

AIR CHANGE
DOAS & DEHUMIDIFICATION

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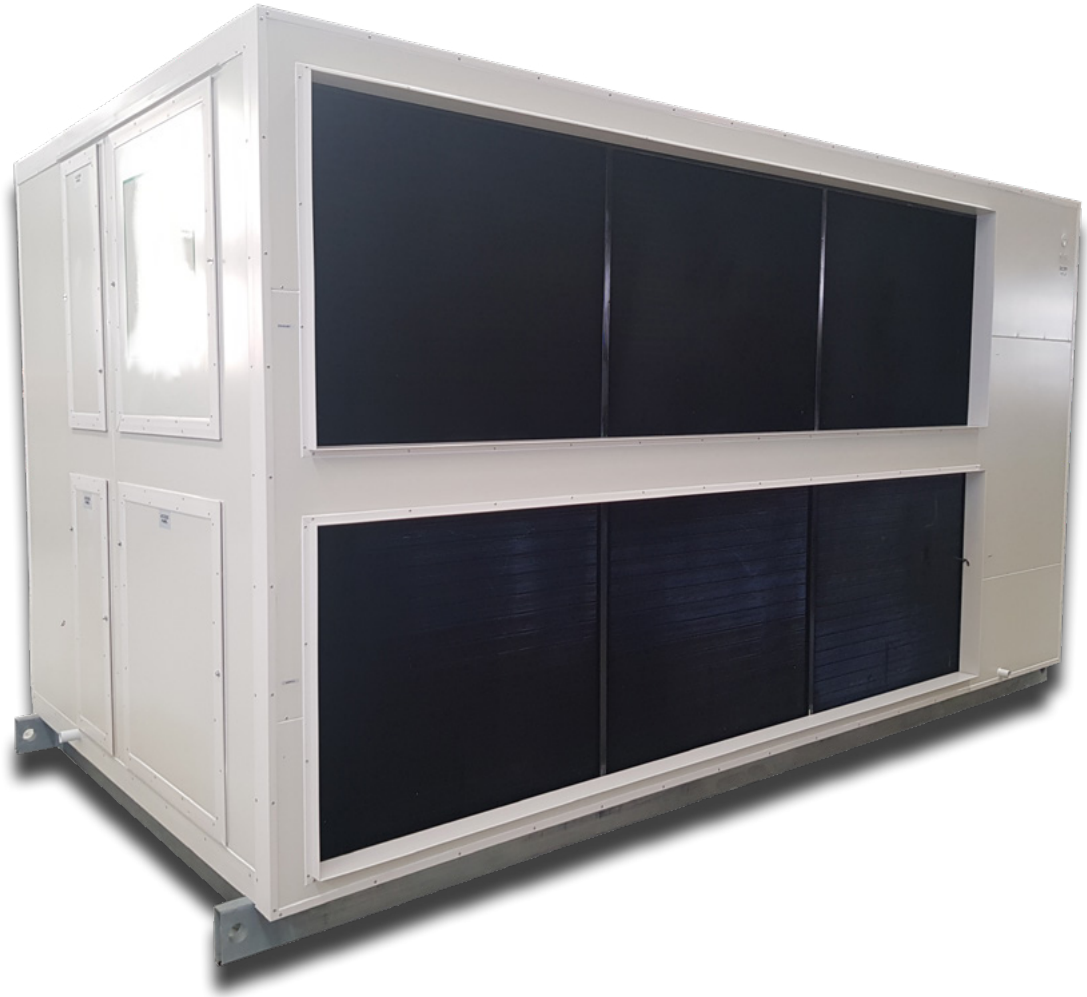
Introduction

Fresh outside air must be supplied to indoor spaces to meet minimum mandated building code legislation (or greater volumes if required to improve occupant comfort) and provide make up air or positive room pressurisation where ever needed. However, providing fresh outside air to an indoor space comes with a significant energy penalty as any temperature differential between outside and inside increases the heating or cooling load required to condition this outside air to a space neutral temperature. The greater this differential, the greater the amount of energy required. Similarly, if the humidity present in the outside air exceeds that in the space it will need to be removed to maintain a space neutral condition. The removal of this excess humidity adds a latent component to the cooling load and further increases the energy required to maintain the desired room condition. The air conditioning necessary to provide outside air at a space neutral condition is known as the fresh air load ('FAL").

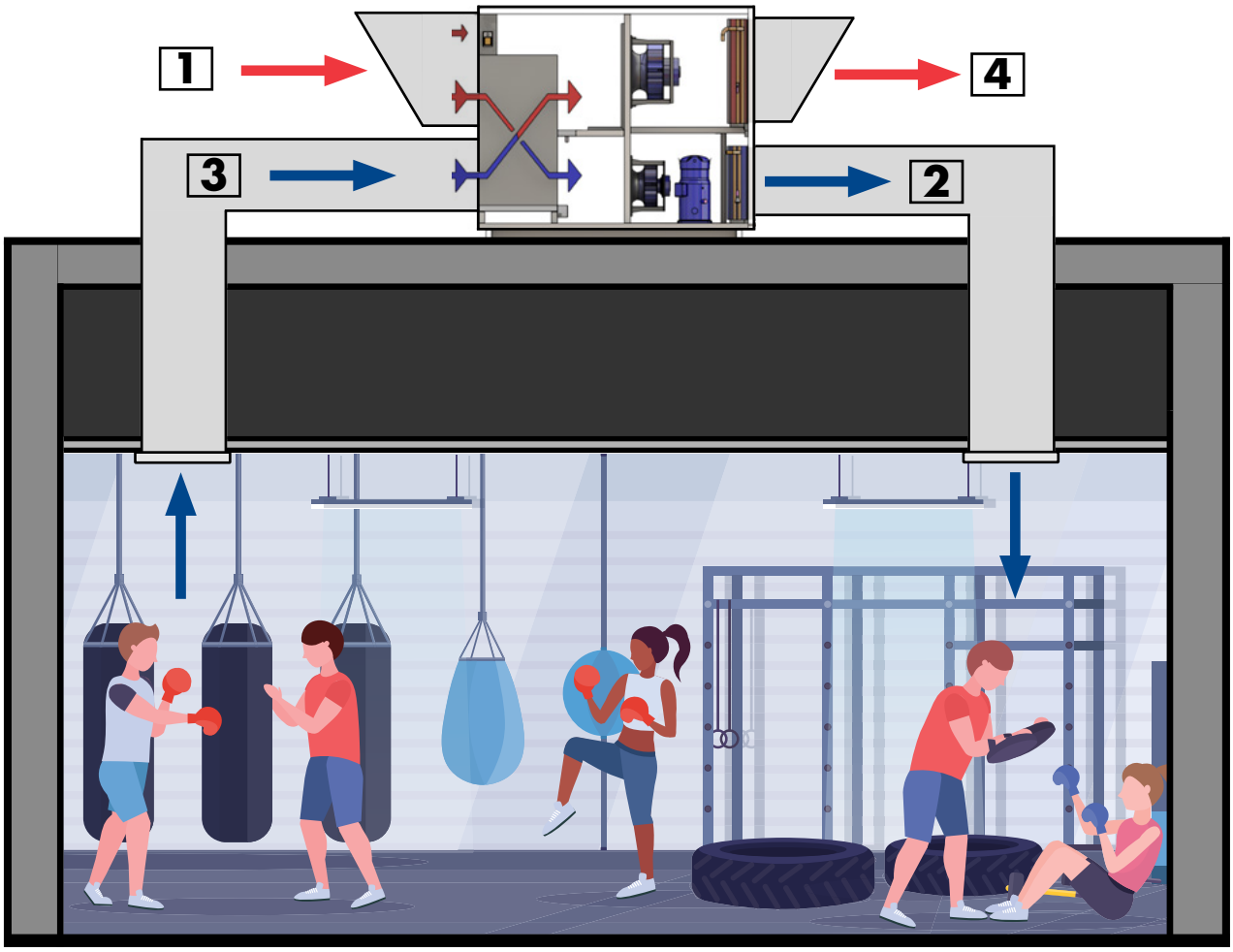
The most efficient way to remove this FAL is treat it separately to the normal sensible load that arises from the space use and the building fabric heat gain or loss by employing a dedicated outdoor air system ("DOAS"). The cool dehumidified fresh air supply will provide sensible room cooling but may need to be supplemented depending on the overall room load.

To minimise the energy consumed for this FAL, Air Change have been manufacturing and supplying its DOAS Rooftop Packaged Unit Range for over 20 years to a vast array of projects across Australia. By combining air-to-air heat and energy recovery technology to reduce the FAL with a reverse cycle DX heat pump, the Air Change Rooftop Packaged Range is able to provide space temperature and humidity control using significantly less energy. With a wide product range and other design options available, there is an Air Change Rooftop Packaged solution for any application requiring fresh outside air.

Contact one of our experienced sales engineers for a detailed unit selection.



How it Works



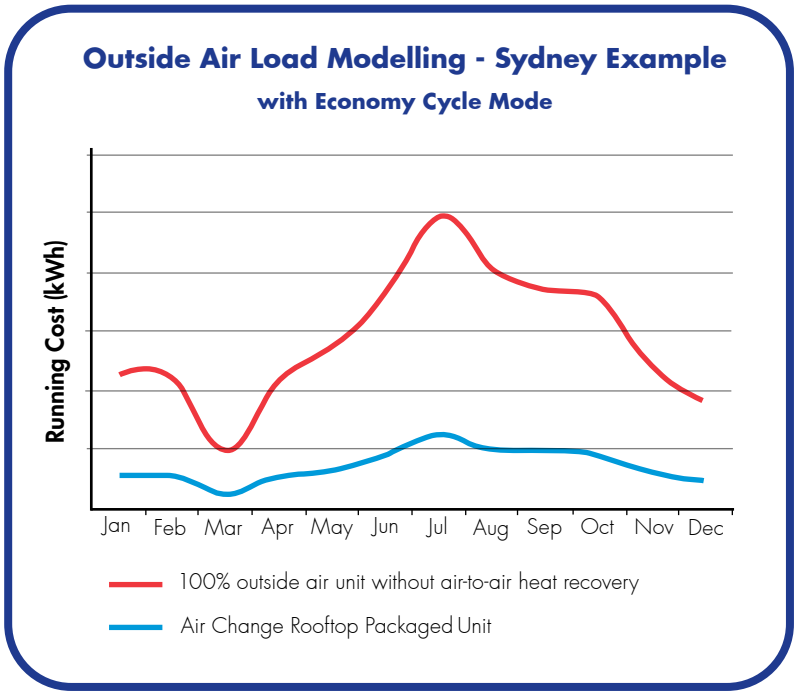
Cooling Mode Scenario

1. 100% fresh outside air enters the unit and passes through an air-to-air heat / energy exchanger where it exchanges heat (and moisture) with the return air (stage 3) that is to be exhausted.
2. Once the air has been precooled (or dehumidified) passing through the air-to-air heat / energy exchanger, additional cooling is provided by a DX evaporator coil to maintain the desired room temperature.
3. Cool dry air returns to the unit where it exchanges heat / energy with the hot fresh air before it is exhausted from the building.
4. Before the return air is exhausted outside, it is used to reject heat from the DX condenser coil and being cooler than the outside air boosts unit EER.

Conversely, in a heating scenario the air-to-air heat exchanger provides preheating to minimise the outside air load. The integrated DX system is reverse cycle and switches to heating mode when required

The Advantages

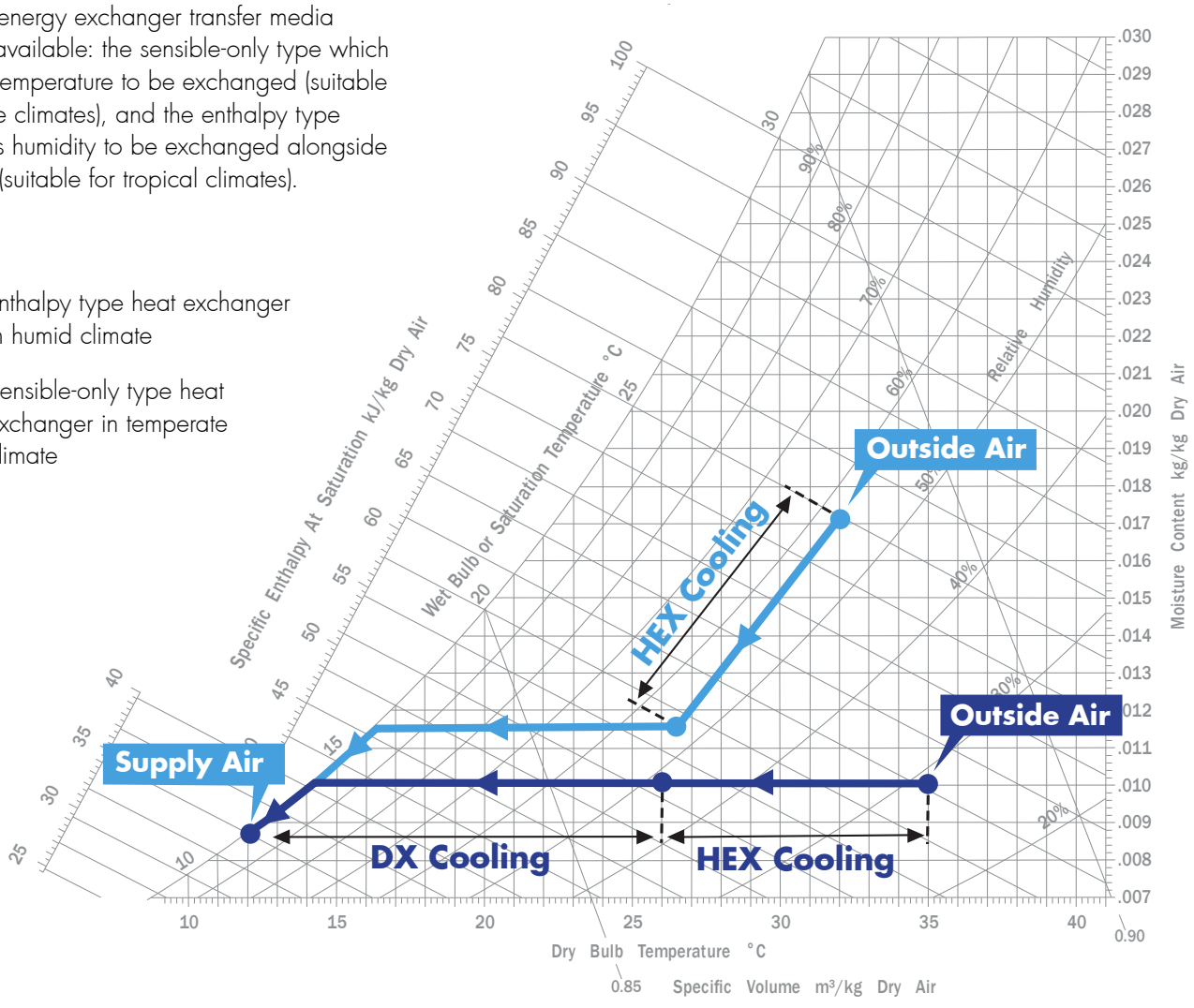
The air-to-air heat / energy exchanger provides significant year-round energy savings by providing precooling in summer and preheating in winter.



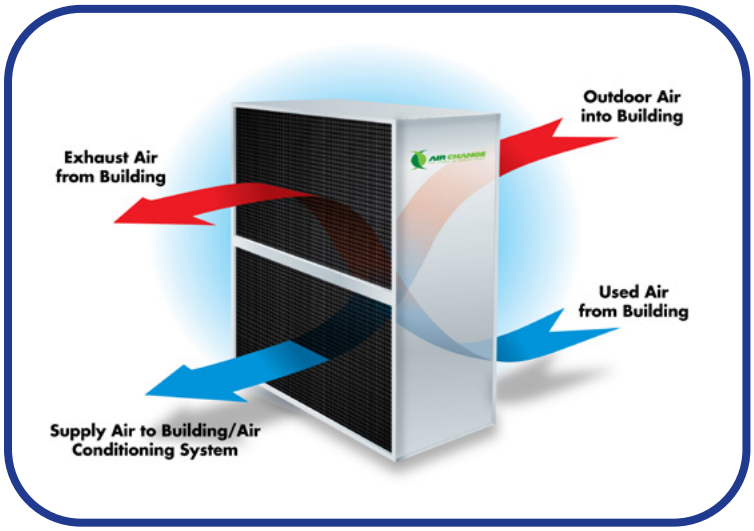
Two heat / energy exchanger transfer media options are available: the sensible-only type which allows only temperature to be exchanged (suitable for temperate climates), and the enthalpy type which allows humidity to be exchanged alongside temperature (suitable for tropical climates).

Enthalpy type heat exchanger in humid climate

Sensible-only type heat exchanger in temperate climate



Features

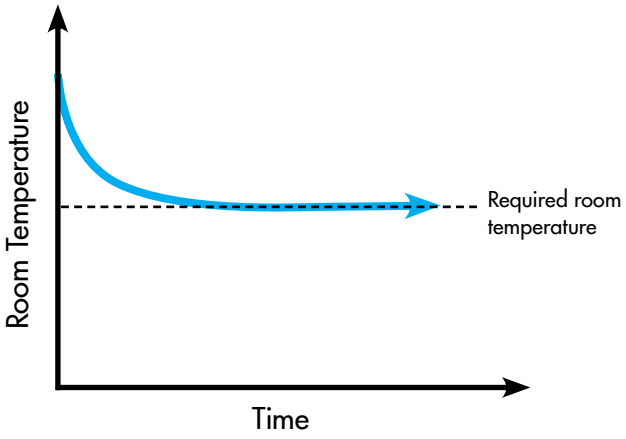


Air-to-Air Heat Exchangers

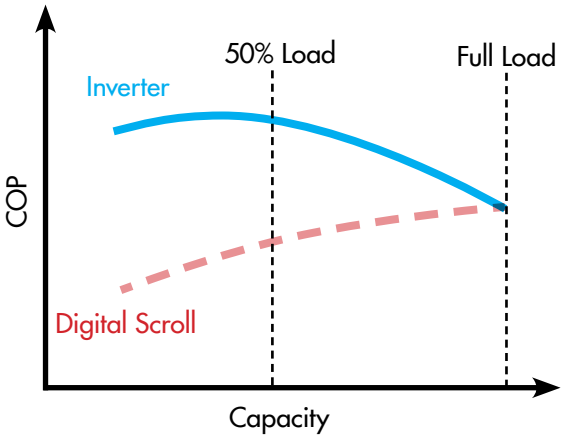
Air Change's unique counterflow plate heat / energy exchangers provide optimal heat transfer between outside air and return air, reducing the outside air load with significant running cost savings.

BLDC Inverter Compressors

The variable capacity of inverter compressors provide a match of heating or cooling capacity with the heating or cooling load. Because the load and capacity are matched, inverter compressors offer enhanced energy efficiency during capacity turn-down due to the reduced compressor lift. As DX systems typically spend minimal time at full design load, this translates to significant seasonal energy savings.



Smooth and steady control of room temperature achieved by inverter compressors.



Indicative COP vs. capacity profiles of inverter and digital scroll compressors.

Features

EC Supply Air and Exhaust Air Fans

EC fans offer optimal levels of energy efficiency. They also have high static pressure development, making them suitable for applications requiring high filtration grades or long ductwork runs.

ClimaSync Control System (Optional)

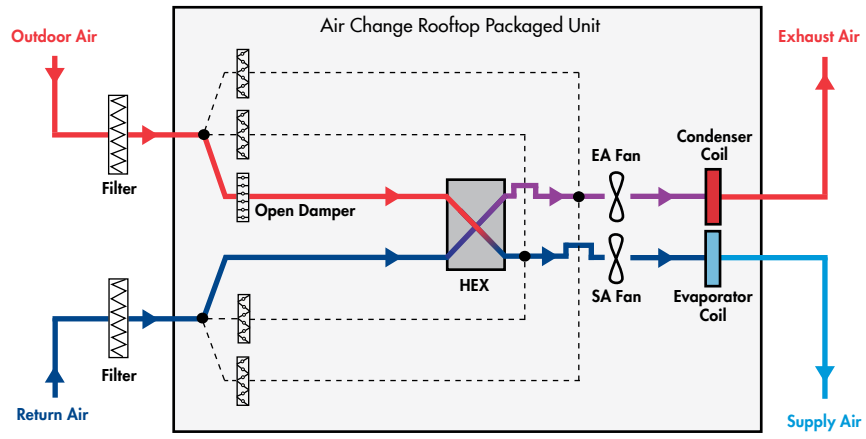
The optional ClimaSync Control System ensures optimal performance and reliability. The control logic and operational functions are programmed to meet the requirements of each project. Features include proactive thermostat logic, performance status and trends, advanced protection logic, alarm histories, and time scheduling. Unit operation is achieved through touchscreen human machine interface, high level interface, or through online connectivity.

Economy Cycle & Return Air Bypass Modes (Optional)

Dampers can be integrated into the unit to provide the optional operating modes of Economy Cycle and Return Air Bypass. See the schematics on the following page for details.

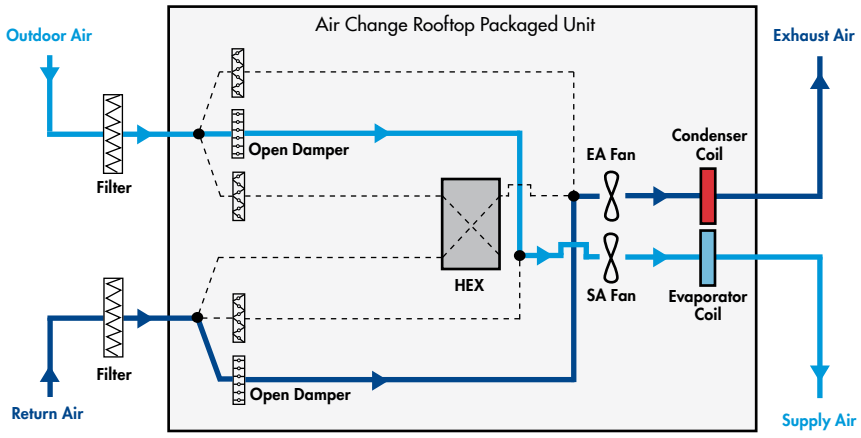
Operating Modes

100% Outside Air Heat Recovery (default)



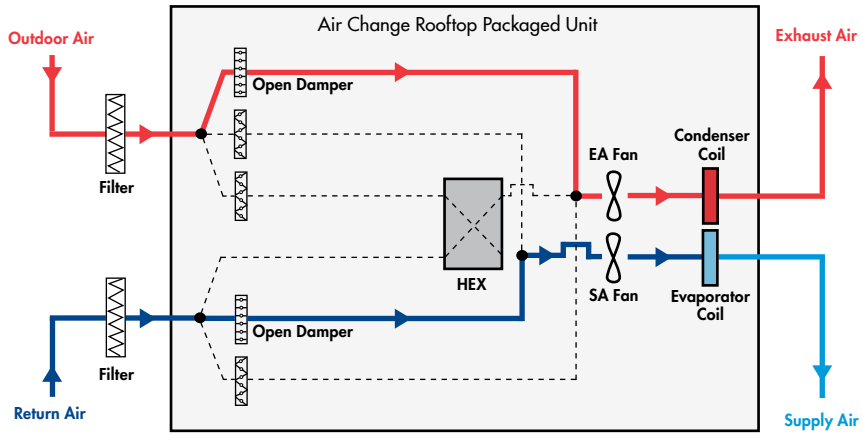
Used when the outside air temperature is hot or cold, and the indoor space requires 100% fresh outside air. The air-to-air heat / energy exchanger minimises the outside air load.

Economy Cycle (optional)



Used for free-cooling - when cold 100% outside air is brought straight into an indoor space to address the room load. Also used when the outside air temperature is mild and air-to-air heat / energy recovery is not necessary for supplying 100% fresh outside air.

Return Air Bypass (optional)



Used when 100% fresh outside air is not required (eg. when room occupancy levels are low). Outside air volume can be modulated between 0% and 100% to provide the minimum required fresh air and achieve further energy savings.

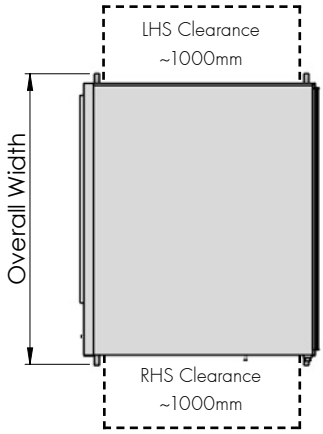
Technical Data

Model Number:	ACS--RCRTP 11	16	20	23	27	32	36	ACL--RCRTP 45	52	60	65	70	82	96	125
Supply Air (l/s)	500	750	1000	1100	1200	1400	1700	2000	2300	2700	2800	3200	3700	4200	5000
Return Air (l/s)	500	750	1000	1100	1200	1400	1700	2000	2300	2700	2800	3200	3700	4200	5000
Outside Air	Up to 100%														
Condenser Make-Up Air (l/s)	350	490	550	680	890	1080	1090	1490	1730	1950	2230	2220	2650	3230	4680
Exhaust Air (RA + CMA) (l/s)	850	1240	1550	1780	2090	2480	2790	3490	4030	4650	5030	5420	6350	7430	9680
HEX Media	Sensible-Only or Enthalpy														
Comp. Capacity # **Cooling** (kW)	11	16	20	23	27	32	36	45	52	60	65	70	82	96	125
Heating (kW)	14	21	26	30	35	42	47	59	68	78	85	91	107	125	163
Comp. Stages	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2
Comp. Type	Brushless DC (BLDC) Inverter														
Refrigerant	R32 or R410A														
Fan Type	EC Plug Fans - Variable Speed														
Volts / Ph / Hz	415 / 3 / 50														
Construction	50mm PIR Sandwich Panel														
Dimensions (Standard)	All units are custom-made to suit individual projects, dimensions are indicative and subject to change														
Body Width (mm)	1150	1600	2050	2050	2050	2050	2050	2000	2300	2750	2750	2750	3300	3300	4100
Body Depth (mm)	1650	1650	1850	1850	1850	1850	1850	2300	2300	2300	2300	2300	2300	2300	2300
Overall Height (mm)	1480	1480	1480	1480	1600	1600	1600	2300	2300	2300	2300	2300	2300	2300	2450
Weight (kg)	600	650	800	850	1000	1050	1100	1300	1400	1500	1700	1800	2150	2200	2750
Dimensions (Economy Cycle)	All units are custom-made to suit individual projects, dimensions are indicative and subject to change														
Body Width (mm)	1150	1900	1900	2350	2100	2300	2300	2650	2950	3400	3400	3400	3800	4350	5300
Body Depth (mm)	2000	2100	2100	1800	2100	2200	2200	2300	2300	2300	2300	2300	2300	2300	2300
Overall Height (mm)	1850	1850	1850	1500	2000	2100	2100	2300	2300	2300	2300	2300	2300	2300	2450
Weight (kg)	650	800	850	900	1150	1200	1250	1400	1500	1600	1850	1900	2300	2400	3000

*Specifications are subject to change. Refer to project certified documentation for finalised details.

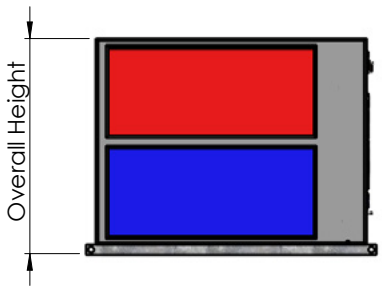
*We can cater tailored solution with various cabinet configurations including reduced and/or one sided access. Please contact our engineer for more details.

Cooling capacity based on: OA 35/24°C, RA 24/17°C with 100% outside air. Heating capacity based on: OA 8°C, RA 21°C with 100% outside air.

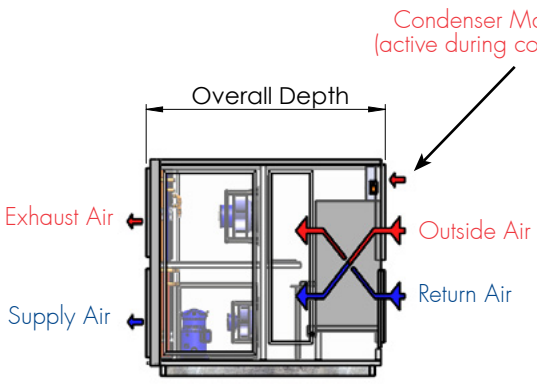


Plan View

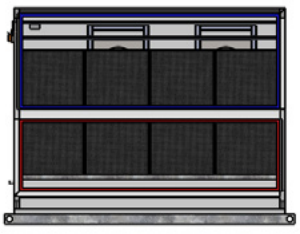
Outside air and return air filter boxes supplied by others.



Front View



Right Side View



Back View

Recent Projects

- Lennox Community Centre, NSW
- Tamworth Public School, NSW
- Coogee Synagogue, NSW
- Electra Community Centre, VIC
- Adina Apartments, VIC
- Catholic Regional College, VIC
- TSS Annand Theatre, QLD
- Northgate Hall, QLD
- Hillbrook Anglican College, QLD
- Fullarton Lutheran Homes, SA
- Sacred Heart College, SA
- Mawson Lakes School, SA
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- Burswood Tavern, WA
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AIR CHANGE
DOAS & DEHUMIDIFICATION

For more than 20 years, Air Change has provided unique equipment and engineering solutions for local and international clients using our internationally patented heat and energy recovery technology. During that time, we have developed a comprehensive range of energy efficient products to deliver controlled indoor climate conditions satisfying the requirements of all project stakeholders: the developer, the design engineer, and the building's owner and occupants.

www.aircharge.com.au

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Air Change Pty Ltd products internationally patent protected

Refrigerant Trading Authorisation No: AU23586

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