

US Military

Wilo Stratos Circulators demonstrate 88% energy savings.



US Military Facility, Southeast USA

Overview

In its pursuit of the newest technologies to reduce energy consumption, a US Military facility chose to investigate the benefits of high efficiency pumping technology that combines ECM motors and variable speed drive pumps for water circulation. The Wilo Stratos pump was chosen as an example of a pump utilizing ECM (electronically commutated motor) technology, which is able to realize up to 80% energy savings compared to conventional constant speed pumps. Wilo is the industry innovator and leading supplier of this technology, having premiered the technology at the ISH Exhibition in Frankfurt in 2001.

Strategy

Barracks 1506 and 1511, two residential buildings serving as barracks, was identified as an ideal site. The two buildings have the same structure, orientation, mechanical systems, and occupancy, thereby presenting an opportunity to quantify energy savings. The cooling systems in both building consists of circulated chilled water (45°F) to air handler coils with 3 way zone valves controlling flow direction. Chilled water is operating from a central chilling tower plant. The outside high temperature average during the testing period was 83°F, and the average low was 59°F.

Barracks 1511 – 3HP Constant Speed End Suction Pump



Barracks 1506 – Wilo Stratos 3x3-40



Stratos pumps were installed in the cooling system in barracks 1506, while the 1511 building's cooling system remained unchanged. Power consumption for both the new and existing pumps were metered over a 35 day period to compare energy consumption. E-Mon electric meters were utilized for the analysis, measuring the kWh consuming during the period from September 16, 2010 through October 22, 2010.

Results

Power consumption of the standard pump was 1144 kWh, while the Wilo Stratos showed tremendous savings, consuming only 135 kWh. The 88% difference in energy consumption translates to a savings of 0.65 tons of CO₂ emissions* and 2,000 USGal of water**. Based on the measured and extrapolated data, the following results were observed:



Building	Pump	Delta-T (Target 10°-12°)	kWh During Test Period
1511	Existing	4°	1144
1506	Wilo Stratos	10°	135
Energy Savings – Over 35-day test period			88.2%
CO2 Savings – *Based on US National avg. 1.3 lbs/kWh			0.66 Tons
Water Savings – **Based on US National avg. 2.0 USGal to create 1 kWh			2,000 US Gallons

The Wilo Stratos demonstrated 88% energy savings when compared to the 3HP constant speed pump. These results are similar to experiments conducted in Europe since the Stratos was premiered by Wilo in 2001. As an added bonus, the base was able to turn off a 25HP pump in the main plant due to decreasing flow requirements from the oversized 3HP pump. The 25HP pump has not been turned back on since the test period ended - saving an additional 163,374 kWh & 106 tons of CO₂ emissions* per year.



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