

Monday, July 22, 2019

Condensing Boilers – O₂ Trim Should be Standard in Your Specification

Any person who loves to drive fast classic cars understands the need for proper air to fuel mixture or ratio. If you are old enough to remember Kennedy, you are old enough to remember adjusting the carburetor before hitting Woodward or Gratiot on a Saturday night. Today's vehicles make these adjustments through a computer. You've invested in a high efficiency/high performing Aerco condensing boiler. Why not move up to the 21st century and make sure the boiler is specified with O₂ trim.

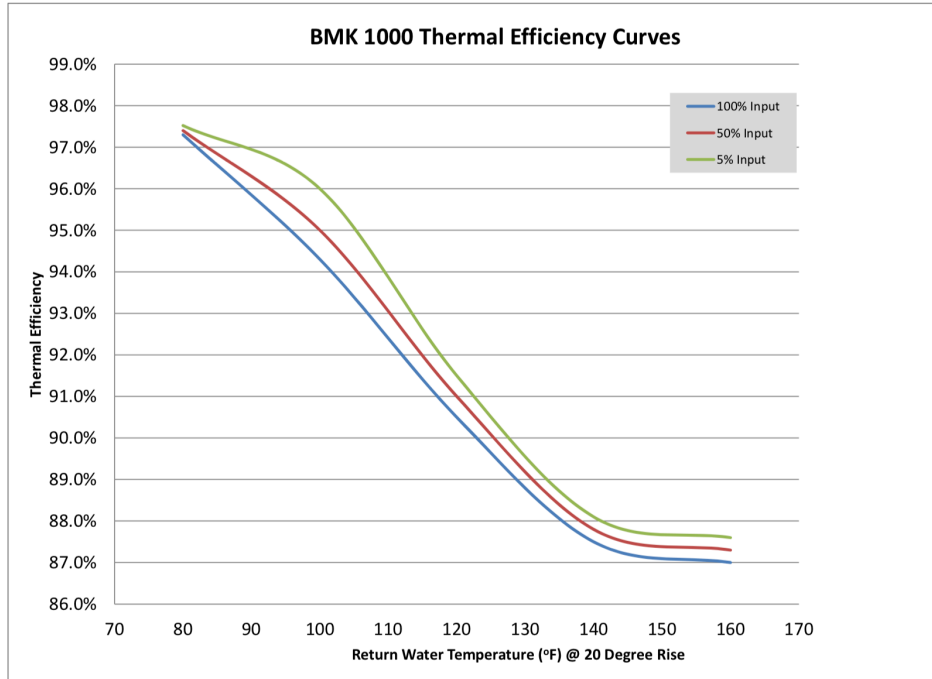


The proper air and fuel mixture provides peak efficiency in a boiler. The combination of engine efficiency and performance is all about adjusting this mixture depending on weather conditions.

It is possible to specify a premium efficiency boiler, make sure the return temperature is low, and end up with no efficiency gains and the boiler not condensing. Let's discuss how this happens and how we can solve.

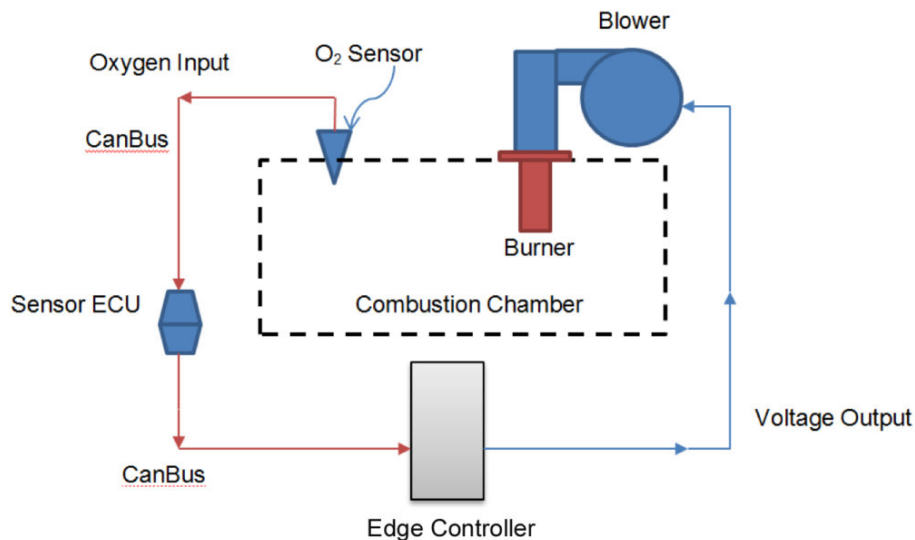
What is O₂ trim and Why Do I Need It?

All condensing boilers advertise premium efficiency over non-condensing boilers. This premium efficiency is based on dropping the return temperature below the dew point to cause condensing. Here is an example performance curve of the Aerco Benchmark BMK-1000.

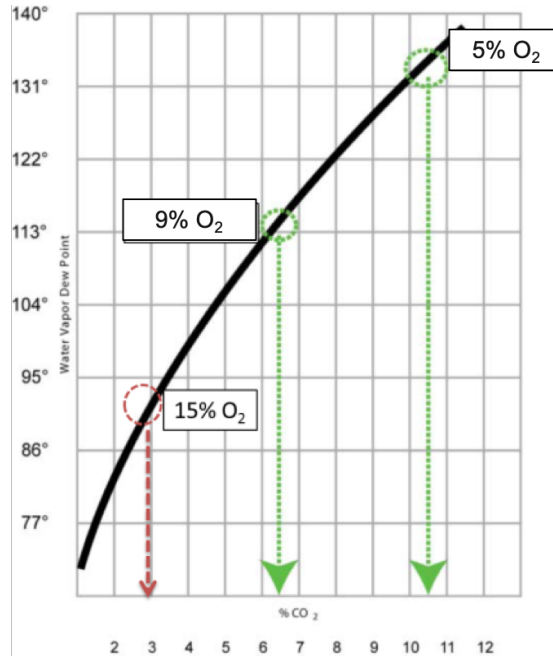


Notice that at return temperatures below the 135°F dew point, the efficiency soars. In order for this to happen in any boiler regardless of the manufacturer, the air to fuel mixture must be fine-tuned. Too rich a mixture, not enough O₂, and, there are nuisance shutdowns, noises, and vibration. In your car, you would call it rough idling.

Weather plays a huge part in the O₂ required. As the weather changes from fall to winter to spring, the temperature and humidity changes will affect the performance of the boiler. The Aerco AERtrim system senses the changes and adjusts the air volume.

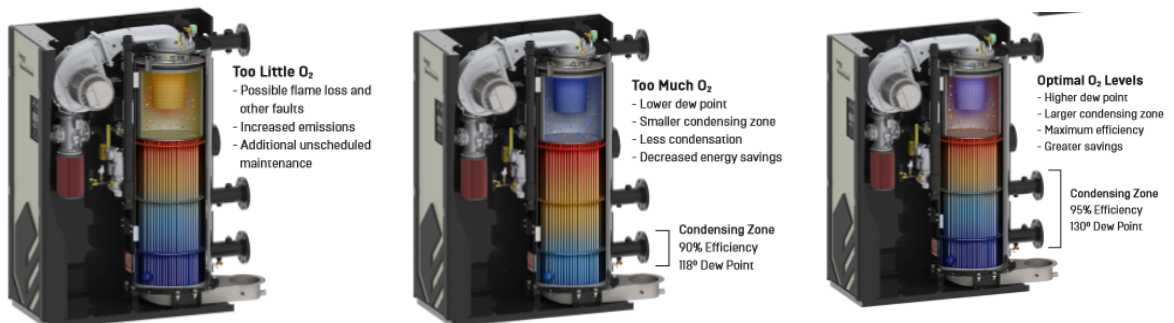


When there is too much O₂, the boiler runs “lean”. The lean mixture will cause the dew point to shift down and the published efficiency cannot be met. This can also be caused by changes in the weather. See the following from ASHRAE’s handbook.



Notice in the chart that a 4% increase in O₂ will lower the required return water temperature to 113°F. This will drop the boiler efficiency dramatically.

Many boiler manufacturers just set the boiler up, right from the start, with too much oxygen. This avoids callbacks and can even hide issues with poor combustion design. It gives the appearance that their boiler runs better than others but there is a cost. The owner will pay for the inefficient operation year after year. If you pass by your boiler and the return temperature is below 130°F there should be water or condensate coming out the drain. If not, maybe you should question the manufacturer choice you made!



Trim is Not New

Large boilers have offered O₂ trim for decades. Manufacturers of non-condensing fire tube and water tube boilers like Burnham and Bryan recognized long ago that the efficiency and performance of boilers increases with this feature.



Aerco Platinum Boilers Come Standard with O₂ Trim

A very easy way to make sure you have this valuable addition to the controls on your boilers is to specify the Aerco Platinum boiler. This trim is not proprietary, although the unique control of the Platinum is limited to Aerco. If you don't want your efficiency and boiler plant operation to depend on the weather, **GO PLATINUM.**