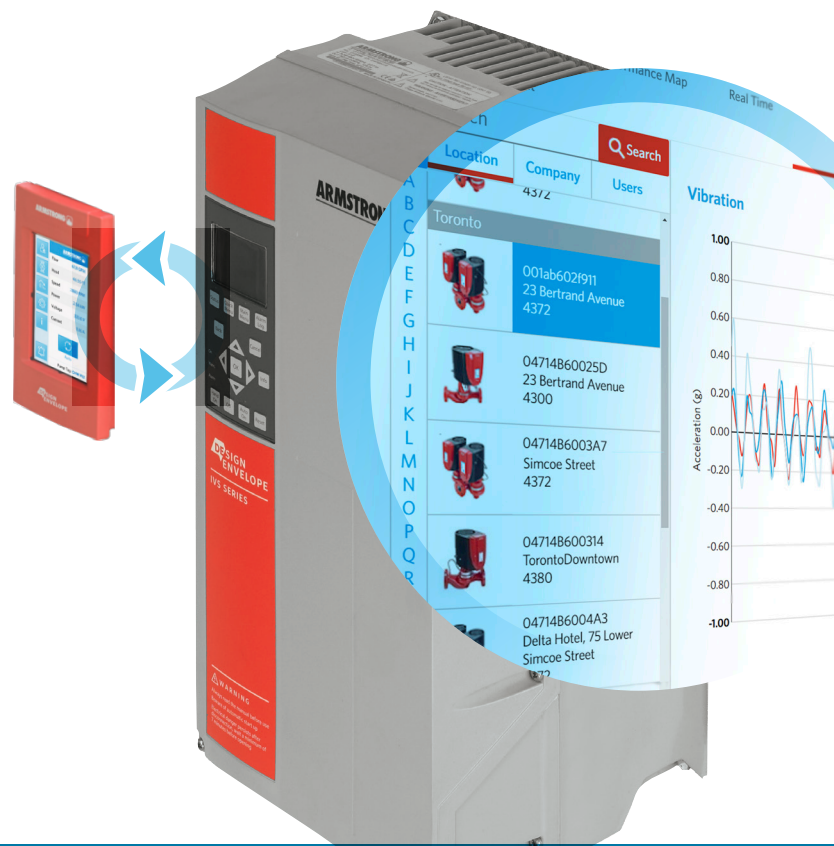


ARMSTRONG

# UPGRADE YOUR SYSTEM



Performance Upgrade Services Suite



ACTIVE PERFORMANCE MANAGEMENT™

OPTIMIZED EFFICIENCY  
AND PERFORMANCE

# ACTIVE PERFORMANCE MANAGEMENT™

LEARNS  
PREDICTS  
OPTIMIZES

With Active Performance Management at the plant level, you can save up to

**40%**

annual energy savings

Active Performance Management is a systems management approach that optimizes HVAC systems at any stage of a building's life-cycle by continually learning from a broad network of installations and responding to changing HVAC requirements. The combination of smart commissioning with real-time alerts and system transparency addresses performance drift and maintains occupant comfort.



**PERFORMANCE UPGRADE AND SERVICES FOCUSED  
ON MANAGING FOR PERFORMANCE**

# PERFORMANCE UPGRADE SUITE

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The Performance Upgrade Suite is one of five service suites that enable Active Performance Management. Solutions included in the Performance Upgrade Suite let you upgrade installed components to take advantage of industry-leading technology and unique Performance Management capabilities.

These upgrade solutions work at the equipment level to provide the best possible mechanical system efficiencies and maximize uptime. Performance Upgrade solutions also include technology for Active Performance Management, delivering actionable insights to help building operators make informed decisions for better results.



Performance Upgrade Suite is one of five service suites that enable Active Performance Management



## SEE THE PRESENT KNOW THE FUTURE

## FLOW INFORMS

The rate of fluid flow in an HVAC system is crucial to understanding how the different components are operating. Without information on system flow, it's difficult to diagnose and optimize performance. With accurate flow information, the picture changes entirely. Armstrong can optimize each component and the overall system.

## CASE STUDY | Delta Hotel

ANNUAL ENERGY SAVINGS



40%

The Delta Hotel commissioned an upgrade of one of their existing pumps to a new Tango. New control algorithms and performance management of the Tango pump proved that the upgrade was the right choice. The total annual energy cost savings amounted to over \$2,295 with a total kWh savings of 22,957 kWh: a 40% savings overall.

### ANNUAL ENERGY COST

BEFORE	AFTER
\$5,659	\$3,364
CAD	CAD
AVERAGE	AVERAGE

ANNUAL COST SAVINGS **\$2,295** CAD



### CO<sub>2</sub> EMISSIONS

BEFORE	AFTER
7,923	4,709
kg CO <sub>2</sub>	kg CO <sub>2</sub>
AVERAGE	AVERAGE

ANNUAL CO<sub>2</sub> EMISSION REDUCTION **3,214** kg CO<sub>2</sub>



FACILITY TYPE  
Hotel



LOCATION  
Toronto, Canada



SIZE  
300,000 ft<sup>2</sup>



WITH  
PERFORMANCE  
UPGRADE SUITE  
YOU'LL GET:

Factory tested and validated upgrade solutions designed to minimize disruption and tenant discomfort

Risk mitigation through upgrade with a clear fallback plan

Payback in as soon as three to six months

Ability to perform predictive maintenance on your assets

Deeper insights into pump and HVAC operations through Active Performance Management to meet your operations and sustainability targets

## THE SOLUTIONS

PERFORMANCE UPGRADE  
FOR DESIGN  
ENVELOPE PUMPS



**LEAP**

to an intelligent  
pump solution

VERTICAL IN-LINE  
RETROFIT TO  
DESIGN ENVELOPE



**UPGRADE**

legacy pump

DESIGN ENVELOPE  
BOOSTERS



**UPGRADE**

booster packages

OPTI-VISOR™



**OPTIMIZE**

chiller plant performance

TOWERMAX



**OPTIMIZE**

cooling tower



# CONTROLLER & CONNECTOR

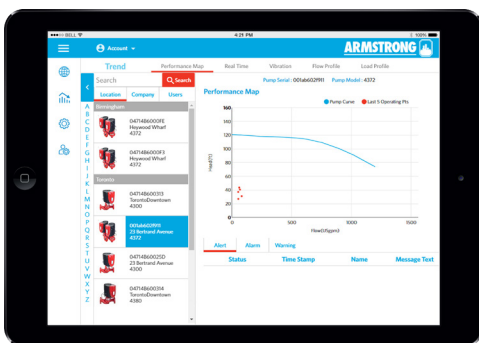
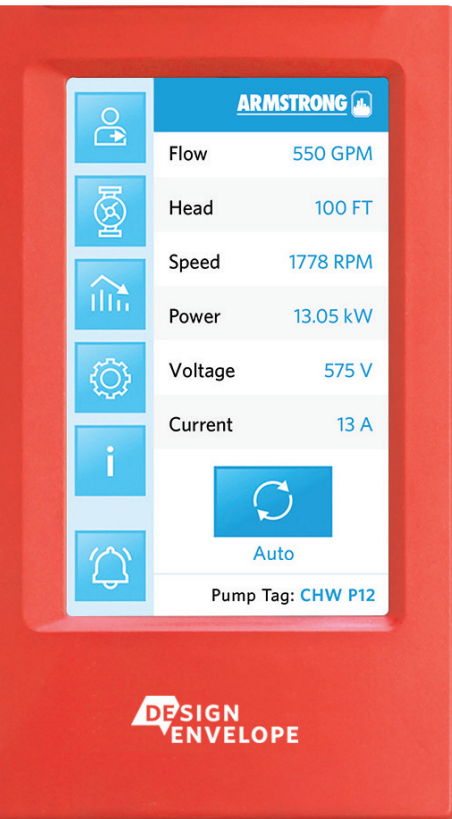
**Performance Upgrade for Design Envelope Pumps** retrofits an existing Design Envelope pump seamlessly without having to remove the pump.

Advanced control capabilities

Intuitive touchscreen user interface for updates

Pump Manager, a subscription-based service for alerts, warnings, reports and predictive maintenance

Upgrading existing Armstrong Design Envelope pumps



Powered by:

**IBM Watson®**

## Step up to Active Performance Management™

Pump Manager is a secure cloud-based subscription service that enables Active Performance Management™ connecting to existing BAS, CMMS and EMS systems. Pump Manager leverages deep analytics for greater predictive accuracy and even greater efficiencies.

Real-time operating insights and early diagnostic warnings

Full transparency in energy savings and carbon footprint reduction

Reduce pump maintenance cost by up to 50% with predictive maintenance

# DROP-IN UPGRADE

**The Vertical In-Line (VIL) Retrofit to Design Envelope upgrades an existing Armstrong constant-speed VIL pump to a new Design Envelope pump, but retains the existing casing.**

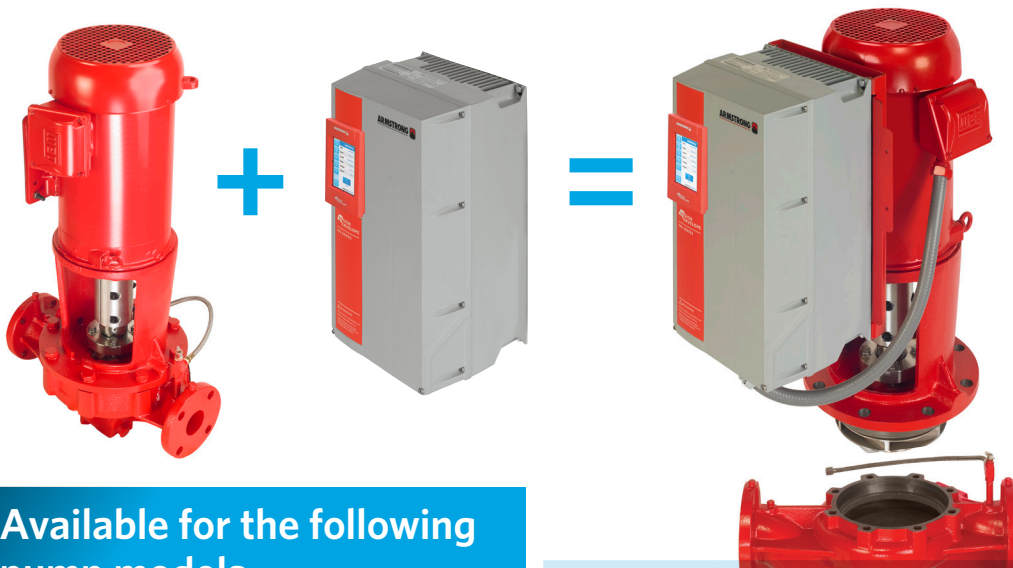
Integrated intelligent controls with connectivity,  
alerts and reporting

Saves up to 70% in energy over a constant speed pump

Preserves the existing insulation:  
no need to disconnect or disturb the piping

Qualifies for rebate programs in many jurisdictions

The Design Envelope Vertical In-Line Retrofit Solution lets you upgrade a constant speed pump to an intelligent, Sensorless, variable speed solution



Available for the following  
pump models

4300/4380 Vertical In-Line pumps | 132 pump models in 14 casing sizes

4312/4392 Vertical In-Line Twin pumps | 39 pump models in 7 casing sizes

4302/4382 Vertical In-Line dualArm pumps | 59 pump models in 9 casing sizes

All VIL Retrofit units are performance tested using a matching casing.



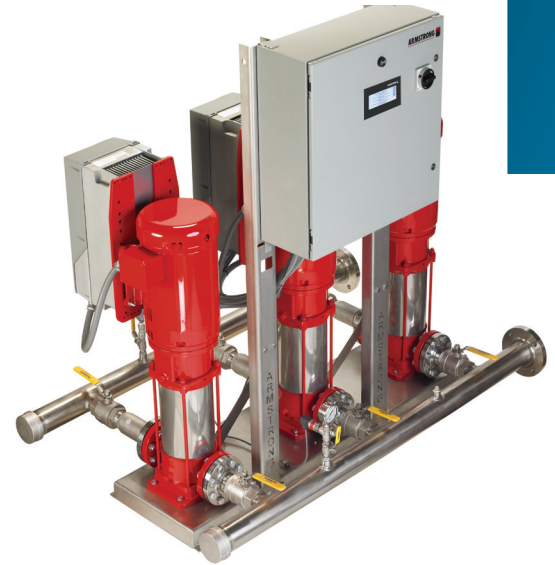
# JUST ENOUGH PRESSURE

**Design Envelope 6800 Boosters are fully assembled, programmed, booster systems**

Precise, demand-based approach to pressure boosting

Reduces energy use by up to 70%

Compact design and integrated controls minimize installed cost



# ALL TOGETHER NOW

**OPTI-VISOR™ is a supervisory control solution that interfaces with any BAS to optimize HVAC efficiency**

Harmonizes operation of existing HVAC components for up to 30% better efficiency

Full compatibility with existing Building Automation Systems: uses a serial communications link and logic sequences

No other replacements or upgrades are required



# SYNCHRONIZED COOLING

**TOWERMAX is an optimization service that uses advanced control sequences to reduce energy use and water consumption in HVAC systems**

Control sequences and automated staging for cooling towers, pumps, fans and chillers

Optimizes performance of a chiller plant for savings of up to 25%

Available as an upgrade for an Armstrong IPC 9521 plant controller





# DESIGN ENVELOPE



**HIGHEST**  
ENERGY EFFICIENCY



**LOWEST**  
INSTALLED  
COST



**LOWEST**  
OPERATING COST



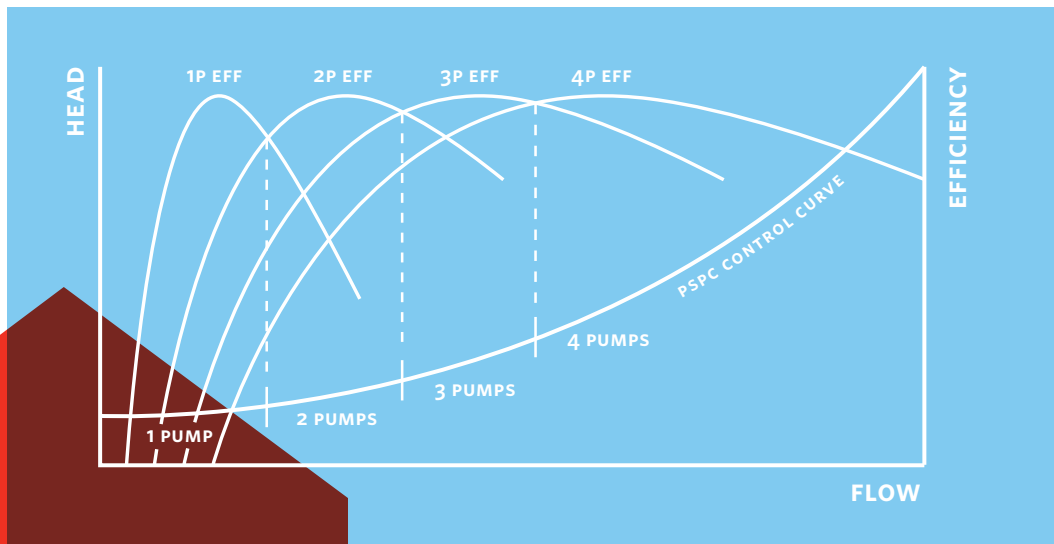
**LOWEST**  
ENVIRONMENTAL  
COST



**LOWEST**  
PROJECT  
& OPERATING RISK

Design Envelope technology is a demand based intelligent control solution that models equipment and system behavior, monitors actual system conditions and dynamically adjusts equipment operation to match system demand.

**Highest Energy Efficiency savings of up to 70% compared to constant speed solutions, plus built-in Parallel Sensorless Pump Control**



**NEXT  
LEVEL  
THINKING**

## Parallel Sensorless Pump Control

Parallel Sensorless Pump Control (PSPC) is a patented technology that improves the efficiency of a multi-pump installation through optimized load sharing

Stages pumps based on efficiency

Reduces the energy use of the entire pump array by up to 30%

Available for all Design Envelope pumps: standard on all Design Envelope Tango units

# Ask your Armstrong Representative about the entire family of five service suites that enable Active Performance Management:



**MANAGE YOUR SYSTEM**



**PERFORMANCE MANAGEMENT SUITE**

Pump Manager

ECO\*PULSE



**UPGRADE YOUR SYSTEM**



**PERFORMANCE UPGRADE SUITE**

Pump Retrofit

Upgrade legacy pumps

Upgrade Booster package

OPTI-VISOR

TOWERMAX



**GET IT RIGHT**



**STARTUP SUITE**

Expert planning and design services

Managed system startup

Smart Commissioning



**BOOST YOUR UPTIME**



**MAINTENANCE, OPERATIONS, REPAIRS SUITE**

Replacement parts

Emergency services

Service agreements



**UNDERSTAND THE POSSIBILITIES**

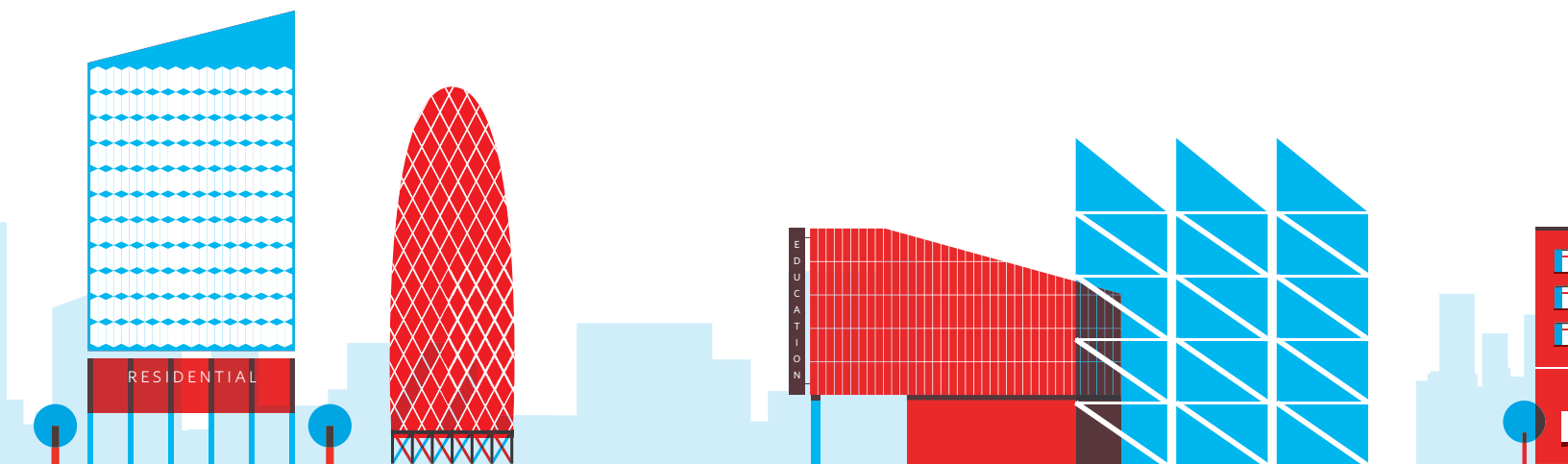


**CONSULTING SUITE**

Pump energy consulting

Booster energy consulting

Plant energy consulting



# OUR SUSTAINABILITY VISION



## PLANET PROPOSITION

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**T**hrough our Planet Proposition charter, Armstrong has committed to minimizing our impact on the environment. Around the world, Armstrong's Planet Proposition teams have taken on projects that are helping us meet our targets. Two examples of ongoing projects are:

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### 2 BY 22

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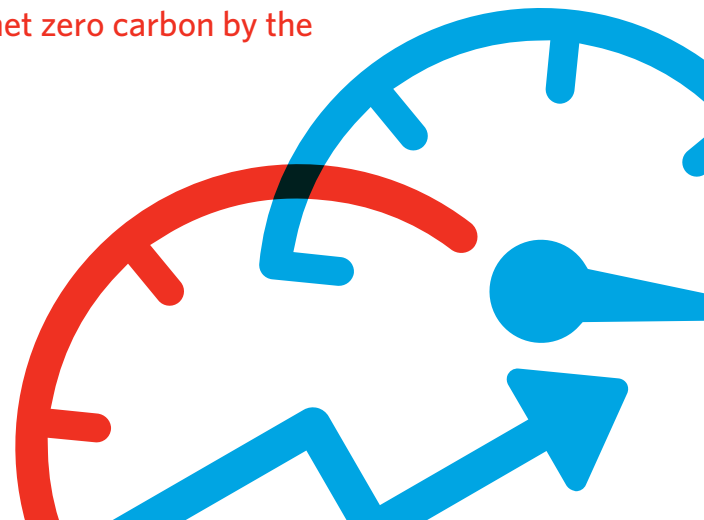
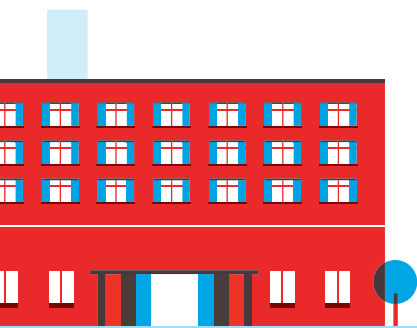
Armstrong is committed to helping existing customers reduce GHG emissions of installed equipment by two million tons by the year 2022. Under this initiative, Armstrong works with customers to upgrade existing installations and continues to develop new energy-savings solutions.

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### NET ZERO CARBON BUILDINGS COMMITMENT

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The Net Zero Commitment positions energy efficiency as a central component to achieving decarbonization globally. In signing the Net Zero Carbon Buildings Commitment, Armstrong has pledged to ensure our entire portfolio of buildings operates at net zero carbon by the year 2030.



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

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**ARMSTRONGFLUIDTECHNOLOGY.COM**

**MAKING  
ENERGY  
MAKE  
SENSE™**