# PUMPSMART®

## PumpSmart's Pre-engineered Multi-Pump System

Multi-pump systems provide a cost-effective and flexible solution for pumping applications with highly variable flow demands.  With this approach, low demands can be managed by a single pump, and as demand increases, one or more additional pumps can be operated.

Control of these systems is one of the most challenging tasks pump users face, and unfortunately many operators choose to run all of their pumps, all of the time, rather than face the potential of missing process demands. As a result, many multi-pump systems have pumps that run outside of their recommended minimum or maximum flows, and ultimately leading to reduced pump reliability.



*Traditional Multi-pump applications often run all of the pumps all of the time to avoid process conditions.  Variations in pump performance can result in pumps running at shutoff and run-out flow.*

PumpSmart offers a pre-engineered and documented multi-pump package that manages all of the operating details, including:
- Determining how many pumps should operate to meet the process demand.
- Evenly distributing the load to each pump being operated.
- Automatically sequencing pump operation based on the hours of operation for each pump.

One of PumpSmarts' most unique features is its ability to balance loads between pumps, rather than simply pump speed. Synchronization of pump speed is a common approach to multi-pump control; however it fails to account for differences in pump wear, dimensional tolerances, and process inlet conditions. Balancing flow rates of each pump results in improved pump reliability and process control. When these conditions are not accounted for, the resulting pump flows can vary greatly.



*Pump-Smart is designed to balance the flow rates of each pump*
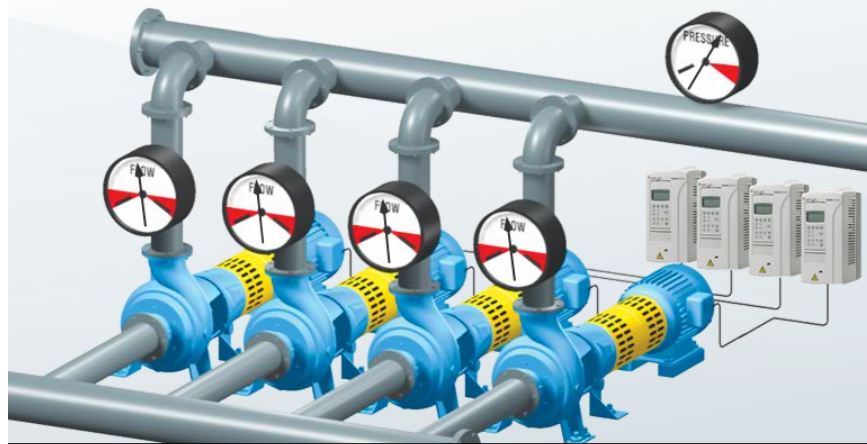
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PumpSmart is designed to easily integrate into a plants control system, which can then define the process requirements such as flow rate, pressure or level and which pumps can and can't operate. PumpSmart will manage the plant demand according to these requirements and will feed-back all of the operation data including flow rate.



*Pump-Smart is designed to integrate directly into a plant's control system or work autonomously.*

PumpSmart's multi-pump is a pre-engineered package that simplifies the management of multi-pump systems. This includes synchronizing pump loads to equalize pump flows to maximize pump reliability, manage pump operation in the most efficient manner to reduce energy costs and reduce system wear. All of this is provided in a package that is simple to install and operate.

**Multi-Pump Case Study – Multi-pump operation problems finally solved**

**System Challenge:** A large multi-national chemical company utilized three end-suction pumps operating in parallel to supply water to its main process unit. The existing system utilized a variable speed drive control system where pumps in operation were controlled to the same speed to meet the process demand based upon pressure. One of the pumps was significantly worn and unable to meet the same performance characteristics of the other two pumps. As a result, the worn pump was unable to pump any water into the pressurized header. The pump, operating well below its recommended minimum flow rating, heated the water to the point that the plant control system initiated a safety shutdown of the entire pump system. These events resulted in costly unit shutdowns.

**PumpSmart with Multi-Pump Control:** By setting this system up with a PumpSmart Multi-Pump system set in Synchronous Torque control, the customer was able balance the flow between the pumps despite the presence of the worn pump. By controlling all the pumps to the same load point, the worn pump would run at a slightly higher speed to compensate for its reduced head-capacity performance.

**Results:** This pump unit has not experienced a temperature related safety shutdown since the implementation of the PumpSmart Multi-Pump control with Synchronous Torque function.