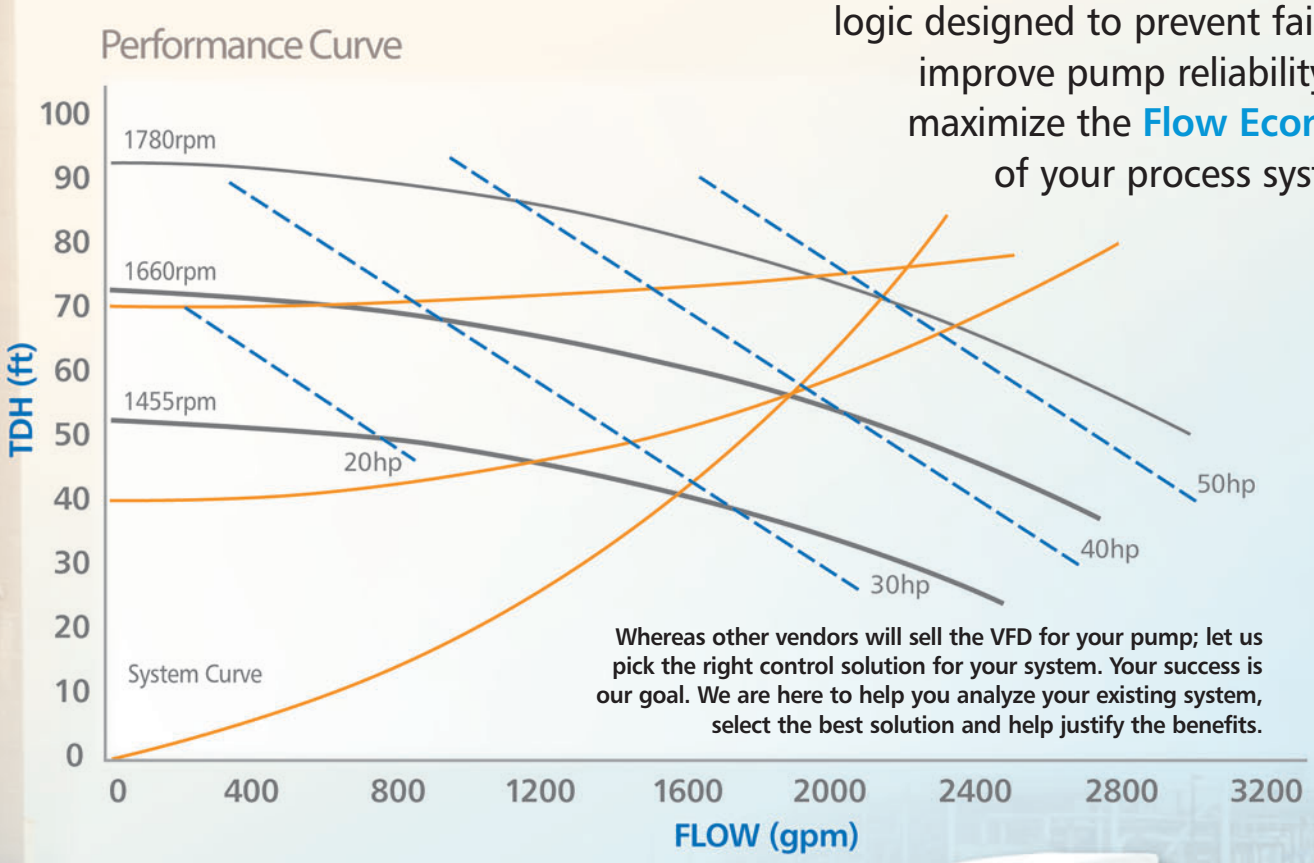
PumpSmart®
Control Solutions

ITT

Engineered for life

Advanced pump **Control**, **Protection**, and **Optimization** logic designed to prevent failures, improve pump reliability and maximize the **Flow Economy** of your process systems.



Whereas other vendors will sell the VFD for your pump; let us pick the right control solution for your system. Your success is our goal. We are here to help you analyze your existing system, select the best solution and help justify the benefits.

PumpSmart provides the next level in intelligent pumping by using a standard variable frequency drive and directly imbedding pump specific algorithms into the drive.

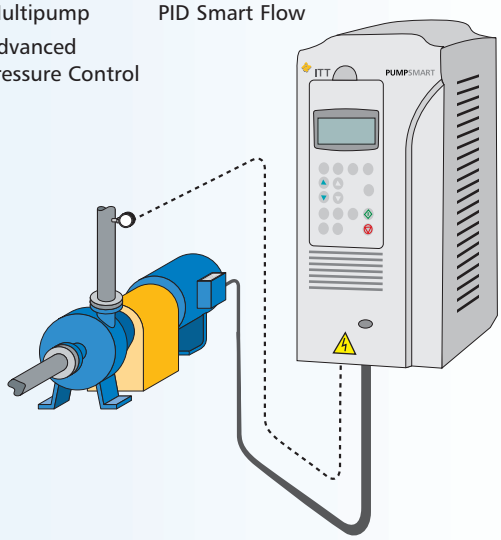
2 Ways to Benefit

Integrated Process Control

PumpSmart offers automatic pump control by integrating the pump controller in the drive. No external controller is required, making PumpSmart a simple and cost-effective solution for your basic pumping needs.

Process Control Features

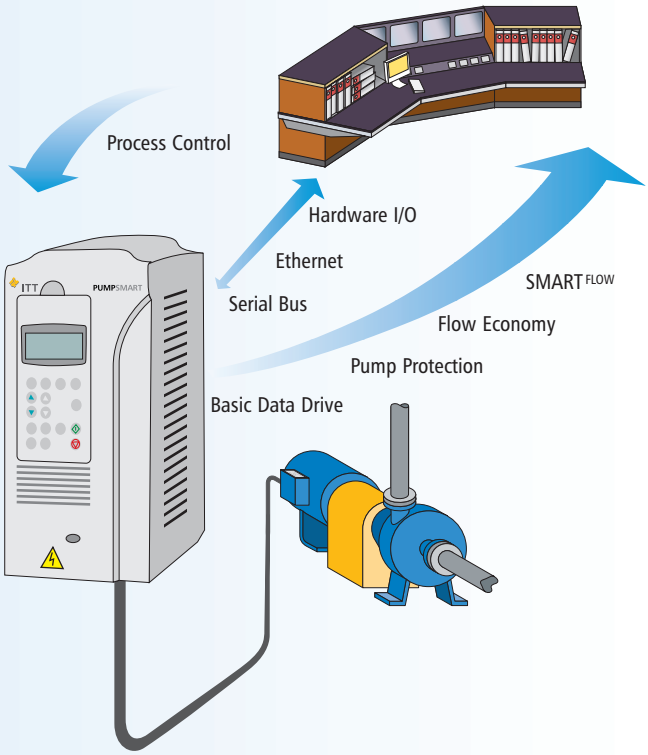
Single Pump
Multipump
Advanced Pressure Control
Cavitation Control
PID Smart Flow



As standard, PumpSmart systems come equipped with advanced process control features that help optimize your pumping system for maximum uptime, reliability and energy savings.

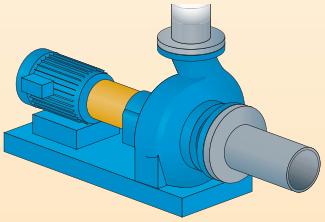
Drive for the DCS

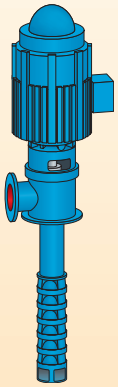
While most VFD's can provide basic information to your control system, PumpSmart systems have been designed to provide the important data you need to help run your process smoothly and efficiently.

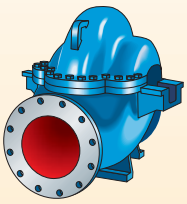


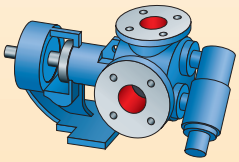
Use PumpSmart as a standard VFD, but gain unprecedented insight into the performance of the pump with sensorless functions such as Smart Flow, Flow Economy and Advanced Pump Protection.

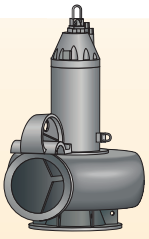
PumpSmart is pump-specific and was developed to protect the pump and optimize pump control. PumpSmart can be applied to any manufacturer's centrifugal or positive displacement pump.

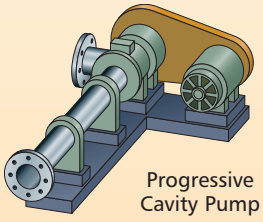

Horizontal Centrifugal Pump


Vertical Centrifugal Pump


Double Suction Centrifugal Pump


Positive Displacement Pump


Submersible Pump


Progressive Cavity Pump

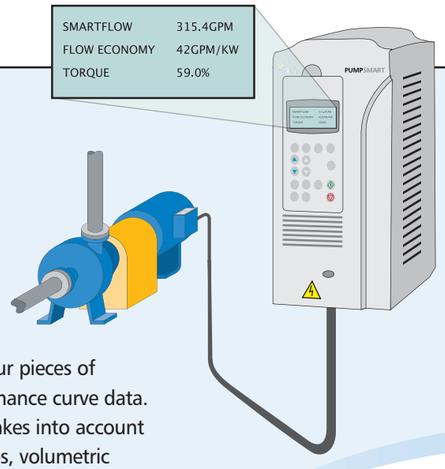
PumpSmart

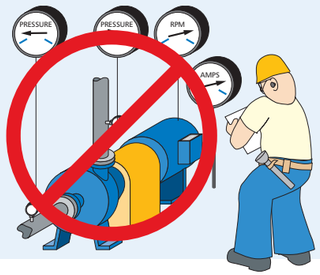
Enhanced Data

SMART FLOW

Sensorless flow measurement within ± 5% of the pump's rated flow.

Determining the flow of a centrifugal pump can be a challenging exercise without a flow meter. PumpSmart is able to capture real-time data such as speed, torque and power and use this information to calculate the flow of the pump.



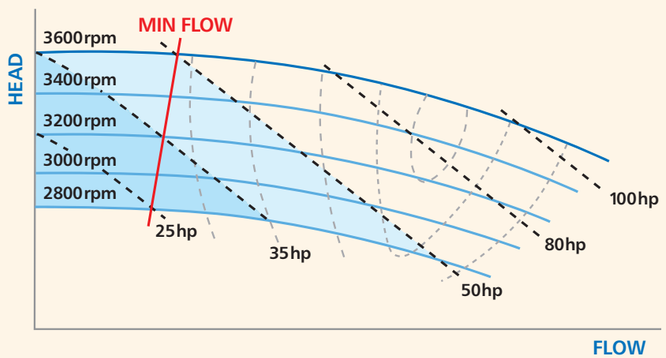


SMART FLOW requires only four pieces of standard price book performance curve data. A self-calibration function takes into account changes in mechanical losses, volumetric efficiency and separates the true hydraulic load to calculate the actual pump flow.

Pump Protection

PumpSmart can protect your pump from process upset conditions, such as **dry-run**, **dead-head**, **shut-off**, **minimum flow** and **run-out**.

With patented sensorless pump protection algorithms, PumpSmart is able to determine the operating state of your pump at any operating speed.

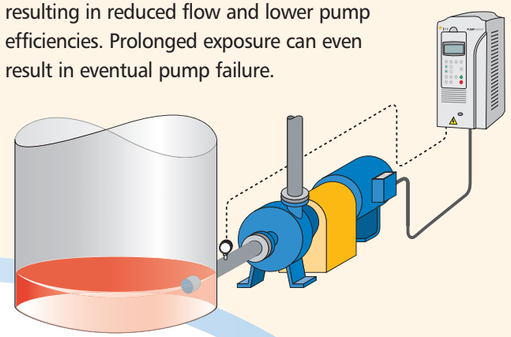


Factors you must include in your pump protection logic:		
	Variable Torque Load	Pump Wear
	Mechanical Losses	Casting Variations
	Volumetric Efficiency	Pump Type (Ns)
	Eddy Current Losses	

Optimized Control

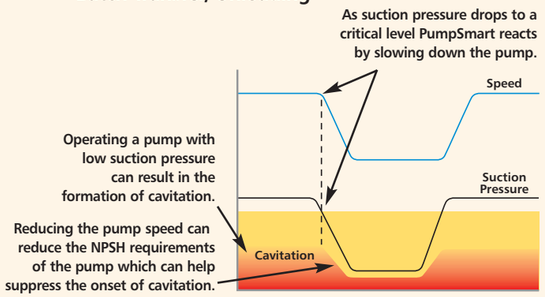
Cavitation Control & Protection

Low suction pressure can lead to the onset of cavitation, resulting in reduced flow and lower pump efficiencies. Prolonged exposure can even result in eventual pump failure.



PumpSmart can monitor the suction conditions of your pump to protect against cavitation. Cavitation Control improves overall pump reliability in low NPSH services that routinely cause pump failure.

Typical Services: Evaporator, Condensate, Batch Transfer, Unloading



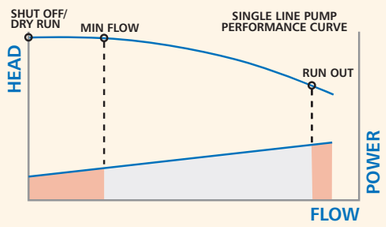
Flow Economy

Flow Economy is a simple metric that defines how much fluid can be moved per unit of energy. Similar to fuel economy of your car, Flow Economy defines how much flow (gpm or m3/hr) can be moved with 1 kilowatt (kW) of power.

Combined with SMART FLOW, PumpSmart is able to calculate the Flow Economy of your pump allowing you to know what the true pump system efficiency is.

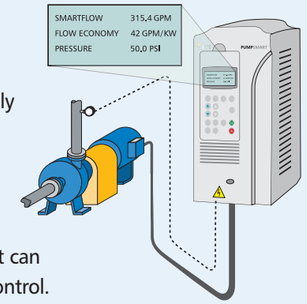
Fixed Speed
18

PUMPSMART
39



Using a simple load monitor function on a variable speed pump application can lead to false indications of pump distress. Be confident your pump is protected by the pump experts.

Integrated PID Control



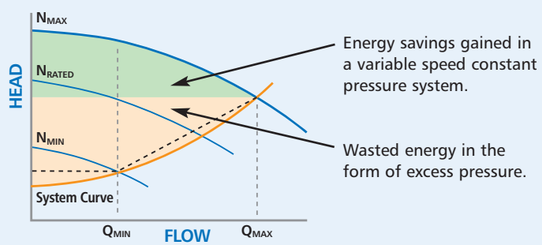
PumpSmart includes an integrated pump controller that can automatically control the pump based on feedback from a process transmitter. Pump-specific algorithms make field setup quick and simple.

PumpSmart is ideal for all pumps that can benefit from simple and automatic control.

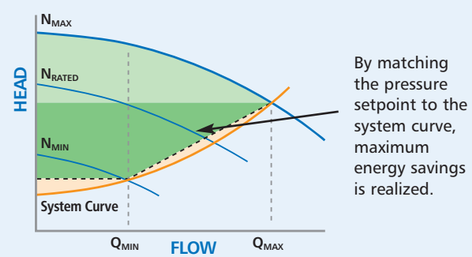
Typical Applications: Pressure, Flow, Level, Temperature, Differential Pressure

Advanced Pressure Control

The practice of setting the pump to maintain the highest pressure requirement is a wasted opportunity to maximize the energy savings in a constant pressure system.



Advanced Pressure Control recognizes an increase in demand and automatically increases the pressure setpoint to match the system resistance curve maximizing Flow Economy.

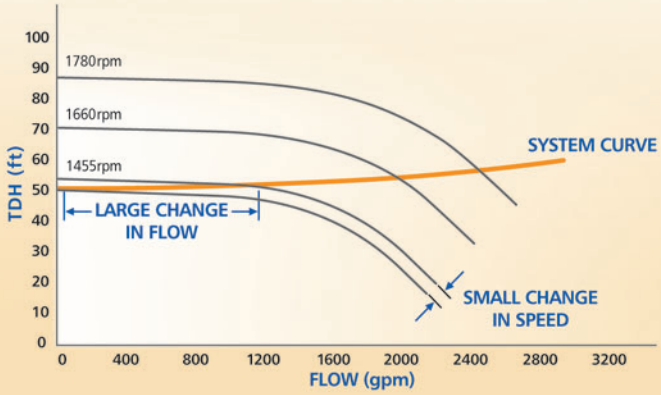


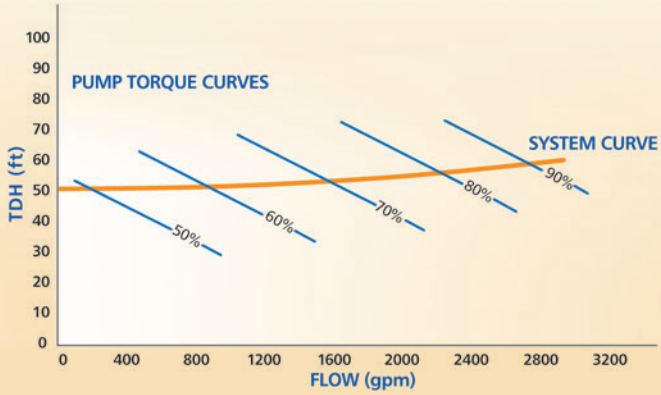
SMART CONTROL

When changing the speed of the pump with a relatively flat head-capacity curve, a small speed change can result in a large swing in flow.

This type of system can result in unstable flow, making control very difficult.

SMART CONTROL is able to increase and decrease pump flow by changing the pump torque rather than the pump speed. Controlling to pump torque can change a relatively flat pump performance curve into a steep, easy-to-control pump performance curve.



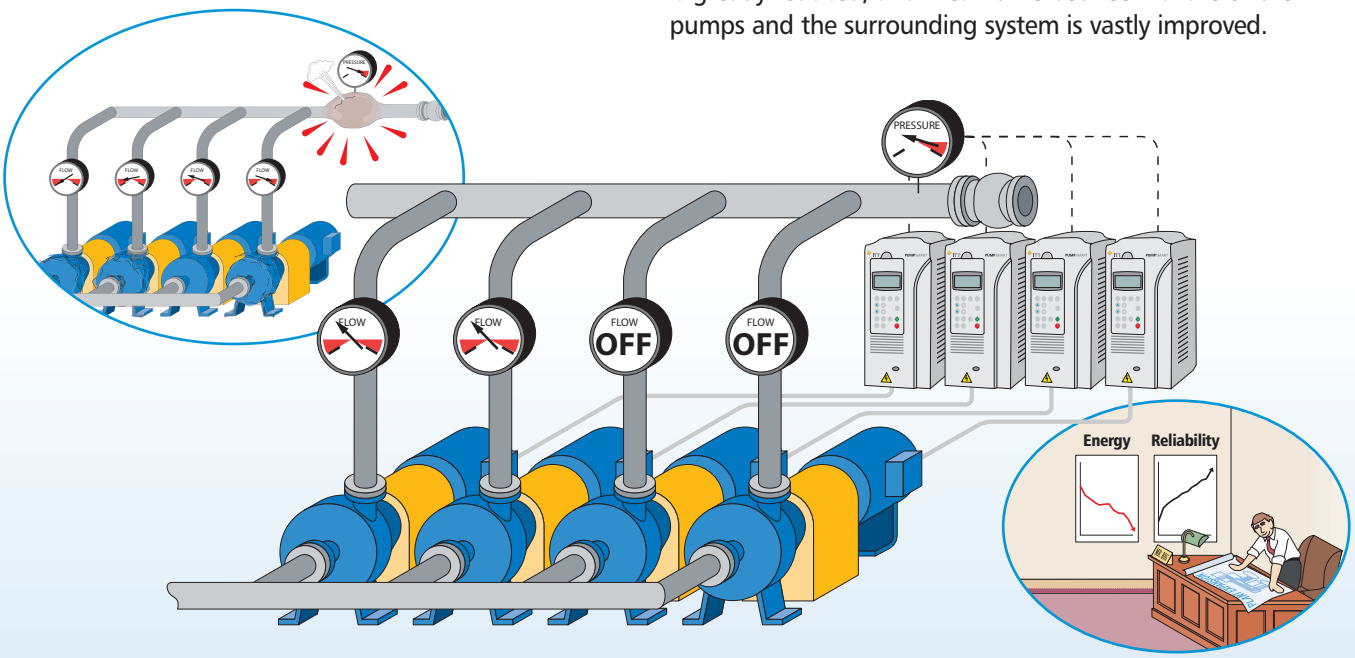


MultiPump Control

Control coordination between 2 to 4 pumps

All too often, multi-pump systems end up running with all the pumps on, all the time. This situation leads to high vibrations, pressure buildup and excess energy consumption… to name a few.

PumpSmart runs only the pumps necessary to meet the current system demand. In addition, it ensures that flow is balanced between the operating pumps using our SmartControl functionality. In total, energy consumption is greatly reduced, and mean time between failure of the pumps and the surrounding system is vastly improved.



Product Portfolio

PS200

DRIVE PLATFORM ..... ABB ACS800
POWER..... 1-2250hp (1-1500kW)
VOLTAGE..... 208-690Vac 3Ph +/– 10%
INPUT FREQUENCY..... 48-63HZ
EFFICIENCY ..... 98% at nominal load
INPUT..... 6-Pulse Rectifier
OUTPUT ..... Pulse Width Modulated (PWM)
MOTOR CONTROL ..... ABB Direct Torque Control
OUTPUT FREQUENCY..... 0-300Hz (0-120Hz w/dv/dt filter
ENCLOSURE NEMA1, NEMA12 (IP21, IP54)
TEMPERATURE..... 5-104F (-5-40C) standard
122F (50C) with de-rate
ALTITUDE ..... 0-3300ft (0-1000M) standard
13123 ft (4000m) with de-rate
HUMIDITY..... 5-95% non-condensing
APPLICABLE STANDARDS UL 508C, CSA C22 No. 14-95, EN 50178, EN60204-1, IEC 60529, IEC 60664-1, EN61800-3 + Amendment A11, CE Compliant

OPTIONS
Low Harmonic (AFE)
Field Bus Communication
Fused Disconnects
NEMA3R (IP55)
NEMA4 (IP65)
NEMA4x (IP66)
VFD Bypass

PS75

DRIVE PLATFORM ..... ABB ACH550
POWER..... 1-150hp (1-90kW)
VOLTAGE..... 208-600Vac 3Ph +/– 10%
208-240Vac 1Ph +/– 10%
(50% de-rate)
INPUT FREQUENCY..... 48-63HZ
EFFICIENCY ..... 98% at nominal load
INPUT..... 6-Pulse Rectifier
OUTPUT ..... Pulse Width Modulated (PWM)
MOTOR CONTROL ..... Sensorless Vector
OUTPUT FREQUENCY..... 0-300Hz (0-120Hz w/dv/dt filter
ENCLOSURE NEMA1, NEMA12 (IP21, IP54)
TEMPERATURE..... 5-104F (-5-40C) standard
122F (50C) with de-rate
ALTITUDE ..... 0-3300ft (0-1000M) standard
13123 ft (4000m) with de-rate
HUMIDITY..... 5-95% non-condensing
APPLICABLE STANDARDS UL 508C, CSA C22 No. 14-95, EN 50178, EN60204-1, IEC 60529, IEC 60664-1, EN61800-3 + Amendment A11, CE Compliant

OPTIONS
Field Bus Communication
Fused Disconnects
NEMA3R (IP55)
NEMA4 (IP65)
NEMA4x (IP66)
MCC Bucket Mount
VFD Electronic Bypass

PF700

DRIVE PLATFORM ..... Allen Bradley PowerFlex700
POWER..... 1-200hp (1-150kW)
VOLTAGE..... 208-200Vac +/– 10%
208-240Vac 1Ph +/– 10%
(50% de-rate)
INPUT FREQUENCY..... 47-63HZ
EFFICIENCY ..... 97.5% at nominal load
INPUT..... 6-Pulse Rectifier
OUTPUT ..... Pulse Width Modulated (PWM)
MOTOR CONTROL ..... AP Vector Control
OUTPUT FREQUENCY..... 0-420Hz (0-120Hz w/dv/dt filter
ENCLOSURE ..... NEMA OPEN, (IP20), NEMA 1 (IP21)
TEMPERATURE..... 5-104F (-5-40C) for NEMA 1(1P21)
122F (50C) with NEMA OPEN (IP20)
ALTITUDE ..... 0-3300ft (0-1000M) standard
13123 ft (4000m) with de-rate
HUMIDITY..... 5-95% non-condensing
APPLICABLE STANDARDS UL 508C, CSA C22 No. 14-95, EN 50178, EMC Directive (89/336/EEC) EN61800-3 Second Environment, EMC Low Voltage Directive (79/23/EEC) CE Compliant

OPTIONS
Field Bus Communication
Fused Disconnects
NEMA12 (IP54)
NEMA3R (IP55)
NEMA4 (IP65)
NEMA4x (IP66)
MCC Bucket Mount
VFD Bypass

	SMART FLOW	Flow Economy	Sensorless Pump Protection	Protection Limit	SMART CONTROL	Torque Balance	PID Process Control	PID Sleep Function	Cavitation Control	Advanced Pressure Control	Multipump Synchronous	Multipump Constant Slave	Condition Monitoring	Secondary Protection	Energy Savings Calculator
PS200	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆
PS75				◆	◆		◆	◆				◆		◆	
PF700				◆	◆		◆	◆	◆	◆			◆	◆	◆

PUMPSMART FEATURES TABLE

For technical details, visit www.ittmc.com

ITT Monitoring and Control

Increased Uptime and Reduced Operating Costs

Leveraging our 150+ years in process machinery design, manufacture and operation, ITT Monitoring and Control products and services have one goal — improving your plant's profitability. Our ProSmart systems provide continuous, predictive monitoring of all your rotating equipment at an exceptionally low price.

Our PumpSmart pump control systems provide real-time control and protection of your centrifugal pumps while also providing valuable process knowledge without the need for additional sensors. Our Performance Services team delivers our system knowledge to your plant floor to help you optimize the performance of your system.

Visit our website at www.ittmc.com