

**DRAFT**

# **ADDISON™**

**RC-SERIES**

**SPLIT SYSTEM CONDENSING UNITS  
WITH 100% OUTSIDE AIR AND RECIRCULATING SYSTEM OPTIONS**



**R410A**

**Commercial/Institutional/Industrial  
Heating, Cooling and Dehumidification**

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# ADDISON™ RC-SERIES

## OUTDOOR CONDENSING UNITS WITH 100% OUTSIDE AIR AND RECIRCULATING OPTIONS 3½ To 36 Nominal Tons

The RC-Series are split system condensing units, typically installed in new or retrofit commercial and industrial applications, such as hotels, sports arenas, office buildings and manufacturing facilities. These units are installed outside the building on a concrete slab or on a roof and connected to the ADDISON™ VC/HC-Series of indoor air handlers. Air is drawn in through the sides of the unit and discharged out the top to help ensure quiet and efficient performance.

In addition to the product's standard features, the RC-Series also has a wide range of capacities and options. These models have been engineered to offer high quality, design flexibility and product longevity.

Designed for R410A refrigerant, the refrigerant circuit for all models is shipped charged with dry nitrogen holding charge that can be vented to the atmosphere before piping to the air handler is completed.

The product line consists of three models: the RCA air cooled 100% outside air condensing unit, the RCC air cooled condensing unit for recirculating systems and the RCH heat pump condensing unit. Each model mates with the appropriate VC/HC-Series air handler. The 100% outside air combination is the RCA with the VCA/HCA, the RCC with the VCC/HCC creates an air cooled recirculating system, while the heat pump system consists of the RCH with the VCH/HCH.

**Interior of 100% Outside Air Unit  
(RCA Model)**



**Cooling Only Unit  
(RCC Model)**



**Heat Pump  
(RCH Model)**



**HEATING, COOLING AND DEHUMIDIFICATION  
FOR COMMERCIAL/INSTITUTIONAL/INDUSTRIAL APPLICATIONS**

# AIR COOLED 100% OUTSIDE AIR CONDENSING UNITS

## RCA MODELS

RCA split system models are designed to condition 100% outside air for applications that need make up air.

When outdoor air is used for ventilation, it may be hot or humid. To condition outdoor air, the air flow velocity must be reduced. This reduced velocity helps assure adequate moisture removal and helps prevent condensate carry over.

The condensing unit is field piped to the indoor vertical (VCA) or horizontal (HCA) air handler, which is then field ducted to circulate 100% outside air. The RCA refrigerant circuit includes a low ambient head pressure control to 35° F (1 ° C) and hot gas bypass valve. Low ambient head pressure control is a system that includes a condenser fan cycling motor controlled from refrigerant pressure, rather than ambient temperature to reflect the operating conditions in the unit. The hot gas bypass is supplied on these single circuit units to keep the compressor online at light cooling load conditions.

The RCA unit is controlled by a factory installed adjustable ambient thermostat, which controls the cooling operation at a setting between 60° F (15.5° C) and 70° F (21° C). The compressor starts when the outside air temperature is above the adjustable set point. Evaporator blower motors run continuously as signaled by the user defined operating schedule.

In the cooling mode, the leaving air temperature will be maintained by hot gas bypass. For RCA 271, 361 and 421 models, compressor unloading is an additional feature. Both features are accomplished through suction-pressure sensing which tracks the outside air variations.

## RCA CAPACITIES

100% Outside Air Condensing Unit	100% Outside Air Handler	Capacity (Btu/h)	Leaving Air Temp.* (LAT)- °F	Leaving Air Temp.* (LAT)- °C
			Dry Bulb (DB)/ Wet Bulb (WB)	Dry Bulb (DB)/ Wet Bulb (WB)
<b>RCA051</b>	<b>VCA/HCA051</b>	50,400	58.4/58.0	14.7/14.4
<b>RCA061</b>	<b>VCA/HCA071</b>	61,193	56.9/56.0	13.8/13.3
<b>RCA071</b>	<b>VCA/HCA081</b>	82,180	56.2/56.0	13.4/13.3
<b>RCA101</b>	<b>VCA/HCA101</b>	115,100	56.8/56.0	13.8/13.3
<b>RCA141</b>	<b>VCA/HCA141</b>	148,700	57.6/57.0	14.2/13.9
<b>RCA171</b>	<b>VCA/HCA201</b>	192,500	56.7/56.0	13.7/13.3
<b>RCA201</b>	<b>VCA/HCA201</b>	225,000	57.4/57.0	14.1/13.9
<b>RCA271</b>	<b>VCA/HCA271</b>	284,900	58.4/58.0	14.7/14.4
<b>RCA361</b>	<b>VCA/HCA361</b>	335,700	60.1/59.9	15.6/15.5
<b>RCA421</b>	<b>VCA/HCA421</b>	420,400	59.1/58.3	15.1/14.6

\*Performance is based on 95° F (35° C) dry bulb , 78° F (25.6° C) wet bulb entering air temperature on evaporator and condenser coil, with matching air handler.

# AIR COOLED CONDENSING UNITS FOR RECIRCULATING SYSTEMS

## RCC MODELS

Available in single and multiple circuit configurations, the RCC models are air conditioning condensing units. Utilizing system performance characteristics, RCC units are designed to match single packaged indoor air handlers with face split coils, VCC (vertical) or HCC (horizontal) arrangements with single or dual circuits.

To help meet various space conditions, these models incorporate independently controlled compressors that allow part load operation. (RCC 044-064 are single circuit only). The 24 volt control circuit includes a transformer and low voltage terminal board for external thermostat control connection.

RCC units less than 65,000 Btu/h are rated in accordance to AHRI standard 210/240, while units greater than or equal to 65,000 Btu/h, but less than 250,000 Btu/h, are rated in accordance to AHRI 340/360.

## RCC CAPACITIES

Condensing Unit	Air Handler	Capacity (Btu/h)	Energy Efficiency Ratio (EER)
RCC 044	VCC/HCC070	42,400	*13.6
RCC 054	VCC/HCC070	53,600	*13.4
RCC 064	VCC/HCC070	67,300	*12.7
RCC 074	VCC/HCC074	80,200	11.5
RCC 104	VCC/HCC104	98,400	11.4
RCC 134	VCC/HCC134	115,000	11.0
RCC 154	VCC/HCC154	169,000	11.5
RCC 194	VCC/HCC194	188,000	11.1
RCC 254	VCC/HCC254	252,700	9.7
RCC 314	VCC/HCC314	326,100	10.2
RCC 374	VCC/HCC374	390,000	10.0
RCC 414	VCC/HCC374	428,200	9.5

\*Seasonal Energy Efficiency Ratio (SEER)

# HEAT PUMP CONDENSING UNITS

## RCH MODELS

Split system heat pumps provide year round heating and cooling by removing heat from the building in the summer and adding heat to the building in the winter.

The RCH unit is matched with the indoor air handler, which is either a vertical (VCH) or horizontal (HCH) configuration. Each RCH unit refrigerant circuit includes a reversing valve, check valve and thermo-expansion valve. The expansion valve has adjustable superheat and distributors to meter the refrigerant evenly to the evaporator refrigerant circuits. Also included is a compensating receiver to balance charge in the heating and cooling cycles. The unit includes either a single or dual compressor, depending on model. Dual circuit units can also be two-stage.

Controls for the RCH unit include heat relay, fan relay and the compressor motor contactors. The 24 volt control circuit includes a transformer and low voltage terminal board for external thermostat control connection. (RCH 044-064 are single circuit only.)

Units less than 65,000 Btu/h are rated in accordance to AHRI standard 210/240, while units greater than or equal to 65,000 Btu/h, but less than 250,000 Btu/h, are rated in accordance to AHRI 340/360.

## RCH CAPACITIES

Condensing Unit	Air Handler	Cooling (Btu/h)	Heating (Btu/h)	EER	Coefficient of Performance (COP)
RCH044	VCH/HCH 104	46,300	42,500	*13.6	3.9
RCH054	VCH/HCH 104	56,000	51,600	*13.8	4.0
RCH064	VCH/HCH 104	67,600	61,400	*13.3	4.1
RCH074	VCH/HCH 074	78,000	79,400	10.5	3.5
RCH104	VCH/HCH 104	92,500	95,100	10.5	3.3
RCH134	VCH/HCH 134	112,000	113,700	10.5	3.4
RCH154	VCH/HCH 154	161,700	167,300	10.7	3.4
RCH194	VCH/HCH 194	181,800	189,100	10.4	3.5
RCH254	VCH/HCH 254	245,210	267,500	9.5	3.3
RCH314	VCH/HCH 314	329,800	339,550	10.7	3.2
RCH374	VCH/HCH 374	345,500	425,500	10.5	3.3
RCH414	VCH/HCH 374	432,600	477,800	10.2	3.2

\*Seasonal Energy Efficiency Ratio (SEER)

# RC-SERIES' FEATURES AND ACCESSORIES

## STANDARD FEATURES

- Heavy-gauge, galvanized steel cabinet
- Cabinet design provides easy access to the compressor and electrical panel
- Pre-paint finish-primer (both sides), interior, exterior top coat
- Stainless steel hardware
- Discharge air is directed up which helps eliminate the effects of wind direction and helps minimize air flow sound projection
- Statically and dynamically balanced condenser fans help provide efficient operation
- Fan motors are fitted with permanently lubricated and sealed ball bearings protected with shaft mount rain shields
- Vinyl coated condenser fan guards
- Aluminum fin on seamless copper refrigeration tubing in condenser coils
- High efficiency scroll compressors equipped with crankcase heaters; motors equipped with internal overheat-overload protection
- Dual refrigeration circuits on dual compressor units (RCA and RCH only); multi-compressor models provide partial stand by and two-stage operation (RCC and RCH only).
- Service valve on liquid line
- Service ports for charging hose connections in suction and liquid lines
- Factory-wired and tested controls include five-minute compressor anti-short cycle timer, defrost timer and defrost relay
- Manual high and automatic low pressure controls

## FIELD INSTALLED ACCESSORIES

### Humidistat

The humidistat is wall mounted; the terminals are in the control panel to switch the compressor and/or hot gas reheat helping to provide optimal humidity control. (Humidistat is not available on 100% outside air units.)

### Room Thermostats

Electromechanical, electron and programmable electronic thermostats may be furnished. For single or multiple compressor units, wall mounted room thermostats are available with or without system switch functions. Locking covers for thermostats are also offered.

### Air Handling Control Kit

The air handling control kit includes blower contactor or starter, transformer, terminal board and blower interlock relay for use with electric heat. The control kit used with the VCH/HCH heat pumps includes the blower contactor or starter. For special applications, interlock relays can be factory installed in the control panel for exhaust fan, outside air damper, heat recovery water pump, etc.

# RC-SERIES' OPTIONS

## FACTORY INSTALLED OPTIONS

### Refrigeration

- **Low Ambient Head Pressure Control to 35° F (1 °C)** – system with a fan cycling motor controlled from refrigerant pressure, rather than ambient temperature to reflect the operating conditions in the unit for improved efficiency. Required with hot gas bypass on systems without hot gas reheat. (Option for RCC and RCH ; standard on RCA.)
- **Vari-Speed Condenser Fan Motor and Head Pressure Control to 0° F (-18 ° C)** – adjustable pressure sensing system consisting of a variable speed motor-driven fan and a constant speed fan, both controlled from refrigerant pressure, rather than ambient temperature for greater efficiency and lower operating costs. Required with hot gas reheat.
- **Hot Gas Bypass** – supplied on single compressor units or lead compressor or both compressors on dual compressor units, to keep the compressor online at light cooling load conditions. Required on 100% outside air units. (Option on RCC and RCH; standard on RCA).
- **Digital Scroll Compressor** – greatly improves unit performance at part load conditions, allowing the unit to match the required load, reduce on/off cycling and help increase compressor life.
- **Hot Gas Reheat (staged or modulating)** – single or dual circuit, one-row copper fin aluminum coil to reheat air leaving the evaporator coil. Dependent operation with Vari-Speed head pressure control results in energy savings and delivers drier air to the space without additional operating cost.
- **Liquid Injection Components (internal hot gas bypass)** – with long refrigerant lines (greater than 75 feet), hot gas bypass will not operate correctly when piped to the indoor coil. Liquid injection injects hot gas or high pressure gas into the suction side of the unit, helping prevent freezing on the low side and providing capacity control.
- **Oil Separator** - used to help maintain oil volume where extra long refrigerant lines are required between the condensing unit and the air handler (both circuits in dual compressor units).
- **Sight Glass/Moisture Indicator**– provides a visual indication of refrigerant flow and indicates the presence of damaging moisture.

- **Liquid Line Check and Relief Valves** - used on applications with long horizontal runs of refrigerant lines across a roof.
- **Adjustable High and Low Pressure Switches** – deactivates system if abnormally high or low pressure or refrigerant loss occurs.
- **Service Valves** – located on suction line.

### Electrical

- **Stagger-Start Delay** – helps prevent electrical overload that might be caused by simultaneous starting current of multiple compressor motors.
- **NEMA 3R Non-Fused Disconnect** – factory mounted and wired to provide power disconnect at the unit.
- **115 Volt Ground Fault Circuit Interrupter Convenience Outlet with 15 amp Breaker** – field wired requires a separate circuit to the GFCI. Provides service personnel with power conveniently located at the unit.
- **Phase/Voltage Monitor** – provides line voltage and phase monitoring for momentary power failure or thermostat interruption. System will shut down to protect compressors and motors.

### Corrosion Protection

- **Corrosion-Resistance and Microbial Coating** - applied to condenser or coils. Coating is approved up to 10,000 hours salt spray test (per ASTM B117) and applied prior to assembly, providing a high level of protection.
- **Harsh Environment Protection** - includes corrosion-resistance and microbial coating on the entire unit before assembly and on the refrigerant piping after unit is assembled and piped.
- **Coils** - air cooled condenser coils can be furnished with copper fins on seamless copper refrigeration tubing for enhanced corrosion protection.



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**Installation Code and Quarterly Inspections:** All installation and service of ADDISON™ equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Addison and conform to all requirements set forth in the ADDISON™ manuals and all applicable governmental authorities pertaining to the installation, service and operation of the equipment. To help facilitate optimum performance and safety, Addison recommends that a qualified contractor conduct quarterly inspections of your ADDISON™ equipment and perform service where necessary, using only replacement parts sold and supplied by Addison.

**Further Information:** Applications, engineering and detailed guidance on systems design, installation and equipment performance is available through ADDISON™ representatives. Please contact us for any further information you may require, including the Installation, Operation and Service Manual.

**This document is intended to assist licensed professionals in the exercise of their professional judgment.**

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