PHANTOM II® Heat Only and Combi Boilers

How Rate-Based Reset Works

Everything you need to know about how it works and the benefits

Understanding Traditional Outdoor Reset

Traditional outdoor reset works by limiting the water temperature of the supply required to heat the building based on the current outdoor air temperature. For example, under "design conditions" of 0°F outdoor air temperature, 180°F water might be required to maintain an indoor air temperature of 70°F. When the outdoor temperature is 60°F, however, the same building may only require 86°F water to maintain 70°F inside the building. By limiting the water temperature to what is needed as opposed to a fixed high value, boiler efficiency increases. When combined with burner modulation, outdoor reset also reduces burner cycling, which reduces off-cycle losses.

There are two things to keep in mind when it comes to outdoor reset:

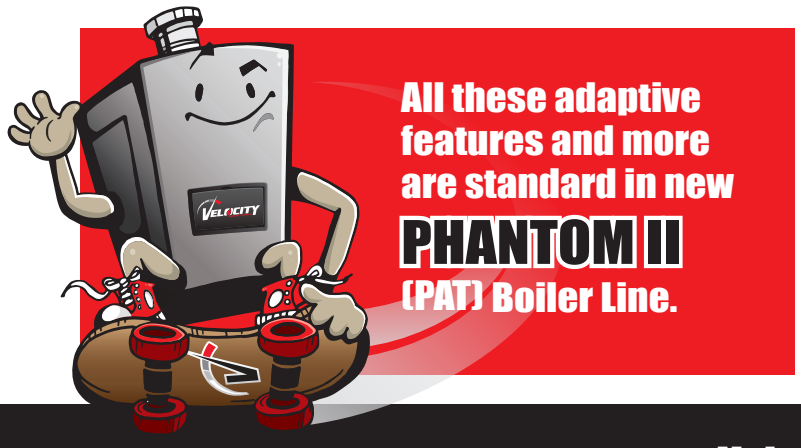
1. A sensor must be installed on the outside of the building in a location where it will accurately measure the outdoor air temperature.

2. The reset curve, or the relationship between outdoor air temperature and required supply temperature, can vary dramatically based on the type of system. Because the boiler/control manufacturer doesn't know what reset curve will be appropriate for the job when they ship the product, outdoor reset controls tend to be pre-programed conservatively, prioritizing guaranteed adequate space heat over optimized fuel savings. While it is possible to change the reset curve in the field, doing so requires knowledge of the original system design conditions.

Rate-Based Reset Solves Both of Those Problems and More

The "rate-based reset" feature on the Phantom II gets around both of these problems by inferring the current heat loss based on the recent average burner input (modulation rate and cycle pattern) required to satisfy calls for heat. For example, if recent calls for heat have been satisfied with an average burner firing rate of 65% modulation, the Phantom II will infer that the ideal target supply water temperature should be 165°F and will use this as the target temperature on the next call for heat. More cycling/lower burner modulation rates tend to reduce the target temperature. Less cycling/higher burner modulation rates tend increase the target temperature.

With built-in features like Rate-Based Reset and Adaptative Combustion, the Phantom II Series of Heat Only and Combi boilers are the most installer-friendly boilers currently on the market.



VELOCITY BOILER WORKS