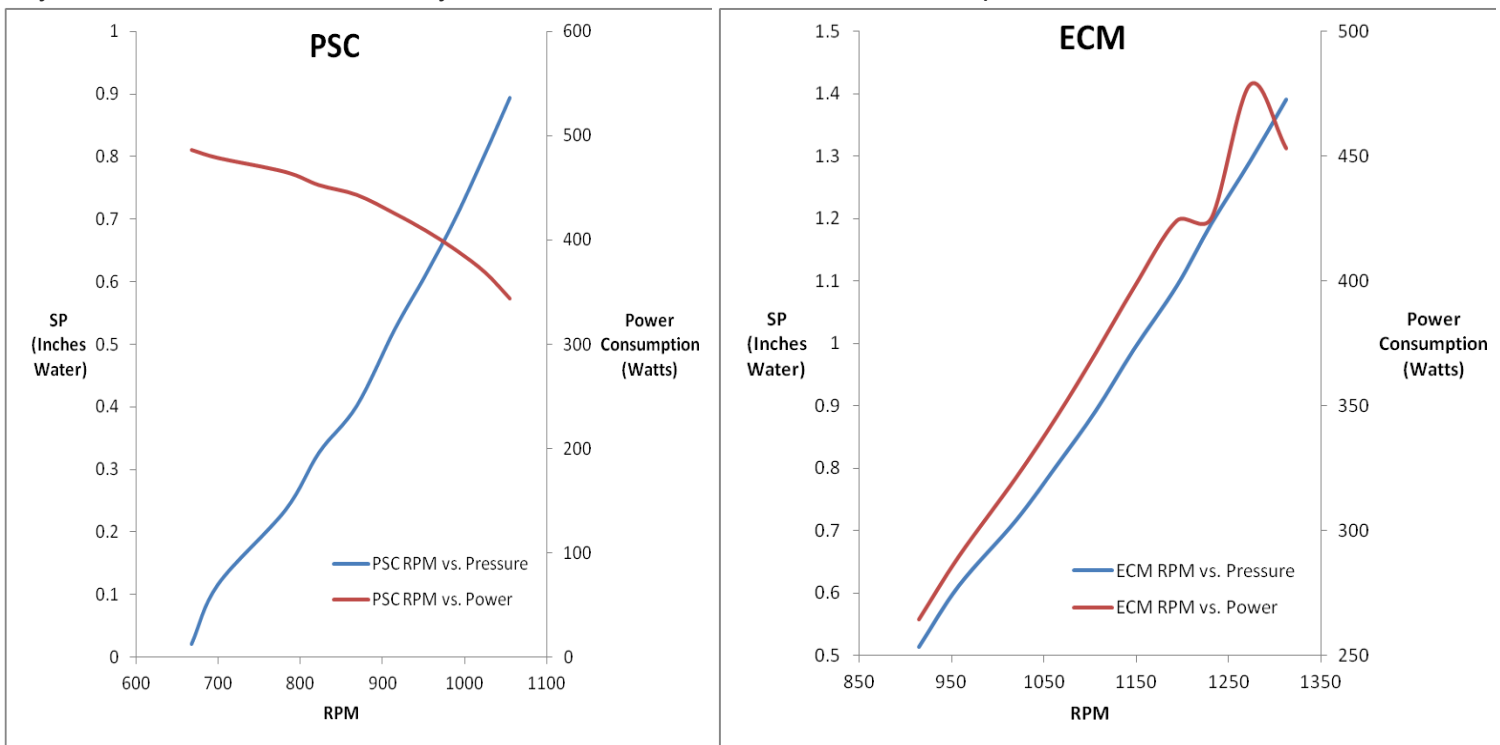


## ECM Vs. PSC Motor Control

ECM (Electronically Commutated Motor) control manipulates motor speed and torque in order to control airflow. This speed control is accomplished through the use of armature-mounted windings to rotate the motor shaft, eliminating mechanical brushes and commutators. ECM control offers true variable speed capability along with high efficiency ratings over a full operating range. In contrast, Permanent Split Capacitor (PSC) motors become less efficient when motor speed is decreased. As multi-speed applications become more common and energy efficiency requirements increase, ECM control is a useful tool to create efficient and comfortable indoor environments. The performance of two 88 kBtuh furnaces, one controlled by a ½ HP ECM and the other by a 1/3 HP PSC motor can be seen in the pair of charts below.



While the ECM displays a nearly constant efficiency (decreased power consumption with decreased airflow), the PSC unit consumes more power when its speed is modulated downwards. This difference in operating characteristics results in the ECM's higher upfront cost being mitigated by a swift payback period. Assuming an operating condition of 1,000 RPM for 24 hours a day and \$0.10/kw-h, the use of the ECM unit from above pays for itself over the PSC unit in 2.5 years. Variable speed applications would experience accelerated payback periods. ECM control has the advantages of increased thermal environmental quality, decreased energy bills, soft-start capability, and simple balancing and tuning.