

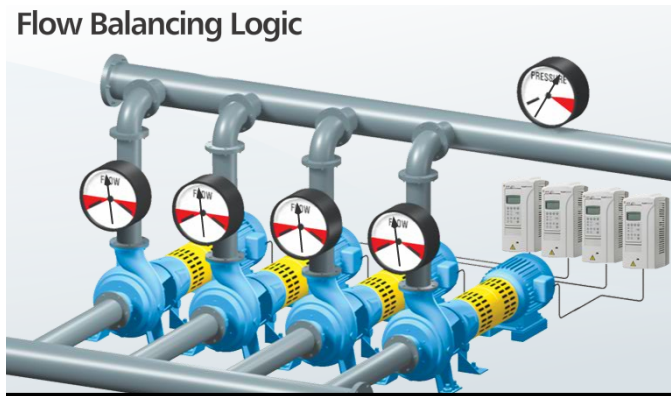
Lift Stations and Wet Wells

A lift station is an assembly of a wet well(s), a level control and pumps designed to take the flow of waste water from a gravity sewer system and boost it into another above grade holding pond where it can be gravity fed into the water treatment plant. The control objective is to maintain a constant level in the below grade wet well.

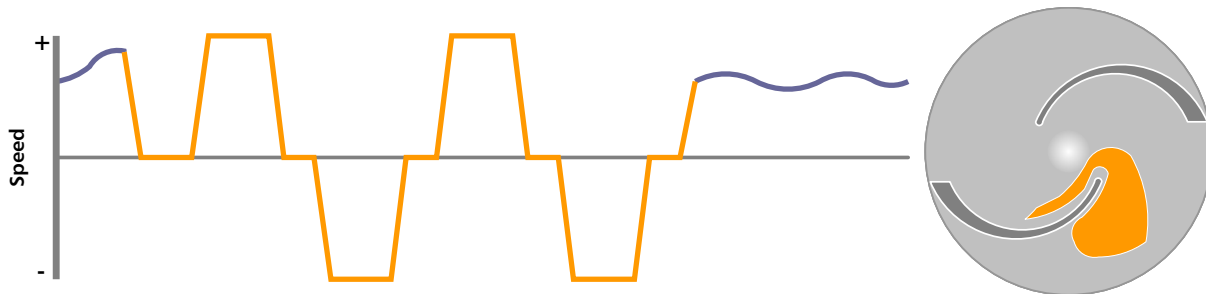
PumpSmart Advantage #1 – Multi-pump Functionality– The flow into the wet well is highly variable and PumpSmart will adjust the pump speed accordingly. At peak times, multiple pumps will be required to keep pace with the flow and PumpSmart will automatically determine how many pumps should be in operation, will equalize operating times for each pump to equalize wear, and will balance the flows to balance pump loads. PumpSmart can also assure pumps are not be subjected to detrimental operating zones such as dead head, minimum flow, or run-out. No external controller is required to perform these functions.

Flow Balancing Logic

PumpSmart offers a pre-engineered, and documented, multi-pump package that manages all of the operating details

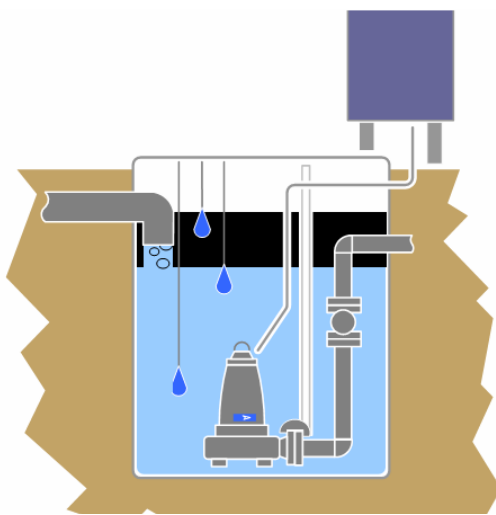


PumpSmart Advantage #2 – Pump Cleaning Sequence- Wet well pumps are prone to clogging because of the presence of clogging materials such as rags, ropes, and other debris. Clogged pumps often have to be removed to be unclogged. PumpSmart's pump cleaning sequence is able to detect clogs by closing monitoring pump load and can automatically initiate a cleaning sequence to dislodge the clogging material. This sequence involves running the pump in a forward and reverse sequence that is field proven to dislodge items. In the event the material can not be dislodged, PumpSmart will shut down the pump and signal an alarm. This prevents permanent damage to the pump and motor from over torque and high amps.

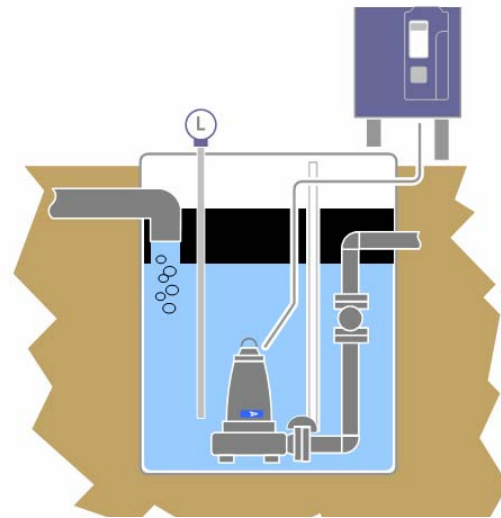


PumpSmart will detect clogs early in the clogging cycle and automatically initiate a cleaning sequence that involves a sequence of forward and reverse operation.

PumpSmart Advantage #3 – 15% Energy Reduction (Estimated Average) - Wet well control schemes traditional involve managing to a range of levels using float switches. For fix speed operation this involves constant on and off cycling and pumping through a range of flows with each cycle. PumpSmart’s control logic involves a multi variable control scheme using its SmartFlow capability and wet-well level. By leveraging SmartFlow, the pump is managed at the most efficient flows at reduced speed for each level in the tank. Cycling of the pump on and off is greatly reduced.



Traditional float arrangement results in constant pump cycling



PumpSmart's level control method which varies flow rate based on level can result in a 15% reduction in energy consumption

PumpSmart Advantage #4 – Force Main Applications – Many times a wet-well pump system feeds into a pressure trunk line, referred to as a Force-Main. Depending upon the total network conditions, the pressure in the Force-Main may vary, creating very difficult conditions for the pump to accommodate. If the pressure is low, larger pumps may operate past their recommended maximum flow as the backpressure is insufficient to keep it on its performance curve. Smaller pumps must be oversized to account for worst-case scenarios, even though the majority of the time they will never see these conditions. PumpSmart, using its SmartFlow technology, enables pump systems to stay within their designed operating range and maximize energy savings without having to add costly transducers to the system.

Case Study: Municipal application in Florida

System Challenge: A municipality with the City of Stuart Florida has many wet well pumping systems that use submersible dry-pit Flygt pumps. These systems are controlled with high and low level float switches for start/stop and use traditional fixed speed motors. These systems are continually prone to pump clogging and are unreliable in maintaining the level in the wet well. Operators have to manually stop the pumps that do not perform and start backup pumps as necessary. It has been standard procedure to wire switching circuitry to reverse the rotation of the pumps or to have the pumps removed from service and have the clogged pumps serviced.

PUMPSMART®



PumpSmart Solution: PumpSmarts were installed using a level transmitter to vary pump speed to maintain the level to within an inch of the desired level in the wet well. When the level dropped to where the pumps no longer needed to pump the PumpSmart were put into sleep control and restarted when the level in the wet well rose to a predetermined level. The units were also configured with the pump cleaning sequence functionality invoked. This immediately proved to work as prescribed as the sequence detected a clogged pump. Within minutes the sequence of stopping and running in reverse and then restarting for 2 cycles removed the clog and the pumping system was back in full operation without any operator intervention.

Customer Testimonial: The plant manager who had witnessed the commissioning operation and startup of the PumpSmarts was extremely impressed and stated that all new pump installations will have PumpSmart controllers. He also stated that where it can be justified he will retrofit existing applications to automate what continues to be a very manual and expensive unclogging procedure.