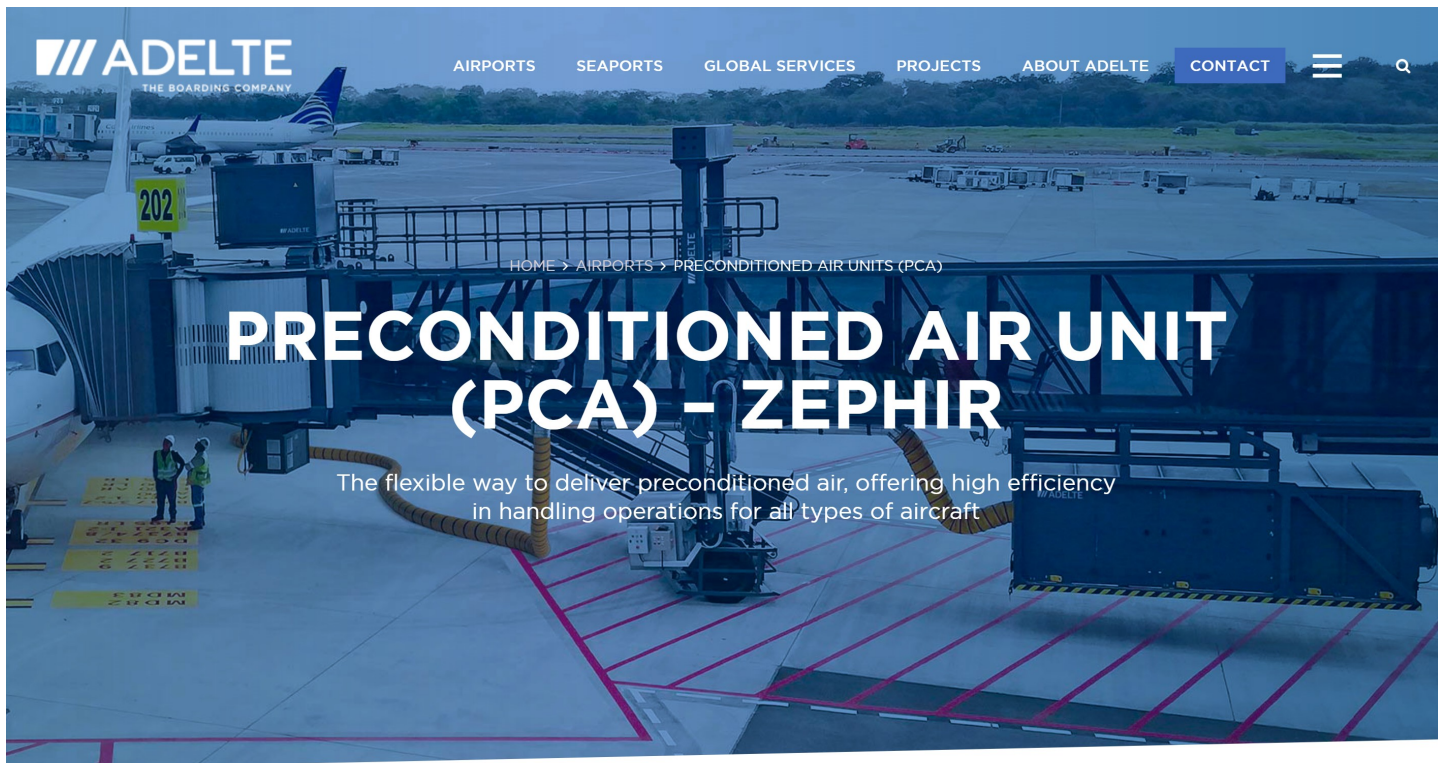




PRECONDITIONED AIR UNIT (PCA) - ZEPHIR

The flexible way to deliver preconditioned air, offering high efficiency in handling operations for all types of aircraft

Investing in a PCA system for your airport will increase your revenues, reduce your impact on the environment, and appeal on airlines by reducing their own costs

The use of air conditioning for an aircraft during its turnaround is necessary whether on a warm or sunny day, or in cold ambient conditions as the cabin would otherwise become quickly uncomfortable.

To achieve this, when no appropriate facilities are available on the ground, the aircraft will use its on-board APU (Auxiliary Power Unit) which is a jet turbine fed from the main aircraft fuel tanks primarily used in flight for example in case of a main engine failure.

Using the APU on the ground is a last resort solution being **uneconomical for the airline and an aggression against the environment** as this jet engine has an overall energy efficiency of only 4%! Simultaneously, large amounts of air contaminants are emitted. Among these the CO₂, creating a Greenhouse effect in the Earth's atmosphere, as well as NO_x and small particles which directly affect our daily lives.

Running the APU on the ground is very expensive for the Airline; for example a Narrow Body aircraft consumes about **100 kg/hour of Jet Fuel** to which must be added the cost of maintenance for APU. A ground-based Pre Conditioned Air (PCA) system offers an attractive alternative. Being powered by electricity from the grid, the PCA unit will dramatically reduce the on-site emissions and noise pollution. As a rule of thumb, let's consider that a single narrow body aircraft running its APU during one hour every day produce in excess of 100 tons of CO₂ in one year.

[DOWNLOAD BROCHURE](#)



Energy Efficiency

The innovative Inverter System is designed to save amount of electricity in cooling and heating operations, reducing the energy consumption in airports.



Inverter Scroll Compressors

They allow to modify the frequency of the compressor from 20 to 100% of the power which increase the lifespan and reduce the consumption of the compressor up to 30% with respect to the non-inverter



Heat Pump

The heat pump system for heating using the refrigeration system instead of electric heating elements, which can reduce the energy cost up to 60%.

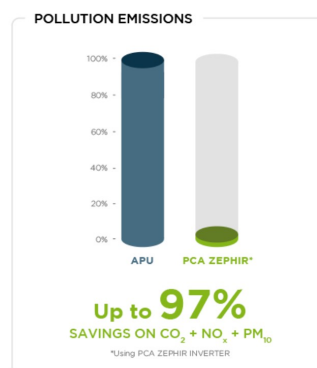
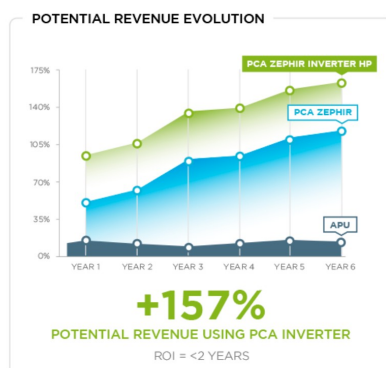


CO₂ + NO_x + PM₁₀ Savings

Using PCAs Inverter powered by electric network will allow your airport to generate new revenue and decrease drastically air pollution emissions

ANNUAL EVOLUTION USING ZEPHIR INSTEAD OF USING APU

Using PCAs powered by electric network will allow your airport to generate new revenue and decrease drastically air pollution emissions



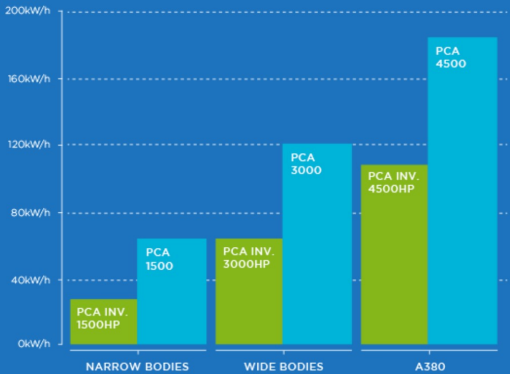
The above calculations are for illustration purpose only. ROI has been calculated under the online PCA simulator conditions that are described in the webpage.
 The APU burn rates used are 100 kg/h for a NB and 250 kg/h for a WB. The Jet Fuel AI cost is based on latest available data provided by IATA.
 Emissions are calculated per ICAO Document 9889 Airport Air Quality Manual. The maximal admissible annual values of NO_x and PM₁₀ are 40µg/m³ per EU Directive 2008/50/EC.
 The CO₂ generated by the off-site production of electricity is 500 g / kWh average high value per EPTA (European Parliament Technology Assessment).

HIGH ENERGY EFFICIENCY WITH INVERTER TECHNOLOGY

Get much lower electrical power consumption using the Heat Pump System

The PCA ZEPHIR Inverter HP incorporates the system Heat Pump for the supply of heating to the Aircraft. The heat pump system uses the refrigeration circuit of the equipment itself to generate heat, avoiding the use of electrical resistances in a temperature range up to -6°C outside, depending on conditions.

With this system we are able to supply all the required heat capacity with a **reduction in energy of up to 60%** thanks to the efficiency of the refrigeration system with COP of 2.5.



The electric power consumed has been calculated under PCA unit nominal heating conditions for each aircraft body type and under ambient conditions of 0°C / 90% Hr.
Only heat generation elements consumption has been indicated in the graphic: electrical heaters vs. frigorific heat pump.

PRECONDITIONED AIR UNIT SPECIFICATIONS

Our PCA is good for the environment & profitable for airports and airlines

High efficiency and low operations costs

Heating and cooling Inverter technology

Environmentally-friendly refrigerants

Ease of installation

Durability and ease of maintenance

Smart PLC control

Superior passenger comfort



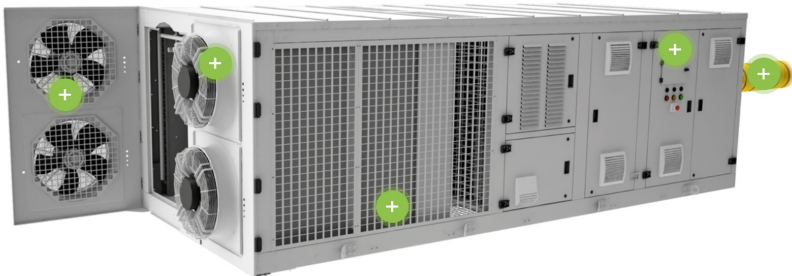
High efficiency and low operations costs

Zephir Series are designed and engineered to deliver optimum airflow to each aircraft, using four compressors four phases and high efficiency direct drive centrifugal blower (VFD), while consuming the minimum energy.



Preconditioned Air Unit Components

ADELTE's PCA is specially designed for heating and cooling all types of aircrafts and for providing maintenance personnel fast and easy access to all components.



NARROW BODIES

ZEPHIR 1500		ZEPHIR INV-1500HP	
Cooling Capacity:	125kW	Cooling Capacity:	20-125kW
Maximum Air Flow:	110kg/min	Maximum Air Flow:	110kg/min
Available Static Pressure:	6300Pa	Available Static Pressure:	6300Pa
Discharge Temperature:	-2°C	Heat Pump Capacity:	19-82kW
		Discharge Temperature:	-2°C

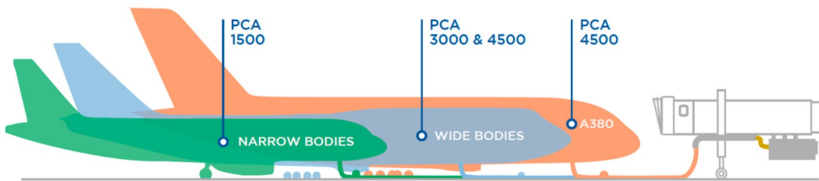
WIDE BODIES

ZEPHIR 3000		ZEPHIR INV-3000HP	
Cooling Capacity:	160kW	Cooling Capacity:	28-184kW
Maximum Air Flow:	150kg/min	Maximum Air Flow:	150kg/min

Available Static Pressure: 8500Pa	Available Static Pressure: 8500Pa
Discharge Temperature: -2°C	Heat Pump Capacity: 26-110kW
	Discharge Temperature: -2°C

WIDE BODIES & A380

ZEPHIR 4500	ZEPHIR INV-4500HP
Cooling Capacity: 318kW	Cooling Capacity: 40-300kW
Maximum Air Flow: 210kg/min	Maximum Air Flow: 210kg/min
Available Static Pressure: 10000Pa	Available Static Pressure: 10000Pa
Discharge Temperature: -2°C	Heat Pump Capacity: 22-160kW
	Discharge Temperature: -2°C



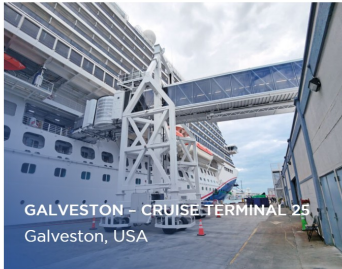
PCA ZEPHIR, THE GAME CHANGER

Discover how our PCA ZEPHIR can be good for the environment
 and profitable for your airport or airline

SIMULATE YOUR SAVINGS NOW

Explore recent projects

ADELTE has extensive experience in the design, manufacture, installation and
 maintenance of PBBs at airport, cruise and ferry terminals around the world



VIEW PROJECTS

Do you need more information?

Interested to know how ADELTE's engineering solutions and technical services can help you enhance your daily operations?

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About ADELTE

ADELTE Group is an engineering organization with more than six decades of experience in the design, manufacture, supply and maintenance of innovative solutions and results-driven services to enhance airports, seaports and road transport operations around the world.

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Preconditioned Air Units (PCA)
ARCOS – Remote Control Operating System
APRONAUT – The PBB Docking Simulator
Seaport Passenger Boarding Bridges
Global Services

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