

R410A

ECO COOLER

ROOFTOP PACKAGE

50Hz

10% Fresh Air

2021

INTRODUCTION

ECO PACKAGE High Efficiency Package Units are designed for outdoor installation specifically for tropical operation with high performance, low power consumption, easy installation and low noise operations.

ECO PACKAGE Packaged Units can be used for cooling or heating with optional electric heater.



OUTSTANDING FEATURES

Applications

- 10% Fresh air applications
- Low cfm mixed air applications

Superior Efficiency

- High EER (Energy Efficiency Ratio)
- Low power consumption
- Heavy duty, High volumetric efficiency scroll compressors
- High efficiency Back Inclined Evaporator Blowers
- Fans are manufactured in Galvanized Steel Sheet with Structurally reinforced housing
- Totally Enclosed Fan cooled (TEFC) Blower Motor, class F insulation, IP 55
- Designed to operate at severe ambient temperature up to 52°C without tripping
- Condenser and Evaporator Coils are heavy duty built up seamless copper tubes and mechanically bonded louvered hydrophilic fins
- Standard Refrigerant line accessories filter drier, sight glass, thermostatic expansion valves
- UL certified components
- Standard hot gas bypass
- Condenser coils metal guards

Quiet operation

- Low noise level compressors, condenser fans, and evaporator blower
- Compact physical footprint
- Special designed refrigerant piping in addition to the insulation for the evaporator section

controls

- Microprocessor Controller
- Single point power supply
- Color coded wires
- Weatherproof Control panel

Quality Assurance

- All units in the FPNG series are :
- Factory run tested
- Produced in an ISO 9001-2000 listed manufacturing facility
- Constructed in compliance with ASHRAE 15 safety requirements
- AHRI certified cooling coils

Options & Accessories

- Intelligent air Quality System by Economizer control
- Ultraviolet (UV) lamps
- Mild ambient control
- Return air Bag filters
- Electric Heaters
- Steam Humidifiers
- Anti ice thermostats

OUTSTANDING FEATURES

Evaporator's Side

- Easy access to the evaporator side with a removable panel for maintenance purposes for the fan, motor, belt, pulleys, and expansion valve
- Easy access to drain pan for cleaning

Compressor's side

- Easy access to the compressor side for maintenance purpose for the compressors and the filter drier
- Easy access to the condenser fans and motors

Electrical Panel

- Easy access to the electrical panel with access panel for microprocessor access and electrical parts



STANDARD SPECIFICATIONS

General

The 10%Fresh Air Package New Generation units (FPNG) are factory-assembled cooling or a combination of cooling and heating with an electric heater, suitable for outdoor installation mounting on the roof or ground.

The Fresh Air packaged unit consists of scroll compressors, a cooling coil, a condenser coil, fans, an electric heater (optional), control wiring, and interconnecting piping factory assembled.

Unit Casing

The casing sheet metal is fabricated from hot dipped G90, Zinc coating and zero spangle galvanized steel, oven-baked powder coated.

The unit is provided with an integral weather resistant control panel for outdoor application. Panels and access doors are provided for inspection and access for all internal parts.

Evaporator Fan

The units are provided with centrifugal fans which are statically and dynamically balanced, designed for low sound level operation Belt driven.

Evaporator Coils

The coils are built up of ripple-finned seamless copper tubes and mechanically bonded to scientifically designed louvered fins.

The assembled coils are factory leak-tested under water at a pressure of 350 psi for quality and leak-free units.

Drain Pan

The drain pan is fabricated of galvanized steel. The drain pan is powder coat painted and the outer surface is thermally insulated.

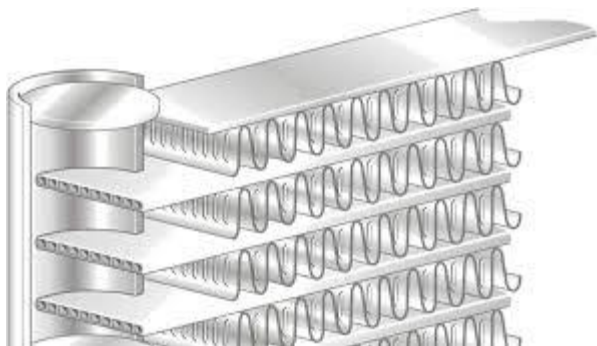
Compressor

The compressors are hermetic scroll type provided with crankcase heater, internal pressure relief valve which offers high-pressure protection for the refrigerant system, and rubber vibration isolators for quiet and efficient operation.

The compressors are equipped with internal motor protectors for safe operation. The compressors are built to NF, VPE, CSA, & UL certification.

Condenser Coils

The condenser coils utilize microchannel technology, which offers several advantages. The coils are constructed using integral NOCOLOK brazing, resulting in low contact resistance and improved heat transfer performance. The AL-AL structure eliminates electric potential differences and enhances corrosion resistance.



STANDARD SPECIFICATIONS

Condenser Coils

The benefits of microchannel condensers over finned-tube coils include:

1. Smaller diameter, more tube holes, and a larger internal surface area, resulting in higher unit capacity per volume.
2. The small cross-sectional area reduces air flow resistance, minimizes eddy areas, and decreases noise levels.
3. The parallel arrangement of flat tubes increases the refrigerant circulation area.
4. Baffles can be adjusted in terms of position and quantity to accommodate refrigerant phase transition, optimizing heat transfer and pressure drop.
5. The structure effectively disrupts the air thermal boundary layer, reducing heat exchange resistance.
6. The waving path design lengthens the contact area, further enhancing heat exchange efficiency.

Overall, microchannel condensers offer improved performance and efficiency compared to traditional finned-tube coils.

Condenser Fans

The direct drive vertical discharge condenser fans are dynamically balanced to ensure smooth operation. The fans feature totally enclosed air over motors, providing complete sealing of the motor windings to protect them from exposure to ambient conditions. The condenser fan motors are three-phase and equipped with permanently lubricated ball bearings and internal thermal overload protection.

To enhance acoustic performance, the condenser fans are designed with optimized blade designs and utilize external rotor motors that comply with protection class IP54. The winding insulation corresponds to insulation class F, ensuring high electrical insulation capability.



The condenser fans are designed for maintenance-free and low-noise operation. This is achieved through the use of deep groove ball bearings that are closed on both sides, along with specially paired grease lubricant. These features guarantee the reliable and quiet performance of the fans.

OPTIONAL SPECIFICATIONS

Construction

- Double skin for evaporator side
- Coil protection materials: a) Polyurethane pre-coat Aluminum fins with copper tubes b) Tinned copper tubes with copper fins • Stainless steel drain pan
- Double side drain connections
- Other types of filter: synthetic fiber media for flat filter, 2" or 4" flat filter, bag filter" • Mixing box
- Vibration isolation for the unit : a) Neoprene rubber pads b) 1" spring isolator
- Lockable door for the control panel

Electrical

- Electric heaters (open coil type)
- Electric heaters (fin type)
- Compressor circuit breaker
- Mild ambient (fan cycling) control
- Duct sensor
- Anti - ice thermostat
- Volt free contacts
- External overload
- Ultraviolet light
- Dirty filter indication
- Fire alarm connection
- Economizer controller
- Steam Humidifiers

Refrigeration

- Pump down solenoid valve (PDS)
- Adjustable high-pressure switch
- Adjustable low-pressure switch
- Muffler
- Replaceable filter drier with mechanical shut-off valve

MICROPROCESSOR CONTROLLER

Microprocessor Based Controller

The Fresh Air Package New Generation units are provided with technologically advanced Microprocessor based controller, incorporating the following benefits and features:

- ANTI-RECYCLE TIMER
- Compressor lock out function
- Balance loading of compressors
- Compressor's lead-lag operation
- Pump down option.
- Fault diagnostics
- Indicator lights for high- & low-pressure Safeties



SELECTION PROCEDURE

The below example illustrates the selection procedure to assist using this catalog to select the appropriate FPNG unit that meets the design requirements.

Example :

Design requirements

- Total cooling capacity 201 [MBH]
- Sensible cooling capacity 163 [MBH]
- Design ambient temperature 115 [°F]
- Evaporator air flow 3100 [CFM]
- Evaporator entering temperature DB/WB 115/80 [°F/°F]
- External static pressure 1.0 [in.wg]
- Altitude 2000 [ft]
- Power supply 415V / 3Ph / 50Hz

Altitude [ft]	Correction factor
Sea level	1
1000	0.996
2000	0.990
3000	0.984
4000	0.980
5000	0.974
6000	0.965
7000	0.960

*Using the correction factor table at the specified altitude, thereby the required capacity will be:

Corrected capacity = Required capacity / corr. factor
Corrected total capacity = 201[MBH]/0.99 = 203.03 MBH
Corrected sensible capacity = 163[MBH]/0.99 = 164.64 MBH

From the cooling capacity at performance data tables (page 10), the closest selection model to the required capacity is FPNG 240. From the performance table:

Total capacity = 206.63 [MBH]
Sensible capacity = 164.67 [MBH]

GENERAL DATA

Model		RPU-5	RPU-7	RPU-10	RPU-12	RPU-15
COOLING CAPACITY*	RT	5	7	10	14	18
	kW	18	25	35	48	63
Refrigerant		R410A				
Power supply [Volts/Phase/Hz]		400V/3PH/50Hz				
Compressor	Type	Hermetic Scroll				
	QUANTITY (No.)	1				2
	CAPACITY CONTROL (%) (STEPPED)	100 (1)				50-100(2)
Expansion device type		Thermostatic Expansion Valves				
Condenser Fan	Type	Propeller-Direct Drive				
	Diameter, mm	500	500	630	800	800
	QUANTITY (No.)	1	1	1	1	1
	AIR FLOW RATE (m3/h)	6000	6000	11000	22500	22500
	MOTOR POWER FAN (kW)	1.9	1.9	1.9	1.9	1.9
	RPM	890	890	890	910	910
Condenser Section	Type	Microchannel				
	QUANTITY (No.)	1	1	1	2	2
	Total Face area, m2	0.5	1	1	2	2
Supply motor and fan	Type	Forward - Belt Driven				
	QUANTITY (No.)	1				
	MOTOR POWER FAN (kW)	1.1	1.5	2.2	3	4
Evaporator Coil	Type	Enhanced Fins and Tube				
	Rows/FPI	4/9	4/12	5/7	6/8	6/12
	Total Face area, m2	40	65	65	91	125
Air Filter	Type	Panel G4				
	Thickness [inch]	2"				

GENERAL DATA

Model		RPU-20	RPU-25	RPU-30	RPU-35	RPU-40
COOLING CAPACITY*	RT	20	27	30	40	40
	kW	69	93	104	140	140
Refrigerant		R410A				
Power supply [Volts/Phase/Hz]		400V/3PH/50Hz				
Compressor	Type	Hermetic Scroll				
	QUANTITY (No.)	2	2	3	3	3
	CAPACITY CONTROL (%) (STEPPED)	50-100(2)		33-66-100(3)		
Expansion device type		Thermostatic Expansion Valves				
Condenser Fan	Type	Propeller-Direct Drive				
	Diameter, mm	800	800	800	800	800
	QUANTITY (No.)	1	2	2	2	2
	AIR FLOW RATE (m3/h)	22500	4500	4500	4500	4500
	MOTOR POWER FAN (kW)	1.9	3.8	3.8	3.8	3.8
	RPM	910	910	910	910	910
Condenser Section	Type	Microchannel				
	QUANTITY (No.)	2	2	2	2	2
	Total Face area, m2	2	4	4	4	4
Supply motor and fan	Type	Forward - Belt Driven				
	QUANTITY (No.)	2				
	MOTOR POWER FAN (kW)	4.4	6	8	8	8
Evaporator Coil	Type	Enhanced Fins and Tube				
	Rows/FPI	4/10	6/8	6/8	6/12	8/8
	Total Face area, m2	148	175	185.5	263	252.5
Air Filter	Type	Panel G4				
	Thickness [inch]	2"				

ECO COOLER
AIR CONDITIONER