PHANTOM II® Heat Only and Combi Boilers

How Phantom Adaptive Technology (PAT) Works

What is Gas Adaptive Technology and what can it do for you?

The Problem Gas Adaptive Technology Solves

Gas Adaptive Technology has been around for a while, but it is relatively new to the North American market. In Europe, it was developed to deal with gas compositions and heating values that can vary dramatically by both region and time in a more effective way. Such variations can create challenges obtaining reliable ignitions and clean, quiet combustion when the air-fuel ratio adjustments are manually set.

This technology solves both problems by directly regulating the air-fuel ratio rather than simply regulating the gas pressure as is done on a traditional pneumatic gas-air ratio control. In most cases, this eliminates the need to make air-fuel adjustments in the field. More importantly, the air-fuel ratio will stay constant over time, even if the fuel composition changes after the boiler is placed in service.

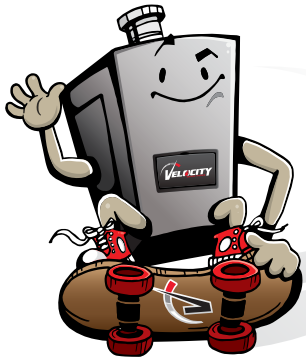
Conversions Made Easy

Gas Adaptive Technology makes conversions from natural gas to propane (and vice versa) much easier because the control system can compensate for the large difference in heating values of the two fuels (roughly 2500 BTU/ft3 for LP vs. 1000 BTU/ft3 for Natural Gas). In the case of the Phantom II, there is one simple physical adjustment and one control parameter change required to change fuels. Gas Adaptive Technology takes care of the fine-tuning automatically.

How it Works

The Phantom II infers the air-fuel ratio from the flame ionization signal. This means that it knows that for a given fuel, different flame signals correspond to certain air-fuel ratios. The Phantom Adaptive Technology (PAT) control system also knows what the air-fuel ratio should be at each fan speed (i.e., firing rate). With this information, at any fan speed, it can open or close the gas valve to obtain the target ionization signal, and therefore the optimum air-fuel ratio, for that input.

All these adaptive features and more are standard in new PHANTOM II (PAT) Boiler Line.



VELOCITY BOILER WORKS