

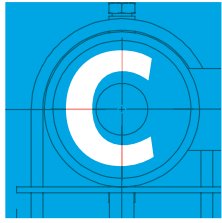
## DESIGN ENVELOPE

Series 6800 booster

## SOLUTION OUTLINE

FILE NO: 100.14IN  
DATE: OCTOBER 2013

SUPERSEDES: 100.14  
DATE: MAY 2013



**Consider the challenges of plumbing systems when selecting the right booster for your building.**

## PLUMBING COMPLEXITIES

Taller buildings need booster systems to create pressure and move water to upper floors. While water usage in your building can vary considerably throughout the day, each plumbing fixture still requires constant pressure for proper operation.

Traditional constant speed boosters maintain a constant pressure supply to the entire building by operating at full load, regardless of the actual water demand. In doing so, they cause unnecessary high pressure in the water main.

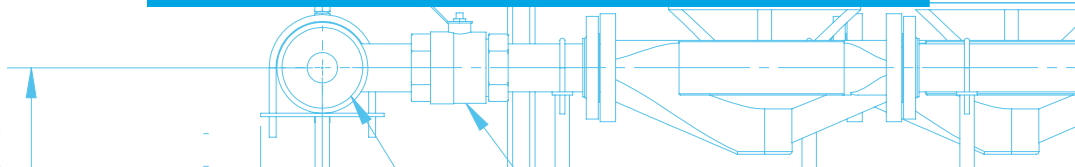
The excess system pressure, not needed at the fixtures, is reduced mechanically with pressure reducing valves. While this configuration meets the demand for water pressure, operating the booster pumps at full speed for all demand levels wastes energy and inflates your operating costs. Over time, constant speed settings can also waste water through increased flow and leakage caused by higher operating pressures.

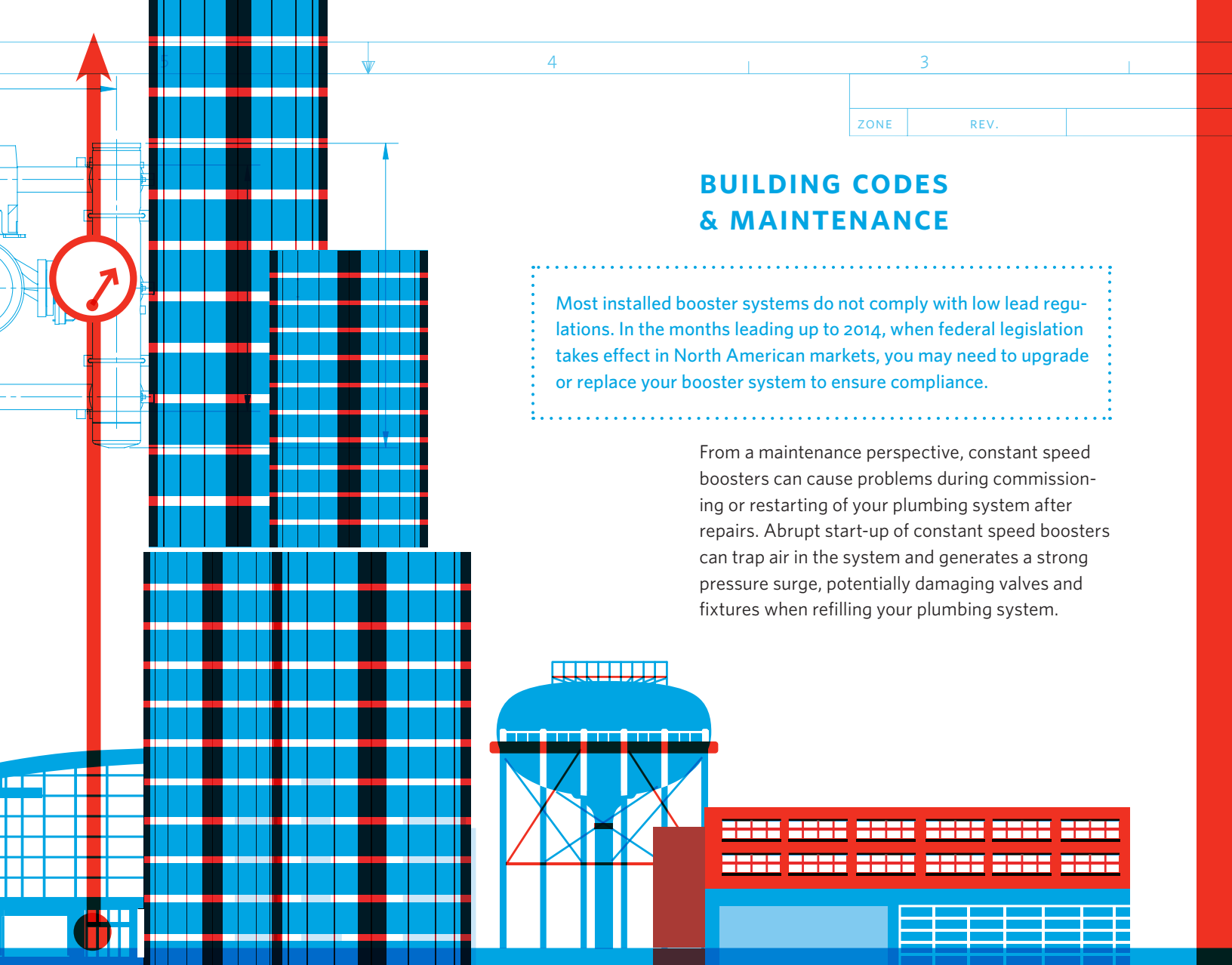
Because roughly half the amount of water flowing through your fixtures is hot water, excess system pressure also increases your water heating costs.



**VARIABLE SPEED**

**PERFORM WITH CONFIDENCE**



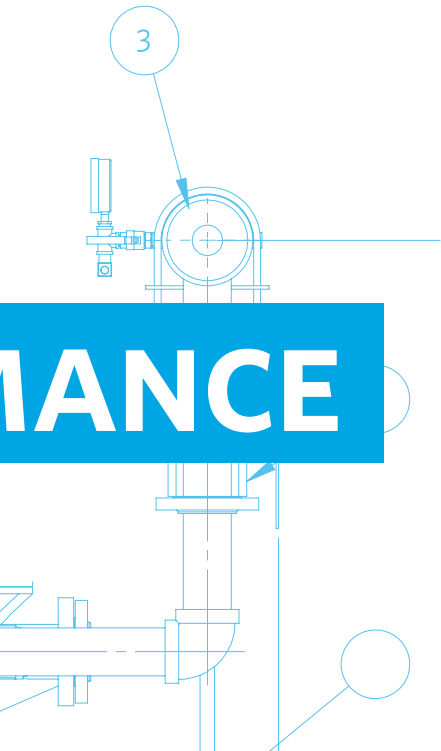


ZONE	REV.

## BUILDING CODES & MAINTENANCE

Most installed booster systems do not comply with low lead regulations. In the months leading up to 2014, when federal legislation takes effect in North American markets, you may need to upgrade or replace your booster system to ensure compliance.

From a maintenance perspective, constant speed boosters can cause problems during commissioning or restarting of your plumbing system after repairs. Abrupt start-up of constant speed boosters can trap air in the system and generates a strong pressure surge, potentially damaging valves and fixtures when refilling your plumbing system.



**To address these challenges, you need a variable speed booster system that:**

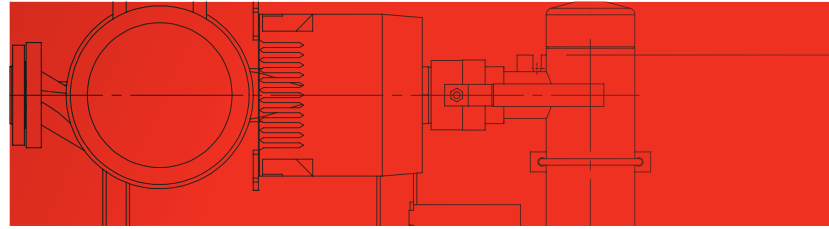
**Creates system pressure in accordance with the demand for water at any given time**

**Saves energy by shutting off the pumps when there is no demand for water**

**Meets building codes for transportation of clean, safe drinking water**

**Refills the piping system at a controlled rate, avoiding water hammer and allowing trapped air to escape**

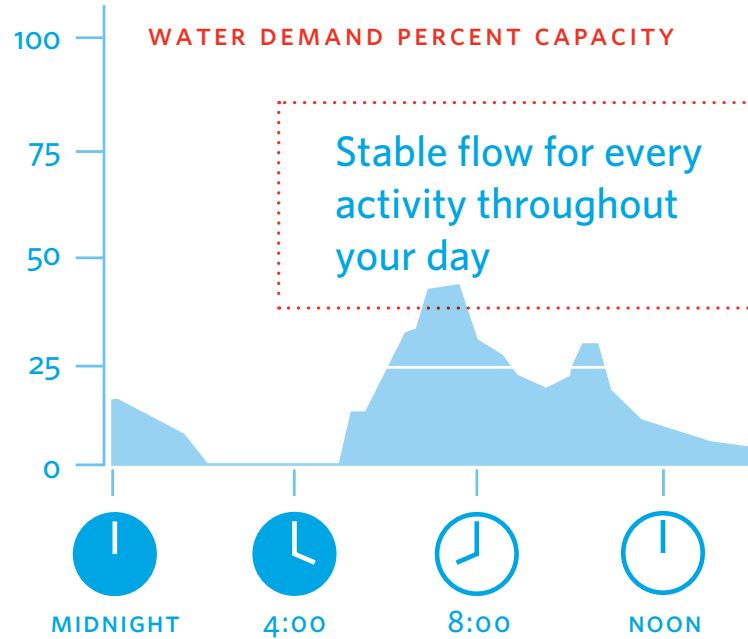
# DESIGN ENVELOPE



**A**rmstrong Design Envelope boosters are designed to address the plumbing challenges in high-rise buildings. Each booster combines high efficiency vertical multistage pumps with modern variable speed controls to create a solution that lowers energy costs, reduces water consumption, and minimizes maintenance issues.

Armstrong Design Envelope boosters reduce the pumping costs for your building through intelligent variable speed demand-based operation, consuming only the energy required based on the water consumption at any given time.

The embedded control logic for staging pumps also ensures optimum energy efficient operation at all times, staging pumps on as needed during times of high water demand, and staging them off during periods of low flow.

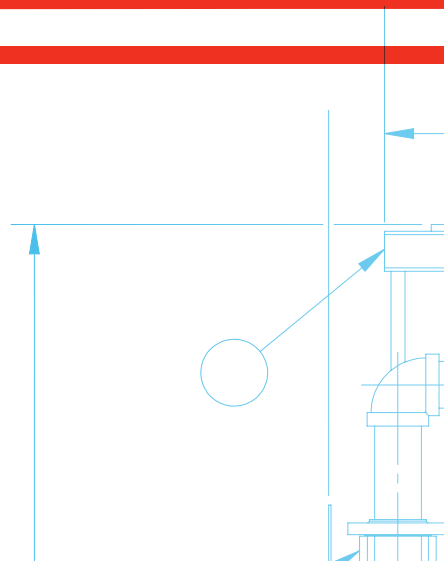


If there are any fluctuations in the suction supply pressure, the embedded control of the Design Envelope booster adjusts operating speed to maintain smooth, accurate discharge pressure. This prevents excess pumping pressure and eliminates hydraulic surges and water hammer.

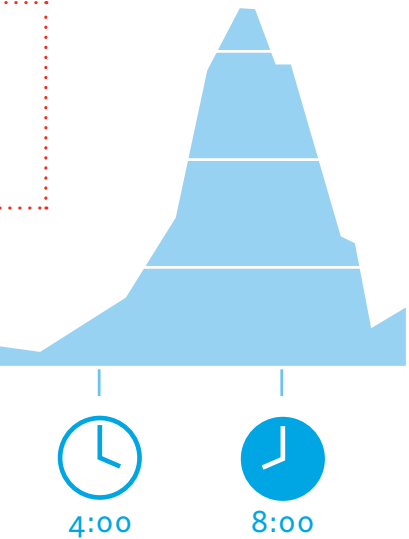
Welcome, John Brown			
IVS Booster			
Calculations			
Total Net Installed Cost (\$)	15,886.10	Comparison Booster Or Repair Cost (\$)	992.88
Annual Consumption Reduction (kWh)	90,879.7	DE Booster (kWh)	25,996.0
Energy Savings as % of base	64,883.7	Annual Consumption Reduction (kWh)	90,879.7
Annual Energy Cost of Constant Speed	90,879.7	Energy Cost (\$/kWh)	0.17
Annual Energy Cost of DE Booster	25,996.0	DE Booster (kWh)	25,996.0
Annual Energy Savings (\$)	11,114.58	Annual Energy Cost of Constant Speed (\$)	15,114.58
		Annual Energy Cost of DE Booster (\$)	4,419.31
		Annual Energy Savings (\$)	3,179.31

# OPTIMUM PERFORMANCE ANY GIVEN TIME

View your savings and ROI using real data from your installation. **Ask your Armstrong representative or visit [roi.armlink.com](http://roi.armlink.com)**



# SAVINGS & SAFETY



Compared to constant speed systems, Design Envelope boosters operate at ideal pressure levels at all times. Operation at reduced system pressure avoids unnecessary water consumption — which also reduces heating cost on the hot water side. From a maintenance perspective, a less pressurized plumbing system mitigates damages and unduly wear of system components — keeping leakages and component replacements in check.

Armstrong Design Envelope boosters are certified to the NSF-61 standard, making them the perfect choice for both new and retrofit projects, delivering safe, clean drinking water to building occupants.

LOW-LEAD  
IAPMOR&T<sup>®</sup>  
NSF/ANSI 61

## LOW LEAD CERTIFICATION

SSURE

ME



# FUTURE PROOF

## DESIGN ENVELOPE

## FLEXIBILITY

Armstrong Design Envelope solutions are sized using a pre-set collection of the most efficient booster sizes for a range of performance levels. This approach allows you to create a comfort zone around your base-line performance requirements when selecting your product. By choosing a booster model with sufficient envelope space around your preliminary design point you can easily adapt to changes in design, site, or operating conditions — without substantial revisions to your system design or mechanical components.

Over the life of your building, the Design Envelope approach to selection protects you against potentially costly and time consuming system rework due to:

Changes to fixtures  
(EX. LOW FLUSH)



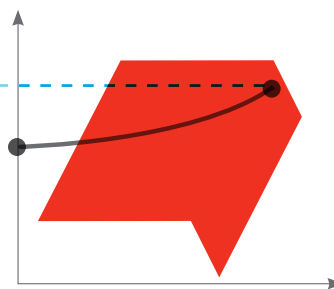
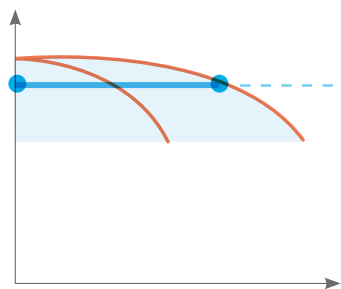
Changes to building design



Inclusion of backflow prevention



Aging pipeline: corrosion and scaling



Most variable speed booster systems use constant pressure control to maintain stable discharge pressure to the building's fixtures.

## DESIGN ENVELOPE

UP TO  
ENERGY SAVINGS

15%

OVER THE CONVENTIONAL APPROACH

# KEY FEATURES

Armstrong Design Envelope boosters fully leverage demand-based variable speed technology to provide industry leading control features and savings:

## NO FLOW PRESSURE OPTIMIZATION

The booster generates an additional boost pressure under no flow conditions to increase the volume of water stored in the drawdown tank.

## SOFTFILL

Design Envelope boosters fill the entire plumbing system gradually, prior to actual pressure build up. This allows building managers to recharge the system with no risk of damage to components.

## NO FLOW SHUTDOWN

Senses when there is no demand in the system and shuts off the pumps.

## PRESSURE SETBACK

Adjusts pressure set point in proportion to usage. The quadratic pressure control curve follows the actual system curve resulting in up to 20% energy savings.

## Advantages of Design Envelope boosters over hybrid boosters:

### SMALLER FOOTPRINT

Hybrid boosters use larger control panels and motors, leading to increased baseplate and stanchion supports. Armstrong Design Envelope booster systems are constructed to use minimal floor space.

### HIGHER EFFICIENCIES AND INCREASED ENERGY SAVINGS

Hybrid boosters use only one drive to adjust one pump at a time. The other pumps will operate at constant speed. Design Envelope booster systems integrate variable speed technology with each individual pump for optimal pumping efficiency and consume on average **10%-15%** less energy.

### IMPROVED OCCUPANT COMFORT

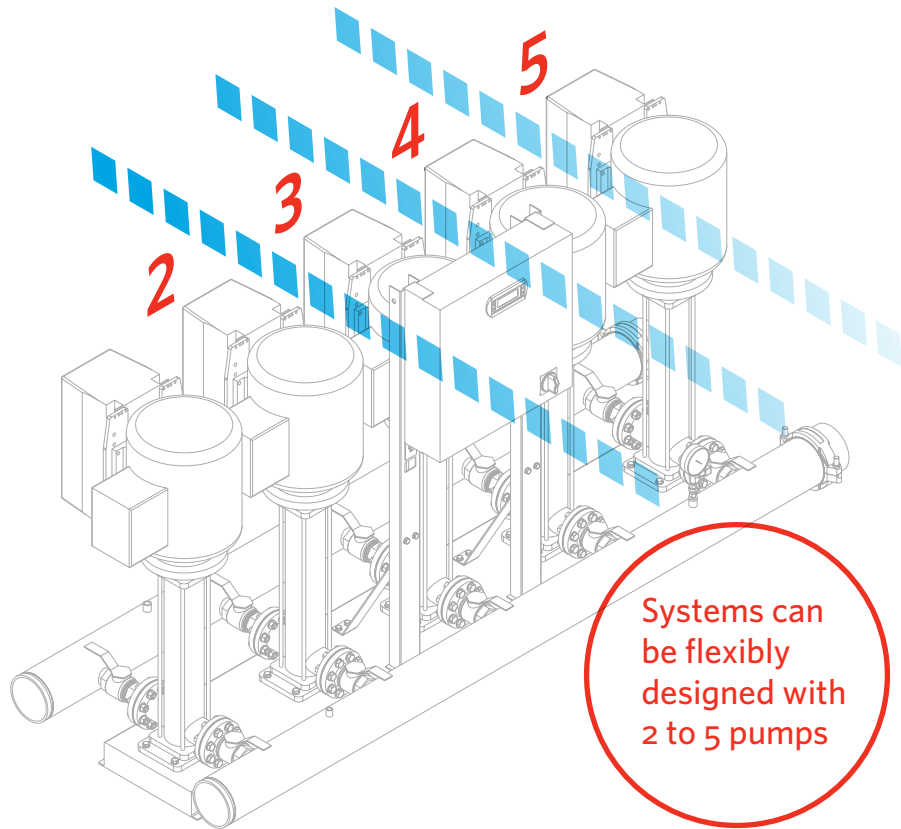
The combination of constant speed and variable speed found in Hybrid boosters leads to inefficient staging, and uneven system pressure. Design Envelope pumps stage efficiently, so system pressure is never compromised.

### REDUCED MAINTENANCE COSTS

The combination of fixed speed and variable speed control in hybrid systems leads to uneven wear on the pumps and can also lead to damaging pressure spikes. Design Envelope variable speed technology eliminates pressure spikes and distributes usage evenly to minimize maintenance requirements.



# BOOSTER APPLICATION RANGE



Systems can be flexibly designed with 2 to 5 pumps

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## PERFORMANCE

## NUMBER OF UNITS

	2	3	4	5
<b>MAX FLOW</b> m <sup>3</sup> /hr	120	180	360	450
<b>MAX PRESSURE</b> bar	20	20	16	16
<b>MAX POWER</b> kW	44	111	148	185

For more information, ask your  
Armstrong representative or visit us at  
[armstrongfluidtechnology.com/ContactUs](http://armstrongfluidtechnology.com/ContactUs)