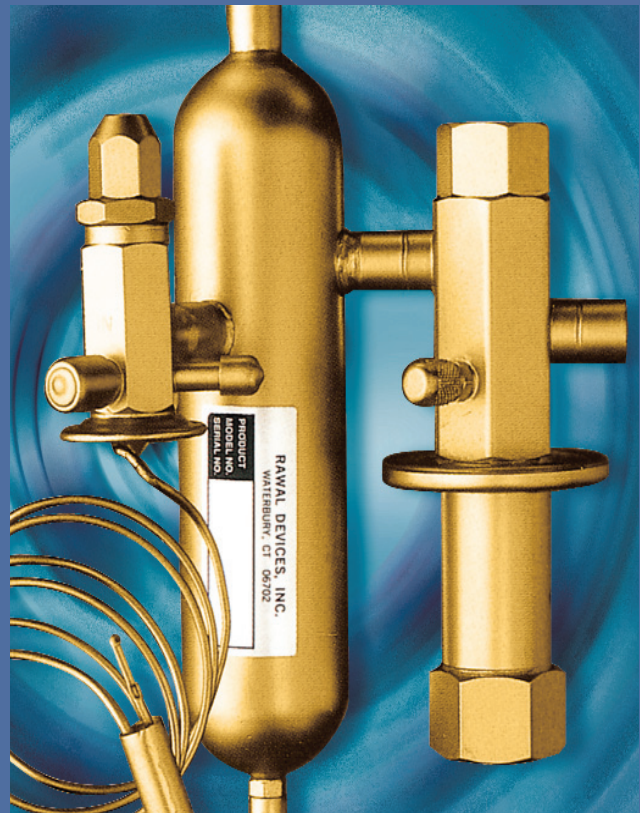


APR Control

- **Continuously Matches AC System Capacity to Changing Loads**
- **Eliminates Problems of Excess Capacity**



The APR Control Solves Most Common AC System Problems



AC Systems Have Overcapacity by Design

AC systems are typically sized for a "design day" of maximum load — a sunny, 95°F day with high relative humidity and maximum building occupancy. Since these assumptions are usually more extreme than actual conditions, most AC systems have excess capacity for up to 96% of the year.

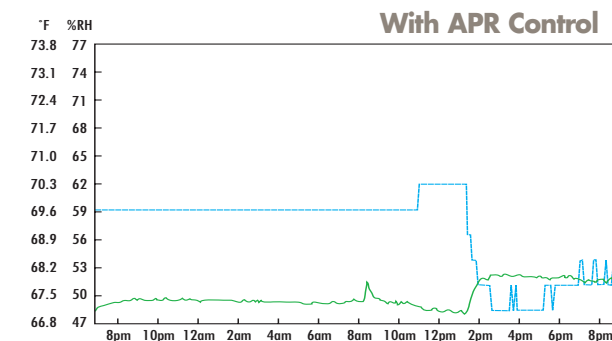
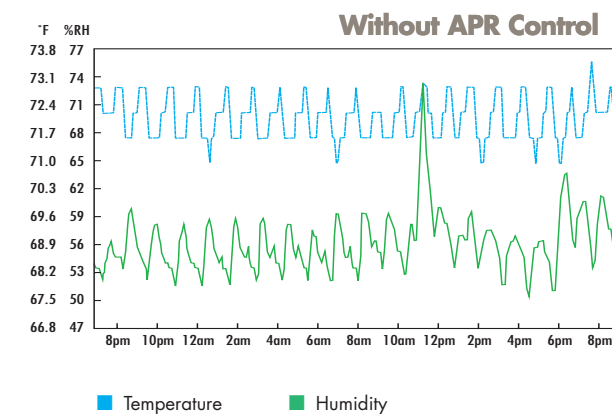
Poor Capacity Control Leads to Humidity, Compressor Cycling, and Service Problems

Most direct-expansion AC systems offer limited capacity control; they either run at full capacity or are off. That means on most days, the systems don't run long enough to remove humidity. As a result, occupants feel uncomfortable even though temperatures are within the desired range.

This problem is magnified on cloudy, muggy days with moderate temperatures. Frequent on-off compressor cycling causes excessive wear and tear on system components, increased downtime, and additional maintenance. Also, because the intake air temperature is too low, the evaporator coils often ice up, leading to liquid slugging and other system failures.

The APR Control provides more consistent temperature and humidity control.

These graphs show actual temperature and humidity readings from two rooms with identical load characteristics at the Sheraton World Resort, Orlando, FL. Both rooms had identical GE 9,000 BTU/hour DX PTAC units. One unit was fitted with an APR Control; the other was not.



The APR Control Automatically Matches System Capacity to Changing Loads

Installing an APR Control is like giving your AC system a brain. It continuously modulates system capacity, automatically matching it to reduced or changing loads. The APR Control responds quickly to variable load conditions by monitoring the heat content of the return air and adjusting refrigerant flow. As a result, it maintains the AC system in dehumidifying mode while providing accurate temperature control.

With lower humidity levels, the space feels more comfortable to occupants, permitting higher thermostat settings and reducing energy consumption.

Additional and Greater Energy Savings

At part load, the APR Control generates energy savings of 12% to 30% at the compressor. This results from stabilizing the suction pressure while reducing the head pressure. Our technology externally unloads the compressor. The device lowers the ΔP (pressure differential), making the compressor run more efficiently and cutting energy consumption.

Improves System Performance, Reduces Service Costs

The APR Control:

- Enhances humidity control, improving comfort without overcooling the space
- Reduces compressor cycling, cutting wear and tear on components
- Prevents coil icing or liquid slugging, even with clogged filters or malfunctioning belts
- Reduces system maintenance, service calls, and repair costs
- Outperforms hot-gas bypass
- Compensates automatically for inaccurate designs and data assumptions or changes in load

Outperforms End-type Controls

Because the APR Control responds immediately to the heat content of the return air, it outperforms (but does not replace) end-type controls such as thermostats and humidistats.

Simplifies System Renovations

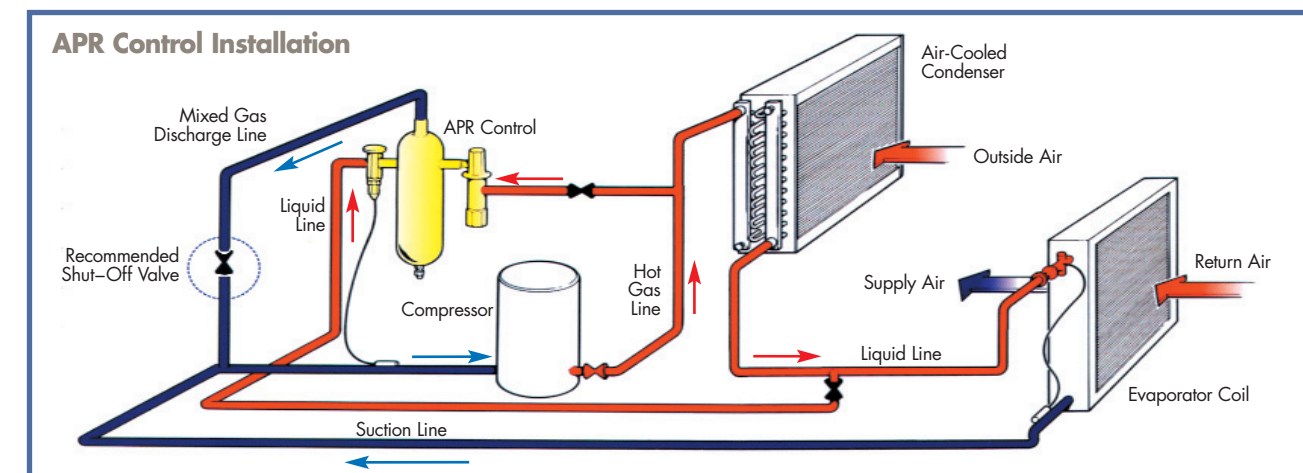
The APR Control has improved comfort and system performance across a wide range of renovation applications. These include oversized RTUs and split systems, undersized ductwork, system expansions, and building layout/use changes that result in dramatic shifts or variations in load. The device is installed without the need for costly external piping or electrical connections.

Reduces Variability of Make-up Air

In high-percentage make-up air systems (25% ~ 100%), cooling/dehumidifying loads can vary widely. By keeping the system on line longer, the APR Control reduces the cycling caused by wide variations in the make-up air's temperature and humidity. In addition, by reducing these variations, the APR Control improves the ability to comply with AHRAE ventilation standard 62-2001.

Decreases or Eliminates Reheat

The APR Control can significantly reduce or eliminate reheat. Since reheat typically accounts for 30% to 50% of an AC system's operating cost, the device pays for itself in months.



Thousands of Satisfied Users

Facilities

Bayer Pharmaceuticals
Caterpillar
Cincinnati Zoo
Dell Computer
Del Monte Food Company
Forrest Labs
GTE
Hampton Inn
Jack-in-the-Box
Kodak
Langley Air Force Base
PPG Industries
St. Louis Public Schools
Sheraton World Resort
University of Georgia
White Castle
Yale University

Engineers

Aquarius Consulting
Consulting Engineering Associates
Ericson, Ellison and Associates
Lester, Buehler Engineers
Parsons Engineering
Scheeser, Buckley, Mayfield
TLC Engineering
URS Consultants

Contractors

Airco Mechanical
Comfort Systems USA
Coolray Heating and Cooling
County Fair Air Conditioning
George Haney & Son
Hill York, Inc.
Kentuckiana Comfort Center
Monsen Engineering
Rieck Mechanical
Shambaugh & Sons
United Mechanical
The Warko Group

"We have a 35-ton rooftop AC unit on our county library that was grossly oversized and therefore would not dehumidify sufficiently. Books were molding, the space was very uncomfortable, and electric reheat was required. The APR Control we installed has performed wonderfully, maintaining both humidity and temperature without the need for reheat. We are very pleased with the results."

Keith Chandler, HVAC Department Manager
WestPoint Stevens Inc.
Valley, AL

"After speaking with Rawal Devices technical support a few years ago, I had a number of uses in mind for the APR Control. Since then, I have installed over 100 APRs in a wide range of applications, and I've seen it used in many more. It solves a long list of design and service problems."

Bob Reichenbach, HVAC Service Manager
The Warko Group
Reading, PA

"After 2½ years and almost 400 APR Control installations, I have yet to have a single problem. Rawal Devices applications support is top-notch. Both the product and the company are a pleasure to work with."

Chuck Ruedebusch
Rollie Johnson, Inc.
Chesterfield, MO



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