

# Why BACS Will Make PID Aeration Control as Obsolete as the Carburetor

A while back, we posted an article which explained why conventional PID (proportional, integral, derivative) systems are not well suited to the complex wastewater environment ([link here](#)).

It occurs to us, that a more familiar analogy involving a new technology's supplanting of another comes from the automotive industry. Remember the carburetor? Every car used to have one. A carburetor was a vacuum pressure controlled device used to regulate the air / fuel mixture entering the combustion chamber. It "worked", in that your car would run. You had to tune it (like PID) for the kind of driving you wanted to do (economy or performance), as it was only really efficient in a very narrow RPM band. Probably the single most significant reason that cars today are two to three times as efficient, while also yielding more power per unit of displacement than say in the 1980s, is the advent of computer controlled fuel injection (and the associated control of the valve train). Fuel injection provides the precise amount of fuel and air required at every RPM and load condition. No unburned fuel goes out the exhaust, and the precise amount of fuel and air, required for the specific operating demand, is always provided.

Like a modern, computerized fuel injection system, BioChem's BACS aeration control system measures system demand, and proactively matches it. It does not react (after the fact, blindly) to pressure changes like PID. This is because its built in intelligence can actually measure changes in the oxygen uptake rate of the process biology, calculate the oxygen demand, and convert it to the required airflow. The airflow demand is then used to directly control the valves (independently by zone, to infinity) and the blower. Dynamic, most open valve logic is also employed to keep the blower always operating at the minimum required pressure.

As a result - the actual DO concentration of BACS installations tracks the set-point precisely, easily to within .05mg/L 95% of the time. At the same time, (because it "knows what it is doing") valve adjustments are significantly reduced, extending actuator life by as much as 600%, process goals (permit compliance) are more easily met, while saving energy (up to 50%).

No one uses carburetors anymore. Not since the 1990s has any production car in the world used a carburetor. This is what BACS should do for wastewater. It has that kind of significance.

And BACS is not inherently more costly to install than PID, and it is much less costly to operate, as it never has to be tuned. Set it and forget it. To find out more, please contact [sales@biochemtech.com](mailto:sales@biochemtech.com)