



# Modulating Hot Gas Reheat



## The Split System Humidity Solution

Another Breakthrough from the  
Leader in HVAC Innovation

Functionality

Factory Testing

Ease of Installation

Ease of Maintenance

Energy Efficiency

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# Humidity Problems? The Solution: Modulating Hot Gas Reheat

## Humidity Problems?

In recent years, there has been a move towards improving indoor air quality. This increased recognition and study of indoor air quality has pointed to moisture as one of the main causes of poor indoor air quality. High humidity can cause many problems including mold growth, condensation, wood rot, paper deterioration, increase in sickness and allergic reactions, and a variety of other indoor air quality and physically damaging issues.

In many geographic locations and in some building applications, the standard moisture removal ability of the cooling system cannot match the humidity control demand since it has been designed to satisfy a dry bulb temperature setpoint. When the setpoint has been satisfied, the supply fan continues to provide fresh air while the cooling system is shutoff until the temperature rises to some level above the setpoint. During that time all moisture removal has been lost.

Previous split system designs have tried to address this situation by taking a standard design and adding a 3-way solenoid valve to bypass hot refrigerant gas to a reheat coil that is placed after the cooling coil. The 3-way valve is usually controlled by a humidistat in the space that allows the unit to continue the moisture removal process after the dry bulb thermostat has been satisfied. This solves some moisture related problems, but a number of other problems may continue, including:

- Poor control of the amount of reheating
- Uncomfortable discharge air temperature swings during operation
- Unacceptable discharge air temperatures and poor temperature control when used in make up air applications, especially 100% outside air.

## The Solution

The ideal solution would be to have a split system design that has the ability to continue the moisture removal from the space after the dry bulb temperature

setpoint has been satisfied but with a controlled amount of reheat to meet the actual dehumidification requirement.

## Modulating Hot Gas Reheat

AAON has addressed all of the above problems with a unique design incorporating a reheat coil, a modulating reheat hot gas valve, a modulating condenser hot gas valve, and an electronic controller.

*The advantages of the design are many:*

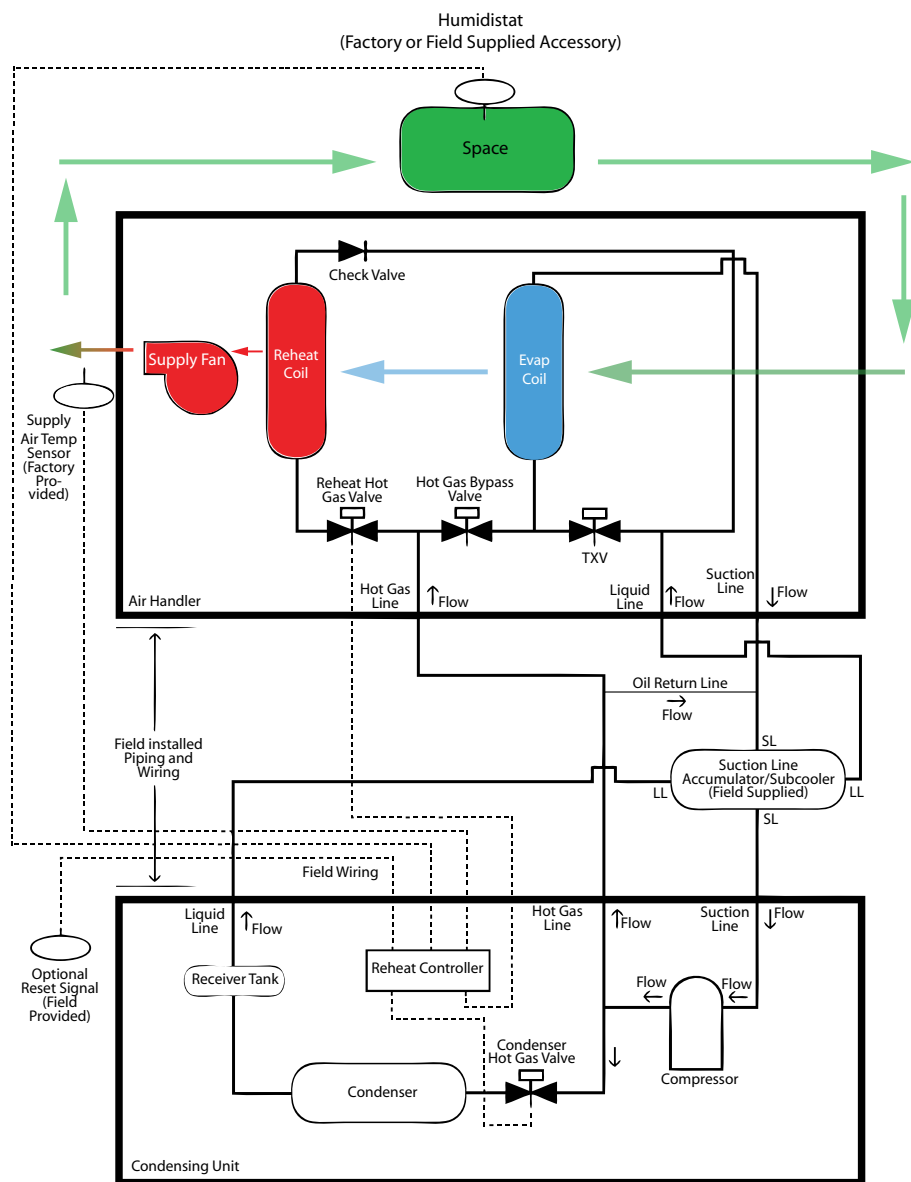
- With the reheat option, piping of only one additional refrigerant line between the condenser and air handler is required.
- If the dry bulb thermostat is satisfied and the humidistat is still calling for moisture removal, the control valves will start to modulate the amount of hot refrigerant gas passing through the reheat coil.
- A factory provided supply air temperature sensor field mounted in the supply air ductwork provides input to the electronic controller for reheat temperature control.
- The valve positions are controlled to provide a specific supply air temperature or a specific reset supply air temperature that are set on the control board. The temperature setpoint used is determined by a field provided 0-10 VDC reset signal.
- Since the amount of hot refrigerant gas passing through the reheat coil is modulated, the system delivers only the amount of reheating that is required for space comfort.
- Occupant comfort is uniform and consistent because there will be no drastic swings in the supply air temperature that are inherent with on/off solenoid valve control systems.

## Minimum Work, Maximum Performance

- In the condensing unit and air handler refrigerant piping, valves, and reheat coil are all factory installed.

## A Simple and Effective Modulating Hot Gas Reheat System

- Field connection of suction line, liquid line, and hot gas line between the condensing unit and the air handler is required.
- Field supplied and installed suction line accumulator/subcooler is recommended, especially for heat pump, VAV, and make up air systems.
- Controls are factory configured and ready to accept inputs from the field mounted, factory provided supply air temperature sensor in the ductwork, supply air temperature and reset supply air temperature DIP switch setpoints, and field wiring of a humidistat and a field provided 0-10 VDC supply air temperature reset signal.



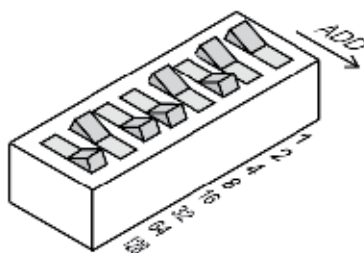
Split System Refrigerant Piping

## Modulating Hot Gas Reheat System



**Modulating Control Valve**

$$64 + 8 + 2 + 1 = 75$$



**75°F Supply Air Temperature  
DIP Switch Setting**



**Modulating Reheat Electronic  
Controller**

## AAON System Advantages

### Normal Cooling and Heating

During normal cooling and heating operations, the system will respond to the dry bulb temperature being controlled. A call for cooling or heating always overrides a call from the humidistat for dehumidification.

### Outside Air? High Humidity? No Problem

- To meet today's standards for ventilation, units must be designed to handle large amounts of outside air. With its enhanced latent capacity, the modulating hot gas reheat option can handle large amounts (up to 100%) of outside air and still maintain neutral supply air temperature.
- Split systems from other manufacturers are not able to meet the dehumidification requirements of many areas. AAON split systems with the modulating hot gas reheat option, however, allow increased moisture removal ability based on the space requirements and the ambient conditions.

### Reheat Operation

When the dry bulb temperature is satisfied but the humidistat is not satisfied, the compressors will continue to operate. The supply air temperature will be controlled to the setpoint selected and set on the control board. The AAON modulating hot gas reheat option provides a controlled supply air temperature at all times.

### Precise Comfort

The AAON split system modulating hot gas reheat option is the only in the industry to provide consistent supply air temperature during dehumidification. The system therefore provides precise comfort by controlling both temperature and humidity.

Contact your local AAON representative to find out more about this, and other, innovative solutions from AAON.



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*“AAON leads the way in hot gas reheat humidity control. Since its incorporation in 1987 AAON has offered On/Off hot gas reheat for energy efficient humidity control. In 1996 AAON began offering modulating hot gas reheat for precise energy efficient humidity control. Today AAON continues to improve and add to its humidity control solutions to provide complete comfort its customers.*

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