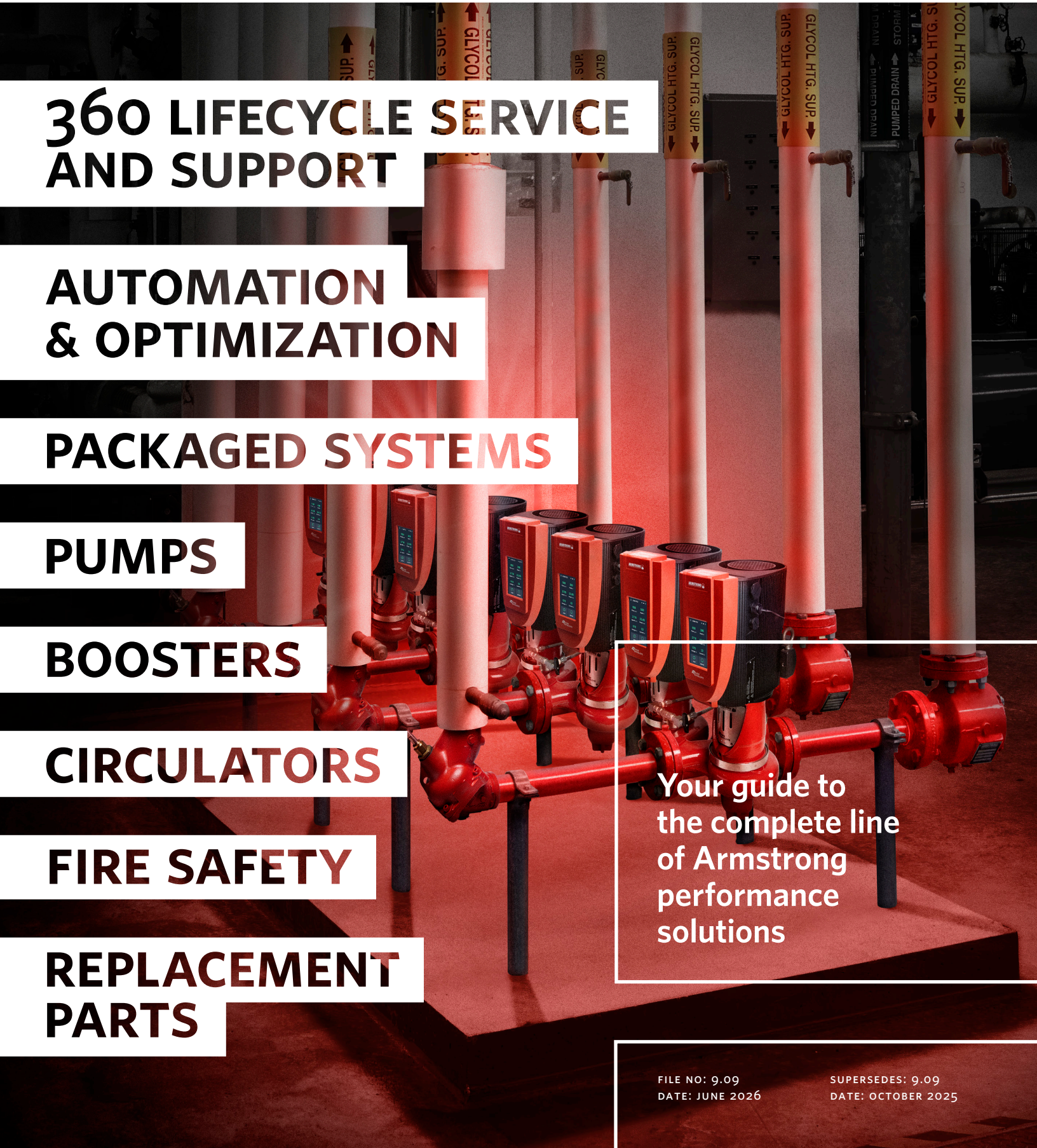
ARMSTRONG



360 LIFECYCLE SERVICE AND SUPPORT

AUTOMATION & OPTIMIZATION

PACKAGED SYSTEMS

PUMPS

BOOSTERS

CIRCULATORS

FIRE SAFETY

REPLACEMENT PARTS

Your guide to the complete line of Armstrong performance solutions

FILE NO: 9.09
DATE: JUNE 2026

SUPERSEDES: 9.09
DATE: OCTOBER 2025



BUILDING LIFECYCLE PERFORMANCE SOLUTIONS

FROM THE SMART BUILDING PERFORMANCE EXPERTS



A building doesn't move much, but it has to work. Every day. For decades. A building has to last. It has to withstand the elements and the ravages of time. It has to endure.

Armstrong provides solutions to help buildings perform and endure.

Just like a building that has to endure, our earth, our planet, also has to endure. Armstrong products and solutions help buildings and building owners minimize the environmental impact of their operations.

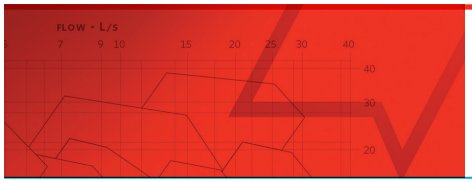
Armstrong Fluid Technology is known the world over as an innovator for designing, engineering and manufacturing intelligent fluid flow equipment, control solutions and digital technologies.

In the application of technology to mechanical systems for buildings, Armstrong is a change agent and a thought leader, taking mechanical systems to entirely new levels of operating efficiency.

Drawing on our experience and our history of service, Armstrong is able to serve a wide range of industries and contribute to mechanical systems in a diverse set of building types, supporting air conditioning, heating, commercial cooling, domestic water and fire safety systems.

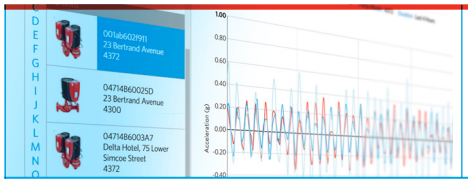
CONTENTS

5 DESIGN ENVELOPE TECHNOLOGY



Armstrong's innovative Design Envelope technology combines highest operating efficiency with lowest installed cost and lowest operating cost for your application.

7 ACTIVE PERFORMANCE MANAGEMENT



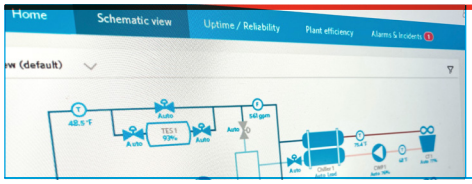
From a single pump to an entire plant, Armstrong can help your system learn, predict and optimize performance at every level to make your project a success.

9 360 SERVICE & SUPPORT



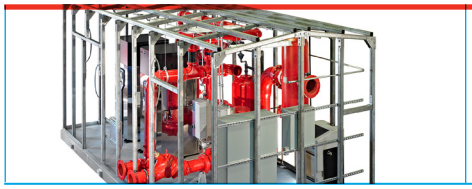
Armstrong provides complete solution support to help you get the best possible performance from your mechanical systems, at every phase in the lifecycle of your building.

11 AUTOMATION & OPTIMIZATION



We offer a range of expert services to assist you in evaluating current operational equipment and energy efficiencies, as well as delivering complete ultra-efficient chilled water plants.

9 PACKAGED SYSTEMS



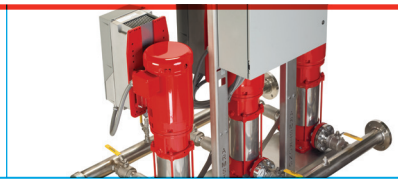
Pre-fabricated HVAC systems for chiller and boiler plants, pumping stations, energy transfer stations, cooling tower applications, fire pump systems, and water-based process applications.

13 PUMPS



Our expertise in demand-based control, fluid flow, variable speed, and heat transfer gives you the industry-leading outcomes you expect.

19 BOOSTERS



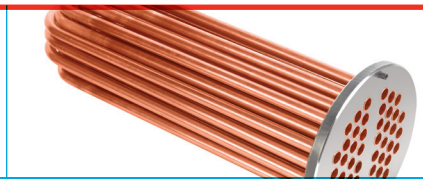
The most efficient and safest booster and water supply equipment, featuring cutting-edge capabilities such as soft fill, no-flow shutdown, and sensorless pressure optimization.

20 CIRCULATORS



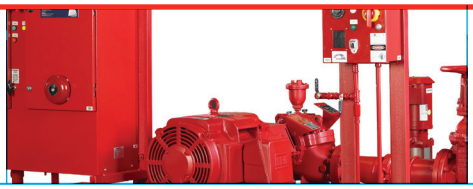
Wet or dry rotor circulators that lead in reliability, ease of repair, and out-of-thebox energy savings. Armstrong circulators are a perfect match for installed based and many competing models.

22 HEAT EXCHANGERS



High quality and durability combined with excellent heat transfer rates have placed Armstrong heat exchangers and tank heaters amongst the top in their categories.

23 FIRE SAFETY



Our proven and reliable fire safety pumps, controls, and packages meet the most demanding test standards and applications, available in diesel as well as electrical versions.

25 **See our exciting new developments in replacement part kits and accessories**

DESIGN ENVELOPE



Design Envelope technology replaces mechanical components with electronics and software intelligence in order to:

Boost energy efficiency

Downsize equipment

Optimize part-load performance

As a design or building professional, this helps you achieve the lowest installed cost, lowest operating cost, and lowest environmental impact with your mechanical designs and installations. Design Envelope technology puts your projects at the sustainability forefront, in energy savings, cost savings, and carbon savings.

ENERGY SAVINGS

Savings for our clients' Design Envelope installations worldwide since 2007.

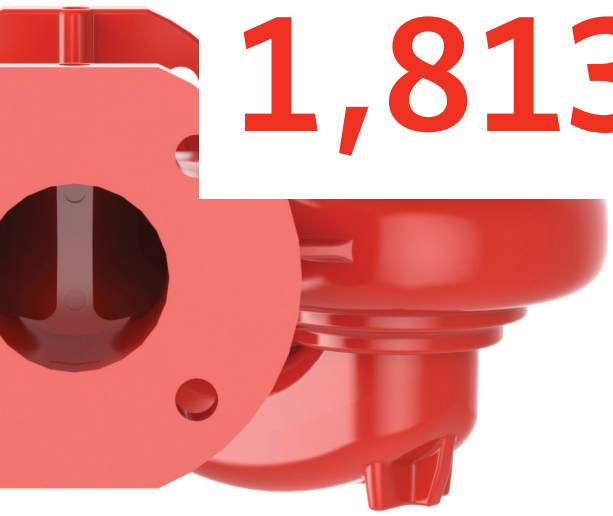
1,050,989

Tonnes of CO_2 equivalent*

1,813,782,505

kWh electricity*

*as of April, 2021



Scan to discover more benefits of Design Envelope technology for your new or retrofit project.



FLAGSHIP EFFICIENCY

A COMMERCIAL FACILITY CASE STUDY

LOWEST
ENERGY USE

LOWEST
INSTALLED COST

LOWEST
OPERATING COST

LOWEST
CARBON EMISSIONS

LOWEST
PROJECT & OPERATING RISK

The RBC Centre has achieved a

50% ENERGY SAVINGS

relative to similar towers built to standard code.

RBC Tower

A flexible HVAC system includes responsive HVAC controls that provide individual cooling at high efficiencies. The application draws on Toronto's Enwave deep lake water cooling system to dramatically reduce energy and operating cost.

Scan to learn more about this case study.

OPTIMIZED EFFICIENCY AND PERFORMANCE

ACTIVE PERFORMANCE MANAGEMENT™

LEARNS

PREDICTS

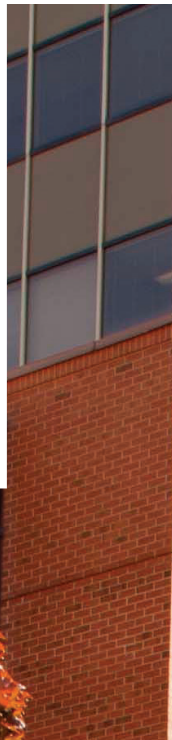
OPTIMIZES

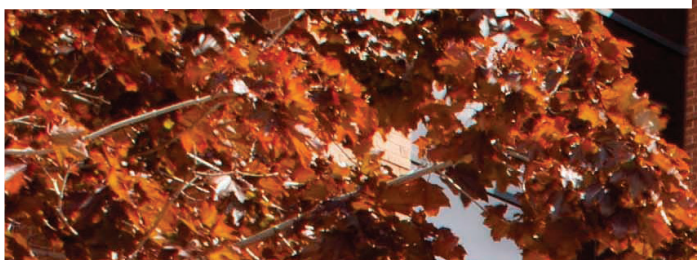
With Active Performance Management at the plant level, you can save up to

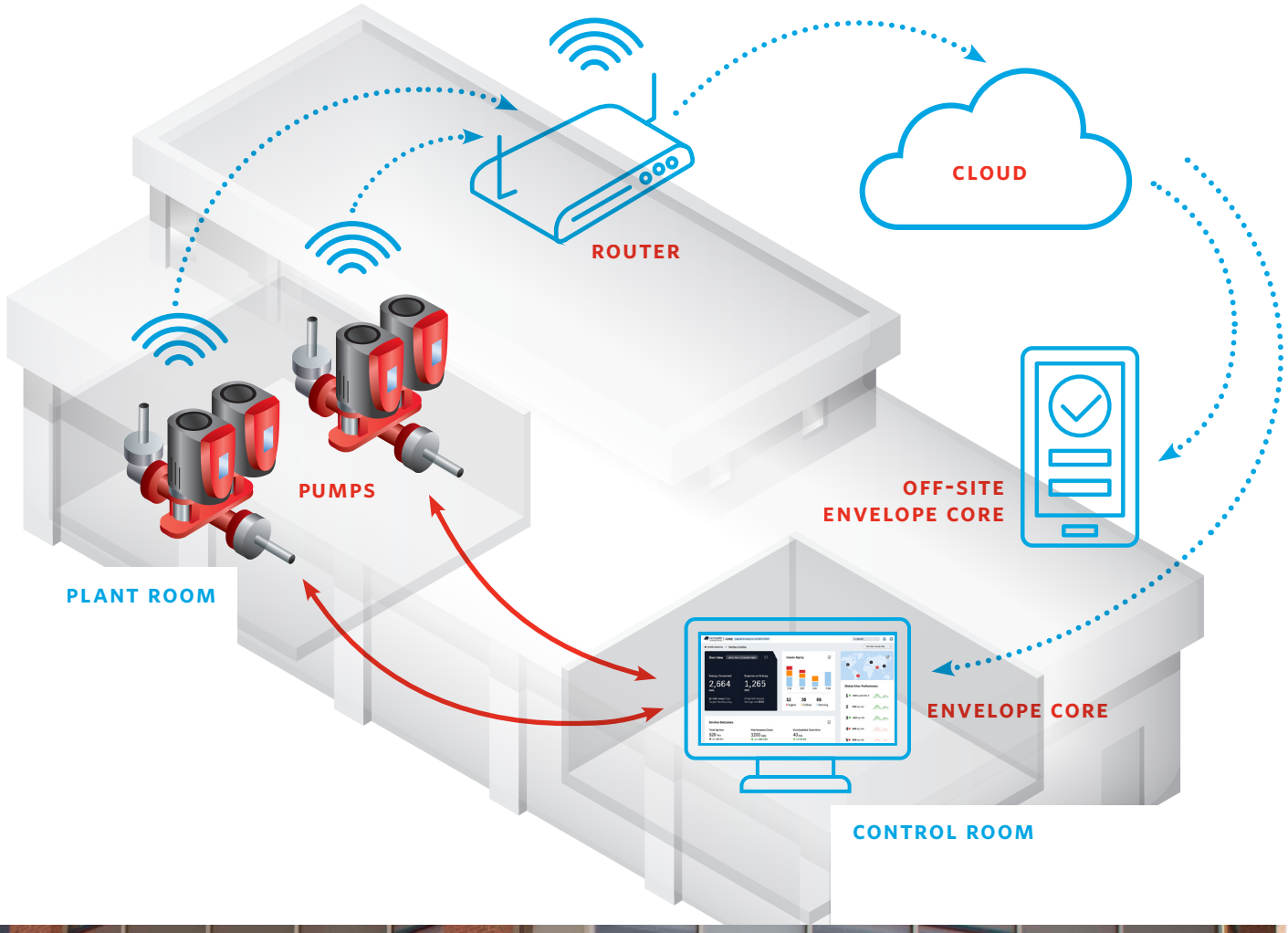
40%

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 continuously 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.







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.

We're there for the lifecycle of plant and equipment operations

Armstrong provides proven audit services that give you the most flexibility for equipment selection and right-sizing.

DESIGN & CONSULTING

Training, services and warranties for the lifecycle of your project, and kits that bring together the parts you need in one place.

MAINTENANCE, REPAIRS & PARTS KITS

Ease of replacement and modularity allow you to build a better solution that can be scaled.

UPGRADES & PERFORMANCE ENHANCEMENT

360

Rapid response attention

MATCHED TO YOUR NEEDS.

24/7 GLOBAL RAPID RESPONSE



CUSTOMER LIFECYCLE SUPPORT

BUILD

Speed-to-market and quality are assured with modular, packaged systems.

START-UP & COMMISSION

Armstrong offers a reduced timeframe, and energy savings from day one.

OPERATE & OPTIMIZE

Our service plans ensure maximum equipment uptime through real-time performance management, informed system optimization and expert support for your building assets.





Envelope Core

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

AUTOMATION & OPTIMIZATION

Ultimate system performance requires seamless integration of mechanical equipment, sensing and controls — with solid technical and logistics support. Armstrong HVAC control systems enable you to meet operating budgets, project schedules and environmental goals with a single point of supplier accountability.

APPLICATION	EQUIPMENT	SOLUTION

NOTE COLOUR CODING FOR APPLICATION-EQUIPMENT PAIRINGS

CHILLED WATER PLANT

Large and small scale facilities can both benefit from fully automated and optimized HVAC systems

ENERGY TRANSFER STATION

For cooling and heating applications in commercial spaces or for industrial applications

DATA CENTRE

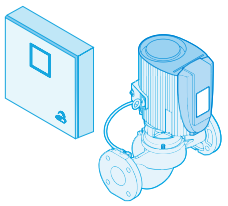
For a data center market that evolves and as the pace of construction continues

DISTRICT ENERGY

For buildings in municipalities and campuses that are dependent on district energy networks to meet their heating and cooling needs.

BOILER

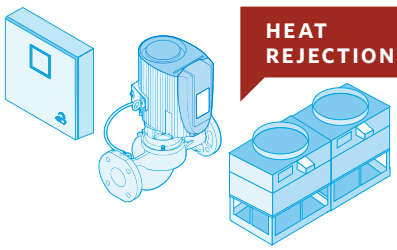
For industry professionals that are always searching for ways to improve their results.



PUMPING SYSTEMS

DESIGN ENVELOPE 4000 INTEGRATED PUMPING SYSTEM

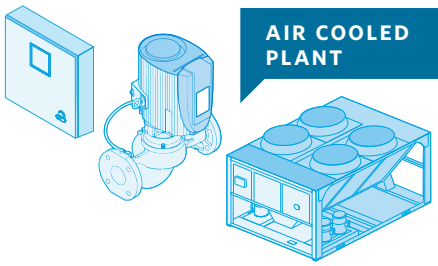
- Advanced multi-zone control that directly integrates with pumping units to optimize energy performance, system handling, and installation
- Controls up to 8 pumps and 16 zones
- No limitations in system size and capacity



HEAT REJECTION

DESIGN ENVELOPE ITC 9521 INTEGRATED TOWER CONTROL SYSTEM

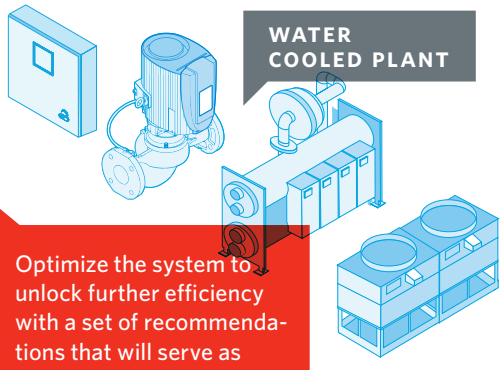
- Reduces energy rates
- Simplified tower automation and easy integration for improved system reliability
- Real-time flow metering accuracy and diagnostics to better understand your tower performance



AIR COOLED PLANT

DESIGN ENVELOPE 9511 INTEGRATED PLANT CONTROL SYSTEM

- Boosts energy efficiencies of new and existing chiller plant installations to class-leading levels
- Controls up to five chillers and five pumps
- Integrates with all brands of chillers, pumps, and automation systems



WATER COOLED PLANT

Optimize the system to unlock further efficiency with a set of recommendations that will serve as a roadmap for your upgrading system assets.

DESIGN ENVELOPE 9521 INTEGRATED PLANT CONTROL SYSTEM

- Boosts energy efficiencies of new and existing chiller plant installations to class-leading levels
- Integrates with all brands of chillers, pumps, and BAS

IPC 9521 + OPTIMIZATION

- Interfaces seamlessly with any existing building automation to maximize overall plant efficiency – without replacing or reconfiguring existing componentry
- A subscription-based patented self-learning optimization technology that enables efficiencies by creating the digital
- An optimization service that boosts energy and water savings, available as an upgrade for any previous installation of an Armstrong plant controller

DESIGN ENVELOPE EVERCOOL™

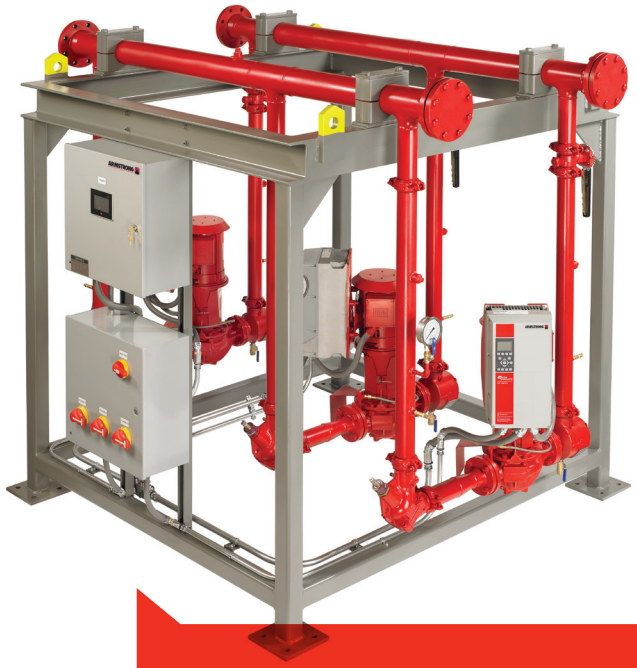
- Air-cooled or water-cooled chilled water system automation for data centers

Armstrong packaged systems deliver a variety of benefits to your project including:

- Reduced risk to project schedule
- Reduced risk of scope omissions and cost impacts
- Conformance to construction schedule
- Single point of supplier accountability
- Expert design for optimal performance

CONFIGURATIONS

- Modular plant rooms, chillers, boilers, boosters
- Central utility plants
- Intelligent fluid management systems
- Fire pump houses



Sectors we specialize in:

INDUSTRIAL · DATA CENTRE · PHARMECEUTICAL & HEALTHCARE · RETAIL · GOVERNMENT

RESIDENTIAL · ENERGY SERVICES · SPORTING EVENTS · HOSPITALITY · EDUCATION

COMMERCIAL · TRANSPORTATION · AGRICULTURE · DISTRICT ENERGY

FEATURE: DESIGN ENVELOPE INTELLIGENT FLUID MANAGEMENT SYSTEM

- Integrates pump and control technology into a single pumping solution yielding:
  - + compact footprint
  - + energy efficiency
  - + rapid installation
- Catalogue-based pre-engineered solutions or custom-designed to specification

With the maximum share of work completed in-factory, all that is needed for the completion of the project is to have the packaged plant connected on-site, Armstrong's packaged plants feature insulated structural design, matching or exceeding building code requirements.







Armstrong pumps have been synonymous with superior design, reliability, maintainability, and operating efficiency. Design Envelope pumps deliver the lowest installed **and** lowest operating costs — resulting in the shortest payback periods compared to any other pumping equipment available in the market today.

MODELS AVAILABLE FOR PLUMBING AND POTABLE WATER APPLICATIONS

VERTICAL IN-LINE | SPLIT-COUPLED

DESIGN ENVELOPE



- Pipe-mounted two-pump unit with integrated intelligent controls for space-saving installation
- Up to 900 USgpm flow; up to 160 ft head
- Temperature: 300°F
- Power: 1 hp to 10 hp
- Size: 1½" to 3"

DESIGN ENVELOPE 4322 TANGO PUMPS

DESIGN ENVELOPE



- Pipe-mounted two-pump unit with integrated intelligent controls and duty/standby or parallel-pumping operation
- Up to 1250 USgpm flow; up to 250 ft head
- Temperature: 250°F
- Power: 1 hp to 75 hp
- Size: 3" to 8"

DESIGN ENVELOPE 4302 DUALARM PUMPS

DESIGN ENVELOPE



- Pipe-mounted UL 778 pumping unit with integrated intelligent controls for space-saving installation and superior energy performance
- 25 to 25,000 USgpm flow; 10 to 300 ft head
- Temperature: 300°F
- Power: 1 hp to 1250 hp
- Size: 1½" to 20"

DESIGN ENVELOPE 4300 PUMPS

VERTICAL IN-LINE | CLOSE-COUPLED

DESIGN ENVELOPE



- Pipe-mounted two-pump unit with integrated intelligent controls and duty/standby operation
- Up to 900 USgpm flow; up to 160 ft head
- Temperature: 250°F
- Power: 1 hp to 10 hp
- Size: 1½" to 3"

DESIGN ENVELOPE 4372 TANGO PUMPS

DESIGN ENVELOPE



- Pipe-mounted two-pump unit with integrated intelligent controls and duty/standby or parallel-pumping operation
- Up to 1000 USgpm flow; up to 140 ft head
- Temperature: 250°F
- Power: 1 hp to 7½ hp
- Size: 3" to 8"

DESIGN ENVELOPE 4382 DUALARM PUMPS

DESIGN ENVELOPE



- Pipe-mounted pump unit with integrated intelligent controls for space-saving installation and superior energy performance
- Up to 1000 USgpm flow; up to 140 ft head
- Temperature: 250°F
- Power: 1 hp to 10 hp
- Size: 1½" to 6"

DESIGN ENVELOPE 4380 PUMPS

NEW DEPM PUMPS FOR OUTDOOR OPERATIONS AND HIGHER HORSEPOWER

Controls enclosure rated for UL Type 4X

Equipped with overhead weather shield to prevent pump from icing and overheating



A new 15 hp to 50 hp range of Design Envelope Permanent Magnet pumps deliver 20% lower operating costs than pumps with standard induction motors



HORIZONTAL

- Base mounted end-suction horizontal pumping unit with integrated intelligent controls for easier installation
- 25 to 4500 USgpm flow; 10 to 400 ft head
- Power: 1 hp to 125 hp
- Temperature: 300°F
- Size: 1.5" to 8"

DESIGN ENVELOPE 4200H

DESIGN ENVELOPE



HORIZONTAL

- Motor-mounted pump unit with integrated intelligent controls for space-saving installation
- Up to 1000 USgpm flow; up to 125 ft head
- Power: 1 hp to 7.5 hp
- Temperature: 250°F
- Size: 1.5" to 6"

DESIGN ENVELOPE 4280

DESIGN ENVELOPE



CASE STUDY | National Grid



FACILITY TYPE
Commercial office

LOCATION
Solihull, Birmingham

SIZE
Three-storey building

ANNUAL ENERGY SAVINGS

BUREAU VERITAS VERIFIED

32%

ANNUAL ENERGY COST

BEFORE	AFTER
£16,076 GBP AVERAGE	£10,866 GBP AVERAGE

ANNUAL COST SAVINGS

£5,210 GBP

Armstrong completed a project in the United Kingdom, retrofitting a building belonging to National Grid.

The retrofit included new pump sets that reduced energy consumption by 32%, saving over 5,000 GBP annually.

SOLUTION EMPLOYED

DESIGN ENVELOPE TANGO PUMPS



VERTICAL IN-LINE | SPLIT-COUPLED

- The Armstrong 4300 pipe-mounted pumps are designed for space-saving installation, high operating efficiency, and long service life
- Up to 28000 USgpm flow; up to 500 ft head
- Temperature: 300°F
- Power: 1 hp to 1250 hp
- Size: 1½" to 20"

4300 VERTICAL IN-LINE PUMPS



VERTICAL IN-LINE | CLOSE-COUPLED

- Integrated intelligent controls for space-saving installation and superior energy performance
- Up to 450 USgpm flow; up to 160 ft head
- Temperature: 250°F
- Power: 0.25 hp to 10 hp
- Size: 1" to 6"

4280 SINGLE-PHASE DEPM PUMPS



CASE STUDY | Bernardin Manor



FACILITY TYPE
Hotel

LOCATION
Toronto, Canada

SIZE
47 floors
567 rooms

ANNUAL ENERGY SAVINGS
74%

ANNUAL ENERGY COST

BEFORE	AFTER
$5,872 CAD AVERAGE	$1,547 CAD AVERAGE

ANNUAL COST SAVINGS
$4,325 CAD

Bernardin Manor is an assisted living facility in Chicago. Armstrong proposed to upgrade existing constant speed pumps with new Design Envelope Tango pumps.

The three new, properly sized pumps are operating much more efficiently than the original pumps. Energy savings from the pump retrofit will be over $4,000 per year.

SOLUTION EMPLOYED
DESIGN ENVELOPE
TANGO PUMPS



VERTICAL IN-LINE | SPLIT-COUPLED

- Pipe-mounted 2-pump units designed for space-saving installation and duty/standby operation
- Up to 1250 USgpm flow; up to 400 ft head
- Power: 1 hp to 100 hp
- Temperature: 121°F
- Size: 2" to 6"

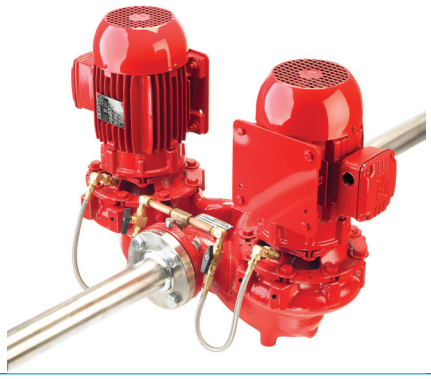
4312 VERTICAL IN-LINE TWIN PUMPS



VERTICAL IN-LINE | CLOSE-COUPLED

- Pipe-mounted 2-pump units designed for space-saving installation and duty/standby operation
- Up to 1250 USgpm flow; up to 350 ft head
- Power: 0.33 hp to 60 hp
- Temperature: 250°F
- Size: 2" to 5"

4392 VERTICAL IN-LINE TWIN PUMPS





FACILITY TYPE
Recreation centre

LOCATION
Fort Worth, Texas

SIZE
179,831 ft²

CASE STUDY | Texas Christian University

ANNUAL ENERGY SAVINGS
63%

ANNUAL ENERGY COST

BEFORE	AFTER
$9,731 USD	$3,905 USD
AVERAGE	AVERAGE

ANNUAL COST SAVINGS
$7,581 USD

With enrollment of over 10,000 students per year, athletics is a key focus for TCU university, with the Horned Frogs competing in the Big 12 conference of the NCAAs.

Armstrong approached TCU with a proposal to upgrade three constant-speed pumps in the Recreation Center. As a result of the retrofit project, TCU is saving over $7,500 per year.

SOLUTION EMPLOYED
DESIGN ENVELOPE
END-SUCTION PUMPS



VERTICAL IN-LINE | CLOSE-COUPLED

- The Armstrong 4360 pipe-mounted pumps are designed for space-saving installation and long service life
- Up to 350 USgpm flow; up to 200 ft head
- Temperature: 225°F
- Power: 0.33 hp to 15 hp
- Size: 1¼" to 3"

4360 VERTICAL IN-LINE PUMPS



- The Armstrong 4380 pipe-mounted pumps are designed for space-saving installation and long service life
- Up to 2500 USgpm flow; up to 300 ft head
- Temperature: 250°F
- Power: 0.33 hp to 60 hp
- Size: 1½" to 8"

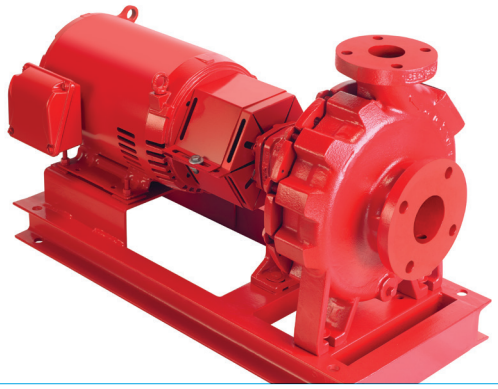
4380 VERTICAL IN-LINE PUMPS



HORIZONTAL

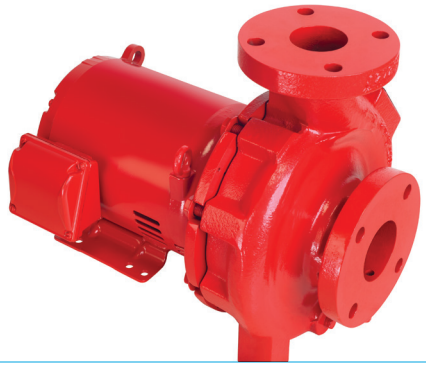
- Reduces cost across installation, operation, and lifetime maintenance. High-efficiency NEMA-premium motors ensure low energy consumption and cost
- Up to 5000 USgpm flow; up to 600 ft head
- Temperature: 250°F
- Power: 0.33 hp to 300 hp

4030 END SUCTION BASE MOUNTED PUMPS



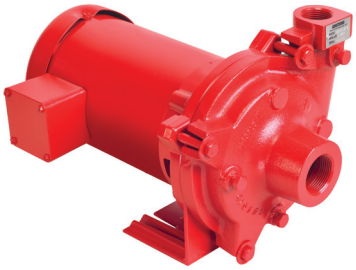
- End-suction pumps equipped with close-coupled motors to minimize footprint requirements
- Up to 2000 USgpm flow; up to 400 ft head
- Temperature: 250°F
- Power: 0.33 hp to 60 hp
- Size: 1" to 6"

4280 MOTOR MOUNTED PUMPS



- Close coupled horizontal pumps, motor mounted and designed for long service life and easy maintenance
- Up to 3600 USgpm flow; up to 130 ft head
- Temperature: 275°F
- Power: 0.33 hp to 60 hp
- Size: 1¼", 1½", 2"

4270 & 4270 STOCK MOTOR MOUNTED PUMPS



VERTICAL MULTISTAGE

- Designed for reliability and low maintenance cost
- Up to 400 USgpm flow; up to 900 ft head
- Temperature: 250°F
- Power: ½ hp to 50 hp
- Size: 1¼" to 4"

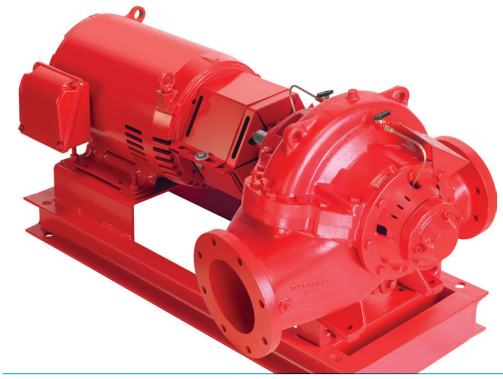
4700 VERTICAL MULTISTAGE PUMPS



HORIZONTAL

- Engineered to reduce cost across installation, operation, and lifetime maintenance. High-efficiency NEMA-premium motors ensure low energy consumption and cost
- Up to 7000 USgpm flow; up to 600 ft head
- Temperature: 225°F
- Power: 1½ hp to 500 hp

4600 HORIZONTAL SPLIT-CASE PUMPS





FACILITY TYPE
Retail

LOCATION
Ghaziabad, India

SIZE
Large 4-storey commercial mall



CASE STUDY | Pacific Mall

Operations Managers asked Armstrong for help with replacing and upgrading three pumps that were over 10 years old and had begun to fail regularly.

Armstrong installed three Design Envelope Vertical In-Line pumps and used a datalogger to capture the energy usage. The replacement pumps doubled the energy savings estimate initially provided.

ANNUAL ENERGY SAVINGS
41%

ANNUAL ENERGY COST

BEFORE	AFTER
$233,613 USD	$136,638 USD
AVERAGE	AVERAGE

ANNUAL COST SAVINGS
$96,975 USD

SOLUTION EMPLOYED
DESIGN ENVELOPE
VERTICAL IN-LINE PUMP



Design Envelope Boosters combine advanced controls with NEMA Premium efficiency induction motors (IE3) and new DEPM (IE5) motors that surpass NEMA Super-premium efficiency. These designs optimize system-wide pressure boosting efficiency and reduce energy costs. Intelligent pump staging, automatic set-point adjustment and integrated variable frequency drives provide even greater savings. All Armstrong boosters are available in lead-free versions that meet the most stringent industry standards for potable water.

- Excellent all-purpose solution for applications requiring higher flowrates and boost pressures. Multiple pump configurations ensure design flexibility and ease of install and commissioning
- Up to 1962 USgpm flow; up to 320 psi
- Power: Up to 250 hp

DESIGN ENVELOPE 6800 VERTICAL MULTISTAGE BOOSTERS

DESIGN ENVELOPE



- The perfect solution for small and medium-sized applications. Compact design has the smallest footprint in the industry
- Up to 500 USgpm flow; up to 100 psi
- Power: Up to 40 hp

DESIGN ENVELOPE 6900 VERTICAL BOOSTERS

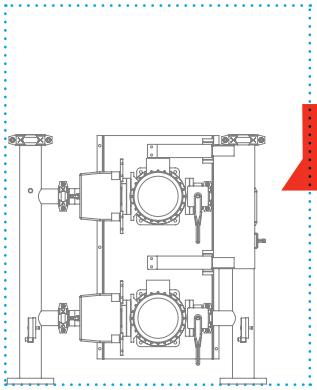
DESIGN ENVELOPE



- The leading solution in the industry. DEPM motors with Design Envelope technology maximize efficiency, reduce noise and ensure reliability
- Up to 580 USgpm flow; up to 250 psi
- Power: up to 50 hp

DESIGN ENVELOPE DEPM 6800G VERTICAL MULTISTAGE BOOSTERS





Design Envelope 6800*
68"× 40"
* Including Permanent Magnet

Competing models
77"× 48"

DEPM motors provide a clear efficiency advantage across the operating range and the difference in efficiency levels is even greater at lower speeds.

- Reduced maintenance requirements
- Longer uninterrupted operating times
- Smaller size and reduced weight
- Ultra-quiet operation
- Larger range of operating speeds
- Maximum design and installation flexibility

The Armstrong Design Envelope Compass circulator embeds the latest motor and control technologies, providing you with the ultimate in flexibility, operating comfort, and energy efficiency. Our broad offering of wet-rotor and dry-rotor designs help you respond to any hydronic situation with ease and confidence.

MODELS AVAILABLE FOR PLUMBING AND POTABLE WATER APPLICATIONS

WET ROTOR DESIGN

DESIGN ENVELOPE



- Designed to replace existing fixed speed circulators, with popular flange-to-flange dimensions. A universal replacement for all circulators in its capacity range
- Cast iron and stainless steel volutes
- Up to 20 USgpm flow; up to 20 ft head
- Power: 5W to 45W

DESIGN ENVELOPE COMPASS H CIRCULATOR



- Circulates water or ethylene-glycol solutions in closed hydronic or solar heating systems. Available in two volute materials for residential, small industrial, and commercial applications
- Up to 64 USgpm flow; up to 42 ft head
- Power: 33W to 218W

ASTRO 2 CIRCULATORS

DRY ROTOR DESIGN

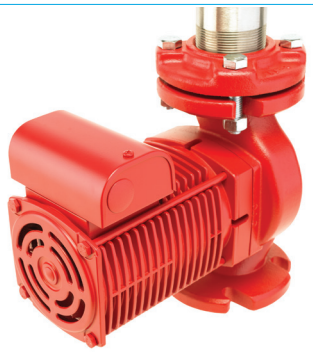
DESIGN ENVELOPE



- Designed to replace existing fixed speed circulators, with popular flange-to-flange dimensions. A universal replacement for all circulators in its capacity range
- Cast iron and stainless steel volutes
- Up to 140 USgpm flow; up to 40 ft head
- Power: ¼–½ hp

DESIGN ENVELOPE COMPASS R CIRCULATOR

DRY ROTOR DESIGN



- Draws on advanced motor technology and efficient hydraulic design to achieve excellent wire-to-water duty point efficiencies
- Up to 140 USgpm flow; up to 60 ft head
- Temperature: 110°F
- Power: ⅙ hp to ⅔ hp
- Size: ¾" to 3"

E.2 CIRCULATORS



- For commercial systems that require higher flow and pressure. Offers the flexibility of customizing the flow curve to specific application requirements
- Up to 250 USgpm flow; up to 55 ft head
- Temperature: 107°F
- Power: ¼ hp to 3 hp
- Size: ¾" to 3"

1050/1060, 3-PIECE CIRCULATORS



- For commercial systems that require higher flow and pressure. Offers the flexibility of customizing the flow curve to specific application requirements
- Up to 250 USgpm flow; up to 55 ft head
- Temperature: 107°F
- Power: ¼ hp to 3 hp
- Size: ¾" to 2"

S&H 3-PIECE CIRCULATORS

DRY ROTOR DESIGN

- A complete repair solution for the S&H circulator line. Armstrong PLVs can also be used to rebuild or upgrade select ITT/B&G circulator models
- Up to 120 USgpm flow; up to 60 ft head
- Temperature: 29°F
- Power: 1/12 hp to 2 hp



S&H CIRCULATOR LESS VOLUTE

WET ROTOR DESIGN

- A combination of circulator and low-flow (LF) valve that provides instant hot water in a residential plumbing system
- Up to 9½ USgpm flow; up to 6 ft head
- Temperature: 40°F
- Power: 33W
- Size: 1½" union



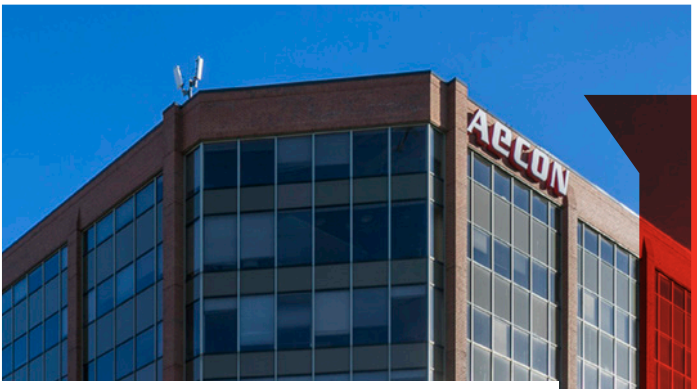
ASTRO EXPRESS 2 HOT WATER RECIRCULATION SYSTEM

CASE STUDY

Crown Reality Partner Pearson Corporate

This 300,000 square foot complex in Toronto consists of two eight-storey office towers joined together by a central atrium. In 2018 the building owners asked Armstrong to upgrade the original pumps to new Design Envelope pumps.

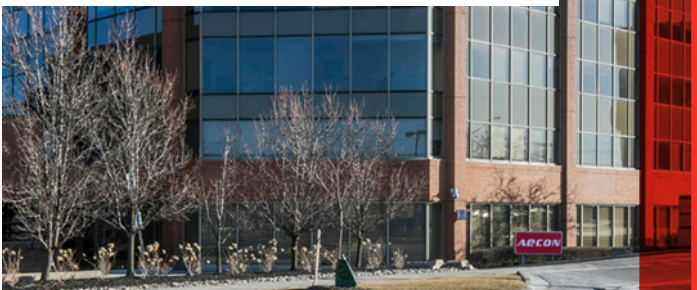
Armstrong's new Design Envelope variable-speed pumps produce energy savings of over 80%.



FACILITY TYPE
Large office complex

LOCATION
Toronto, Canada

SIZE
300,000 ft²



ANNUAL ENERGY SAVINGS
87%

ANNUAL ENERGY COST

BEFORE	AFTER
$140,072 CAD	$18,380 CAD
AVERAGE	AVERAGE

ANNUAL COST SAVINGS
$121,692 CAD

SOLUTION EMPLOYED

DESIGN ENVELOPE

INTELLIGENT PUMPS WITH CLOUD ANALYTICS PLATFORM



High quality and durability combined with excellent heat transfer rates have placed Armstrong heat exchangers and tank heaters amongst the top in their categories. In concert with other Armstrong equipment, Armstrong heat exchangers are a critical component for getting the maximum performance from your HVAC and fluid flow system.

- Suitable for use in any installation involving hot water boilers. The wide range of in stock models assures fast project turnaround
- In-stock selection covers applications from 0.5 USgpm to 160 USgpm. Larger models available for up to 600 USgpm



ABX BRAZED PLATE HEAT EXCHANGERS

- Provides dependable, efficient heat transfer in various applications ranging from HVAC to industrial installations. Armstrong Shell & Tube heat exchangers are suitable for higher-pressure applications in oil refineries and other large chemical processes



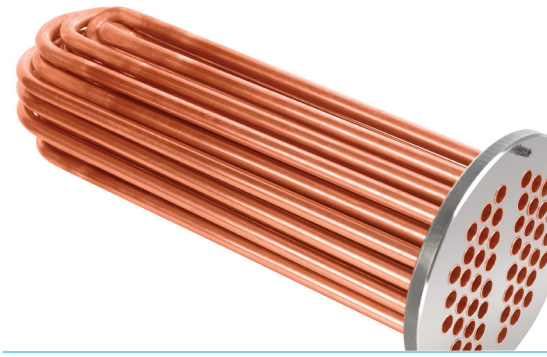
SHELL & TUBE HEAT EXCHANGERS

- Optimized for best water-to-water heat transfer providing enhanced performance especially in HVAC applications
- Performance range: 150 psi standard pressure rating. Pressure rating upto 435 psi available



PLATE AND FRAME HEAT EXCHANGERS

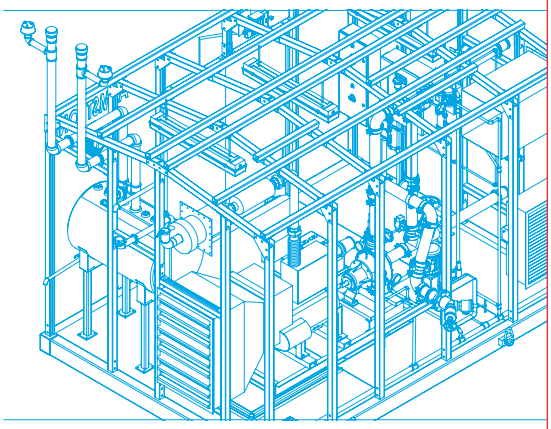
- Internal tube bundles designed for use with agitated or non-agitated tanks
- 150 psi standard pressure rating
- Temperature: 35°F to 375°F
- Size: 4" to 20"



TANK HEATERS

When it comes to fire protection you can count on our track record of delivering reliable, durable and easy to test equipment and systems that are up to this critical task. Armstrong fire pumps and packages are constructed, tested and certified to the strictest global standards including NFPA, UL, ULC, and FM.

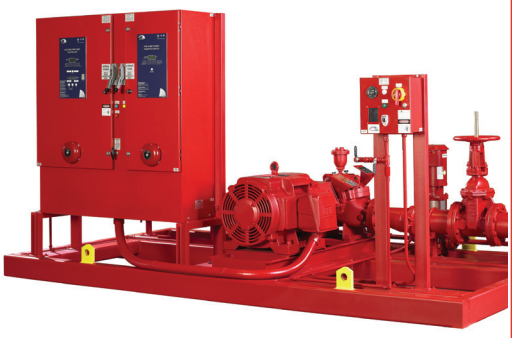
FIRE PACKAGES



- Available as single electric, single diesel, one electric plus one diesel, two electric, or two diesel configurations. Optional features include tamper switches, test header lines, city by-pass and flow meter loops with all required piping and valves

ENCLOSED FIRE PUMP PACKAGES

- Features the full range of Armstrong HSC fire pumps, electric or diesel-driven, and controller. All mounted, piped, and wired on a base at the factory
- Up to 3000 USgpm



FIREPAK HORIZONTAL SPLIT CASE

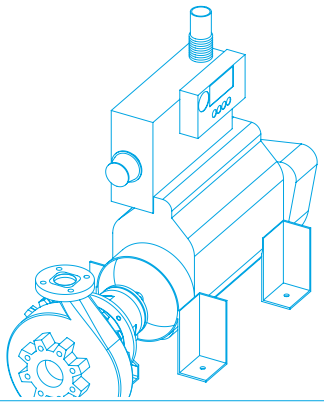
- Features the full range of VIL fire pumps with electric motor and controller. All mounted, piped, and wired on a base at the factory. The complete package is designed to fit through a standard door
- Up to 1500 USgpm



FIREPAK VERTICAL IN-LINE

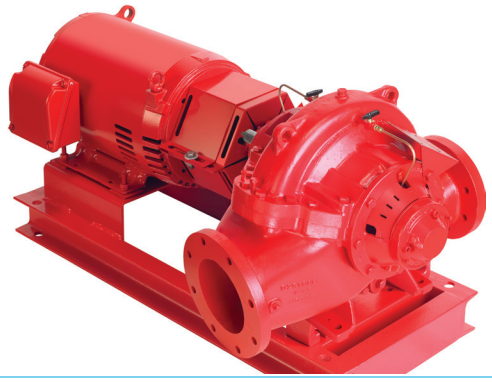
FIRE PUMPS

- Deploys a heavy-duty bearing frame to provide long and reliable service in an over-hung impeller design. Eliminates the design layout constraints imposed by horizontal split-case pump configurations
- Up to 1750 USgpm



FIRESET END SUCTION DIESEL & ELECTRIC

- Deploys a tilted parting design, with the casing of each pump split at a 15° angle. This maximizes efficiency by minimizing turbulence at the impeller eye
- Up to 3000 USgpm



FIRESET HORIZONTAL SPLIT CASE DIESEL & ELECTRIC

- Ideal for applications where space is at a premium. The vertical in-line design saves up to 60% of floor space compared to equivalent horizontal split-case installations
- Up to 1500 USgpm



FIRESET VERTICAL IN-LINE

FIRE PUMPS

- Designed for reliability and low maintenance cost
- Up to 400 USgpm flow; up to 900 ft head
- Temperature: 250°F
- Power: ½ hp to 50 hp
- Size: 1½" to 4"

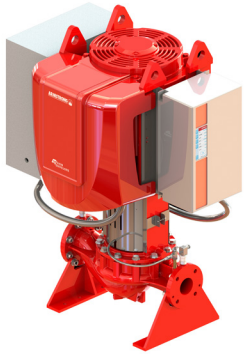
4700 VERTICAL MULTI-STAGE PUMPS



FIRE PUMPS

- Factory-built integrated fire pump unit consisting of pump, driver, and variable speed control unit, configured to maintain the set pressure until the maximum power draw
- Up to 1500 USgpm
- Max. ambient temperature: 50°F+
- Power: 20 hp to 250 hp

DESIGN ENVELOPE FIRE PUMP





FACILITY TYPE
Entertainment

LOCATION
Nairman Point, Mumbai

SIZE
Seven-star multiplex

CASE STUDY | INOX Leisure Limited

This leader in India's cinema industry asked Armstrong to replace four constant-speed pumps with three Design Envelope pumps, and changed their system to use primary-variable control.

HVAC savings as a result of the retrofit project were over $7,900, which represented a 43% decrease in spending year-over-year. The payback period for the investment in energy efficiency was just 1½ years.

ANNUAL ENERGY SAVINGS
43%

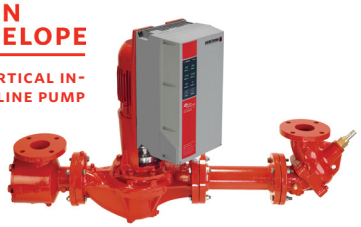
ANNUAL ENERGY COST

BEFORE	AFTER
$18,215 USD	$10,308 USD
AVERAGE	AVERAGE

ANNUAL COST SAVINGS
$7,907 USD

SOLUTION EMPLOYED

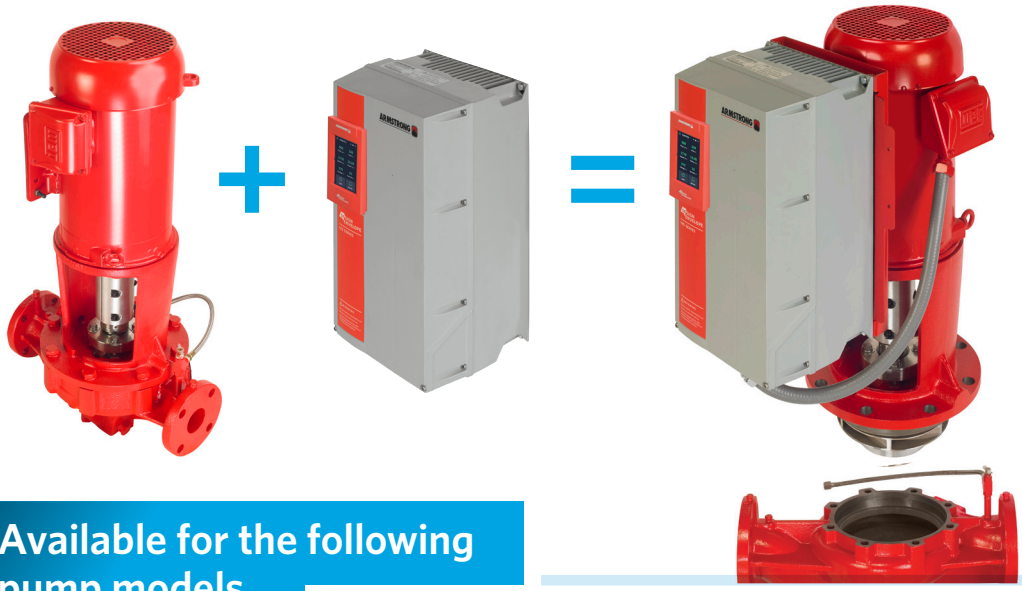
DESIGN ENVELOPE
VERTICAL IN-LINE PUMP



Even the best equipment and installations require attention from time to time. Genuine factory parts keep your Armstrong equipment and systems operating reliably with a long service life — the way they were originally designed for. Call our Field Assistance at +1 416 755 2298 or your local authorized Armstrong Service Dealer.

FEATURE REPLACEMENT PART: DROP-IN UPGRADE

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.

ARMSTRONG PARTS KITS: ENGINEERED AND PRE-ASSEMBLED



Armstrong Parts Kits are engineered combinations of genuine replacement parts — planned, selected and packaged based on solution types and sizes. Use Parts Kits for maintenance projects to add value to your building operators and service personnel.



CASE STUDY | Commercial Towers

FACILITY TYPE
Commercial office tower

LOCATION
Toronto, Ontario

SIZE
18 floors, 20,000 ft² per floor

ANNUAL ENERGY SAVINGS
77%

ANNUAL ENERGY COST

BEFORE	AFTER
$68,185 CAD AVERAGE	$15,918 CAD AVERAGE

ANNUAL COST SAVINGS
$52,267 CAD

The owners of this pair of commercial towers recently completed an HVAC upgrade, replacing three constant speed pumps with new Design Envelope pumps with Cloud Analytics platform.

Along with the energy savings, the Cloud Analytics platform provided system warnings that helped avoid expensive repairs and energy losses.

SOLUTION EMPLOYED
DESIGN ENVELOPE
VERTICAL IN-LINE PUMP



To make sure you get the best possible results from your mechanical room designs and installations we carry an assortment of high-quality ancillary products. By using Armstrong accessories you can be certain no quality low points and operating bottlenecks get in the way of your system performance.

- Multi-function pump fittings that provide a 90° elbow, guide vanes, and an in-line strainer. Suction guides reduce pump installation cost and floor space requirements
- Suitable for all Armstrong commercial pumps and pumping systems
- Size: 1½" to 20"

SUCTION GUIDES

DESIGN ENVELOPE



- Designed to eliminate trapped air and suspended dirt particles associated with the start-up and maintenance of hydronic and HVAC systems

DIRT & AIR SEPARATORS



- Multi-function pump fittings that reduce equipment and installation costs
- Suitable for all Armstrong commercial pumps
- Size: 1½" to 20"

FLO-TREX VALVES

DESIGN ENVELOPE



- Provide automatic glycol make-up for HVAC systems. The specially molded mixing tank offers a compact package with built-in housing for controls and make-up pump
- Suitable for all bladder and compression tanks up to 90 psi (621 kPa) cold-fill pressure

GLYCOL AUTOFILL UNITS



- Designed to reduce tank sizes by up to 80% over standard designs
- Range: AET plain steel expansion tanks: 15 to 525 US gal. capacity; AX diaphragm expansion tanks: 8 to 211 US gal. capacity; Type L bladder type expansion tanks: 10 to 1056 US gal. capacity

EXPANSION TANKS



- ½" to 2" models feature multi-turn adjustment for precise control, hidden memory stops to set balance point and soft seats for positive shutoff
- Temperature: -4°F to 300°F
- Size: ½" to 2"

CIRCUIT BALANCING VALVES (½"–2")



- 2½" to 12" models feature multi-turn adjustment for precise control, hidden memory stops to set balance point and soft seats for positive shutoff
- Temperature: 230°F
- Size: 2½" to 12"

CIRCUIT BALANCING VALVES (2"–12")

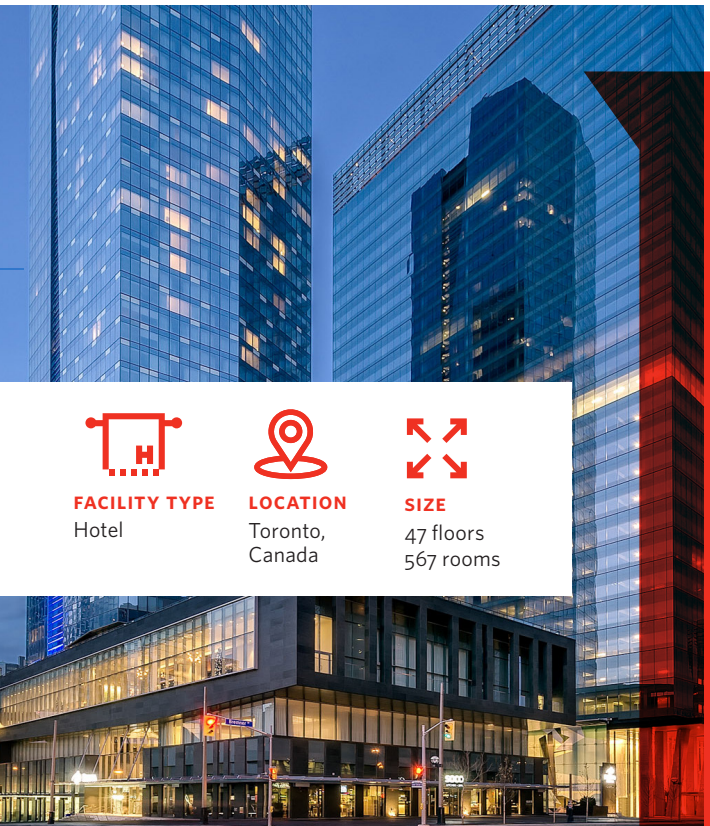


- Built with high-quality materials for premium energy-efficiency and long service life
- Designed for class B temperature rise and equipped with superior class F insulation. Maximum ambient temp 40°C (unless approved differently)
- Power: 0.33 hp to 1250 hp

MOTORS



CASE STUDY | Delta Hotel



FACILITY TYPE
Hotel

LOCATION
Toronto, Canada

SIZE
47 floors
567 rooms

ANNUAL ENERGY SAVINGS
40%

ANNUAL ENERGY COST

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

ANNUAL COST SAVINGS
$1,700 CAD

Delta Hotels Toronto commissioned an upgrade of one of their existing pumps to a new Design Envelope Tango. Energy savings post-installation have proven that the Tango pump was the right choice.

Savings from upgrading just one pump will be over $2,000 per year. Total energy savings will be 22,000 kWh, a 40% improvement.

SOLUTION EMPLOYED
DESIGN ENVELOPE
TANGO PUMPS





Our core expertise of fluid flow, energy transfer, demand-based control and digitalization mitigates risk and reduces complexity. Armstrong harnesses fluid flow and energy transfer expertise to simplify the complexities of a heating and cooling system to deliver resilience.

We then leverage digitalization and demand-based controls to achieve optimal asset utilization and reducing overall construction costs — while maximizing occupant comfort, performance and resiliency throughout the lifecycle of the building.

FLUID FLOW



HEAT TRANSFER



MECHANICAL

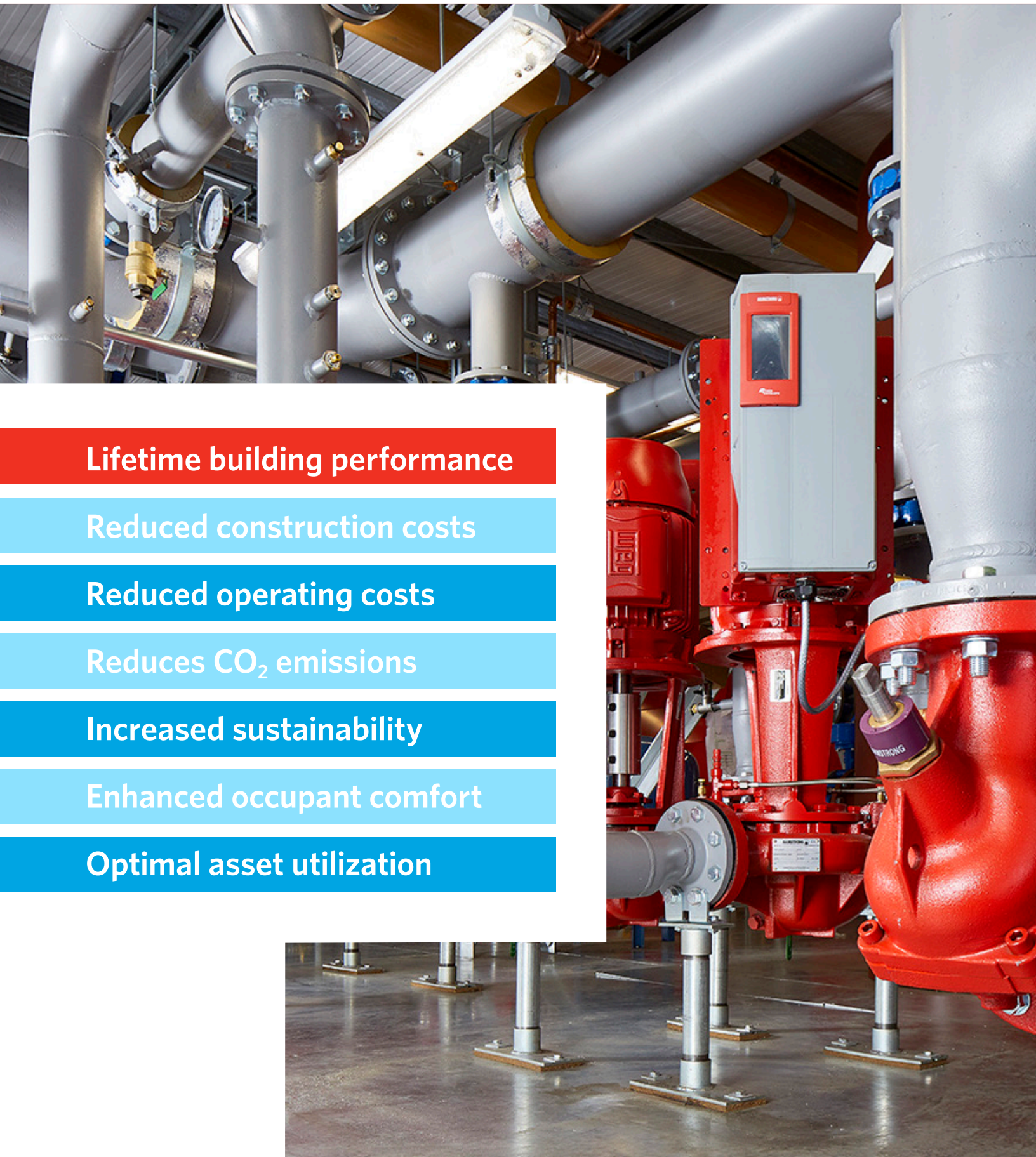
DIGITALIZATION



DEMAND BASED CONTROL



ELECTRONIC



Lifetime building performance

Reduced construction costs

Reduced operating costs

Reduces CO_2 emissions

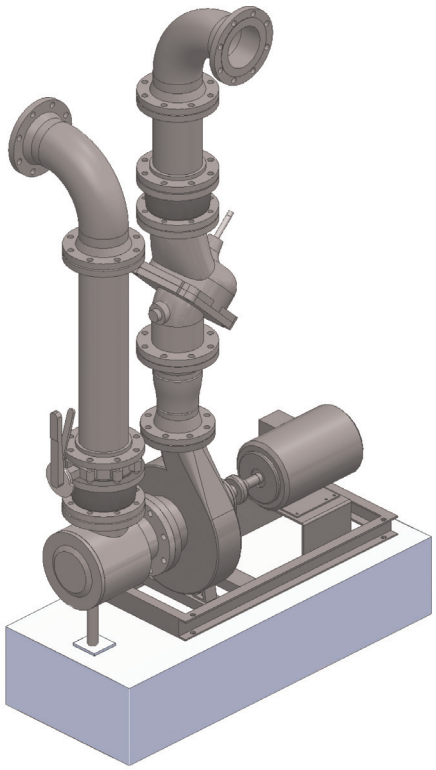
Increased sustainability

Enhanced occupant comfort

Optimal asset utilization

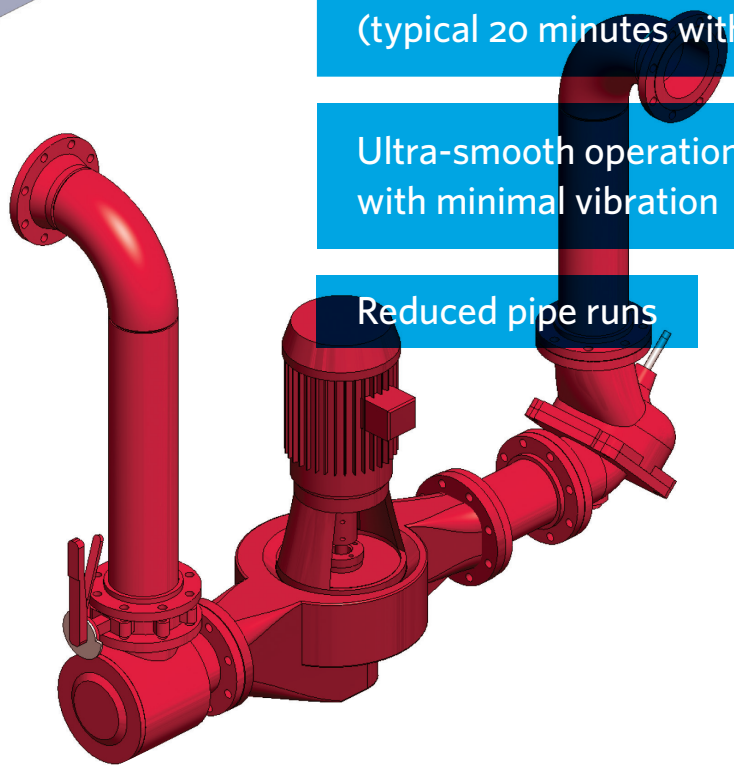
WHY USE VERTICAL IN-LINE (VIL) PUMPS VS. HORIZONTAL DESIGN?

HORIZONTAL DESIGN



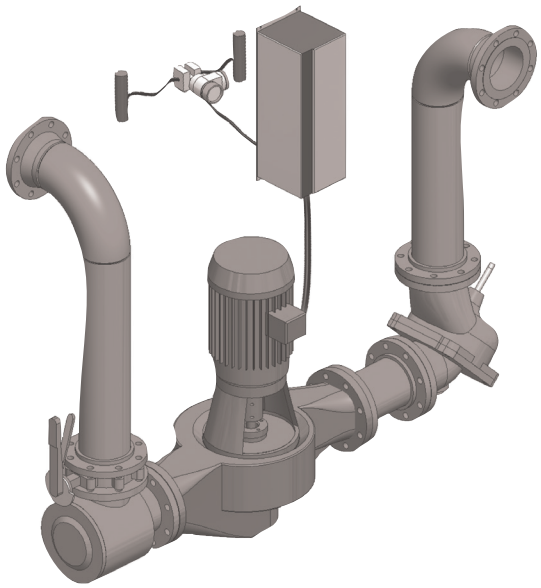
VERTICAL IN-LINE

- Reduced footprint (typically 46% of equivalent horizontal design)
- No requirement for concrete pad
- No requirement for isolation mount and springs
- No requirement for axle alignment after seal change (VIL is self-aligning)
- Rapid seal changes (typical 20 minutes with one person)
- Ultra-smooth operation with minimal vibration
- Reduced pipe runs



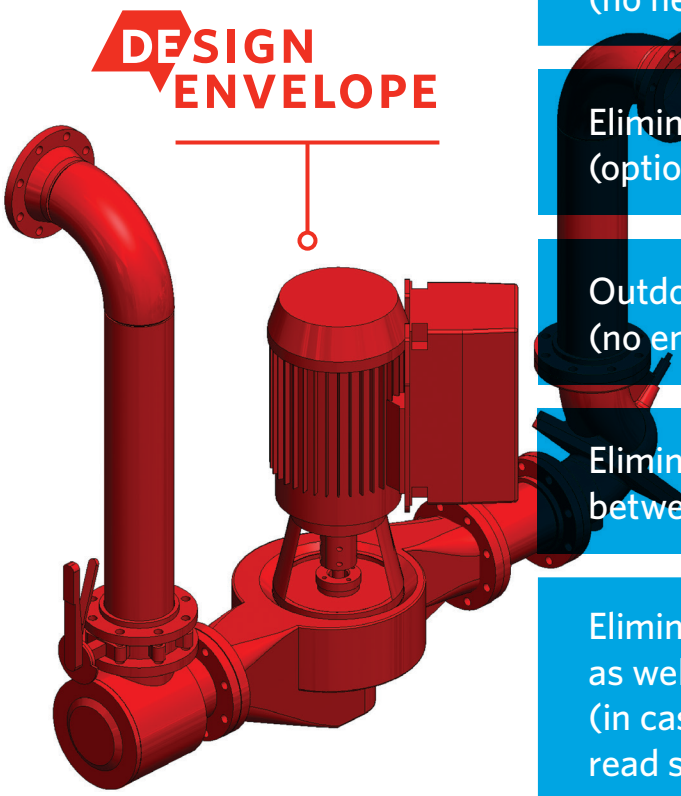
WHY USE DESIGN ENVELOPE INTEGRATED CONTROLS VS. WALL-MOUNTED DRIVES?

WALL-MOUNTED DRIVE



DESIGN ENVELOPE INTEGRATED CONTROLS

- Minimal project and operating risk through three-year warranty on controls and pump
- Single point of supplier accountability
- Factory tested and configured
- Superior energy efficiency and envelope control compared to “non-native” controls (such as wall-mounted drives)
- Integrated 5% line isolation (no need for separate transformer)
- Elimination of grounding rings (optional in case of concern)
- Outdoor option up to 125 HP (no enclosure required)
- Elimination of wiring (power and control) between pump and wall-mounted drive
- Elimination of differential-pressure sensor as well as associated wiring and labor (in case of concern Design Envelope can read sensor input)



What makes Armstrong different?

No other company integrates demand-based controls, heat transfer, fluid flow and variable speed as well as Armstrong, adding value to your project.

Only Armstrong has patented, award-winning, proprietary Parallel Sensorless pumping technology, delivering unmatched efficiency with multiple pumps.

Armstrong's integrated capability offers unmatched scalability and flexibility, opening up significant application opportunities.

Only Armstrong offers intelligent, self-aware and self-optimizing solutions that combine to deliver optimum building performance.

Only Armstrong can deliver both the lowest installed cost AND the lowest operating cost time after time.

Only Armstrong factory tests and programs each unit, resulting in the accuracy and repeatability of all our solutions from custom large plants to small components.

Armstrong is privately held, allowing us to take a long-term perspective on the success of your project.

WHERE TO BUY

Armstrong products, services, and replacement parts are available nationwide from our authorized representatives, distributors, wholesalers, and service dealers.

Visit ArmstrongFluidTechnology.com to find your local representative

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