

**Flygt N-Impeller, Phase Conversion Solve Lift Station Problems**



Control panel with VFD for phase conversion

Key Product Features:

- Semi-open, screw-shaped impeller facilitates passage of fibrous material.
- Provide 'instantaneous' starting torque to flush fibrous material with phase conversion.
- Eliminates drag resistance on the impeller to significantly improve energy efficiency.

**PROBLEM:** South County Sewer and Water Authority has five lift stations that receive a single phase power supply. These stations were originally installed using traditional non-clog submersible pumps in 2001. It wasn't long before these stations became maintenance head aches to the staff due to pump clogging. In fact, in the first nine years of operation, the utility paid out an unexpected \$67,643 in pump rewinds, wear rings, impellers, misc. parts, labor and overtime charges for off-hour dispatches. This total was three times the amount the department had budgeted and was putting personnel's safety at risk as many times the pump failures happened at night and in bad weather. The maintenance director attributed the clogging to popular consumer items such as fibrous paper towels, disinfectant wipes, dusting clothes and other so-called 'flushable' products. It was also believed that the single phase power contributed to the problem because it did not provide sufficient 'instantaneous' starting torque to handle the fibrous material.

**SOLUTION:** South County Sewer and Water Authority contacted Kennedy Industries and purchased nine Flygt N-Impeller pumps and PumpSmart variable frequency drives to convert the incoming single phase power to three phase power. All pumps purchased were the same model. This allowed the owner to adjust the speed using the VFD and meet the duty point of each individual station. Eight of these pumps and drives were installed in four of the duplex stations. The fifth station received the ninth VFD and Flygt N pump and was installed next to the original pump manufacturer's newest vortex, non-clog pump. The arrangement for the fifth station presented the opportunity for a side-by-side comparison of the clog resistance and kilowatt usage of the two styles of pumps by different manufacturers. The Flygt N-pumps, enhanced with the PumpSmart VFD's immediately overcame the clogging issue. After two months of service, both pumps were pulled for inspection. While the N pump's impeller was clean, the new vortex impeller pump from the other manufacturer contained a softball size wad of rags, paper, and 'flushable' material. The maintenance director also noted that the cost for maintenance since retrofitting with the new Flygt pumps, was well within the appropriate budget, and that the elimination of pump drag at the single-phase stations had significantly improved energy efficiency. South County's records show a 26% reduction in kilowatt hours compared to the former pumps. The Authority was also able to reduce spare parts stock as they are now able to stock one drive and pump that will work at all five pump stations.



Material removed from a recess vane pump after 2-month test period



Flygt N-pump showed no signs of clogging