

When does O₂ Trim make Cents?

To combust a fuel, it takes fuel, heat and air. An excessive amount of air in the combustion mix is wasteful as it robs the burner's energy, taking Btu's away from the heat exchange process, applying it to exiting stack gasses. In short, this results in dollars being blown up the stack.

Normally, when setting up the fuel/air ratio on a modulating burner, the technician will attempt to hold the excess air at between 3-7% O₂ throughout the firing range with the low side (3%) being at the higher firing rate and the 7% being at the low end.

Unfortunately, the technician or operator is not at the boiler every operating hour with an analyzer and wrench making adjustments as variations occur due to uncontrollable conditions. What are these varying conditions? They are:

- Relative humidity
- Barometric pressure
- Varying Btu value in the fuel
- Ambient temperature
- NOx control through Flue Gas Recirculation (FGR)

Of these, varying ambient temperature is probably the most common, and it's problematic because as the air temperature varies, the fire can go rich (too little air, sooting the boiler) or lean (too much air heating the excess nitrogen) depending on the density changes of the air due to the increase or decrease in temperature.

FGR is another common causal factor, especially when it is excessive (15-25% hot gas recirculation) as it often precipitates fuel/air ratio imbalance requiring a vigilant monitor to make the ongoing adjustments to compensate for the varying conditions.

Therefore, if you have a boiler room that can experience any of these uncontrollable changes, a quality oxygen trim system should be a serious consideration. It won't tune your burner, but once the burner is properly tuned, it will compensate for the uncontrollable variables. As a result, it will return wealth to the business by constantly monitoring the scarcity or excess oxygen, adjusting the fuel/air ratio accordingly.



O₂ Trim helps regulate the balance of fuel and air for greatest efficiency on these CBL Firetube boilers at a hospital in North Carolina.