REGENCORE

Energy Recovery Unit

SolutionAir™

RegenCore

RegenCore is a high effectiveness energy recovery unit. RegenCore recovers sensible energy during both heating and cooling seasons, and under select conditions, RegenCore also recovers latent energy. The new regenerating core product sets itself apart from other recovery devices with its fully tested design, industry leading effectiveness of up to 92% and no pre-heat requirement down to outdoor temperatures of -40°C/F.

PRC, PRCX, PRCLC and PRCF units are available in a wide range of sizes to accommodate each unique project's airflow requirements. The PRC's wide range of available airflows combined with its indoor and outdoor designs make it suitable for a multitude of applications. The PRCX is suited for outdoor installations with high airflow requirements. The PRCLC is a lighter duty unit for indoor use is an ideal option for use in compact spaces.

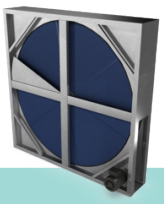
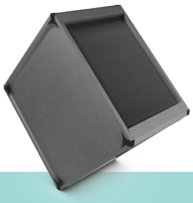
Design Ranges

Unit Type	Airflow	Preheat Requirement	Carry-Over Leakage	Maximum Sensible Effectiveness[1]
PRC	1,000 to 22,500 CFM	No preheat down to -40°C/°F	2% to 4%	92%
PRCX	22,500 to 40,000 CFM			
PRCLC	250 to 2,000 CFM			
PRCF	250 to 2,000 CFM			

Typical Applications

With no preheat required down to -40°C/F, the RegenCore has an attractive in most applications. It is designed for applications that require high air-changes, high efficiency recovery and reduced energy consumption. Examples of suitable applications include: education facilities, sportsplex facilities, commercial office buildings, multi-story residential buildings, banks, warehouses, car dealerships, casinos and more.

Energy Recovery Comparison


	RegenCore	Energy Wheel	Sensible Plates	Heat Pipe
Recovery Type	Sensible and Latent	Sensible and Latent	Sensible	Sensible
Maximum Sensible Effectiveness	92%	85%	70%	60%
Carry-Over Leakage	2% to 4 %	1% to 3%	0%	0%
Preheat Requirement	Below -40°C/°F	Below -5°C /23°F	Below -5°C /23°F	Below -5°C /23°F

[1] Assumptions include ducted indoor units with 1 in. w.c. ESP, outdoor air at 35°F, return air at 70°F, including fan and motor loads. Effectiveness will vary based on air conditions.

S standard feature O optional feature

Features

Cabinet

- S Post and Panel construction
- S 2" polyurethane foam insulation
- S Thermally broken posts and assembly
- S Galvanized or 1500 hour salt pray painted casings
- O Acoustic liners

Filters

- S 2" MERV 8 to 13
- O Pre-Filter
- O 12" MERV 12 to 16
- O Aluminum mesh
- O Washable media filters

Fans

- S AC direct drive backward curved plenum fans with VFD's
- S ODP motors with shaft grounding
- S EC direct drive motors
- S Skid mounted on RIS isolators
- O Airfoil plenum fans
- O Spring isolation

Inlets

- S Louvers
- O Weather hoods

Changeover Dampers

- S Ultra low-leak aluminum airfoil
- S AC gear motors
- O Insulated low leak aluminum airfoil

Controls

- S Constant air volume control
- S DDC BACnet/MSTP or BACnet/IP
- S Remote operable digital controller
- S Internal airflow sensors
- O Variable air volume control
- O Unbalance airflow control (offset supply and exhaust)

Cooling

- O Chilled water
- O DX cooling 8 to 128 tons, packaged or split

Heating

- O Hot water
- O Electric heat
- O Drum and Tube gas heat module
- O Convoluted Tube gas heat module

Airflow Control Options

Variable Air Volume Control

RegenCore can be designed for applications requiring VAV airflow.

+ Turndown to 20% of nominal airflow
  - Ex.: A unit with a nominal airflow of 1,000 CFM can modulate it's supply and exhaust down to 200 CFM (20% of 1,000)
+ No preheat required down to -40°C/°F
+ Airflow measurement included
+ CFM measurements can be output to BMS
+ BMS can be connected to provide airflow set points

Unbalanced Airflow Control

This option is suitable for applications where additional exhaust systems are used in conjunction with a RegenCore.

+ Supply and exhaust airflows can be unbalanced by up to 50%
  - Ex.: A unit with a supply airflow of 1,000 CFM would be able to maintain an exhaust airflow down to 500 CFM (50% of 1,000) or vice versa.
+ No preheat required down to -40°C/°F
+ Airflow measurement included
+ CFM measurements can be output to BMS
+ BMS can be connected to provide airflow set points

Cabinet Options

	Post and Panel Options
Models	+ PRC + PRC X + PRCLC
Outer casing	+ 16 ga. to 22 ga. - Galvanized or galvanneal with 10,000 hour salt spray paint + 14 ga. aluminum
Wall thickness and Insulation	+ 2" R11.5 polyurethane foam with thermally broken posts + Thermally broken panels
Inner liner	+ 16 ga. to 20 ga. galvanized steel + 14 ga. aluminum
Floor panel	+ 16 ga. galvanized or 304 stainless
Acoustic liner	+ 22.ga perforated galvanized with fiberglass insulation
Access	+ Removable panel and hinged door
Roof curb	+ 16" or 24" galvanized; Insulated or noninsulated
Inlet/Discharge location	+ Top, bottom, side, horizontal
Installation location	+ Outdoor on roof curb by SolutionAir + Indoor on roof curb by SolutionAir + On steel by others + On curb by others

Regencore Application:

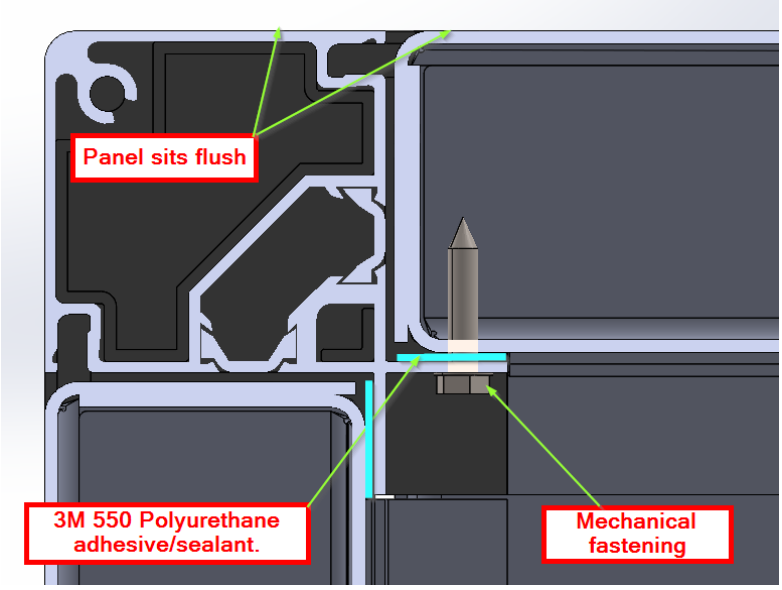
Lauderdale Terrance - Edmonton, Alberta

Regencore Application:

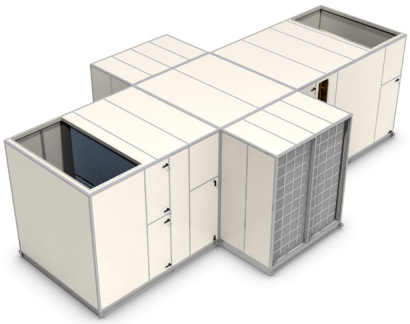
Normandy Living - Whitehorse, Yukon

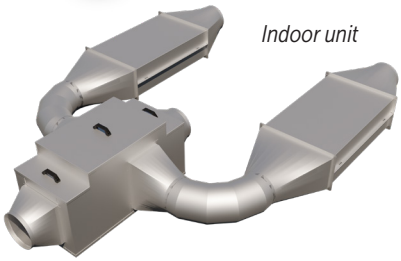
Post and Panel Cabinet

+ Available on all PRC, PRCX, and PRCLC models
+ Standard posts and assembly with thermal breaks increase the thermal resistance of the cabinet, and reduce condensation and frosting
+ Configurable wall panel materials and exterior finish
+ Gasket system ensures smooth internal surfaces
+ The cabinet panels are removable from the exterior of the unit
+ Optional panels with thermal breaks



Post and panel construction





Indoor unit

Indoor unit

Additional RegenCore Models

PRCX (20,000 to 40,000 CFM)

+ Designed for outdoor installations
+ Core sections located on base frames
+ Allows for easier core installation

PRCF (100 to 2000 CFM)

+ Flexible design to fit in compact layouts
+ Designed for indoor installations ONLY

PRCLC (250 to 2000 CFM)

+ Compact design suitable for indoor installations in small spaces, such as mechanical rooms or closets
+ No preheat requirement down to -40°C/F

Packaged DX Cooling & Dehumidification

Standard Features

+ Packaged cooling from 8 to 200 tons
+ Factory tested cooling and controls
+ Electronic expansion valves
+ Remote operable digital controller
+ Detect + Protect monitoring system
+ 2-stage capacity control from 8 to 12 tons
+ 4-12 stage capacity control from 14 to 200 tons
+ Aluminum fin, aluminum frame, and copper tube evaporator and condenser coils
+ Low fin per inch evaporator (10 FPI) and condenser (12 FPI) coils
+ 70°C/154°F high temperature rated condenser motors

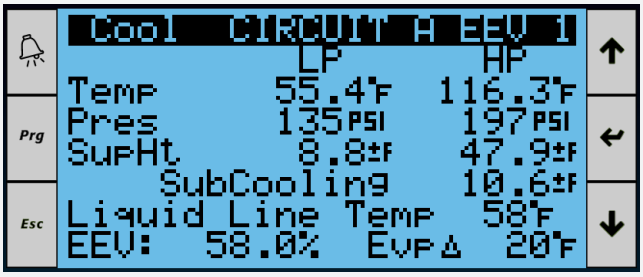
Additional Options

+ Split cooling from 8 to 200 tons
+ Variable capacity cooling control with digital compressors or variable speed compressors
+ 7°C/45°F low ambient and -40°F/C extreme low ambient cooling
+ Hot gas reheat
+ Variable Speed compressor as option
+ R454B refrigerate

Riverside Labs Condensing Section

Detect + Protect Monitoring System

+ Actively monitors:
  - Refrigerant cycle operation (sub cool, superheat, line pressures)
  - Electronic expansion valves
  - Refrigerant charge
  - VFD operation
  - Cooling capacity
+ View alarms, turn the unit on or off, change operating set points remotely through digital controller over a virtual network interface.
+ View live performance and download logged data on the controller. No refrigerant gauges required.
+ Permanently connect to your system via LAN or when necessary via cellular modem.



REGENCORE FLEX (PRCF) - INDOOR ONLY

Features

S standard feature O optional feature

Cabinet

- S 18 GA galvanized steel panels
- S Lift off access panels
- S Condensate drain connections
- O Fiberglass insulation

Filters

- O MERV 8 to 12 final filter

Fans

- S ECM direct drive plenum fans

Changeover Dampers

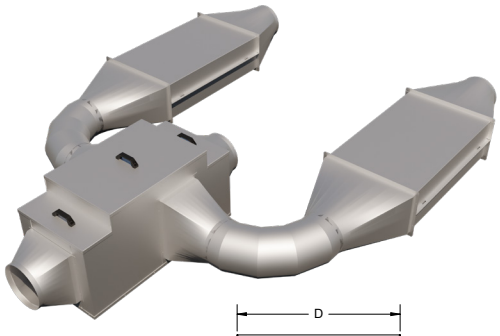
- S Ultra low-leak aluminum airfoil
- S DC closed loop stepper motor

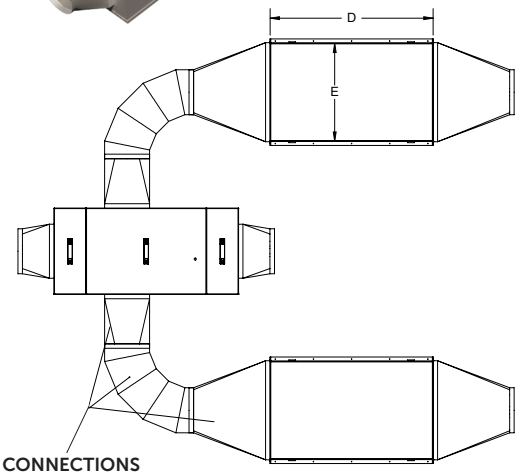
Heating

- O Electric heat

Controls

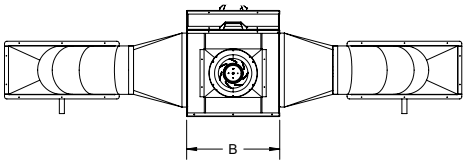
- S Constant air volume control
- O DDC BACnet/MSTP or BACnet/IP
- O Remote operable digital controller
- O Internal airflow sensors
- O Variable air volume control
- O Unbalance airflow control (offset supply and exhaust)

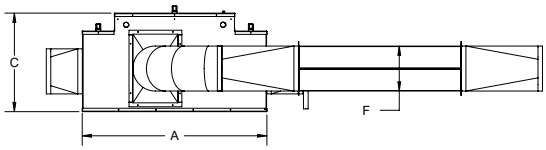




DUCT CONNECTIONS BY OTHERS (TYP.)

*** ALL UNITS IN INCHES, UNLESS OTHERWISE NOTED**
**** ALL WEIGHTS (LBS) ARE ESTIMATED**





PRCF Dimensions

(in)							Weight Center Box (lbs)		Weight Core bank (lbs)	
PRCF Model	A	B	C	D	E	F	208V	120V	Standard	Insulated
250	41	17.25	22.25	39.25	10.5	15.25	108	108	114	133
375	41	17.25	22.25	39.25	19.75	10.5	108	108	153	176
500	54.5	19.25	28.25	39.25	25.25	10.5	192	197	193	220
700	54.5	19.25	28.25	39.25	23.75	14.25	192	197	243	272
1000	54.5	19.25	28.25	39.25	26.75	18.25	192	197	358	393
1500	58.5	21.25	38.25	39.25	23.75	23.75	249	270	441	479
2000	60.5	29.25	44	39.25	31.75	26	345	434	603	648

Dedicated Path Box				
PRCF Model	Length (in)	Width (in)	Height (in)	Weight (lbs)
250	31	21.25	30.5	128
375	31	21.25	30.5	128
500	31	23.25	36.5	160
700	31	23.25	36.5	160
1000	31	23.25	36.5	160
1500	31	25.25	46.5	196
2000	33	34.25	52.5	275

Supplementary Heating and Cooling

Gas Heat

+ Stainless steel 3-pass and 4-pass drum and tube style heat exchanger
  - 15:1 turndown ratio
  - Design temperature rises from 110°F to 60°F
  - Design heat output from 60 MBH to 1440 MBH
+ Convoluted tube style heat exchanger
  - Up to 20:1 turndown ratio
  - Design temperature rises from 110°F to 20°F
  - Design heat output from 250 MBH to 6000 MBH
  - Up to 93% efficient furnaces

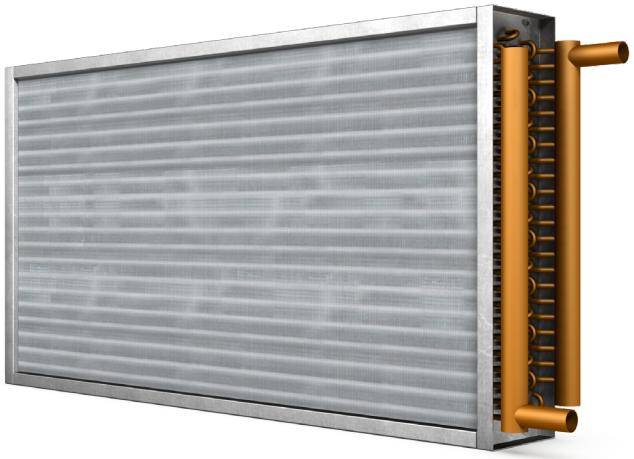
Hydronic Coils

+ Cooling, heating or changeover coils
+ Certified in accordance with AHRI standards

Electric Heat

+ Integrated and pre-wired controls in NEMA-1 control panel
+ Thermal safety switches and fan interlocked heating elements are supplied for safe operation
+ Optional galvanized or stainless steel heater frames

Gas heating



Hydronic coil

Electric heating

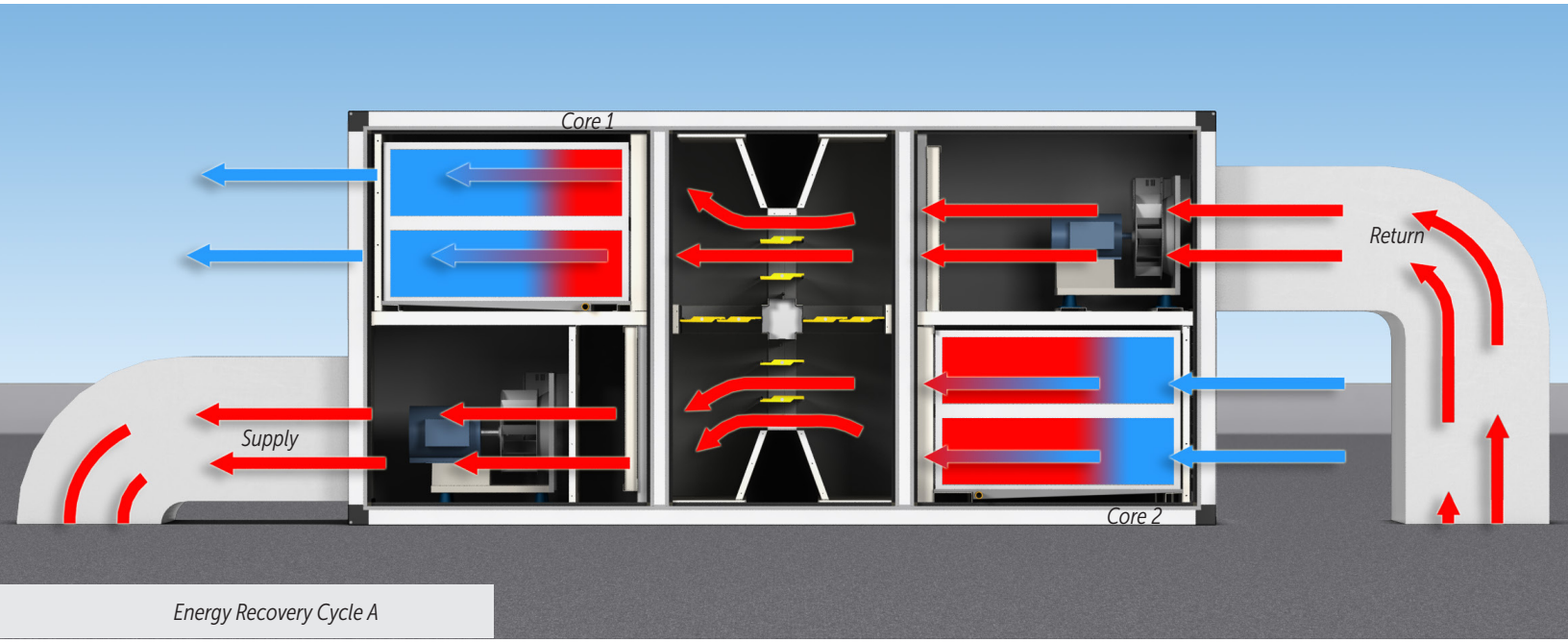
PRC Operating Modes

Energy Recovery

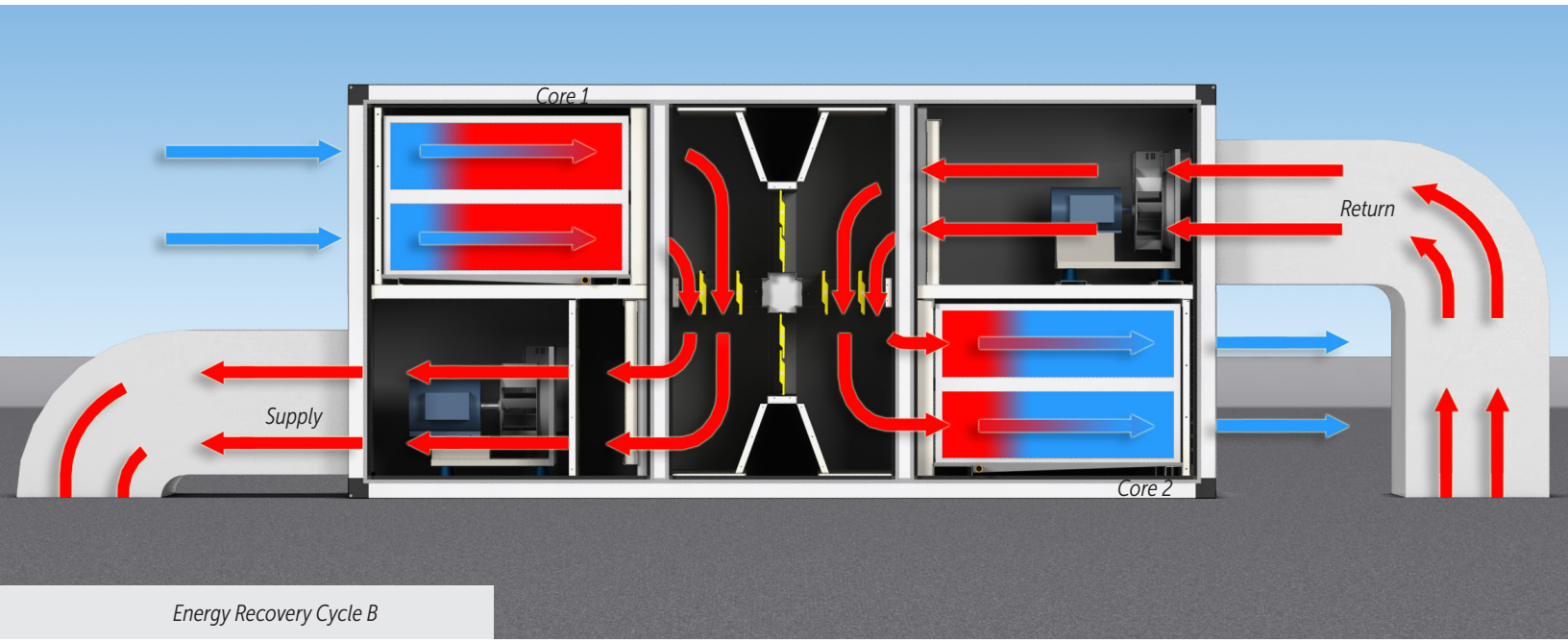
There are two stages to the energy recovery process. Below is an explanation of typical operation during winter conditions:

Cycle A: shows core 1 storing heat from return air being exhausted from the building. Core 2 is releasing the heat previously stored to condition the colder outdoor air to supply air.

Cycle B: During the cycle, dampers are re-positioned so the inverse occurs. Now core 1 is releasing heat it captured and stored during the cycle A. Core 2 is now recovering heat from the exhaust air.



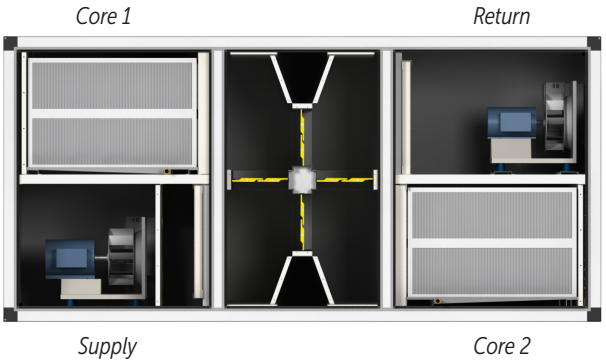
Energy Recovery Cycle A



Energy Recovery Cycle B

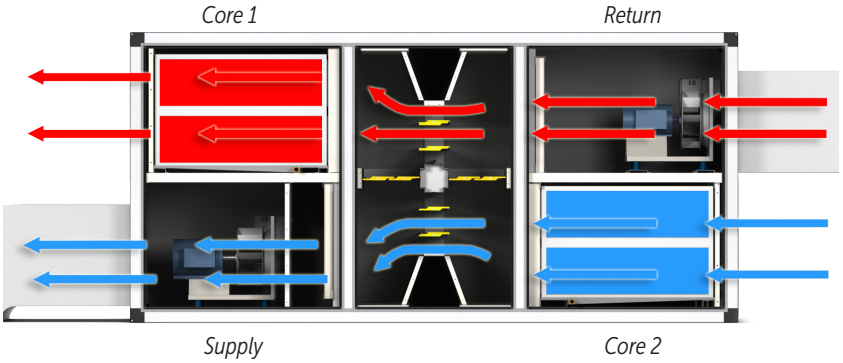
Standby

The standby mode positions the dampers to isolate the building from outdoor conditions.



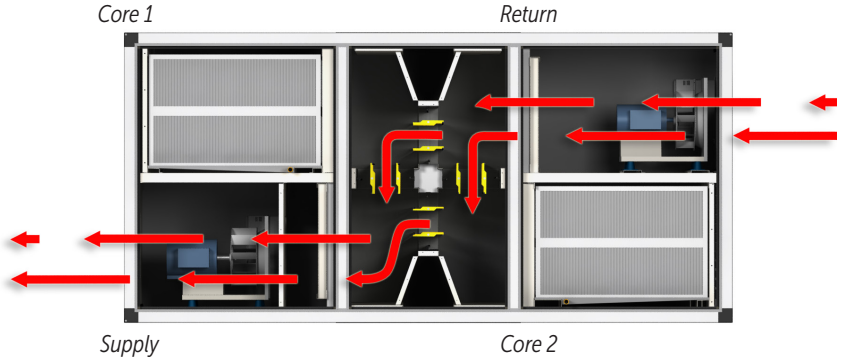
Economizer

The economizer mode suspends the re-positioning of the dampers & energy recovery to use outdoor air for cooling. During this mode the dampers will reposition every 3 hours to self-clean the cores.



Recirculation (Optional)

The recirculation mode positions the dampers to recirculate building air when the space is not occupied. Additional dampers are required for this mode.



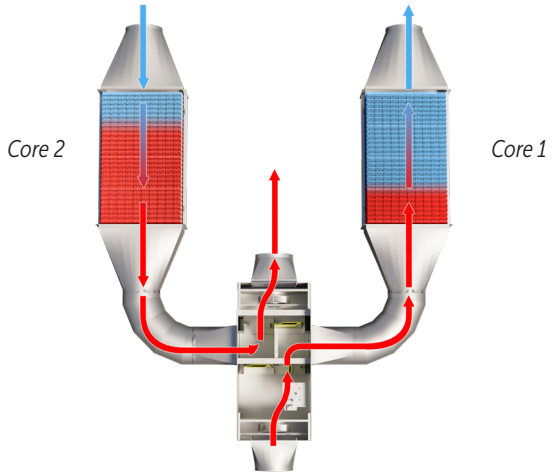
PRCF Operating Modes

Energy Recovery

There are two stages to the energy recovery process. Below is an explanation of typical operation during winter conditions:

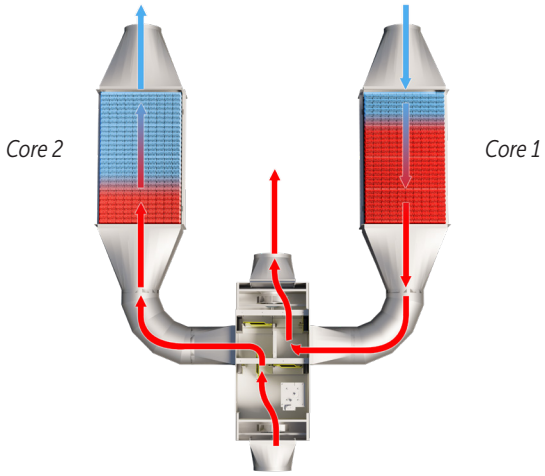
Cycle A

Core 1 storing heat from return air being exhausted from the building. Core 2 is releasing the heat previously stored to condition the colder outdoor air to supply air.



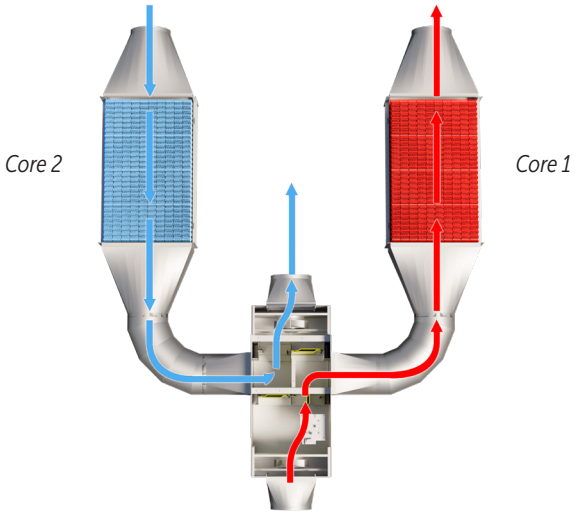
Cycle B

During this cycle, dampers are re-positioned so the inverse occurs. Now Core 1 is releasing heat captured and stored during Cycle A. Core 2 is recovering heat from the exhaust air.



Economizer

The economizer mode suspends re-positioning of the dampers and energy recovery to use outdoor air for cooling. During this mode, the dampers will reposition every 3 hours to self-clean the cores.



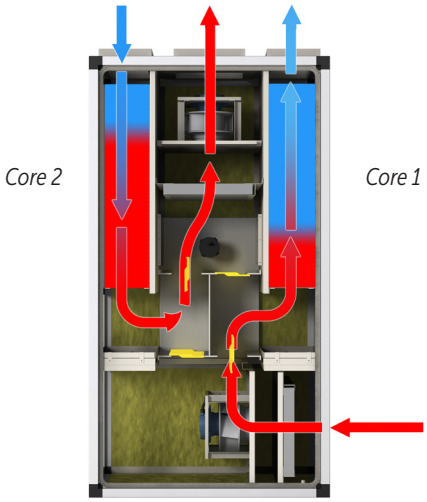
PRCLC Operating Modes

Energy Recovery

There are two stages to the energy recovery process. Below is an explanation of typical operation during winter conditions:

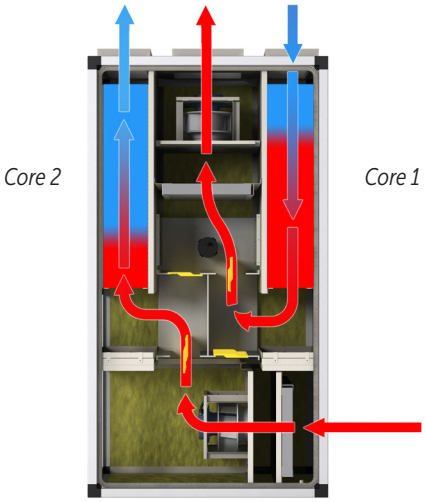
Cycle A

Core 1 storing heat from return air being exhausted from the building. Core 2 is releasing the heat previously stored to condition the colder outdoor air to supply air.



Cycle B

During this cycle, dampers are re-positioned so the inverse occurs. Now Core 1 is releasing heat captured and stored during Cycle A. Core 2 is recovering heat from the exhaust air.



Economizer

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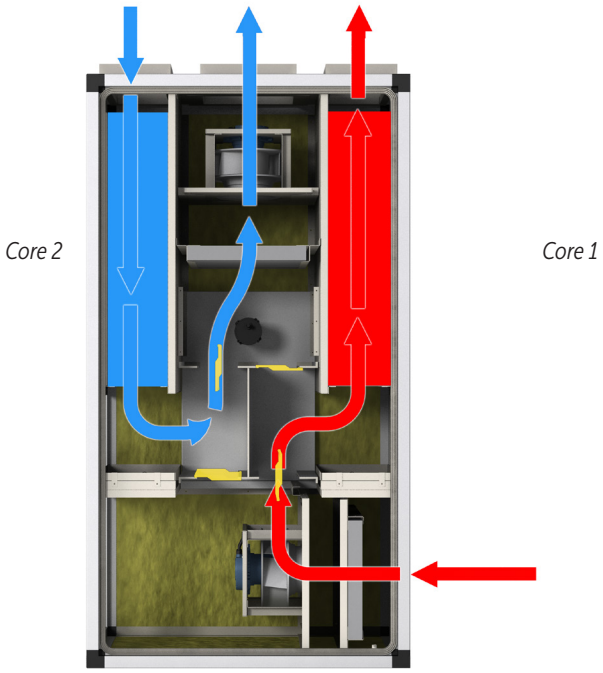


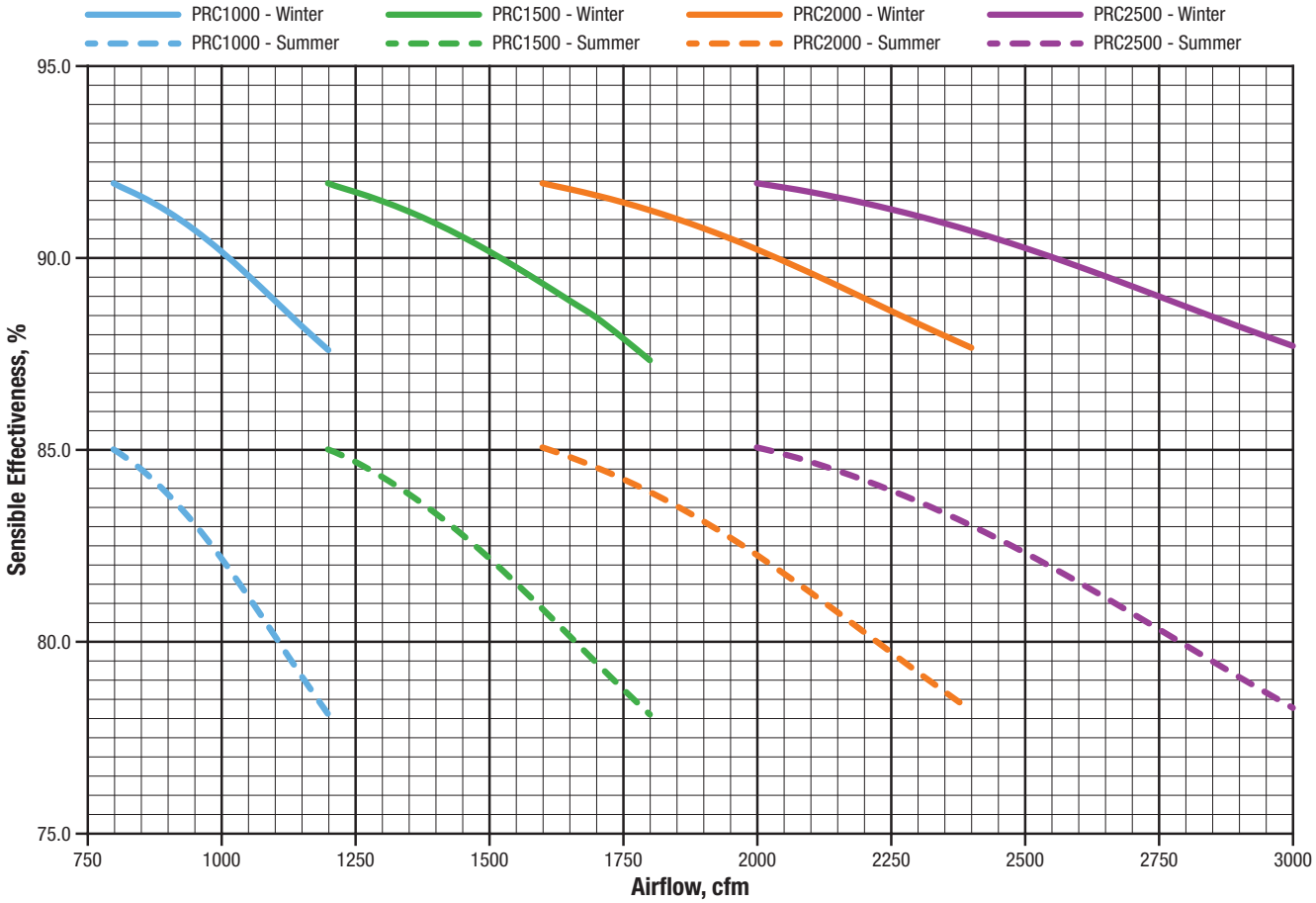
Research and Development at SolutionAir

SolutionAir is committed to creating superior products through scientifically validated design. We have a host of facilities at our disposal that we have used test our products in controlled, real world environments. They are the foundation that supports SolutionAirs dedication to relentless product innovation.

Environmental Chamber

RegenCore units are tested to the highest industry standards using the Environmental Chamber. The chamber maintains temperatures ranging from -40°C/F to +40°C (104°F) and is paired with a configured SolutionAir air handling unit to simulate building return air by heating or cooling and introducing humidity. The chamber, air handling unit, and instrumentation allow for precise energy balances and accurate efficiency measurement making RegenCore the industry's only product with fully-tested indoor and outdoor performance data.

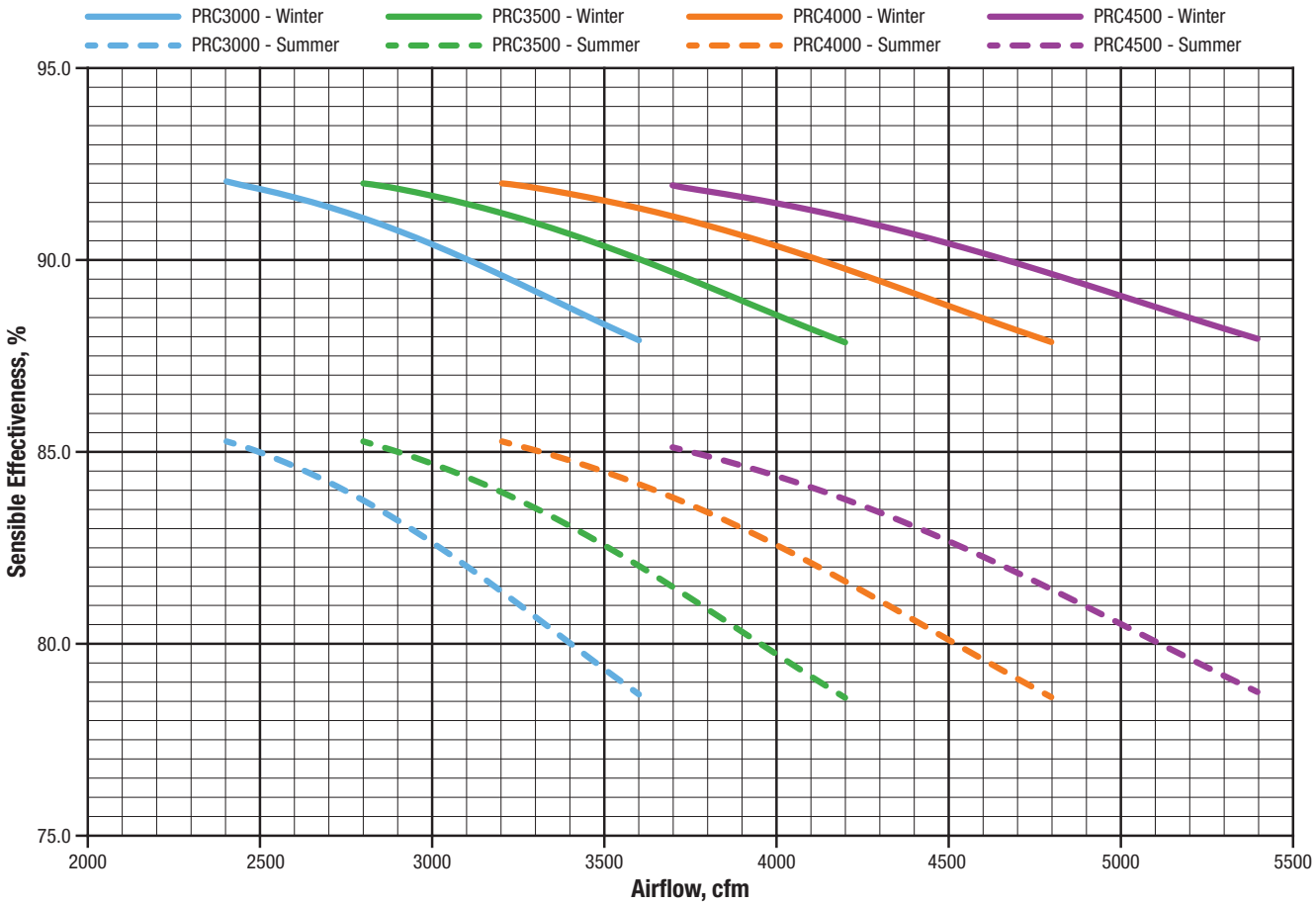
PRC Performance Data



Effectiveness calculations include the following assumptions:

+ Ducted indoor units with 1 in. w.c. ESP
+ Winter outdoor air at 35°F, and return air at 70°F, inclusive of fan and motor loads
+ Summer outdoor air at 95°F, and return air at 75°F
+ Effectiveness will vary based on air conditions

PRC Performance Data



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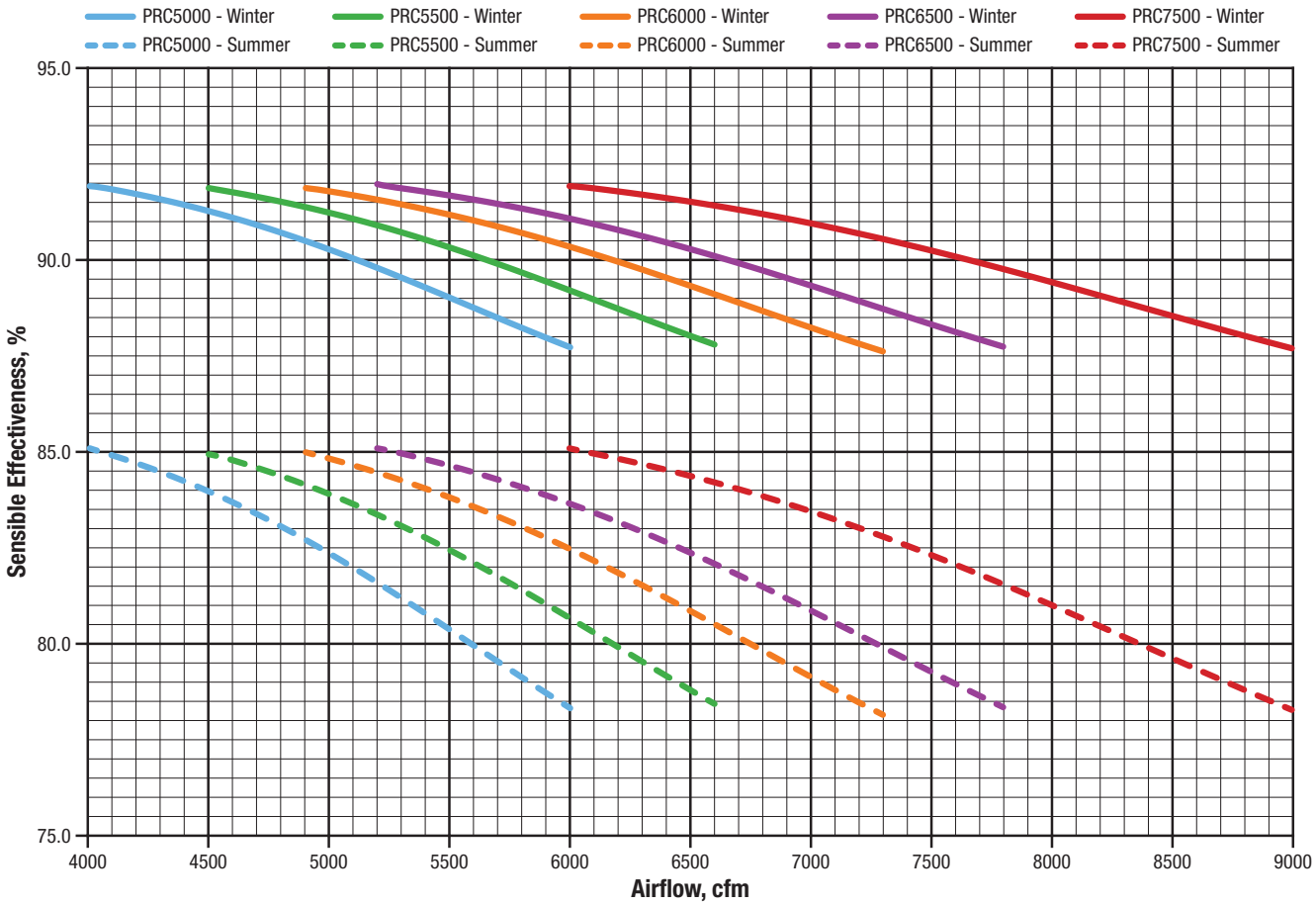
PRC Performance Data



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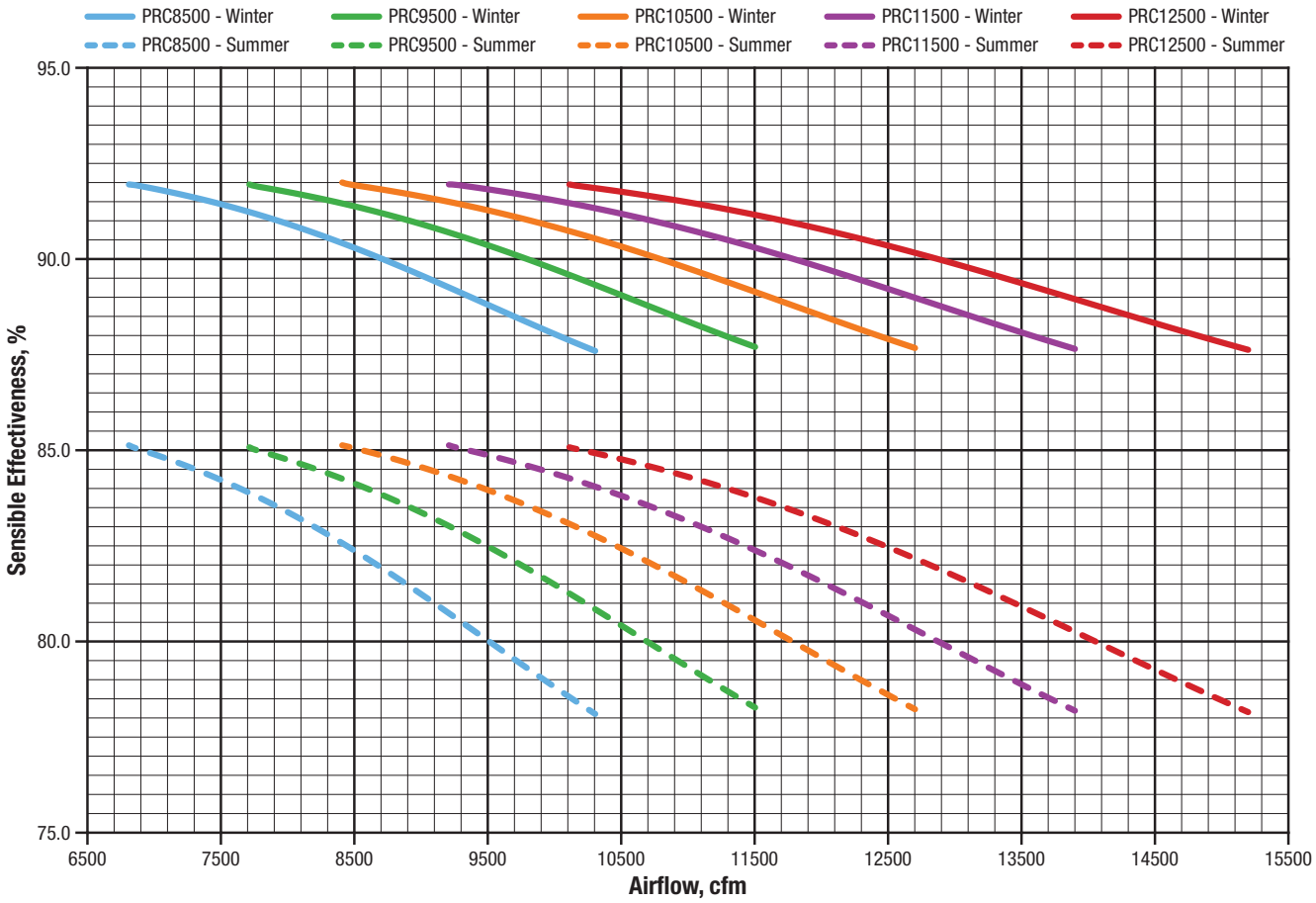
PRC Performance Data



Effectiveness calculations include the following assumptions:

+ Ducted indoor units with 1 in. w.c. ESP
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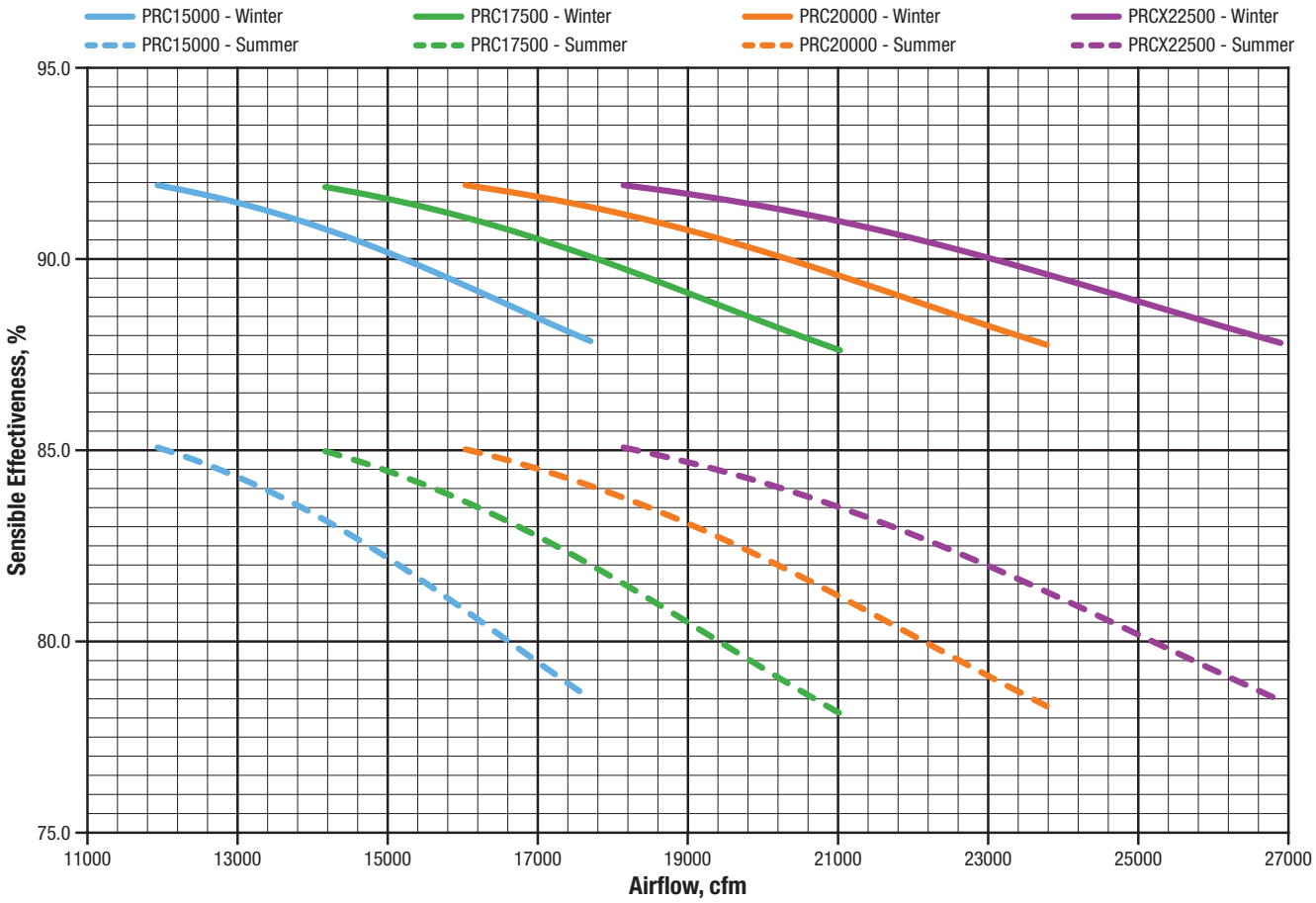
+ Effectiveness will vary based on air conditions

PRC and PRCX Performance Data



Effectiveness calculations include the following assumptions:

+ Ducted indoor units with 1 in. w.c. ESP
+ Winter outdoor air at 35°F, and return air at 70°F, inclusive of fan and motor loads
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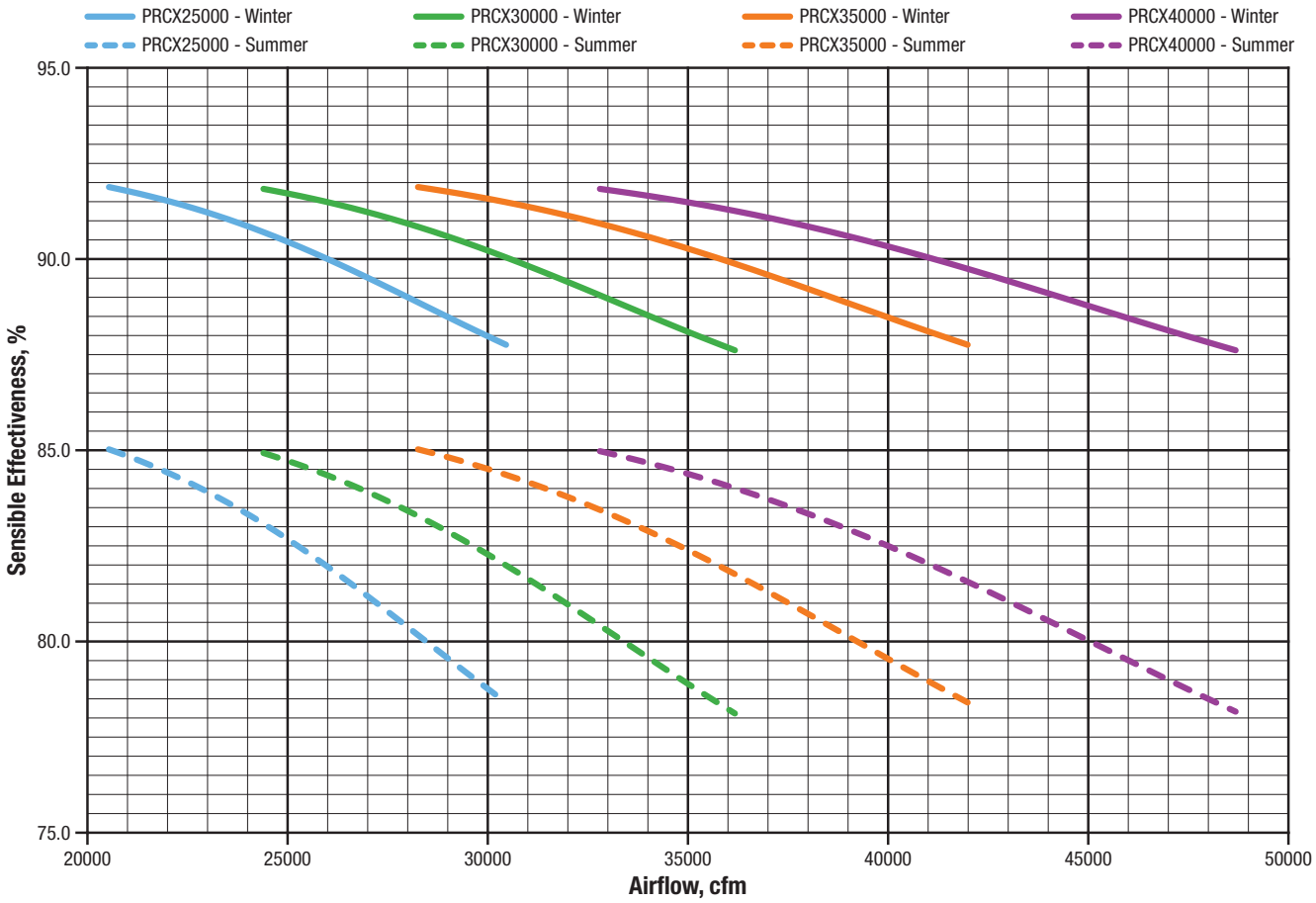
+ Effectiveness will vary based on air conditions

PRCX Performance Data



Effectiveness calculations include the following assumptions:

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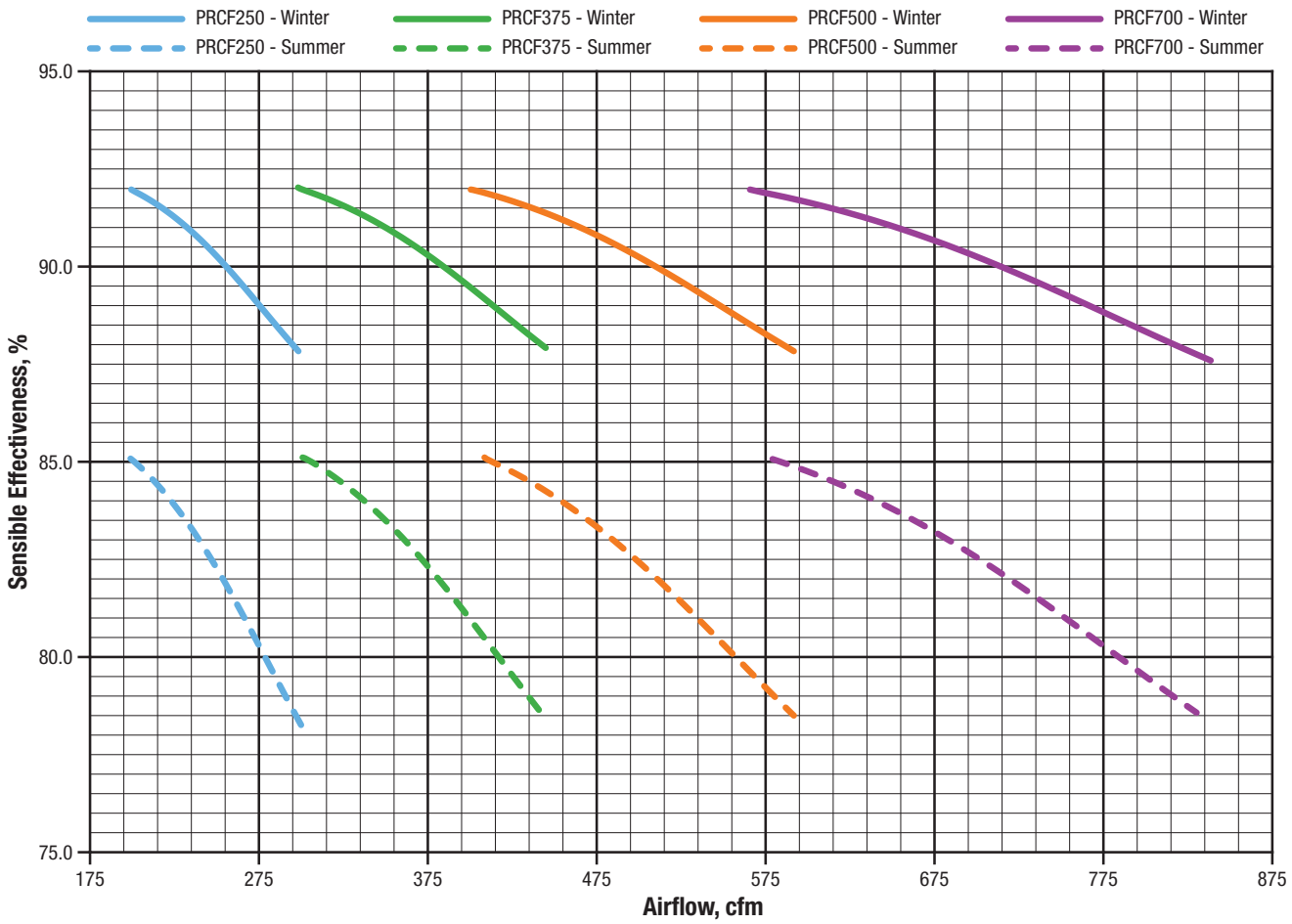
+ Effectiveness will vary based on air conditions

PRCF Perfomance Data



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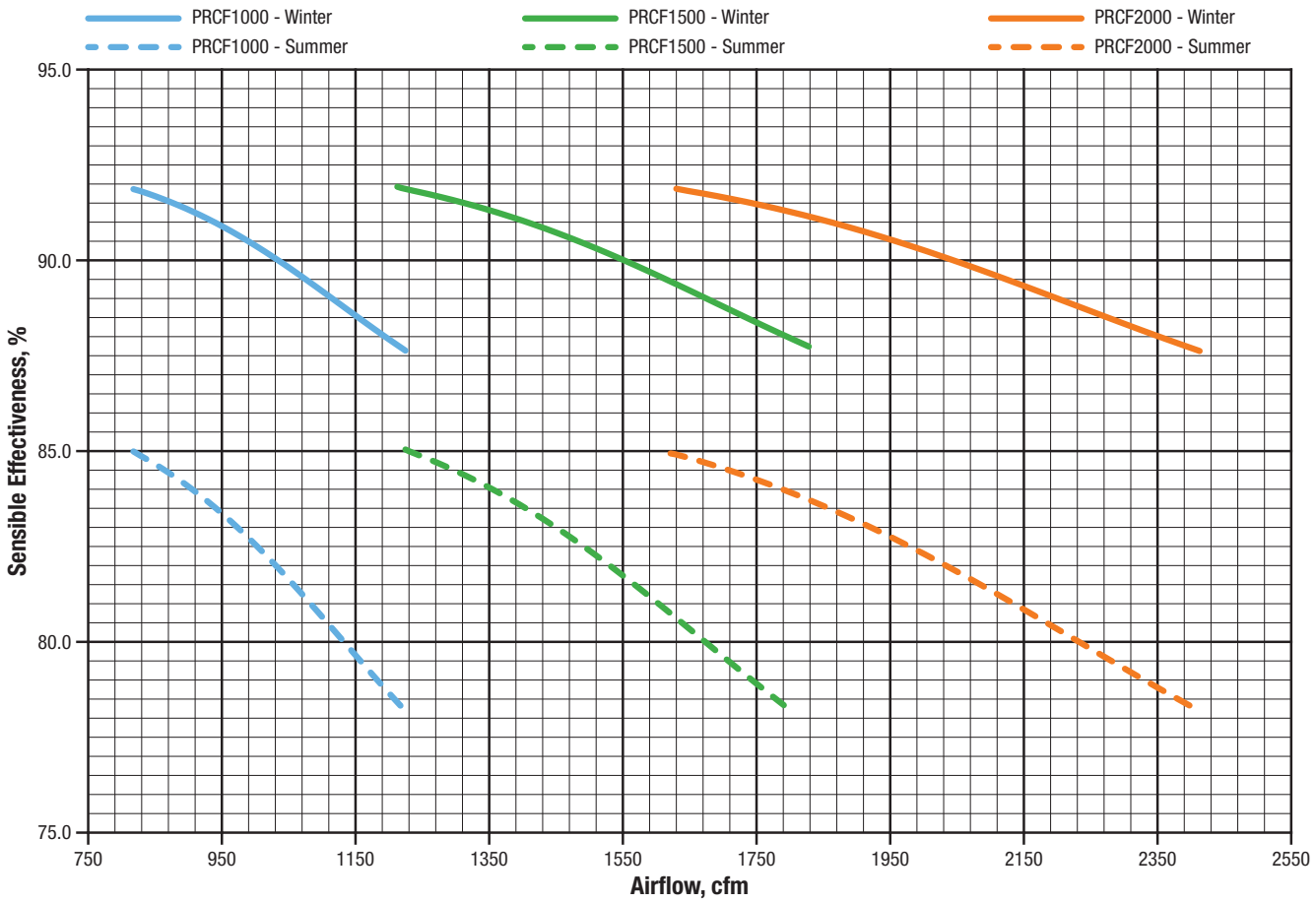
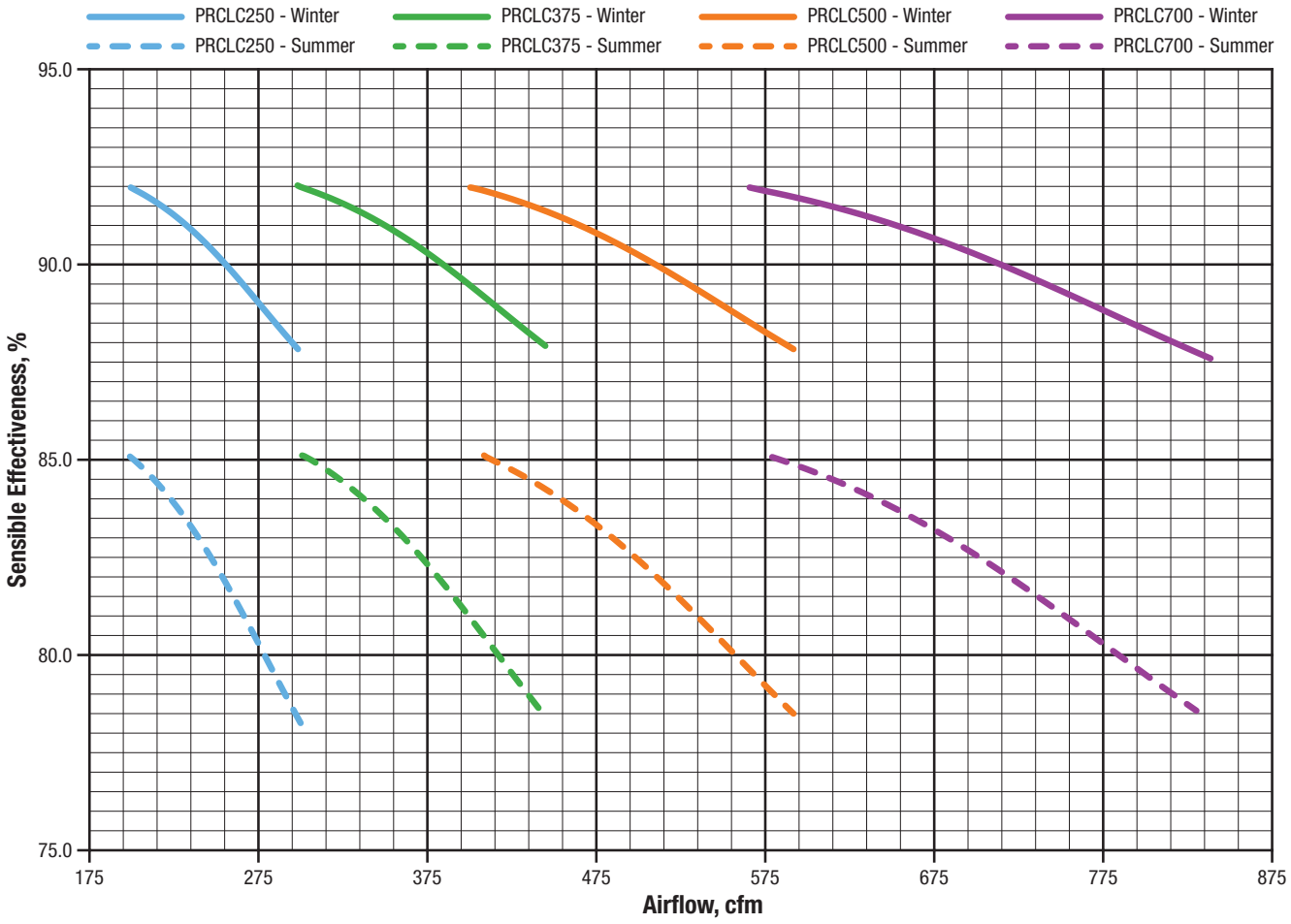
PRCF Perfomance Data



Effectiveness calculations include the following assumptions:

+ Ducted indoor units with 1 in. w.c. ESP
+ Winter outdoor air at 35°F, and return air at 70°F, inclusive of fan and motor loads
+ Summer outdoor air at 95°F, and return air at 75°F
+ Effectiveness will vary based on air conditions

PRCLC Perfomance Data



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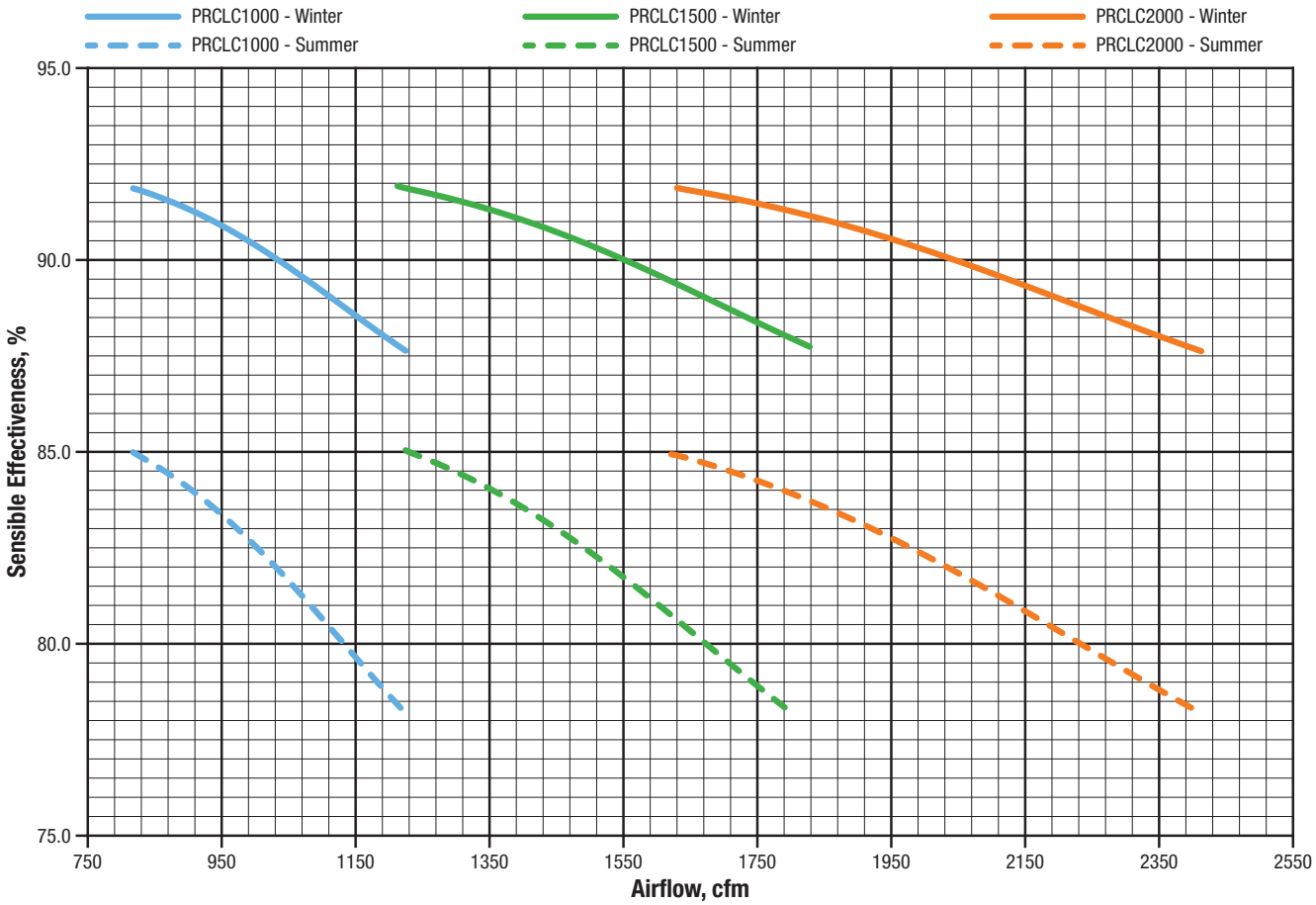

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