- Qualify for Green Building Incentive Programs and Rebates
- Achieve LEED Certification
- Sustainable Water Conservation and Energy Efficiency
- Reduced Environmental Impact
- Lower Electric and Water Utility Costs
- Long-Term Economic Returns

# Powersāv™

## Variable/Constant Speed Pumping System

70X THE MOST AFFORDABLE VARIABLE SPEED SYSTEM
FOR PRESSURE BOOSTER APPLICATIONS

D-229A

Bell & Gossett
a xylem brand

# Technologic® 502 Pump Controller

The energy and operating cost savings from applying variable speed pumps in pressure boosting applications is significant in most installations. Constant speed pumps react to a drop in system demand by riding back on their curve and generating more pressure. As a safety measure this additional pressure is commonly absorbed by a pressure reducing valve resulting in wasted energy. Variable speed pumping allows the discharge pressure of the pump to precisely match the actual system requirement. Energy consumption can often be significantly reduced by applying variable speed pumps in pressure boosting applications.

Bell & Gossett has been building both constant and variable speed pumping systems for over 30 years. Our Model 70X pressure boosting system uses the latest and proven software technology, the 70X applies the concept of combining a variable speed lead pump with one to three constant speed lag pumps. This allows for a highly efficient and very economical pressure boosting package. The 70X allows the operation of multiple pumps in parallel discharging into a common header that supplies a domestic water piping system. Systems that use on/off staging control often experience water hammer or pressure surges each time a pump is switched on or off. This can lead to potential problems with pipe bursts or overpressurization of valves, along with excessive wear and tear on the entire system. The Technologic 502X pump controller uses a combination of pressure and speed to calculate the most efficient points to add and subtract pumps for operation.

## *The benefits are easy to see*

- **Variable speed pumping**
  *Saves energy*
- **Entire system factory assembled and tested**
  *Easy to install and start-up*
- **Small footprint**
  *Saves valuable floor space*

# *Technology ideally suited for pressure boosting applications*

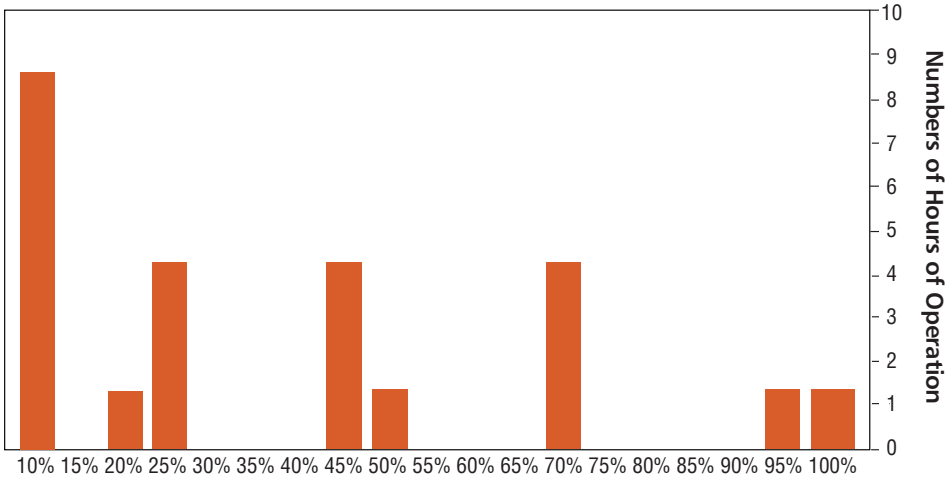
A building's water needs vary over the course of the day and throughout the seasons of the year. In the chart on the right, you will find a typical building's demand profile that shows the number of operation hours per average day, plotted against the percentage of design flow rate. For more than half of each day, a single pump can ensure that adequate water flow and pressure will be delivered to any fixture in the building. The 70X, with its variable speed lead pump, can result in energy savings unmatched by a constant speed booster.

For those times when the lead pump is unable, on its own, to satisfy the building fluctuating needs, a constant speed pump is staged on. The constant speed pump operates at full capacity and the lead variable speed adjusts its speed to supplement the system demand, without overpumping which would lead to excess consumption of energy.

As the need for water at the various fixtures decreases, the lead pump slows down and approaches a point where its discharge check valve could close. By monitoring system pressure and lead pump speed such that prior to reaching this point, the constant speed lag pump is staged off and the lead pump handles the system demand.

**Example:**
System requirement of 200 gpm with 45 psi boost:
**Pump 1:** 1531–1-1/4 AC 5 HP rated 60 gpm @ 112' with check valve
**Pump 2:** 1531–2AC 7-1/2 HP rated 140 gpm @ 125' with PRV

## Typical Pressure Booster Building Demand Profile




Average 15-1/2 hours per average day
Variable speed pump alone meets demand

With energy cost of $0.10 per kW, payback within a year is typical.

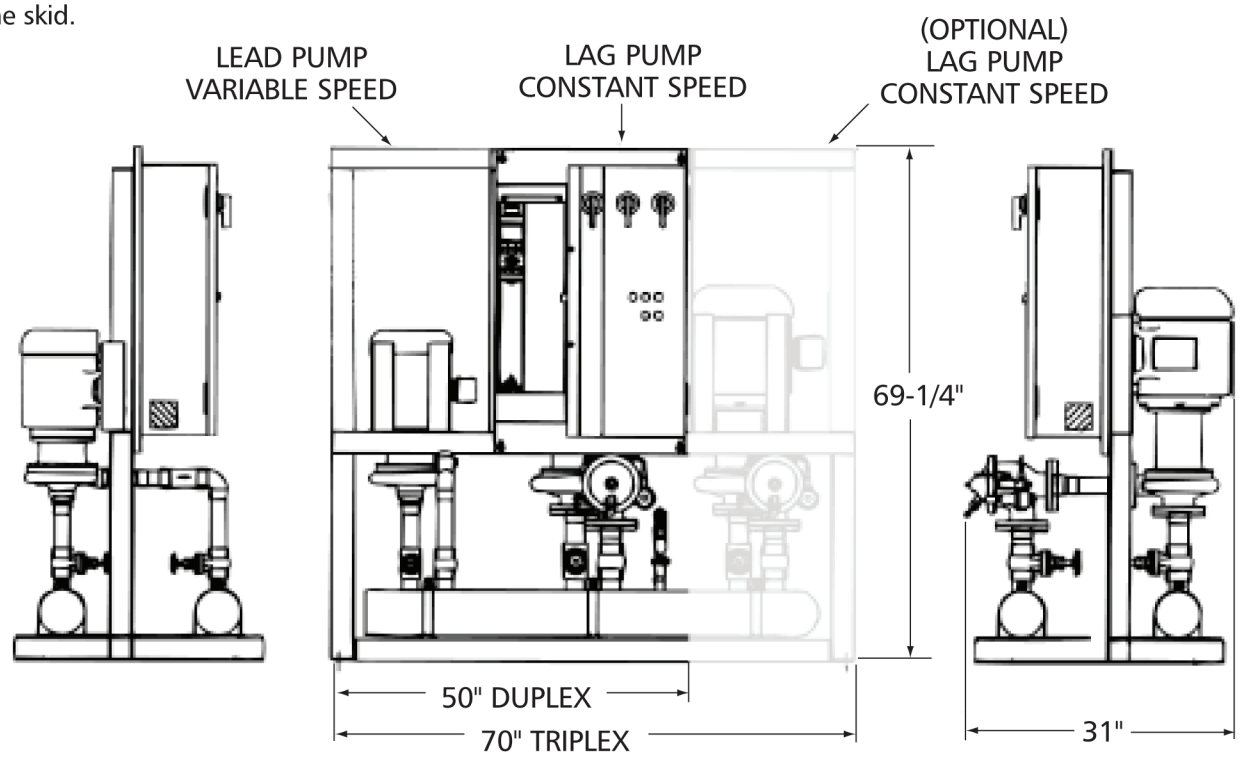
| | |
|---|---|
| Constant Speed Annual Operating Energy Usage: | 29,704 kWh |
| Variable Speed Lead Pump/Constant Speed Lag Annual Energy Usage: | 19,568 kWh |
| **Energy Savings:** | **10,136 kWh** |

POWERSAV™

## 70X Variable/Constant Speed Mixing for Pressure Booster Applications

A typical 70X package includes up to four vertically mounted 1531 pumps with a check valve on the discharge of the variable speed pump, and one, two or three constant speed lag pumps. Each lag pump is provided with a combination pressure reducing and check valve with pilot on the pump discharge. Isolation valves are provided on each pump set for ease of service. The standard package is available with type L copper headers in sizes of 3, 4 or 6 inches. The Tech 502X pump controller and constant speed pump motor starters are installed in a common panel which is wired and mounted on the skid.

The 70X was designed for simple installation requiring only suction and discharge connections and a single input power connection. This system occupies a minimal amount of floor space and easily fits through a standard doorway making it ideal for retrofit applications. Other features include no flow shutdown and high system pressure cutout. 70X packages are designed to provide low initial cost, outstanding reliability, and lower life cycle cost.




Consult factory for 4 pump applications. Consult factory for certified dimensions.

The system is controlled by our Technologic 502X which is a combination variable speed drive and pump controller that is capable of receiving a signal from a pressure transducer and responds by speeding up or down to maintain the programmed set point.

The Tech 502X stages on/off up to three additional constant speed pumps to meet system flow demand. In addition, the controller utilizes B&G's custom algorithms to protect the pumps and the system from damaging conditions such as no/low flow, low suction pressure, and high system pressure.

xylem
Let's Solve Water

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